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Natural Hazard Mitigation Plan for the Old Colony Region



Old Colony Planning Council
70 School Street
Brockton, MA 02301

Notices

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The views and opinions of the Old Colony Planning Council expressed herein do not necessarily state or reflect those of the Federal Emergency Management Agency (FEMA), the Massachusetts Emergency Management Agency (MEMA) or the Massachusetts Department of Conservation and Recreation (DCR).

Acknowledgements

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CHAPTER 1: INTRODUCTION & OVERVIEW

Background

A natural hazard is defined by the Federal Emergency Management Agency (FEMA) as an event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, damage to the environment, interruption of business, or other types of harm or loss.¹ As the costs and seeming frequency of natural disasters continue to rise, governments and citizens must find ways to reduce the risks of natural hazards to our communities. FEMA advocates hazard mitigation planning as a way to reduce or eliminate the long-term risks to human life and property from natural hazards. While hazard mitigation activities may be implemented prior to, during or after an event, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive and long-term plan that is developed before a disaster occurs.²

The Federal Disaster Management Act of 2000 (DMA 2000) established a national program for regional mitigation and streamlined the federal administration of disaster relief. DMA 2000 also mandated that all localities must review and revise their local natural hazard mitigation plans every five years to reflect changes in development, progress in mitigation efforts and changes in priorities. Actively updating the region's plan on a five year cycle will maintain the region's eligibility for specific types of federal funds to implement mitigation activities under the Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA) and Hazard Mitigation Grant (HMGP) programs. To ensure that each community in the state develops a hazard mitigation plan, the Massachusetts Emergency Management Agency (MEMA) partners with the 14 Regional Planning Agencies (RPAs) throughout the state to develop and implement regional and local multi-hazard mitigation plans by providing technical assistance. RPAs exist to help the communities within their jurisdictions plan and implement short and long-range improvements for transportation, economic development, environmental, land use, and community development needs.

This plan is the update of the 2006 Old Colony Planning Council Regional Multi-Hazard Pre-Disaster Mitigation Plan, which included an annex for each of the 15 communities in the Old Colony region. The 2006 Old Colony Regional Multi-Hazard Pre-Disaster Mitigation Plan has been converted into a Multi-Jurisdictional Plan during this update and includes information on 15 of the 16 communities in the region. (NOTE: At the time of the grant award to update this plan, the Town of Duxbury was not a member of the Old Colony Planning Council (OCPC); therefore it is not considered part of the region nor was it included in this plan. The town does have a current Hazard Mitigation Plan however, as the Metropolitan Area Planning Council (MAPC) completed a plan for Duxbury in 2010.) Where applicable, text from the 2006 plan was used, although the updated plan has been reorganized and updated to reflect revised FEMA requirements as well as the most recent data and information. Each section of the plan was reviewed, reorganized and updated as part of the 2013 update, which included updating the planning process, hazard identifications, community risk assessments and mitigation action items.

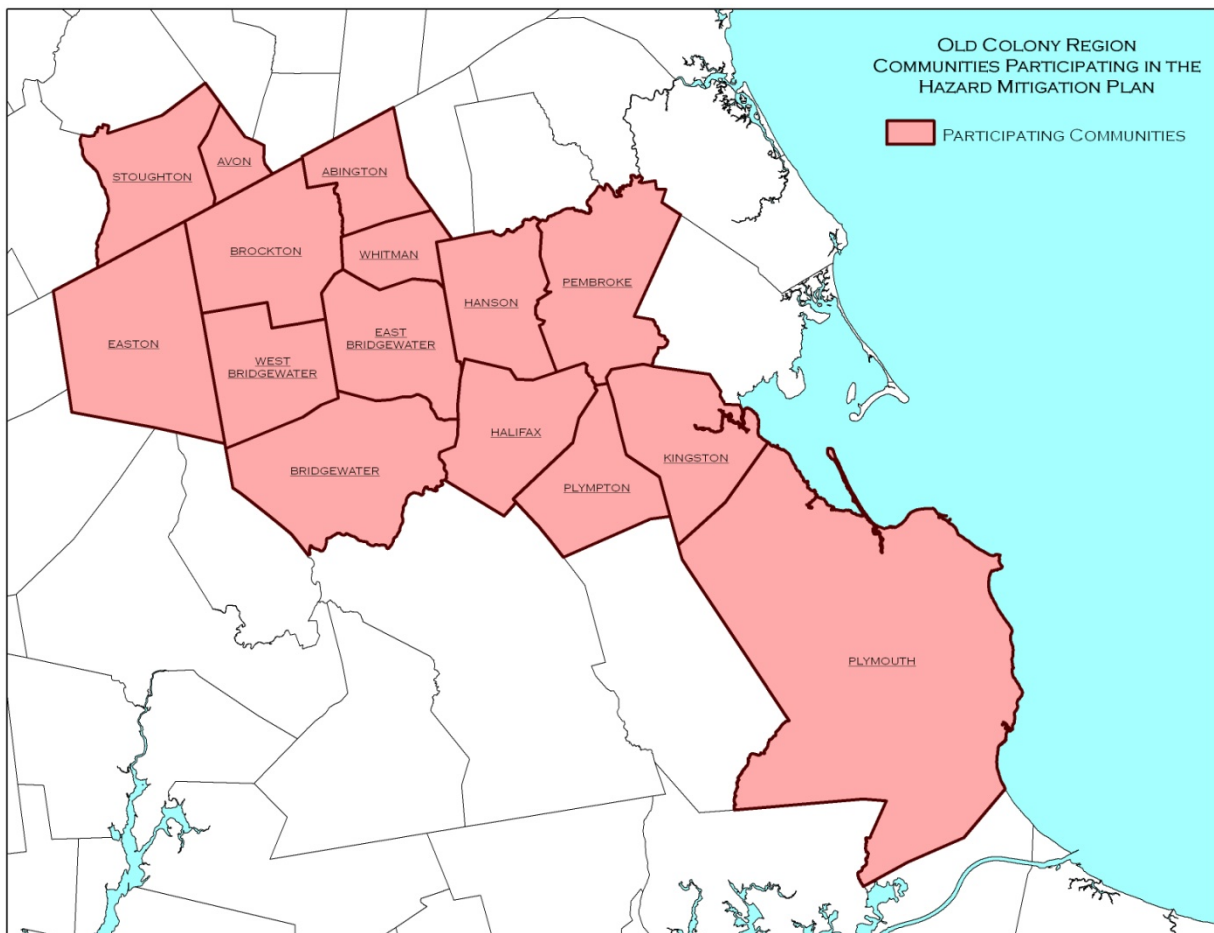
¹ Federal Emergency Management Agency. (1997). *Multi Hazard Identification and Assessment*. Washington, D.C.

² Federal Emergency Management Agency. (2011). *Local Mitigation Plan Review Guide*. Washington, D.C.

Geographic Scope

This plan covers the 344 square mile Old Colony Planning Council region in Southeastern Massachusetts. The region consists of a band of fifteen communities running northwest to southeast from Brockton and Stoughton along Route 24 in the northwestern part of the region down to Plymouth and Kingston along Route 3 and the Atlantic Ocean in the southeastern part of the region. The region is situated south of the metropolitan concentration of activity and population around Boston and Cambridge, but is oriented towards that center and largely cuts across the north-south transportation lines between Greater Boston and the rest of Southeastern Massachusetts. The Old Colony region's terrain consists of generally low and gently rolling glaciated land with many drumlins, eskers and other glacial features, as well as a generally north-south drainage system and extensive wetlands including the Hockomock Swamp in parts of Bridgewater, Easton and West Bridgewater and the Great Cedar Swamp in Halifax and Hanson. All fifteen communities chose to participate in this plan update. Those communities include: Abington, Avon, Bridgewater, Brockton, East Bridgewater, Easton, Halifax, Hanson, Kingston, Pembroke, Plymouth, Plympton, Stoughton, West Bridgewater and Whitman.

**Figure 1: Communities Participating in the Old Colony Region
Natural Hazard Mitigation Plan**



Community Involvement

Each of the participating communities was involved in a number of ways during the update of this plan. Each community was expected to participate in the plan's development by attending some, if not all, of the three regional planning meetings. In addition, a minimum of two meetings were held in each participating community. At least one working meeting was held in each community with emergency responders, planners, administrators and public works staff from the community to gather and update information. The second meeting will be a public meeting in front of the governing body for each community to present the plan and ask for the communities' adoption of the plan. Two regional public outreach meetings were also held, one each in Brockton and Plymouth as well as three public meetings at the Old Colony Planning Council office in Brockton for further public input on the development of the plan. Additionally a short survey was developed to assist in understanding the public's natural hazard concerns. Lastly, a draft copy of the plan was available on the OCPC website as well at the OCPC office for a 75 day public review and comment period. The Draft Old Colony Region Natural Hazard Mitigation Plan 75 day public review and comment period ran from September 24, 2012 through December 7, 2012. This public review and comment period afforded not only communities participating in the plan to comment on the final draft, but also afforded neighboring communities and interested agencies and organizations an opportunity to comment on the plan. Notice of the comment period was advertised in two local newspapers-the Brockton Enterprise and the Patriot Ledger. The circulation areas of these two newspapers not only cover the communities participating in the plan, but also all neighboring communities. The Brockton Enterprise is considered a newspaper of record for Brockton and many nearby towns in northern Bristol and Plymouth counties, and southern Norfolk County, whereas the Patriot Ledger covers Abington, Braintree, Canton, Carver, Cohasset, Duxbury, Halifax, Hanover, Hanson, Hingham, Holbrook, Hull, Kingston, Marshfield, Milton, Norwell, Pembroke, Plymouth, Quincy, Randolph, Rockland, Scituate, Sharon, Stoughton, Weymouth and Whitman. In addition, the plan was also posted on the OCPC website as well as the OCPC Facebook and Twitter accounts.

CHAPTER 2: PLANNING PROCESS

Coordinating Role of the Regional Planning Agency

Old Colony Planning Council (OCPC) was established as a governmental entity under state statute in 1967 as a comprehensive planning agency to provide regional land use, transportation and environmental planning expertise to the one city and fourteen towns in its defined region. As a regional planning agency OCPC has conducted a number of transportation, economic development, environmental and land use studies.

OCPC was awarded a grant from FEMA to develop this Multi-Jurisdictional Hazard Mitigation Plan. The grant is administered through MEMA via a planning grant agreement between OCPC and MEMA. OCPC worked with the participating communities and coordinated the development of this plan.

Planning Process

At the commencement of the planning process, OCPC consulted with hazard mitigation staff from both MEMA and the Massachusetts Department of Conservation and Recreation (DCR) in regards to the development and organization of the plan. OCPC staff reviewed MEMA and FEMA guidance on how to develop a plan as well as the regulations that guide the development of the plan.

OCPC began the process by re-establishing the regional Multi-Hazard Community Planning Team (MHCPT) and required that each participating community designate a primary contact for all correspondence. This follows the Direct Representation Model as suggested in FEMA guidance for multi-jurisdictional plans. The primary contact in each community would be responsible for attending planning meetings, guiding decisions about the contents of the plan in relation to FEMA guidance and for reviewing staff prepared documents. It is expected that members of the MHCPT will remain the same during each stage (monitoring, evaluation and update) of the next 5-year planning cycle.

Over a series of three MHCPT meetings held on April 25, 2011, November 15, 2011 and September 24, 2012 a number of topics were discussed including the what, why and how of hazard mitigation, the current planning process, the findings of the 2006 Old Colony Regional Multi-Hazard Pre-Disaster Mitigation Plan and existing protection and mitigation measures. The members of the MHCPT are shown on Table 1.

Table 1: Multi-Hazard Community Planning Team

Community	Name	Position
Abington	David Majenski	Police Chief
Abington	Christopher Cutter	Deputy Police Chief
Avon	Robert Spurr	Fire Chief
Bridgewater	John H. Mitchell	Emergency Management Director of Operations
Brockton	Donald Gazerro	Fire Department
Brockton	Morton Schleffer/Steve Hooke	Emergency Management Director
East Bridgewater	David Repeta	Fire Department Lieutenant
Easton	Kevin Partridge	Fire Chief

Community	Name	Position
Halifax	William Carrico II/Jason Viveiros	Fire Chief
Hanson	Jerome A. Thompson, Jr.	Fire Chief
Kingston	Robert T. Heath	Fire Chief
Pembroke	J. Michael Hill	Co-Emergency Management Director
Pembroke	Richard Wall	Co-Emergency Management Director
Plymouth	Aaron Wallace	Emergency Management Director
Plympton	Patrick S. Dillon	Police Chief
Stoughton	Mark Dolloff	Fire Chief
West Bridgewater	Leonard Hunt	Fire Chief
Whitman	Timothy J. Grenno	Fire Chief

While these MHCPT meetings were occurring, OCPC staff involved the public by holding a series of public meetings to engage and educate the public on the importance of mitigation planning. A list of these meetings can be found in Table 2. Copies of meeting agendas and presentations made at these and the MHCPT meetings can be found in Appendix 1.

Table 2: Public Meetings

Date	Location	Venue
March 28, 2012	Old Colony Planning Council	Old Colony Planning Council Delegates Meeting
April 12, 2012	Old Colony Planning Council	Joint Transportation Committee (JTC) Meeting
April 30, 2012	Brockton Public Library-Main Branch	Hazard Mitigation Regional Public Meeting
May 9, 2012	Plymouth Public Library-Main Branch	Hazard Mitigation Regional Public Meeting
September 17, 2012	Old Colony Planning Council	Comprehensive Economic Development Strategy (CEDS) Committee Meeting

In addition to the public meetings listed above, the public also had the opportunity to participate in the hazard mitigation planning process via the Old Colony Hazard Mitigation Plan Survey. The survey was another opportunity for the public to comment on the hazard mitigation planning process. The information provided assisted us in understanding the public's hazard concerns and assisted us in developing mitigation activities to lessen the impact of future hazard events. The survey was available via the OCPC website at http://www.ocpcrpa.org/hmp_survey.html as well as in hardcopy form at our offices and at all public outreach events. Although the response rate was low, the information collected was helpful in the development of the plan. The survey and the responses can be found in Appendix 2. OCPC also kept the public informed through its website (www.ocpcrpa.org/hmp.html), which solicited ideas from the public as well as made a draft plan available for review.

In addition to the public meetings listed above, OCPC staff met with officials in each of the 15 communities, as shown in Table 3. Meetings were attended by the MHCPT members in each community as well as by other key municipal officials, when possible, including: emergency management directors, city/town planners, police and fire chiefs, public works directors, health

agents, building inspectors, city/town engineers and other interested parties. The following topics were discussed at each meeting:

- Overview of the Project & Grant Opportunities
- Updating the List of Critical Facilities
- Creating a List of Flood-Prone Areas
- Updating the Existing Protection Measures
- Creating a List of Mitigation Projects Completed Since the Last Plan
- Updating the List of Hazard Mitigation Plan Projects & Strategies

Table 3: Community Meetings

Date	Location
July 21, 2011	Plymouth Emergency Operations Center
September 16, 2011	Halifax Fire Department
September 20, 2011	Plympton Highway Department
September 28, 2011	Hanson Town Hall
January 10, 2012	Brockton City Hall
January 31, 2012	Plympton Highway Department
February 6, 2012	Avon Fire Department
February 28, 2012	East Bridgewater Town Hall
March 6, 2012	Easton Town Hall
March 14, 2012	Kingston Fire Department
March 22, 2012	Whitman Fire Department
April 19, 2012	Stoughton Fire Department
May 7, 2012	Bridgewater Academy Building
May 8, 2012	Brockton City Hall
May 15, 2012	Avon Fire Department
June 4, 2012	Stoughton Town Hall
June 14, 2012	Pembroke Town Hall
June 27, 2012	Abington Police Department
August 14, 2012	West Bridgewater Town Hall

Shortly after the release of the draft plan a number of organizations throughout the region were invited to review the draft plan and provide comments. A list of these organizations can be found in Appendix 3. All comments received from these organizations, as well as from the public at large will be incorporated into this plan where appropriate.

The intent of this hazard mitigation plan is to describe the existing conditions cited in previous work, to compliment and augment past efforts, all while meeting the requirements of a hazard mitigation plan as outlined by FEMA in the Federal Disaster Mitigation Act of 2000 (DMA 2000). It should be noted that during the development of this plan OCPC staff and the local communities reviewed local plans, bylaws, and reports to assist in this plan update. In addition to the review of these many plans and documents, a great deal of the technical information for this plan came from meetings with community staff and the public.

CHAPTER 3: REGIONAL PROFILE

The Old Colony region is comprised of the City of Brockton and fourteen towns - Abington, Avon, Bridgewater, East Bridgewater, Easton, Halifax, Hanson, Kingston, Pembroke, Plymouth, Plympton, Stoughton, West Bridgewater and Whitman – and has a land area of approximately 344 square miles. The City of Brockton and the Town of Plymouth anchor the northern and southern ends of the region respectively. According to the 2010 U.S. Census, the region had a population of 333,468, an increase of 3.7% since 2000. The rate of growth between 2000 and 2010 was one-third of what the region experienced between 1990 and 2000.

The region is located in the southeastern section of Massachusetts, with its eastern-most communities located along the Atlantic Ocean. The City of Brockton is located 20 miles south of the City of Boston, 24 miles northwest of Plymouth and 30 miles east of Providence, Rhode Island. The Town of Plymouth is located 24 miles southeast of Brockton, 37 miles southeast of Boston and 44 miles east of Providence, Rhode Island.

Geographically the region's fifteen communities can be categorized into three areas:

- Greater Brockton (Abington, Avon, Bridgewater, Brockton, East Bridgewater, Easton, Stoughton, West Bridgewater, and Whitman)

This relatively developed area has many streams, scattered, often man-made ponds, and commonly tight glacial soils. While the extensive drainage system has many streams, none are very large because the communities are close to the headwaters of several basins. Though the streams are small, some segments are confined to narrow walled channels to protect nearby buildings. This leaves no room for safe flooding and informal flood storage. Thus streams can overflow during storms into nearby developed areas. The area also has many sections with relatively tight soils limiting on-site disposal opportunities and groundwater yields.

- Lake Communities (Hanson, Halifax, Pembroke, and Plympton)

This area has a range of tight wetlands soils and porous areas of sand and gravel, with many lakes and ponds and few major streams.

- South Coast (Kingston and Plymouth)

This area has porous sandy soils and many ponds. It supports few streams of any size since the coarse soils and irregular terrain absorb most of the rainfall before it can run off. Surface water in this area consists of frequent lakes and ponds, many of them consisting of exposed groundwater.

Population & Housing

Brockton is the most populated community in the region, accounting for approximately 28% of the region's population and also has the region's highest population density as well, with approximately 4,356 persons per square mile. Brockton, along with the three other communities

with population densities over 1,000 persons per square mile—Abington, Stoughton and Whitman, collectively account for 45% of the region’s population. While the population density is highest in the northern end of the region, much of the region’s growth over the past two decades has occurred in the southeastern half of the region, where many communities grew by over six percent. Communities in the northwestern half experienced substantially less growth during this same time period. Areas in the southeastern half of the region generally have had more available developable land, where a substantial amount of subdivisions and low-density, large-lot development has occurred. Table 4 summarizes the region’s population characteristics.

Table 4: 2000 and 2010 Population in the Old Colony Region³

Community	2000 Population	2010 Population	% Change
Abington	14,605	15,985	9.45%
Avon	4,443	4,356	-1.96%
Bridgewater	25,185	26,563	5.47%
Brockton	94,304	93,810	-0.52%
East Bridgewater	12,974	13,794	6.32%
Easton	22,299	23,112	3.65%
Halifax	7,500	7,518	0.24%
Hanson	9,495	10,209	7.52%
Kingston	11,780	12,629	7.21%
Pembroke	16,927	17,837	5.38%
Plymouth	51,701	56,468	9.22%
Plympton	2,637	2,820	6.94%
Stoughton	27,149	26,962	-0.69%
West Bridgewater	6,634	6,916	4.25%
Whitman	13,882	14,489	4.37%
Total	321,515	333,468	3.71%

The total number of housing units in the region increased from 118,300 in 2000 to 128,081 units in 2010, an increase of 9,781 units or 8.7%. While Brockton accounted for the largest share of housing units in the region, its percentage of housing stock in the region decreased slightly from 29.5% in 2000 to 27.8% in 2010. In 2010, 6.7% of the total housing units were vacant in the region, with Plymouth having the highest rate of vacant units at 14.2%. In terms of housing density, Abington, Brockton, Stoughton and Whitman were the only communities in 2010 that had more than 600 housing units per square mile. Table 5 provides population and housing density data for the region as well as for each community.

Table 5: Housing and Population Density in the Old Colony Region⁴

Community	Population	Housing Units	Area (Sq. Mile)	Population Density (Per Sq. Mile)	Housing Unit Density (Per Sq. Mile)
Abington	15,985	6,377	10.19	1,568.70	625.81
Avon	4,356	1,769	4.54	959.47	389.65
Bridgewater	26,563	8,336	28.36	936.64	293.94
Brockton	93,810	35,552	21.52	4,359.20	1,652.05

³ Massachusetts 2010 Census Official Population Numbers: <http://www.sec.state.ma.us/census/>

⁴ United States Census Bureau American Fact Finder: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>

Community	Population	Housing Units	Area (Sq. Mile)	Population Density (Per Sq. Mile)	Housing Unit Density (Per Sq. Mile)
East Bridgewater	13,794	4,906	17.54	786.43	279.70
Easton	23,112	8,155	29.23	790.70	278.99
Halifax	7,518	3,014	17.39	432.32	173.32
Hanson	10,209	3,589	15.73	649.02	228.16
Kingston	12,629	5,010	19.00	664.68	263.68
Pembroke	17,837	6,552	23.55	757.41	278.22
Plymouth	56,468	24,800	102.77	549.46	241.32
Plympton	2,820	1,043	15.11	186.63	69.03
Stoughton	26,962	10,787	16.47	1,637.04	654.95
West Bridgewater	6,916	2,669	15.67	441.35	170.33
Whitman	14,489	5,522	6.96	2,081.75	793.39
Total	333,468	128,081	344.03	969.30	372.30

Land Use Characteristics

The Old Colony region and the surrounding areas in Southeastern Massachusetts are part of the Northeast Coastal Lowlands/Coastal Plain region. This reflects the recession of the last glaciers 12,000 years ago. Thus the area is characterized by low oval hills generally oriented north-south (drumlins), pockets of highly porous soils and major sand and gravel deposits, many swamps, rivers and ponds including un-drained kettle holes, and many areas with a high water table.

Approximately 26% of the Old Colony region is developed, primarily for residential purposes. Brockton itself is the most developed community, with 47% of its land devoted to residential use. Plympton on the other hand is the least developed community, with only 11% of its land devoted to residential use. The continuing pattern of low density residential development of outlying areas and the scattering of non-residential uses (commonly referred to as “sprawl”) causes a variety of negative impacts on the region, including:

- Increased consumption of land
- Additional trips on the transportation network, contributing to increased congestion and pollution
- Increased demand for transportation improvements
- Decreased feasibility of mass transit

Figure 2 displays the land use in the region by percentage. Table 6 displays the land use percentage and acreage for each community.

Figure 2: Regional Land Use

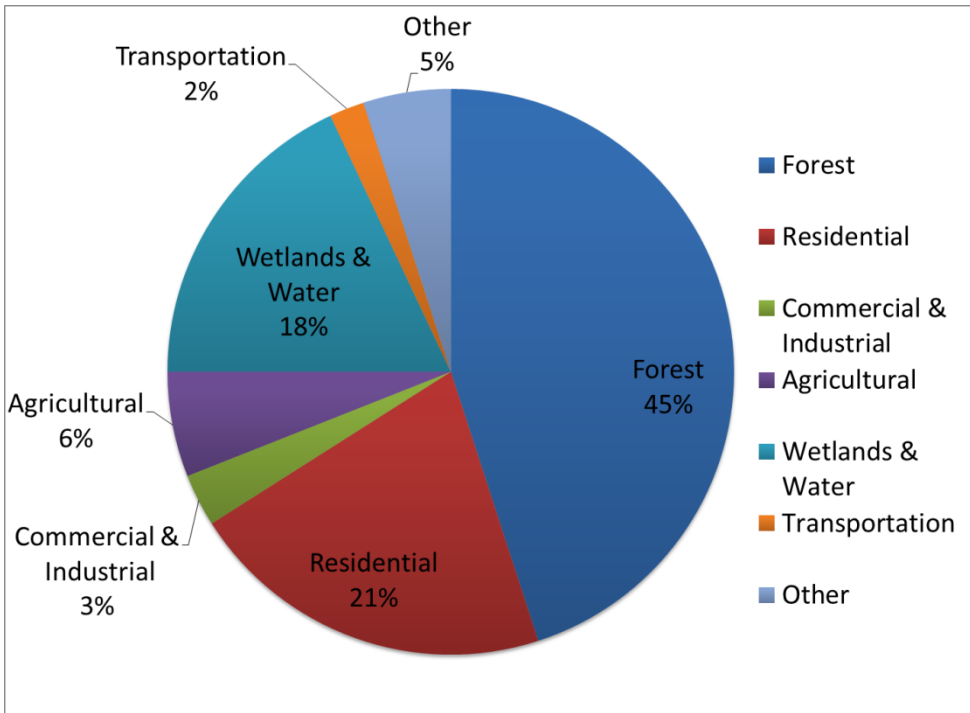


Table 6: Land Use by Community⁵

Community	FOREST		RESIDENTIAL		COMMERCIAL & INDUSTRIAL		AGRICULTURAL		WETLANDS & WATER		TRANSPORTATION		OTHER		TOTAL
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres
Abington	2365.5	36.32%	2240.7	34.40%	322.8	4.96%	86.5	1.33%	1034.0	15.87%	208.6	3.20%	255.4	3.92%	6513.5
Avon	1079.3	37.24%	656.7	22.66%	454.0	15.66%	34.0	1.17%	452.9	15.63%	115.9	4.00%	105.2	3.63%	2898.0
Bridgewater	6484.5	35.73%	3666.8	20.21%	373.9	2.06%	1729.8	9.53%	4435.4	24.44%	342.8	1.89%	1114.4	6.14%	18147.6
Brockton	2813.2	20.44%	6410.6	46.57%	1698.8	12.34%	117.6	0.85%	1036.8	7.53%	326.5	2.37%	1363.1	9.90%	13766.6
East Bridgewater	4596.5	40.95%	2619.0	23.33%	259.7	2.31%	613.6	5.47%	2310.1	20.58%	134.0	1.19%	692.7	6.17%	11225.5
Easton	8358.9	44.69%	3775.9	20.19%	440.4	2.35%	933.5	4.99%	4337.8	23.19%	140.8	0.75%	717.7	3.84%	18705.1
Halifax	3076.8	27.67%	1654.8	14.88%	128.9	1.16%	1841.0	16.56%	3987.6	35.86%	82.3	0.74%	347.4	3.12%	11118.8
Hanson	4146.1	41.20%	2155.4	21.42%	132.6	1.32%	638.2	6.34%	2645.3	26.29%	105.6	1.05%	239.9	2.38%	10063.1
Kingston	5653.9	46.61%	2518.7	20.76%	405.9	3.35%	587.2	4.84%	1958.5	16.14%	344.9	2.84%	661.4	5.45%	12130.5
Pembroke	6162.5	40.95%	3210.6	21.34%	383.8	2.55%	665.2	4.42%	4035.3	26.82%	68.1	0.45%	522.7	3.47%	15048.1
Plymouth	41523.1	63.36%	8755.5	13.36%	1065.9	1.63%	2668.0	4.07%	5706.7	8.71%	1900.9	2.90%	3913.5	5.97%	65533.5
Plympton	3966.0	41.11%	1022.1	10.59%	47.6	0.49%	1233.7	12.79%	2908.2	30.14%	102.6	1.06%	367.9	3.81%	9648.0
Stoughton	4333.0	41.18%	3314.0	31.49%	787.0	7.48%	134.4	1.28%	1304.0	12.39%	145.6	1.38%	504.6	4.80%	10522.4
West Bridgewater	2887.0	28.78%	1513.0	15.08%	449.5	4.48%	1049.0	10.46%	3487.4	34.77%	209.9	2.09%	435.2	4.34%	10031.0
Whitman	1269.5	28.52%	1618.6	36.37%	256.8	5.77%	71.8	1.61%	900.0	20.22%	75.4	1.69%	258.5	5.81%	4450.6

⁵ Office of Geographic Information (MassGIS)

Transportation Network

The Old Colony region is served mainly by three limited access highways, Route 3, Route 24, and Interstate 495. Route 3 and Route 24 are limited access state highways that provide north-south access. Interstate 495 which runs concentrically around Boston and the Route 128 ring, skirts Bridgewater in the southwestern part of the region and provides access to Cape Cod to the southeast and to Interstate 90 (the Massachusetts Turnpike) to the northwest. Route 24 provides access to Fall River and New Bedford to the south and to Interstate 93 and Boston to the north. Route 3 provides access to Cape Cod to the south and connects to Interstate 93 and Boston to the north. North-south travel is also served by local routes 3A, 18, 28, and 138, which offer alternatives to the limited access routes during times of congestion. These state route corridors are mainly two-lane highways that traverse suburban and rural areas connecting community and urban centers. Retail and commercial land uses are interspersed throughout these two lane highway corridors, especially in the vicinity where these state routes connect to the limited access highways.

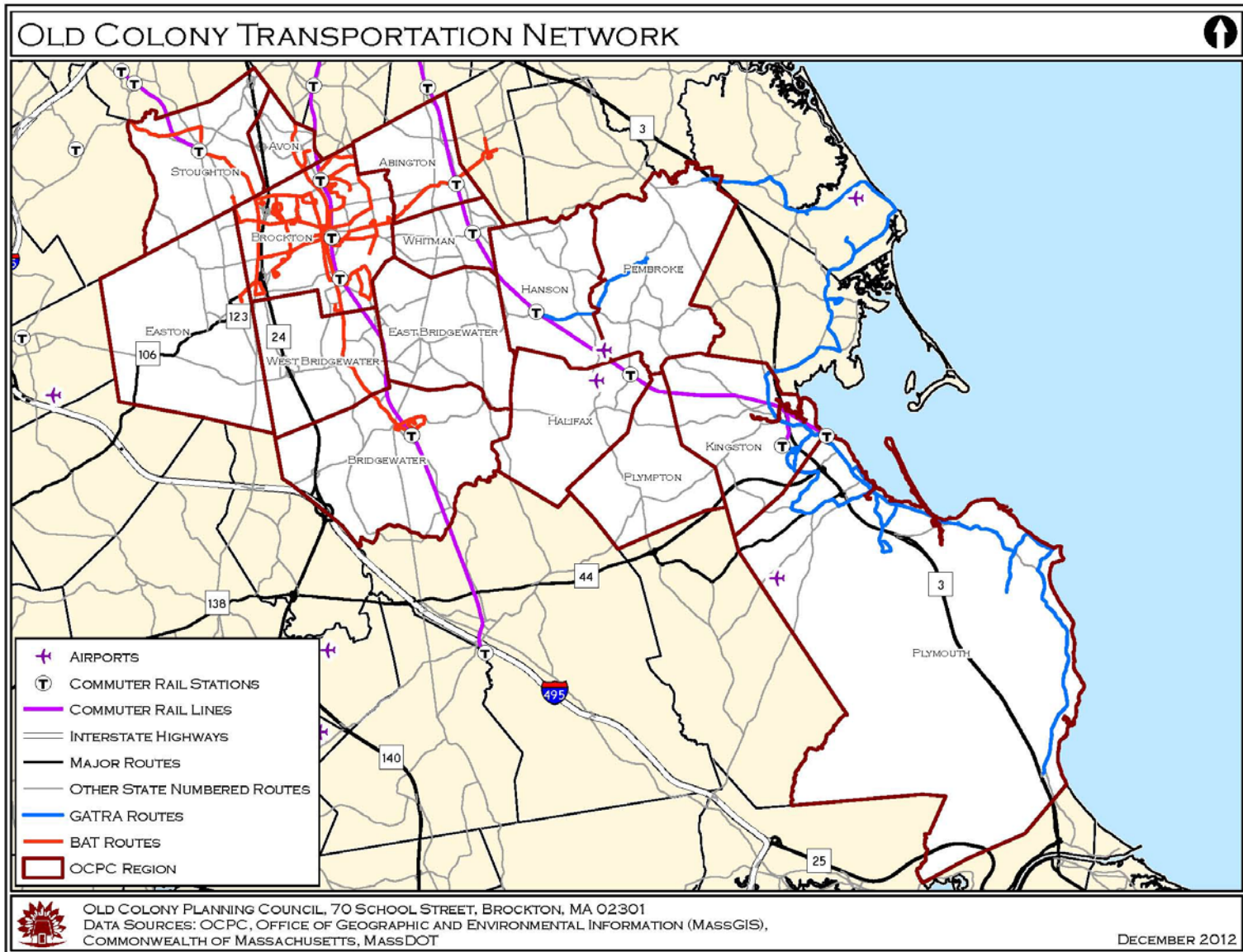
The east-west highways in the region are mainly two-lane state routes. Routes 27 and 106 are important east-west highways in the region with Routes 14, 44, 104, 123, and 139 also serving as east-west routes. The reconstruction and relocation project of Route 44, which was completed in 2005, has added a limited access, high-speed connection (with increased capacity) between Route 3 and Route 24. Other planned projects, such as the widening of Route 106 in West Bridgewater and Route 104 in Bridgewater, will also improve east-west travel in the region.

The Old Colony region is also fortunate to be served by two regional transit agencies as well as the MBTA Commuter Rail. The Brockton Area Transit (BAT) Authority is a regional transit agency based in Brockton that serves ten communities in the northern half of the region. The Greater Attleboro Taunton Regional Transit Authority (GATRA) is a regional transit agency based in Taunton that serves four communities in the southern half of the region. The MBTA Commuter Rail serves most of the region with 11 stations in nine communities.

The Old Colony region also has three local airports, the Cranland Airport in Hanson, the Monponsett Pond Seaplane Base in Halifax and the Plymouth Municipal Airport in Plymouth. While each of these airports offer a variety of airplane-related services (flight training schools, airplane mechanic shops, etc.) they do not provide commercial passenger service.

Figure 3 depicts the transportation network in the Old Colony region.

Figure 3: Transportation Network in the Old Colony Region



Water Resources

The Old Colony region has a variety of water resources within its borders, including a number of rivers and streams, lakes and ponds, wetlands as well as approximately 49.3 miles of coastline.

Most of the region is drained by the Taunton River and its tributaries with approximately 18 smaller rivers streams and brooks flowing into it. The Taunton River is the largest river in the region, running more than 37 miles from its headwaters at the confluence of Matfield and Town Rivers in Bridgewater to Mount Hope Bay. The region is also drained by three other watersheds, including the Neponset Watershed, which drains the northern parts of Avon and Stoughton; the South Coastal Watershed, which drains parts of Abington, Hanson, Pembroke, Kingston, Plympton and Plymouth; and the Buzzards Bay Watershed, which drains the western part of Plymouth.

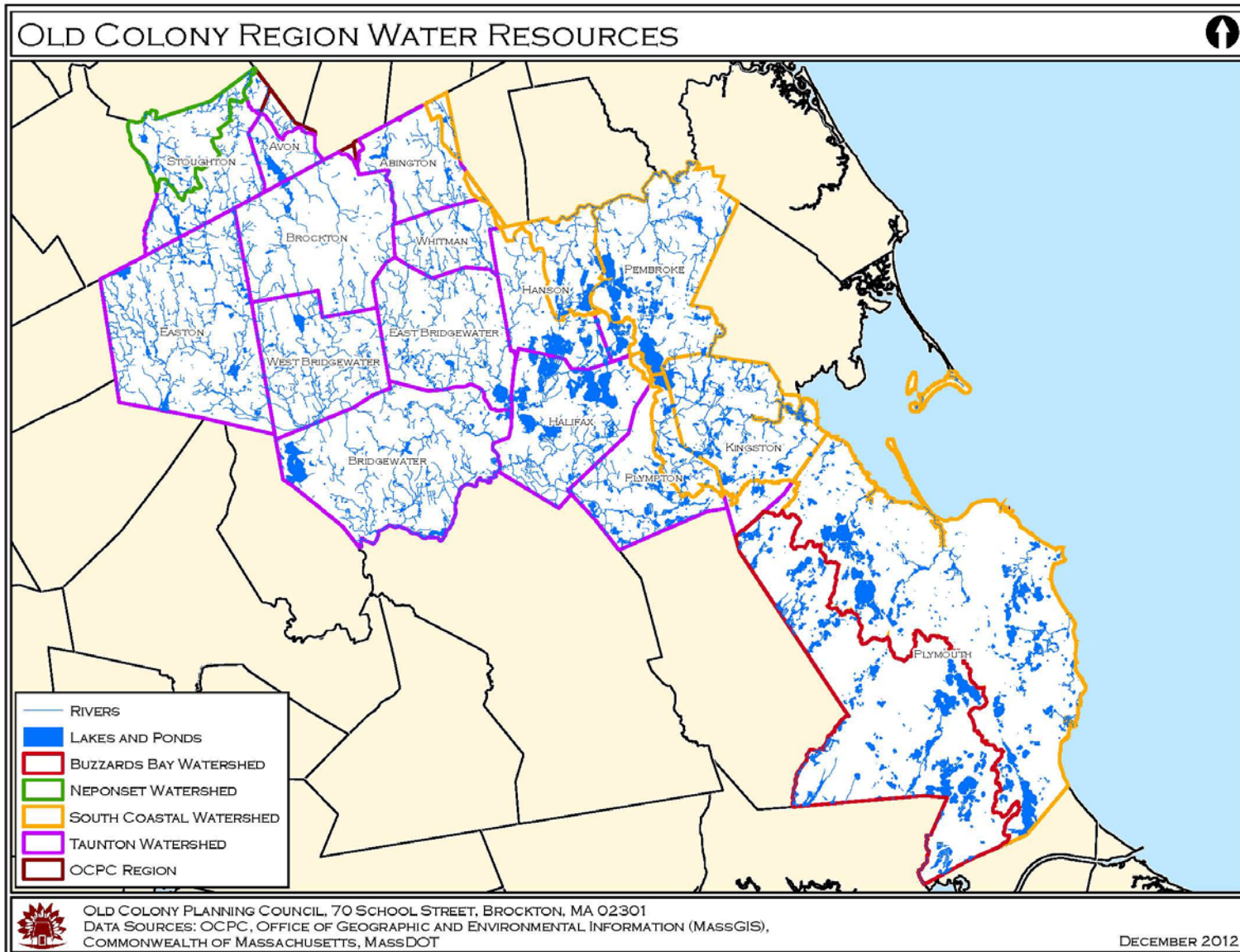
The region also has a number of lakes and ponds. Some are natural glacial products, while others are impoundments made for power and water supplies. Major lakes and ponds in the region include the 640 acre Silver Lake in Kingston, Halifax, Pembroke and Plympton, the 528 acre East and West Monponsett Ponds in Halifax, the 376 acre Great Herring Pond in Plymouth and the 354 acre Lake Nippenicket in Bridgewater.

In addition to the water resources mentioned above, the Old Colony region is also home to a vast amount of wetlands. More than 18% of the region rests in either a wetland or waterbody. The largest wetland area in the region is the 16,950 acre Hockomock Swamp Area of Critical Environmental Concern (ACEC), of which parts are located in portions of the Old Colony communities of Bridgewater, Easton and West Bridgewater. Another large wetland area in the region is the 1,625 acre Burrage Pond Wildlife Management Area located in Halifax and Hanson.

The communities of Kingston and Plymouth are the only two coastal communities in the region and when combined, they have approximately 49.3 miles of Atlantic Ocean shoreline. Most of the shoreline is low-lying, except for bluffs along the coast south of the Manomet section of Plymouth. The shoreline is mostly 20'-30' mean sea level (msl) but reaches 70' msl at Fishermans Landing south of Manomet Point and 120'-130' msl at Nameloc Heights at the far southern end of the town.

Figure 4 depicts the water resources in the Old Colony region.

Figure 4: Water Resources in the Old Colony Region



Employment

Employment in the region has been adversely impacted since the most recent national recession began in December 2007. The recession's full impact on the region's employment was not felt until 2009 and 2010, when the region's average annual unemployment rate climbed from 5.6% in 2008 to 8.6% in 2009 and 8.7% in 2010, with unemployment peaking in January 2010 at 10.2%. Brockton was hit particularly hard by the recession as the average annual unemployment rate was over 10% for three straight years (2008-2010), with it peaking at 12.3% in January 2010.⁶

While the economy has begun to recover and the unemployment rates have started to drop, the unemployment rate is still at pre-December 2007 recession levels, with the region's average annual unemployment rate dipping to 7.7% in 2011 and to 6.5% as of September 2012.⁷ While still severe, unemployment rates in both the region and Massachusetts have been able to recover quicker than in other parts of the country.

In addition to the fluctuating unemployment rates in the region over the past half-decade, the employment sectors in the Old Colony region have also been changing, except they have evolved over a number of decades. The manufacturing industry, particularly the shoe manufacturing industry, was once the dominant employment force in the region, with Brockton being once known as the "Shoe Capital of the World". Today most of the employment in the region is in the managerial and professional, sales and office, and service based industries. The current economy in the Old Colony region focuses on a wide variety of sectors, including retail, education, healthcare, agriculture, tourism and to a much lesser extent than in the past, manufacturing.

Table 7 shows the number of employed persons by occupation in each community. Brockton is by far the largest employment center in the region accounting for over 41,000 jobs, accounting for approximately a quarter of the regions total. The second largest employment center is Plymouth with more than 28,000 jobs and third is Stoughton with 14,592 jobs. Table 7 has the number of jobs in each occupation sector by community.

⁶ United States Census Bureau American Fact Finder: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>

⁷ *Ibid.*

Table 7: 2013 Occupation Sectors⁸

Community	Management, Business, Science & Arts	Service	Sales & Office	Natural Resources, Construction & Maintenance	Production, Transportation & Material Moving	Totals
Abington	3,082	1,596	2,312	761	561	8,312
Avon	884	533	569	259	128	2,373
Bridgewater	5,215	1,936	3,928	744	1,123	12,730
Brockton	10,939	10,153	10,463	2,814	7,145	41,514
East Bridgewater	2,655	1,346	1,840	682	1,014	7,537
Easton	5,908	1,708	3,155	675	684	12,130
Halifax	1,476	605	1,032	483	330	3,926
Hanson	1,804	676	1,800	682	480	5,442
Kingston	3,067	1,030	1,438	333	526	6,394
Pembroke	3,801	1,744	2,515	937	660	9,657
Plymouth	10,968	5,973	6,737	2,435	2,288	28,401
Plympton	665	197	292	226	93	1,473
Stoughton	5,610	2,467	3,778	1,365	1,372	14,592
West Bridgewater	1,303	381	946	296	438	3,364
Whitman	2,641	1,722	2,165	877	641	8,046
Totals	60,018	32,067	42,970	13,569	17,483	165,891

⁸ *Ibid.*

Demographic Data and Projections

When examining the regions exposure to natural hazards it is important to consider population and development trends. As additional land is developed, additional impervious surfaces are created, which decreases available flood storage areas and increases the risk of flooding. The population, household and employment projections for the Old Colony region were developed utilizing a methodology developed by the Massachusetts Department of Transportation (MassDOT). Over the past decade, the region has continued to grow, but not as significantly as in the past. Based upon population projections developed by MassDOT with input from OCPC, the region is expected to grow by 19,532 residents (5.85%) between 2010 and 2020 and by another 24,000 residents (6.79%) between 2020 and 2035. The entire region is expected to grow by 43,532 residents (13.05%) between 2010 and 2035, which represents a greater rate of growth than was experienced by the region between 2000 and 2010 (3.71%). The data in Table 8 shows the projected population growth in the Old Colony region over the next 25 years.

Table 8: Current and Projected Population in the Old Colony Region⁹

Community	2010	2020	2025	2030	2035
Abington	15,985	16,867	16,993	17,397	17,698
Avon	4,356	4,517	4,550	4,600	4,636
Bridgewater	26,563	27,997	28,200	28,674	29,370
Brockton	93,810	96,080	98,083	98,577	99,076
East Bridgewater	13,794	14,878	15,118	15,593	16,553
Easton	23,112	23,667	24,069	24,559	25,376
Halifax	7,518	8,021	8,134	8,595	8,716
Hanson	10,209	10,888	11,183	12,073	12,576
Kingston	12,629	13,030	13,283	14,213	14,418
Pembroke	17,837	18,925	19,259	19,592	19,978
Plymouth	56,468	65,534	68,250	69,281	71,057
Plympton	2,820	3,180	3,283	3,773	3,876
Stoughton	26,962	27,561	28,341	29,120	29,927
West Bridgewater	6,916	7,280	7,293	7,798	8,316
Whitman	14,489	14,755	14,961	15,155	15,427
Total	333,468	353,000	361,000	369,000	377,000

Between 2010 and 2035, each community in the region is expected to increase in population, but none more so than the towns of Plympton and Plymouth, whose populations are expected to increase 37.45% and 25.84% respectively. For those communities that are much more developed, such as Avon, Brockton, Stoughton and Whitman, less dramatic population growth is expected to occur over the next twenty-five years.

Despite the current recession, caused in part by the subprime home mortgage crises, the number of households in the region is expected to increase from 119,437 in 2010 to 138,700 in 2035, an increase of 16.1%. Communities expected to experience the greatest amount of household growth will be in Plympton (50.3%), Hanson (32.5%) and Plymouth (26.3%), as outlined in Table 9 below. More developed communities such as Avon (4.9%), Brockton (6.5%) and Whitman (9.2%) will experience the least amount of household growth between 2010 and 2035.

⁹ Old Colony Metropolitan Planning Organization. (2012) *Old Colony Regional Transportation Plan*

Table 9: Current and Projected Households in the Old Colony Region¹⁰

Community	2010	2020	2025	2030	2035
Abington	6,080	6,604	6,650	6,730	6,840
Avon	1,709	1,774	1,774	1,784	1,794
Bridgewater	7,995	8,634	8,720	8,873	9,256
Brockton	33,303	34,449	35,229	35,400	35,474
East Bridgewater	4,750	5,190	5,369	5,553	5,884
Easton	7,865	8,005	8,224	8,417	8,751
Halifax	2,863	3,071	3,125	3,312	3,402
Hanson	3,468	3,782	3,928	4,220	4,595
Kingston	4,665	4,833	5,013	5,276	5,434
Pembroke	6,298	6,888	7,105	7,321	7,463
Plymouth	21,269	24,151	25,530	26,142	26,836
Plympton	1,006	1,226	1,262	1,472	1,512
Stoughton	10,295	11,200	11,696	12,192	12,521
West Bridgewater	2,571	2,694	2,700	2,936	3,149
Whitman	5,300	5,399	5,475	5,572	5,789
Total	119,437	127,900	131,800	135,200	138,700

Massachusetts has fared reasonably well when compared to other states during the most recent recession. Despite the ongoing struggling economy, the region is projected to add 17,600 jobs between 2010 and 2035 as shown in Table 10 below. This employment growth of 14.15% is expected to be driven by growth in Brockton (5,240 jobs), Plymouth (3,890 jobs), Easton (1,485 jobs) and Bridgewater (1,261 jobs).

Table 10: Current and Projected Employment in the Old Colony Region¹¹

Community	2010	2020	2025	2030	2035
Abington	3,812	4,185	4,234	4,334	4,440
Avon	5,080	5,335	5,634	5,684	5,740
Bridgewater	7,780	8,460	8,684	8,934	9,040
Brockton	36,800	39,635	40,334	41,534	42,040
East Bridgewater	2,540	2,788	2,863	2,924	2,951
Easton	9,330	10,210	10,410	10,661	10,815
Halifax	1,175	1,312	1,359	1,369	1,384
Hanson	1,512	1,676	1,734	1,748	1,766
Kingston	5,100	5,285	5,684	5,734	5,790
Pembroke	6,340	6,539	6,406	6,272	6,226
Plymouth	22,869	24,888	25,768	26,721	26,759
Plympton	384	1,235	1,234	1,234	1,240
Stoughton	12,691	13,605	13,586	13,566	13,444
West Bridgewater	5,860	6,424	6,566	6,707	6,760
Whitman	3,126	3,427	3,502	3,578	3,608
Total	124,400	135,000	138,000	141,000	142,000

¹⁰ *Ibid.*

¹¹ *Ibid.*

Assessed Valuations

The Massachusetts Department of Revenue (DOR) requires each community in the state to value all property every year and do a complete recertification every third year. Both a re-certification and an interim year adjustment (the two years in between the triennial re-certification) include a detailed analysis of the appropriate sales data as a basis for adjusting the property values. The goal is to keep the values as close to market value as possible and avoid an excessive swing in assessments in any one year. Table 11 below contains the FY2013 Assessed Values for all property classes in each community.

Table 11: FY2013 Assessed Values by Class¹²

Community	Residential	Open Space	Commercial	Industrial	Personal Property	Total
Abington	\$1,448,302,746	\$0	\$189,960,354	\$20,445,800	\$35,583,800	\$1,694,292,700
Avon	\$404,762,082	\$0	\$122,441,118	\$171,026,800	\$64,162,554	\$762,392,554
Bridgewater	\$1,969,013,554	\$0	\$169,266,776	\$69,297,020	\$61,643,120	\$2,269,220,470
Brockton	\$ 4,229,251,707	\$0	\$897,846,485	\$166,354,430	\$192,787,250	\$5,486,239,872
East Bridgewater	\$1,382,964,391	\$0	\$89,857,849	\$44,179,000	\$35,170,590	\$1,552,171,830
Easton	\$2,468,113,384	\$0	\$257,075,416	\$102,405,800	\$53,579,003	\$2,881,173,603
Halifax	\$ 672,065,523	\$0	\$50,859,457	\$13,100,560	\$16,383,720	\$752,409,260
Hanson	\$1,068,963,165	\$0	\$48,594,875	\$21,000,900	\$19,511,170	\$1,158,070,110
Kingston	\$1,404,819,100	\$0	\$199,344,229	\$22,676,300	\$42,419,190	\$1,669,258,819
Pembroke	\$1,989,623,920	\$0	\$203,986,788	\$68,491,488	\$33,331,000	\$2,295,433,196
Plymouth	\$6,708,046,206	\$0	\$807,144,212	\$877,170,900	\$219,863,050	\$8,612,224,368
Plympton	\$325,527,580	\$0	\$14,105,802	\$43,831,598	\$17,032,350	\$400,497,330
Stoughton	\$2,340,949,219	\$0	\$381,152,953	\$154,378,666	\$106,368,660	\$2,982,849,498
West Bridgewater	\$663,194,775	\$0	\$157,159,769	\$118,173,035	\$27,317,360	\$965,844,939
Whitman	\$1,145,950,220	\$0	\$80,310,603	\$19,604,296	\$30,170,259	\$1,276,035,378

¹² Massachusetts Department of Revenue, Division of Local Services: Property Tax Information

CHAPTER 4: NATURAL HAZARD IDENTIFICATION

As part of the update of the 2006 Old Colony Planning Council Regional Multi-Hazard Pre-Disaster Mitigation Plan all of the natural hazards were reviewed and updated based on the most recent data. This section outlines the natural hazards that have the potential to affect the Old Colony region based on past occurrences. The natural hazards identified in this section are based on those identified in the Massachusetts State Hazard Mitigation Plan and include the following:

- Flood Related Hazards- Flooding
- Wind-Related Hazards- Hurricanes & Tropical Storms, Tornadoes
- Winter-Related Hazards- Winter Storms
- Coastal Related Hazards- Coastal Erosion & Shoreline Change
- Fire-Related Hazards- Wildfires, Major Urban Fires
- Geologic Hazards- Earthquakes, Landslides and Tsunamis
- Other Natural Hazards- Extreme Temperatures
- Climate Change

This chapter provides a regional summary of each of the hazards and includes:

- Description of each hazard
- Impacts of each hazard
- Location(s) of each hazard
- History and extent of previous occurrences of each hazard
- Probability of future occurrences of each hazard

Within the Old Colony region the three biggest natural hazards are flooding, hurricanes and tropical storms and winter storms, which was also the consensus of the respondents who participated in the Old Colony Hazard Mitigation Community Survey, who stated that of all the hazards that could affect the region, they were concerned with the aforementioned three the most.

Flood-Related Hazards

Description of Flooding

Flooding is defined by FEMA as a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland or tidal waters or the unusual and rapid accumulation or runoff of surface waters from any source.¹³ Flooding can develop slowly over a period of days or very quickly as is the case with flash floods, which can develop in just a few minutes and without any visible signs of rain. Flooding in the Old Colony region can result from any number of weather events that affect the region including hurricanes, nor'easters, thunderstorms and winter storms. The threat of flooding in the region is exacerbated by the increasing amounts of impervious areas and the loss of natural stormwater retention areas due to the increasing amount of development in the region.

Flooding hazards in the Old Colony region can be divided between riverine flooding and coastal flooding. Riverine or inland flooding often occurs when the flow from rainfall or snowmelt is greater than the carrying capacities of the natural drainage system. The inland area within the Old Colony region is predominantly low-lying, with some streams artificially channeled at the cost of both stream capacity and safe flood storage. This, in combination with increasing amounts of impervious area from development, has increased normal flooding by increasing stream flows at the same time that development has reduced the area for natural safe flood storage.

The estimated probability of a riverine flood event occurring in any given year is typically described using the terms “100 Year Flood” or “500 Year Flood”. These terms are referenced in the process of determining flood insurance rates in flood prone areas.

- A 100 Year Flood has a 1% probability of occurring in any given year
- A 500 Year Flood has a 0.2% probability of occurring in any given year

Coastal flooding occurs as the result of a severe weather system such as a tropical storm or hurricane, which contains an element of high winds. The damaging effects of coastal floods are caused by a combination of storm surge, wind, rain, high tides, erosion and battering by debris. This was the combination that made the Blizzard of 1978 and Hurricane Bob in 1991 so destructive and deadly in coastal communities. The threat of coastal flooding is greatest during highest tides of the month when the sun and moon are opposite of each other and their pulls are combined.

Coastal flooding from storm related flood damage in coastal areas is indicated by SLOSH (Sea and Lake Overland Surges from Hurricanes) zones. SLOSH is a computerized model run by the National Hurricane Center to estimate storm surge heights and winds resulting from historical, hypothetical, or predicted hurricanes by taking into account pressure, size, forward speed, track and winds.¹⁴

¹³ Federal Emergency Management Agency (FEMA): Flood or Flooding: <https://www.fema.gov/flood-or-flooding>

¹⁴ National Weather Service: National Hurricane Center, SLOSH: <http://www.nhc.noaa.gov/surge/slosh.php>

Impact of Flooding

Flooding is capable of causing injury or death to people who are exposed to floods and can cause significant damage to property, crops and livestock. People and property most at risk from floods include areas in FEMA defined floodplains or areas that are in close vicinity to a waterbody of some sort. Additionally, certain types of infrastructure are at a higher risk from floods including: dams, bridges, culverts and roadways. The last significant flood event to occur in the region occurred in March 2010.

Vulnerability to Flooding

Southeastern Massachusetts is particularly vulnerable to flooding, with approximately 275 miles of coastline and 1,800 miles of major rivers in the region. Within the Old Colony region itself there are approximately 49.3 miles of shoreline, between the two coastal communities of Kingston and Plymouth and many miles of the Taunton River and its major tributaries as well as a number of smaller brooks and streams.

In Chapter 5 Community Hazard Risk Assessments, the vulnerability of flooding for each community is detailed, with each community having a detailed description of floodprone areas based on FEMA Flood Insurance Rate Maps (FIRM) as well as a list of areas that historically flood.

Extent of Flooding

Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk as shown in Table 12. These zones are depicted on a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area.

Table 12: FEMA Flood Zones¹⁵

Zone	Zone Description
	High Risk Areas
A	Areas with a 1% annual chance of flooding, for which base flood elevations are undetermined.
AE or A1-30	Areas with a 1% annual chance of flooding, for which base flood elevations have been determined.
AH	Areas with a 1% annual chance of flooding (usually an area of ponding) with an average depth of one to three feet, for which base flood elevations have been determined.
AO	Areas with a 1% annual chance of flooding (usually sheet flow on sloping terrain) with an average depth of one to three feet, for which base flood elevations have been determined.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding, with federal flood protection (dike, dam, levee) under construction, for which no base flood elevations have been determined.

¹⁵ Federal Emergency Management Agency (FEMA) Flood Zones: <http://www.fema.gov/flood-zones>

Zone	Zone Description
	High Risk Coastal Areas
V	Areas with a 1% annual chance of flooding with additional velocity hazard (wave action), for which no base flood elevations have been determined.
	High Risk Coastal Areas
VE or V1-V30	Areas with a 1% annual chance of flooding with additional velocity hazard (wave action), for which base flood elevations have been determined.
	Moderate to Low Risk Areas
B and X	Areas between the limits of the 100-year and 500-year floodplain. Also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
C and X	Areas outside the 500-year floodplain with less than a 0.2% chance of flooding on an annual basis.
	Undetermined Risk Areas
D	Areas with possible but undetermined flood hazards as a flood hazard analysis has yet to be conducted.

As stated previously, areas that most frequently flood are areas that lie within a floodplain. Floodplains can be described as low, flat, periodically flooded lands adjacent to rivers, lakes and oceans and subject to geomorphic (land-shaping) and hydrologic (water flow) processes. In the Old Colony region, Table 13 shows that 15.6% of the land within the region is located in a one hundred year flood zone and 6.1% of that land is currently developed and at great risk from flooding. While building in a flood zone is generally a bad idea, many parts of the Old Colony region are more than 300 years old and many communities were built before the idea of flood zone rules and regulations came into being. While most communities have less than 10% of their flood zones developed, the notable exception is the City of Brockton, which has more than 40% of its 100 Year flood zone developed, which can most likely be attributed to the city’s explosive growth during the late nineteenth and early twentieth century when people built homes close to the shoe factories that were located throughout the city, regardless of their location.

The Flood Zones and SLOSH Map (Figure 5) shows that most of the flood zoned areas are along riverine corridors, low-level wetlands and the coast. The developed land within the flood zone is negligible in most communities, with exception of the moderately dense neighborhoods in Brockton along the Salisbury Plain Brook and Salisbury Plain River, which have a history of flooding during extreme precipitation events.

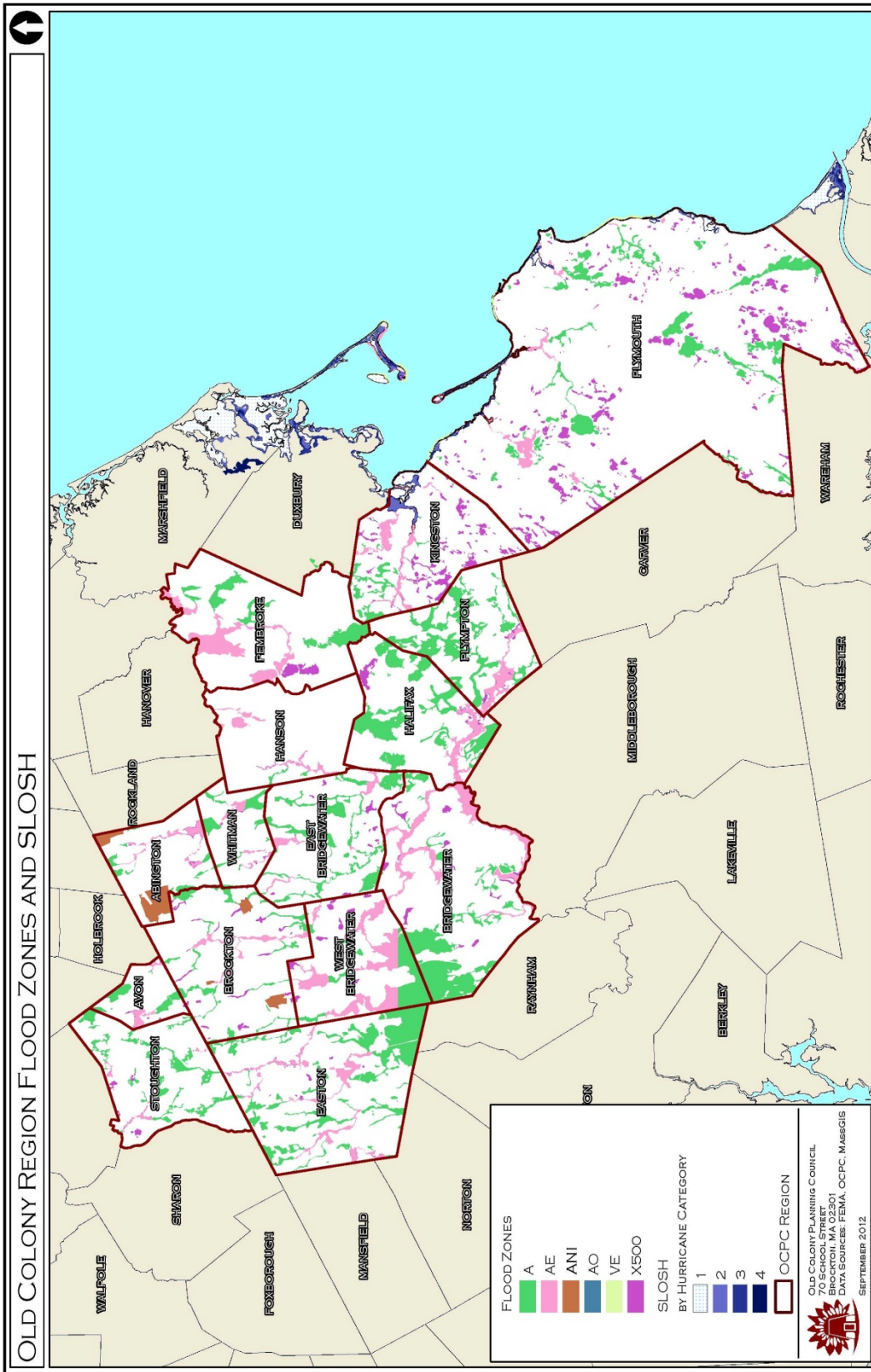
Table 13: Summary of 100 Year-Flood Zone Data per Community¹⁶

Community	Acres in Community	Acres in 100-Year Flood Zone	Percent of Community in 100-Year Flood Zone	Acres of Developed Flood Zone	Percent of Flood Zone Developed
Abington	6,521.335	1,338.318	20.52%	169.37244	12.66%
Avon	2,904.519	540.905	18.62%	96.184014	17.78%

¹⁶ Office of Geographic Information Systems (MassGIS)

Community	Acres in Community	Acres in 100-Year Flood Zone	Percent of Community in 100-Year Flood Zone	Acres of Developed Flood Zone	Percent of Flood Zone Developed
Bridgewater	18,150.291	4,372.615	24.09%	213.44644	4.88%
Brockton	13,769.724	1,549.732	11.25%	630.12591	40.66%
East Bridgewater	11,225.578	1,977.162	17.61%	69.314884	3.51%
Easton	18,709.299	4,378.860	23.40%	186.01788	4.25%
Halifax	11,126.803	3,026.629	27.20%	61.597131	2.04%
Hanson	10,069.083	453.402	4.50%	14.440686	3.18%
Kingston	12,160.117	1,362.838	11.21%	81.558465	5.98%
Pembroke	15,071.890	2,664.765	17.68%	64.430252	2.42%
Plymouth	65,774.950	4,977.634	7.57%	177.83946	3.57%
Plympton	9,667.011	2,738.261	28.33%	25.853038	0.94%
Stoughton	10,537.857	1,273.802	12.09%	135.30332	10.62%
West Bridgewater	10,030.988	3,033.780	30.24%	148.09954	4.88%
Whitman	4,453.393	671.006	15.07%	25.00349	3.73%
OCPC Region	220,172.838	34,359.709	15.61%	2098.5869	6.11%

Figure 5: Old Colony Region Flood Zones & SLOSH Map



Bridges

A bridge is a structure built to span a physical obstacle such as a body of water or roadway to provide passage over the obstacle. Bridges are one of the more susceptible pieces of infrastructure when it comes to the dangers of flooding. Approximately half (78) of the 157 bridges in the Old Colony region (as shown on Table 14) span some type of waterway-rivers, streams, lakes, etc. As it relates to the hazard of flooding, this section of the plan will focus only on bridges that span waterways. Bridges in Massachusetts are rated in accordance with standards set forth by the American Association of State Highway and Transportation Officials (AASHTO). AASHTO standards rate bridges on a scale of 1 to 100, with one being the worst and 100 being the best. In addition to the AASHTO standards, bridges are listed as being structurally deficient (SD) or functionally obsolete (FO) according to the Federal Highway Administration’s (FHWA) National Bridge Inventory (NBI). A structurally deficient bridge is one that has elements that need to be monitored and/or repaired. A structurally deficient bridge does not imply that it is likely to collapse or that it is unsafe. It just means that the bridge must be monitored, inspected, and maintained on a regular basis. A functionally obsolete bridge is one that was built to standards that are not used today. These bridges are not automatically rated as structurally deficient, nor are they inherently unsafe. Functionally obsolete bridges are those that do not have adequate lane widths, shoulder widths, or vertical clearances to serve current traffic demand, or those that may be occasionally flooded.

Table 14: Bridges in the Old Colony Region Spanning Waterways¹⁷

Municipality	Roadway	Water Body	Owner	Year Built /Rebuilt	AASHTO Rating	Deficiency
Abington	Central St.	Shumatuscacant River	Town	1956	49.3	SD
Abington	Adams St.	Shumatuscacant River	Town	1956	80.4	--
Bridgewater	Bedford St.	Taunton River	MassDOT	2007	95.2	--
Bridgewater	Bridge St.	Matfield River	Town	1884/ 1978	74.4	FO
Bridgewater	Broad St.	Town River	MassDOT	1926	91.6	--
Bridgewater	Cherry St.	Taunton River	Town	2002	90.2	--
Bridgewater	Green St.	Taunton River	Town	1922	65.1	FO
Bridgewater	Hayward St.	Town River	Town	1946	44.5	--
Bridgewater	High St.	Matfield River	Town	1886/ 1978	66.1	FO
Bridgewater	Oak St.	Town River	Town	1880	78.6	FO
Bridgewater	Plymouth St.	Taunton River	Town	1993	94.3	--
Bridgewater	Summer St.	Taunton River	Town	2011	79.1	--
Bridgewater	Titicut St.	Taunton River	Town	1850/ 1954	66.3	--
Bridgewater	Vernon St.	Taunton River	Town	1956	74.8	FO

¹⁷ Massachusetts Department of Transportation (MassDOT) Bridge Listing & Rating, 2012

Municipality	Roadway	Water Body	Owner	Year Built /Rebuilt	AASHTO Rating	Deficiency
Brockton	Allen St.	Salisbury Brook	City	2002	76.0	FO
Brockton	Bartlett St.	Salisbury Brook	City	2011	80.6	--
Brockton	Belmont Ave.	Salisbury Brook	City	1850/ 1938	71.8	--
Brockton	Belmont St.	Salisbury Brook	City	1850/ 1924	88.7	--
Brockton	Center St.	Trout Brook	City	1901/ 1993	93.5	--
Brockton	Crescent St.	Trout Brook	MassDOT	1976	95.9	--
Brockton	D.W. Field	Porter Pond	City	1940	64.9	FO
Brockton	East Ashland St.	Trout Brook	City	1937	81.2	--
Brockton	Forest St.	Salisbury Plain River	City	1999	89.0	--
Brockton	Grove St.	Salisbury Plain River	City	1910	78.6	--
Brockton	Main St.	Salisbury Brook	City	1997	96.0	--
Brockton	Montello St.	Salisbury Brook	MassDOT	1889	78.8	FO
Brockton	Otis St.	Salisbury Brook	City	1913/ 1973	75.0	--
Brockton	Perkins Ave.	Salisbury Plain River	City	1995	96.5	--
Brockton	Perkins St.	Salisbury Brook	City	1914	64.9	FO
Brockton	Pine Ave.	Salisbury Plain River	City	1999	92.8	--
Brockton	Plain St.	Salisbury Plain River	City	1988	94.1	--
Brockton	Sargent's Way	Salisbury Plain River	City	1988	95.7	--
Brockton	Spring St.	Salisbury Brook	City	2005	100	--
Brockton	Summer St.	Trout Brook	City	1976	78.6	--
Brockton	Warren Ave.	Salisbury Brook	City	1913	84.1	--
Brockton	West Chestnut St.	Cowesett Brook	City	1970	91.5	--
Brockton	White Ave.	Salisbury Brook	City	2012	85.7	--
East Bridgewater	Bedford St.	Forge Pond	MassDOT	1893/ 1940	73.9	--
East Bridgewater	Bedford St.	Matfield River	MassDOT	1880/ 1930	73.3	FO
East Bridgewater	Bridge St.	Satucket River	Town	1970	99.2	--

Municipality	Roadway	Water Body	Owner	Year Built /Rebuilt	AASHTO Rating	Deficiency
East Bridgewater	North Central St.	Matfield River	Town	1921/ 1929	81.9	--
East Bridgewater	Pleasant St.	Salisbury Plain River	Town	1921	77.5	FO
East Bridgewater	Plymouth St.	Satucket River	MassDOT	1971	91.5	--
East Bridgewater	Spring St.	Matfield River	Town	1946	55.7	FO
East Bridgewater	Washington St.	Satucket River	Town	1927	77.6	FO
East Bridgewater	West Union St.	Matfield River	Town	1902	77.5	FO
Easton	Central St.	Queset Brook	Town	2008	72.4	--
Easton	Sullivan & Mechanic St.	Queset Brook	Town	1969	81.6	--
Easton	Washington St.	Queset Brook	MassDOT	1988	69.2	FO
Halifax	River St.	Winnetuxet River	Town	1951	65.6	FO
Halifax	South St.	Winnetuxet River	Town	1931/ 1985	80.7	--
Halifax	Thompson St.	Bartlett Brook	Town	1992	78.3	FO
Halifax	Thompson St.	Winnetuxet River	Town	1992	76.4	FO
Hanson	Main St.	Poor Meadow Brook	MassDOT	1850/ 1937	49.9	FO
Hanson	State St.	Indian Head River	Town	1995	77.6	FO
Kingston	Elm St.	Jones River	Town	1988	55.2	SD
Kingston	Landing Rd.	Stony Brook	Town	1954	81.5	--
Kingston	Route 3	Jones River	MassDOT	1955/ 1978	73.0	SD
Kingston	Wapping Rd.	Jones River	MassDOT	1971	93.5	--
Plymouth	Main St.	Town Brook	MassDOT	1908/ 1919	86.0	--
Plymouth	Market St.	Town Brook	Town	1964	95.0	--
Plymouth	Plimoth Plantation Highway	Eel River	MassDOT	1951	83.5	--
Plymouth	River St.	Eel River	Town	2004	82.9	--
Plymouth	Route 3 NB	Eel River	MassDOT	1955	85.0	--
Plymouth	Route 3 SB	Eel River	MassDOT	1955	85.0	--
Plymouth	Warren Ave.	Eel River	MassDOT	1958	93.1	--
Plympton	Parsonage Rd.	Winnetuxet River	Town	1973	99.8	--

Municipality	Roadway	Water Body	Owner	Year Built /Rebuilt	AASHTO Rating	Deficiency
Plympton	Winnetuxet Rd.	Winnetuxet River	Town	1923/ 2002	49.7	FO
West Bridgewater	Belmont St.	Salisbury Plain River	Town	1875	64.0	FO
West Bridgewater	Forest St.	Town River	Town	1968	79.9	--
West Bridgewater	Forest St.	Town River	Town	1978	74.3	FO
West Bridgewater	Route 24	Town River	MassDOT	1952/ 1974	82.8	--
West Bridgewater	Scotland St.	Town River	Town	2009	86.1	--
West Bridgewater	South St.	Town River	Town	2008	79.4	--
West Bridgewater	South Main St.	Town River	MassDOT	1897/ 1947	76.4	--
West Bridgewater	Walnut St.	Cowesett Brook	Town	1967	75.5	FO
West Bridgewater	West St.	Cowesett Brook	Town	1935	78.2	FO
West Bridgewater	West Center St.	Hockomock River	MassDOT	1948	62.2	--

Dams

A dam is an artificial barrier that can impound water, wastewater, or any liquid-borne material, for the purpose of storage or control. Dams like bridges, are another piece of infrastructure that are particularly susceptible to flooding. The failure of a dam can be defined as catastrophic, characterized by the sudden, rapid, and uncontrolled release of impounded water or the likelihood of such an uncontrolled release. Dam failures while rare can result from a variety of reasons, including:

- Overtopping caused by floods that exceed the capacity of the dam
- Structural failure of materials used in dam construction
- Piping and internal erosion of soil in embankment dams
- Movement and/or failure of the foundation supporting the dam
- Settlement and cracking of concrete or embankment dams
- Inadequate maintenance and upkeep
- Deliberate acts of sabotage

The Old Colony region has 160 dams, mostly small historic earth/stone structures impounding streams to create shallow mill ponds or very low-head cranberry bog reservoirs. However, some are more substantial stone and concrete structures that were used for industrial or water supply use, such as the Cotton Gin Pond Dam in East Bridgewater, the Silver Lake Dam in Kingston and the Monponsett Pond Dam in Halifax.

Due to abandonment, dissolution of former owners, and/or acquisition by communities for open space or habitat protection, many dams are now owned by localities that have trouble maintaining them during the current economic crisis. By law however, dam owners are responsible for the proper maintenance of their dams. If a dam were to fail and cause flooding downstream, the dam owner would be liable for damages and loss of life that were a result of the failure. Many local officials are unaware of the age and condition of the dams within their communities.

Many of the dams in the region create quite a few valued ponds and have a potential use for flood control. Some dams in the region have had minimal or no maintenance performed on them, which is cause for concern, as these aging dams need ongoing maintenance to control tree growth and need to be monitored for possible defects. In addition some dams may be under increased stress due to greater impervious surfaces leading to larger stream flows, thus a more frequent head against the dam. This may not be a problem for a well maintained dam, but may exacerbate weaknesses in a poorly maintained dam.

The Massachusetts Department of Conservation & Recreation Office of Dam Safety maintains a database of all the publicly and privately owned dams in the state and ensures compliance with acceptable practices pertaining to dam inspection, maintenance, operation and repair of dams. The Office of Dam Safety classifies dams into three hazard types as shown in Table 15 below. The hazards pertain to potential loss of human life or property damage in the event of failure or improper operation of a dam. Probable future development of the area downstream from the dam should be taken into consideration when determining a dam’s classification.

Table 15: Dam Hazard Potential Classification¹⁸

High Hazard Potential Dam	Dams located where failure will likely cause loss of life and serious damage to home(s), industrial or commercial facilities, important public utilities, main highway(s) or railroad(s).
Significant Hazard Potential Dam	Dams located where failure may cause loss of life and damage to home(s), industrial or commercial facilities, secondary highway(s) or railroad(s) or cause interruption of use or service of relatively important facilities.
Low Hazard Potential Dam	Dams located where failure may cause minimal property damage to others. Loss of life is not expected.

Owners of dams are required by state law to hire a qualified engineer to inspect and report results every two years for High Hazard Potential Dams, every five years for Significant Hazard Potential Dams and every ten years for Low Hazard Potential Dams. In addition, owners of High Hazard Potential Dams must develop Emergency Action Plans (EAPs) that outline the activities that would occur if the dam failed or appeared to be failing. Owners of Significant Hazard Potential Dams are strongly encouraged to also develop EAPs. The Plan would include a

¹⁸ Massachusetts Office of Dam Safety: Dam Safety: <http://www.mass.gov/eea/agencies/dcr/conservation/dam-safety/>

notification chart, list of response personnel and their responsibilities, a map of the inundation area that would be impacted, and a procedure for warning and evacuating local residents in the inundation area.

Table 16: Hazard Potential of Dams in the Old Colony Region*¹⁹

Community	High	Significant	Low
Abington	0	3	1
Avon	0	1	0
Bridgewater	0	6	0
Brockton	3	4	1
East Bridgewater	0	2	0
Easton	1	5	3
Halifax	0	1	3
Hanson	0	3	2
Kingston	1	5	3
Pembroke	0	1	6
Plymouth	2	6	4
Plympton	0	3	0
Stoughton	0	0	0
West Bridgewater	0	2	1
Whitman	0	0	1
Total	7	42	25

**This Table does not include breached or non-jurisdictional dams*

As shown in Table 16 above, there are a total of 7 dams that are categorized as High Hazard, which is approximately 4.3% of the 160 total dams in the Old Colony region. It should be noted that this percentage could be higher as the hazard potential of the other 86 dams in the region are either breached or non-jurisdictional dams, thus not being subject to regular inspections.

In analyzing the number of potential hazards by community, the two most populous communities in the region, Brockton and Plymouth are the only communities which have multiple high hazard dams, as Brockton has three high hazard dams and Plymouth has two.

Previous Occurrences of Flooding

The Old Colony region has experienced a number of flood events over the years. Table 17 details flood events the region has experienced since the Blizzard of 78.

¹⁹ Massachusetts Office of Dam Safety

Table 17: Old Colony Region Flood Events 1978-2011²⁰

Flood Event	Date
Winter Storm (Blizzard of 78)	February 1978
Hurricane Gloria	September 1985
Severe Storms & Floods	March 1987
Hurricane Bob	August 1991
Nor'easter (Perfect Storm)	October 1991
Nor'easter	December 1992
Severe Storms & Floods	October 1996
Floods	June 1998
Winter Storm & Floods	March 2001
Floods	April 2004
Floods	October 2005
Nor'easter (Patriot's Day Storm)	April 2007
Floods	March 2010
Tropical Storm Irene	August 2011
Hurricane Sandy	October 2012
Winter Storms & Floods	February 2013

The most recent example of heavy flooding in the region was in March 2010, when a series of two storms dumped more than 14 inches of rain in the region. The first storm occurred during the period of March 13-15, 2010 and dumped between 9-11 inches of rain in the region over three days. While still recovering from the first storm, a second storm struck on March 29-31, 2010 and dumped between another 5-7 inches of rain on the region. This significant amount of rain just over a two week period caused flooding across every community the Old Colony region, with rivers and streams cresting their banks and causing people who live near them to flee. The storm also closed many roads across the region and closing Titicut Street in Bridgewater (Figure 6) and washing away part of the Bridge Street Bridge in Bridgewater (Figure 7) in the process.

Figure 6: Titicut Street in Bridgewater



Figure 7: Bridge Street Bridge in Bridgewater



²⁰ Federal Emergency Management Agency (FEMA): Disaster Declarations by State/Tribal Government: <http://www.fema.gov/disasters/grid/state-tribal-government>

As a result of this severe flooding the President declared seven counties in eastern and central Massachusetts disaster areas. (The three counties represented in the OCPC region-Bristol, Norfolk and Plymouth counties were included in this declaration.) The president's action made federal funding available to affected individuals in these in these counties. Assistance included grants for temporary housing and home repairs, low-cost loans to cover uninsured property losses, and other programs to help individuals and business owners recover from the effects of the disaster.

Probability of Future Flooding

Flooding is one of the most common hazards in the Old Colony Region. Looking back on the number (16) of flood events that have occurred in the region since 1978, this indicates that there is an approximately 46% chance that in any given year an area within the Old Colony region will experience some type of flooding event.

National Flood Insurance Program Compliance

The United State Congress established the National Flood Insurance Program (NFIP) with the passage of the National Flood Insurance Act of 1968. In the decades prior to the passage of the NFIP, the national response to flood disasters was generally limited to constructing flood-control works such as dams, levees, seawalls, and the like, and providing disaster relief to flood victims. This approach, however, did not reduce losses, nor did it discourage unwise development. In some instances, it may have actually encouraged additional development. To compound the problem, due to its high risk and seasonal nature, insurance companies were not able to provide affordable flood insurance coverage.²¹

In light of mounting flood losses and escalating costs of disaster relief to the taxpayers, Congress created the NFIP to mitigate future flood losses nationwide through sound, community-enforced building and zoning ordinances and to provide access to affordable, federally backed flood insurance protection for property owners. The NFIP is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.²²

Participation in the NFIP is based on an agreement between local communities and the Federal Government that states that if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHAs), the federal government will make flood insurance available within the community as a financial protection against flood losses.²³

Within the state of Massachusetts, the coordinating agency for the NFIP is the DCRs Flood Hazard Management Program (FHMP). While the DCR FHMP is the lead floodplain management agency in Massachusetts, other agencies play critical roles in implementing floodplain management across the state. The Board of Building Regulations and Standards (BBRS) promulgate the Massachusetts State Building Code, which contains most of the NFIP

²¹ Federal Emergency Management Agency (FEMA) National Flood Insurance Program (2011) *Answers to Questions About the NFIP*. Washington, D.C.

²² *Ibid.*

²³ *Ibid.*

construction requirements related to buildings or structures. The code is enforced at the community level by local building inspectors. The Department of Environmental Protection (DEP) administers the Wetlands Protection Act (WPA) which helps restrict development in flood-prone areas. The Act is enforced at the local level by Conservation Commissions, with oversight and appeal authority provided by the DEP.²⁴

Each of the 15 communities in the Old Colony region participates in the NFIP. The region's involvement with the program is significant as there are currently 1,396 policies in force covering properties valued at more than \$320 million. Below, Table 18 shows the number of NFIP policies in each community, as well as the number of claims that have been paid out in each community from 1978 through February 2014.

Table 18: National Flood Insurance Program Policies and Claims²⁵

Community	Policies In-Force	Insurance In-force whole (\$)	Claims: 1978- November 2013	Total Payments	Average Payment
Abington	31	\$8,984,200	12	\$27,650	\$2,304
Avon	17	\$7,470,200	2	\$717	\$358
Bridgewater	65	\$14,982,200	27	\$64,662	\$2,395
Brockton	469	\$111,173,500	315	\$1,855,888	\$5,892
East Bridgewater	33	\$8,344,800	8	\$50,650	\$6,331
Easton	98	\$26,330,800	23	\$120,299	\$5,230
Halifax	16	\$4,287,000	6	\$9,231	\$1,539
Hanson	2	\$490,000	8	\$13,078	\$1,635
Kingston	69	\$20,301,200	18	\$72,912	\$4,051
Pembroke	39	\$10,234,500	11	\$21,590	\$1,963
Plymouth	432	\$102,974,200	416	\$5,998,847	\$14,420
Plympton	7	\$1,865,000	6	\$64,937	\$10,823
Stoughton	145	\$33,687,400	33	\$64,924	\$1,967
West Bridgewater	33	\$8,689,500	6	\$6,192	\$1,032
Whitman	16	\$4,040,300	17	\$210,737	\$12,396
Totals	1,472	\$363,854,800	908	\$8,582,314	\$9,452

To remain compliant with the NFIP policies communities are encouraged to take some, if not all of the actions listed below:

- Participate in NFIP training offered by the State and/or FEMA that addresses flood hazard planning and management
- Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event
- Address NFIP monitoring and compliance activities

²⁴ Massachusetts Department of Conservation & Recreation (2004) Floodplain Management Plan. Boston, MA

²⁵ Federal Emergency Management Agency (FEMA), National Flood Insurance Program: <http://bsa.nfipstat.fema.gov/reports/1011.htm>; <http://bsa.nfipstat.fema.gov/reports/1040.htm>

- Revise/adopt subdivision, erosion control and board of health regulations to improve floodplain management in the community
- Distribute or make available NFIP, insurance and building code explanatory pamphlets
- Identify and become knowledgeable of non-compliant structures in the community
- Identify and become knowledgeable of submit to rate structures
- Identify cause of submit to rate structure and analyze how to prevent non-complaint structures in the future
- Inspect foundations at time of completion before framing to determine if lowest floor is at or above Base Flood Elevation (BFE)
- Require the use of elevation certificates
- Report any changes in the Special Flood Hazard Areas (SFHA) to FEMA within 180 days of change
- Identify and keep track of LOMA/LOMR in the community
- Be familiar with community's Flood Insurance Rate Maps (FIRMs)

While every community may not have taken every action listed on the previous page, each community is continuing to comply the NFIP in a number of ways, which can be seen in each communities Existing Protection Measures in Chapter 6 and Mitigation Strategies in Chapter 8.

Repetitive Loss (RL) Properties

A Repetitive Loss (RL) Property is defined as any property that is covered under an NFIP flood insurance policy and has had two or more flood insurance claims of more than \$1,000 have been paid within any rolling 10-year period.

In the Old Colony region there are RL properties in 7 of the 15 communities. Brockton and Plymouth have the greatest number of RL properties, with 39 each. In total, there are 85 RL properties in the Old Colony region that have generated 230 claims since 1978. Below, Table 19 shows the number of RL properties in each community, as well as the number of claims that have been paid out in each community from 1978 through January 2014.

Table 19: Repetitive Loss Properties and Claims²⁶

Community	Number of RL Properties per Community	Property Type(s)	Number of Reported RL Claims	Total Payments (Combined Building & Contents)	Average Payment per Claim
Bridgewater	2	2 Residential Properties	4	\$17,160	\$4,290
Brockton	39	38 Residential Properties 1 Commercial Property	102	\$766,784	\$7,517
East Bridgewater	1	1 Residential Property	2	\$29,878	\$14,939
Easton	2	2 Residential Properties	4	\$25,920	\$6,480
Plymouth	39	35 Residential Properties 4 Commercial Properties	113	\$3,557,186	\$31,480
Stoughton	1	1 Residential Property	3	\$8,793	\$2,931
Whitman	1	1 Residential Property	2	\$3,701	\$1,851

²⁶ Massachusetts Department of Conservation & Recreation, 2014

Community	Number of RL Properties per Community	Property Type(s)	Number of Reported RL Claims	Total Payments (Combined Building & Contents)	Average Payment per Claim
Totals	85	80 Residential Properties 5 Commercial Properties	230	\$4,409,422	\$19,171

Severe Repetitive Loss (SRL) Properties

A Severe Repetitive Loss (SRL) Property is defined as a residential property that is covered under an NFIP flood insurance policy and has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such payments exceeds \$20,000; or at least two separate claim payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. At least two of the referenced claims must have occurred within any ten-year period, and must be greater than ten days apart. The purpose of the SRL program is to reduce or eliminate claims under the NFIP through project activities that will result in the greatest savings to the National Flood Insurance Flood.²⁷ In total, there are four SRL properties in the Old Colony region that have generated 23 claims since 1978. Below, Table 20 shows the number of SRL properties in each community, as well as the number of claims that have been paid out in each community from 1978 through January 2014.

Table 20: Severe Repetitive Loss Properties and Claims²⁸

Community	Number of SRL Properties per Community	Property Type(s)	Number of Reported SRL Claims	Total Payments (Combined Building & Contents)	Average Payment per Claim
Brockton	1	1 Residential Property	4	\$37,574	\$9,394
Plymouth	3	2 Residential Properties 1 Commercial Property	19	\$1,144,322	\$60,227
Totals	4	3 Residential Properties 1 Commercial Property	23	\$1,181,896	\$51,387

Community Rating System (CRS)

The Community Rating System (CRS) is a voluntary program that provides incentives, mainly a discount on flood insurance premiums, for communities to do more than just regulate construction of new buildings to minimum national standards. Under the CRS, flood insurance premiums are adjusted to reflect community activities that reduce flood damage to existing buildings, manage development in areas not mapped by the NFIP, protect new buildings beyond the minimum NFIP protection level, help insurance agents obtain flood data, and help people obtain flood insurance.

²⁷ Federal Emergency Management Agency (FEMA): The Unified Hazard Mitigation Assistance Grant Programs https://www.floodsmart.gov/toolkits/flood/downloads/hma_grants_factsheet.pdf

²⁸ Massachusetts Department of Conservation & Recreation, 2014

The goals of the CRS are to recognize, encourage and reward by the use of flood insurance premium adjustments, community and state activities beyond the minimum required by the NFIP that:

- Reduce flood damage to insurable property,
- Strengthen and support the insurance aspects of the NFIP, and
- Encourage a comprehensive approach to floodplain management.

The Community Rating System consists of 10 classes (Class 10-Class 1). When a community first adopts the CRS, they are categorized as a Class 10 community-0% discount. For each floodplain management activity that the community adopts that goes above and beyond the minimum NFIP requirements, flood insurance premium rates for residents within the participating community are discounted within 5% class increments, with the maximum discount being given to Class 1 communities-45% discount.²⁹

The Benefits of Participating in the Community Rating System include:

- Reduced flood insurance rates for participating communities.
- Floodplain management activities that provide enhanced public safety, a reduction in damage to property and public infrastructure, avoidance of economic disruption and losses, reduction in human suffering and protection of the environment.
- The ability for a community to evaluate the effectiveness of its flood program against a nationally recognized benchmark.
- Technical assistance in designing and implementing some activities is available through the CRS at no charge.
- A CRS community's flood program benefits from having an added incentive to maintain its flood programs over the years. The fact that the community's CRS status could be affected by the elimination of a flood-related activity or a weakening of the regulatory requirements for new development, should be taken into account by the governing board when considering such actions.
- The implementation of some CRS activities, such as floodplain management planning, can help a community qualify for certain federal assistance programs.³⁰

Community Costs & Responsibilities to Participate in the Community Rating System include:

- The designation of a CRS Coordinator who is familiar with the agencies that implement CRS activities and who will work with the Insurance Services Office (ISO) during the verification visit.
- The annual recertification that states the community is continuing to implement its activities. Additionally the community must submit the appropriate documents with the annual recertification.
- The maintaining of elevation certificates, other permit records, and old Flood Insurance Rate Maps (FIRMs) forever.
- The maintaining of other records of its activities for five years, or until the next verification visit, whichever comes sooner.³¹

²⁹ Federal Emergency Management Agency (FEMA) (2013) *NFIP Community Rating System Coordinator's Manual*. Washington D.C.

³⁰ *Ibid.*

³¹ *Ibid.*

Currently the only community in the Old Colony region that participates in the CRS is Plymouth, which is rated as a Class 9 community, and as a result all residents receive a 5% discount on their flood insurance policies. The other 14 communities in the Old Colony region are eligible and encouraged (as all participate in the NFIP) to reduce their CRS rating, to both improve its floodplain management and reduce the flood insurance premiums it residents pay.

For additional information on the CRS and how to apply, go to FEMA's Community Rating System website: <http://www.fema.gov/business/nfip/crs.shtm>.

Wind-Related Hazards

Hurricanes

Description of Hurricanes

A hurricane is a type of tropical cyclone, which is an organized system of clouds and thunderstorms that produce strong winds and heavy rain that originate over tropical or subtropical waters. Tropical cyclones rotate counterclockwise in the Northern Hemisphere and are classified as follows:

- Tropical Depression: An organized system of clouds and thunderstorms with a defined surface circulation and maximum sustained winds of 38 mph or less
- Tropical Storm: An organized system of strong thunderstorms with a defined surface circulation and maximum sustained winds of 39-73 mph
- Hurricane: An intense tropical weather system of strong thunderstorms with a well-defined surface circulation and maximum sustained winds of 74 mph or higher³²

Hurricanes can vary greatly in size, speed and strength, although the size and speed of an average hurricane is about 300 miles wide and has an average forward speed of 15-20 mph. Hurricane-force winds can extend outward to about 25 miles from the storm center of a small hurricane and to more than 150 miles for a large one. The area over which tropical storm-force winds occur is even greater, ranging as far out as almost 300 miles from the eye of a large hurricane. During their life span, hurricanes can last for more than two weeks over the ocean and can travel up the entire Atlantic Coast. Once a hurricane makes landfall, the source of the hurricane's main moisture source (ocean) is shut off and then gradually begins to weaken and dissipate.³³

Impacts of Hurricanes

Impacts from hurricanes include heavy rainfall, high winds, inland flooding and storm surge, all of which can result in injury and death and severe destruction to infrastructure and property. The strength or intensity of a hurricane is a good indicator of its damage potential. Hurricanes often produce widespread, torrential rains in excess of six inches, which may result in deadly and destructive floods. In fact, flooding is the major threat from tropical cyclones for people living inland. Flash flooding, defined as a rapid rise in water levels, can occur quickly due to intense rainfall. Hurricane force winds, 74 mph or more, can destroy buildings and mobile homes. Debris, such as signs, roofing material, siding and small items left outside become flying missiles during hurricanes. Storm Surge can result in building being destroyed, beach and dune erosion and road and bridge damage along the coast. Storm surge can travel several miles inland. In estuaries salt water intrusion endangers public health and the environment.

Extent of Hurricanes

Hurricanes are classified into five categories as shown in Figure 21 (the Saffir-Simpson Scale) based on their wind speed, central pressure, and damage potential. Category Three and higher hurricanes are considered major hurricanes, though Category One and Two hurricanes are still extremely dangerous and warrant one's full attention.

³² National Weather Service: National Hurricane Center: Tropical Cyclone Climatology:
<http://www.nhc.noaa.gov/climo/>

³³ *Ibid.*

Table 21: Saffir-Simpson Hurricane Scale³⁴

Scale Number (Category)	Sustained Winds (mph)	Damage	Storm Surge
1	74-95	Minimal: Unanchored mobile homes, vegetation and signs.	4-5 feet
2	96-110	Moderate: All mobile homes, roofs, small crafts, flooding	6-8 feet
3	111-130	Extensive: Small buildings, low-lying roads cut off.	9-12 feet
4	131-155	Extreme: Roofs destroyed, trees down, roads cut off, mobile homes destroyed. Beach homes flooded.	13-18 feet
5	More than 155	Catastrophic: Most buildings destroyed. Vegetation destroyed. Major roads cut off. Homes flooded.	Greater than 18 feet

Vulnerability to Hurricanes

While hurricanes are relatively uncommon in the Old Colony region, each of the communities are at risk from them. The Atlantic Ocean hurricane season runs from June 1 to November 30, with peak season in New England running from August to mid-October. Massachusetts is susceptible to hurricanes as its geography projecting easterly into the Atlantic is in the typical path of storms that originate in Cape Verde or the Bahamas. Given the fact that hurricanes are not limited to particular areas of the region and can affect the entire region, the vulnerability to hurricanes is the same across the entire region.

Previous Occurrences of Hurricanes

The damage inflicted by hurricanes in the Old Colony region and the surrounding area has been significantly less than that caused by hurricanes in other parts of the country. Table 22 shows the list of hurricanes and tropical storms that have affected Southern New England from 1900 through 2013. Since 1950, five of these storms have passed through the Old Colony, including Alma, Barry, Bob, Gordon and Hermine as shown in Figure 8.

Table 22: Hurricanes & Tropical Storms in Southern New England 1900-2013³⁵

Name	Date	Intensity
Unnamed	7/21/1916	Category 1
Unnamed	9/21/1938	Category 3
Unnamed	9/14-15 1944	Category 3
Carol	8/31/1954	Category 3
Edna	9/11/1954	Category 3
Diane	8/18-20 1955	Tropical Storm
Donna	9/12/1960	Category 2
Alma	6/4-13/1966	Tropical Storm

³⁴ The Weather Channel: Hurricanes and Tropical Storms: <http://www.weather.com/encyclopedia/charts/tropical/saffirscale.html>

³⁵ National Weather Service: National Hurricane Center: NHC Data Archive: <http://www.nhc.noaa.gov/data>

Name	Date	Intensity
Belle	8/9-10 1976	Category 1
Gloria	9/27/1985	Category 2
Bob	8/19/1991	Category 2
Bertha	7/12-13 1996	Tropical Storm
Floyd	9/16-17 1999	Tropical Storm
Gordon	9/14-21/2000	Tropical Storm
Hermine	8/27-31/2004	Tropical Storm
Barry	6/4-5 2007	Extratropical
Hanna	9/7/2008	Extratropical
Irene	8/28/2011	Tropical Storm
Sandy	10/29/2012	Extratropical
Andrea	6/8/2013	Extratropical

The most recent hurricane/tropical storm to make a significant impact on Massachusetts was Tropical Storm Irene, which struck the Old Colony region on August 28, 2011. Tropical Storm Irene was once a Category 3 Hurricane, but had lost strength before striking the region, but still left plenty of damage in its wake. The strong winds from Irene knocked down trees and utility poles across the state, causing more than 700,000 people to lose power statewide at the height of the storm, including more than 100,000 in the Old Colony region. Due to the massive amount of damage to electrical lines, it took crews almost one week to restore electricity to everyone in the region. The resulting damage from Irene was widespread as the Massachusetts Office of Consumer Affairs and Business Regulation stated that homeowners from across the state filed more than 28,500 claims for \$90 million in damage.

In October 2013, Hurricane Sandy or more commonly known as “Superstorm Sandy” was the most damaging hurricane ever, in terms of economic impact, to make landfall in the Northeastern United States. The storm made landfall in southern New Jersey with such ferocity that it caused more than \$30 billion in damage throughout the state and heavily damaged much of the New Jersey shoreline, including a number of tourist destinations, including Atlantic City. While the heavily populated New York/New Jersey metropolitan area was spared a direct hit from the storm, it caused heavy damage by knocking out power to tens of millions of people and flooding mass transit systems. While the storm was felt in the Old Colony region, it was to a much lesser degree. The most damage was caused in Plymouth, where the storm surge breached Plymouth Beach, forcing police to close a stretch of Warren Avenue (Route 3A) for several hours during the storm. The storm also snapped a number of trees and tree limbs in town, knocking out power to approximately 6,000 customers. Luckily the power outages were not lengthy and most customers had power restored within 24 hours. While the storm was disruptive, it caused little lasting damage.

Figure 8: Old Colony Region Hurricanes, Tropical Storms & Extreme Wind Events

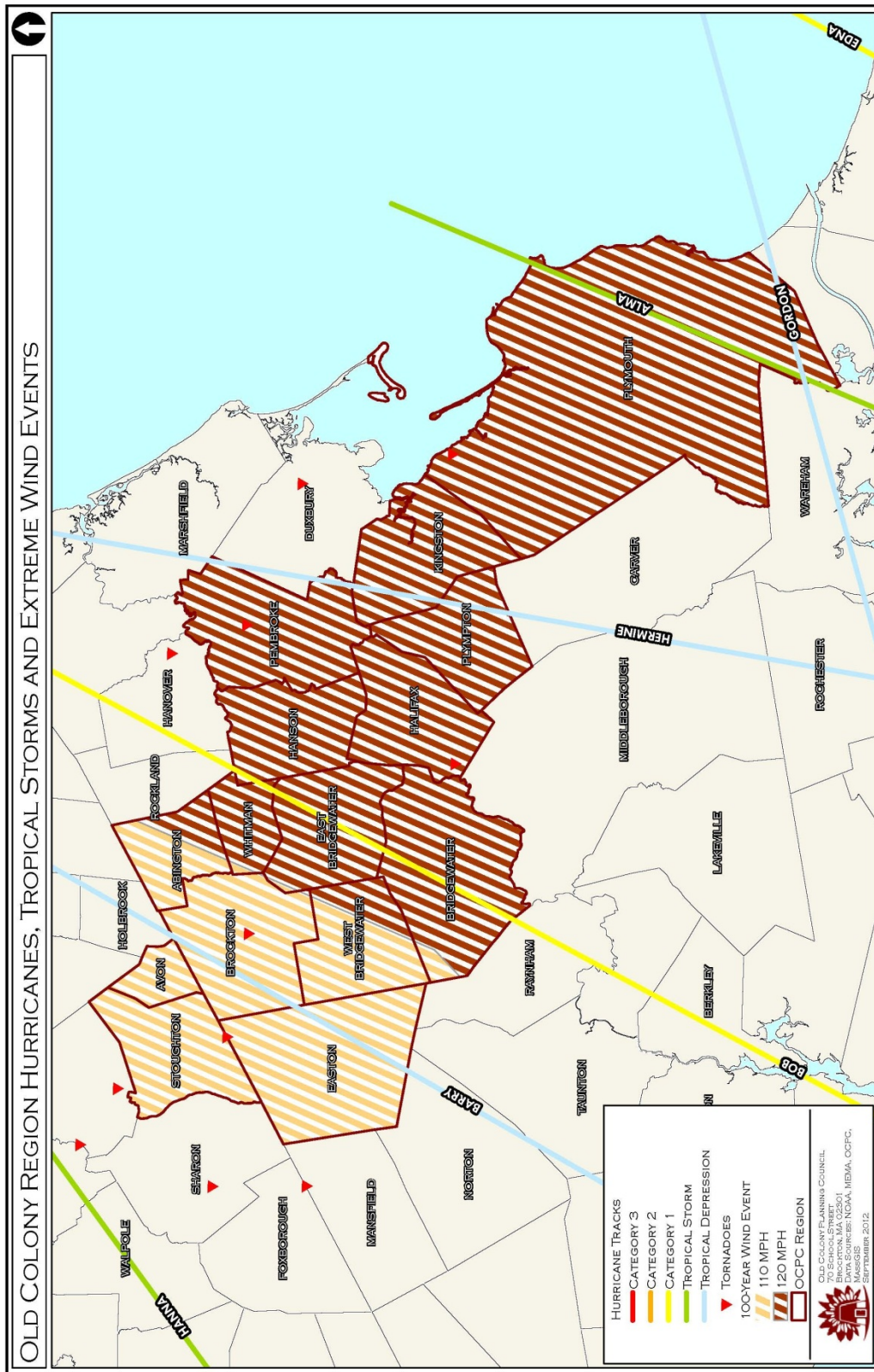


Figure 9: Damage from Tropical Storm Irene in Brockton



Probability of Future Hurricanes

In the 113 year period from 1900 through 2013, there have been 20 hurricanes/tropical storms that have affected Southern New England. Based on this historical information, there is an approximately 18% chance that a hurricane/tropical storm could strike in any given year in Southern New England. There is less than a 1% chance that two hurricanes, tropical storms or extratropical storms would affect the Old Colony Region in the same year, as it has only occurred once in the past 112 years-in 1954 when two hurricanes, Carol and Edna struck the Old Colony region within two weeks of each other. FEMA states that Massachusetts is at a Medium Risk of a direct-hit from a hurricane.

Tornadoes

Description of Tornadoes

According to FEMA, tornadoes are nature's most violent storms. Spawned from powerful thunderstorms, tornadoes can cause fatalities and devastate a neighborhood in seconds. A tornado appears as a narrow, violently rotating column of air that extends from the base of 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 and can have enough power to break branches off trees to lift houses off their foundations.³⁶

Waterspouts are another tornadic type hazard that can affect the Old Colony region. Waterspouts are rapidly rotating columns of air extending from the cloud base to water surface, such as a bay or an ocean. Waterspouts are generally broken into two categories: tornadic and fair weather. Tornadic waterspouts are simply tornadoes that form over water, or move from the land to water and are accompanied by high winds, hail and lightning. Fair weather waterspouts are usually a less dangerous phenomenon and occur during periods of fair weather. Since they do not move very far and usually do not make landfall they are not as dangerous as a tornadic waterspout.

Microbursts are yet another tornadic type hazard that can affect the region. A microburst is a small column of fast-sinking air, below a thunderstorm that reaches the ground and causes strong winds. A microburst, aka downdraft, is typically less than 2.5 miles wide, but it can produce winds of more than 100 mph which can cause as much damage as a small tornado, flattening trees and power lines.

Impacts of Tornadoes

Tornadoes are capable of causing injury or death of people who are in or near a tornado's path. The extreme winds associated with a tornado can destroy anything in its path, including vehicles, houses, buildings, etc. Lightly built housing and manufactured homes are at an increased risk because of their structural characteristics. The infrequent occurrence and relatively low risk of tornadoes coupled with the large number of older homes and buildings in the region constructed prior to the establishment of building codes makes the Old Colony region very vulnerable to tornado damage.

Vulnerability to Tornadoes

While tornadoes are relatively uncommon in the Old Colony region each of the communities are at risk from tornadoes. Although they can occur at any time of the year, they most frequently occur between the months of March and September. Although relatively rare in Massachusetts, the Massachusetts State Hazard Mitigation Plan states that tornadoes are most likely to occur in the central and northeastern parts of the state. Given the fact that tornadoes are not limited to particular areas of the region and can affect the entire region, the vulnerability to tornadoes is the same across the entire region.

³⁶ Ready.gov: Tornadoes: <http://www.ready.gov/tornadoes>

Extent of Tornadoes

As a way to measure the intensity and severity of tornadoes, Dr. T. Theodore Fujita developed the Fujita Scale (as shown in Table 23) in 1971. The rating was based primarily on damage that tornadoes inflicted on human built structures and vegetation. At the time the scale was derived, there was little information available on damage caused by wind, so the scale presented little more than educated guesses at wind speed ranges for specific tiers of damage.

Table 23: Fujita Tornado Damage Scale³⁷

Fujita Scale	Wind Speeds	Typical Damage
F0	< 73 MPH	<u>Light Damage:</u> Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112 MPH	<u>Moderate Damage:</u> Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157 MPH	<u>Considerable Damage:</u> Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	158-206 MPH	<u>Severe Damage:</u> Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260 MPH	<u>Devastating Damage:</u> Well-constructed houses leveled; structured with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	261-318 MPH	<u>Incredible Damage:</u> Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds.); trees debarked; incredible phenomena will occur.

While the Fujita Scale was used to rate the intensity of tornadoes for more than 35 years, the National Weather Service updated the Fujita Scale in 2007 and came up with the Enhanced Fujita Scale or EF Scale (as shown in Table 24). The EF Scale was developed due to research which suggested that the wind speeds require to inflict damage by intense tornadoes on the Fujita Scale were greatly overestimated. The EF Scale is a much more precise way to assess tornado damage than the original Fujita Scale. The EF Scale classifies F0-F5 damage as calibrated by engineers and meteorologists across 28 different types of damage indicators. The idea was that a “one size fits all approach” did not work in rating tornado damage, and a new scale was needed to take into account the typical strengths and weaknesses of different types of construction.

³⁷ National Ocean and Atmospheric Administration Storm Prediction Center: *Fujita Tornado Damage Scale*: <http://www.spc.noaa.gov/faq/tornado/f-scale.html>

Table 24: Enhanced Fujita Tornado Scale³⁸

Enhanced Fujita Scale	Wind Speeds	Typical Damage
EF-0	65-85 MPH	<u>Light Damage:</u> Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF-1	86-110 MPH	<u>Moderate Damage:</u> Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF-2	111-135 MPH	<u>Considerable Damage:</u> Roofs torn off well-constructed houses; foundations of frame houses shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF-3	136-165 MPH	<u>Severe Damage:</u> Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF-4	166-200 MPH	<u>Devastating Damage:</u> Whole frame and well-constructed houses completely leveled; cars thrown and small missiles generated.
EF-5	200+ MPH	<u>Incredible Damage:</u> Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 yards; high-rise buildings have significant structural deformation; incredible phenomena will occur.

Previous Occurrences of Tornadoes

The damage inflicted by tornadoes that have occurred in the Old Colony region and the surrounding area have been significantly less severe than damage caused by tornadoes in other parts of the country. Table 25 shows that the most severe tornado in the Old Colony region was an F2 (considerable damage), in Halifax in 1967. Luckily, the tornado occurred away from developed areas, therefore causing little property damage and no loss of life.

Table 25: Tornadoes in the Old Colony Region & Surrounding Area 1950-2013³⁹

Date	Community	Damage Range	Category	Deaths/Injuries
Old Colony Region				
7/4/1964	Pembroke	\$50,000-\$500,000	F1	0/0
11/18/1967	Halifax	\$50-\$500	F2	0/0
7/10/1989	Brockton	\$5,000-\$50,000	F1	0/1
8/20/1997	Plymouth	\$0	F0	0/0
7/24/2012	Plymouth	\$3,000	F0	0/0
5/9/2013	Stoughton	\$20,000	F0	0/0

³⁸ National Ocean and Atmospheric Administration Storm Prediction Center: *Enhanced Fujita Scale for Tornado Damage*: <http://www.spc.noaa.gov/faq/tornado/ef-scale.html>

³⁹ TornadoHistoryProject.com: Tornadoes in Massachusetts: <http://www.tornadohistoryproject.com/tornado/Massachusetts/map>

Date	Community	Damage Range	Category	Deaths/Injuries
Surrounding Area				
11/21/1956	Norwood	\$500-\$5,000	F2	0/0
9/7/1958	Duxbury	\$500-\$5,000	F0	1/1
8/2/1970	Foxborough	\$5,000-\$50,000	F1	0/0
9/6/1973	Sharon	\$5,000-\$50,000	F1	0/0
7/10/1989	Hanover	\$5,000-\$50,000	F0	0/0
Date	Community	Damage Range	Category	Deaths/Injuries
Surrounding Area				
5/18/1990	Canton	\$500-\$5,000	F0	0/0

The most recent large tornado to occur in Massachusetts occurred on June 1, 2011. The EF-3 (severe damage) tornado touched down in Westfield and travelled 39 miles to the east passing through the communities of West Springfield, Springfield, Wilbraham, Monson, Brimfield, Sturbridge and Southbridge before dissipating in Charlton. The tornado had a maximum width of one-half mile and left a major line of destruction in its path, as shown in Figure 10. All told, the tornado claimed three lives and injured hundreds more as well as caused damage to hundreds of houses and businesses that were in its path. The tornado also caused near deforestation when it passed through forested areas like the Brimfield State Forest.

Figure 10: Destruction in Springfield after the Westfield-Charlton Tornado



Additional notable tornadoes to occur in Massachusetts include the 1995 F4 tornado in Great Barrington that killed three people and caused \$25 million in damage as well as the 1953 F4 Worcester tornado, which is killed 94 people and caused \$52 million in damage. The Worcester tornado was the deadliest tornado ever to strike Massachusetts.

The most recent tornado in the Old Colony region occurred in July 2013, when an F0 tornado made landfall on Washington Street in Stoughton. The tornado caused approximately \$20,000 in damage, as it briefly lifted campers off the ground at a recreational vehicle dealership and destroyed garage doors at an adjacent car dealership. Luckily nobody was injured.

Probability of Future Tornadoes

In the 63 year period from 1950 through 2013, there have been six tornadoes in the Old Colony region. Utilizing that historical data, there is an approximately 9.5% chance that a tornado could strike in any given year within the Old Colony region. In the areas adjacent to the Old Colony region there have been an additional six tornadoes within the same timeframe, meaning that there is an approximately 19% chance that a tornado could strike the Old Colony region or its adjacent areas in any given year.

Winter Storm Hazards

Description of Winter Storms

A winter storm is a storm that consists of widespread snowfall, freezing temperatures, heavy winds and ice. Winter storms, ice storms, blizzards and nor'easters are some of the most common hazards that affect Massachusetts, as 1-2 major winter storms make landfall annually.

Impacts of Winter Storms

Winter storms and their associated cold temperatures can cause injury and death to people, particularly to those who are exposed to these elements for an extended period of time. Winter storms are also dangerous to motorists, as the accumulation of snow and ice on roadways make travelling treacherous, resulting in an increased number of accidents. Winter storms can make houses with flat roofs susceptible to roof collapses from heavy snow loads. When temperatures are below zero for a lengthy amount of time pipes can freeze and burst. Ice resulting from winter storms can cause build ups of ice on trees and power lines causing them to weaken and fall.

Vulnerability to Winter Storms

The entire Old Colony region is susceptible to winter storms, but inland locations are more likely to experience winter storms with significant snowfall because the region has a wide-range of average annual snowfall totals as shown in Figure 11. Coastal areas of Plymouth and the southern edge of Kingston receive the least, 24.1 to 36.0 inches annually, while the extreme inland northernmost portions of Avon and Stoughton receive 48.1 to 72.0 inches annually. Most of the region receives 36.1 to 48.0 inches annually. While the amount of snowfall resulting from winter storms in the region varies, the region's vulnerability is the same across the entire region.

Extent of Winter Storms

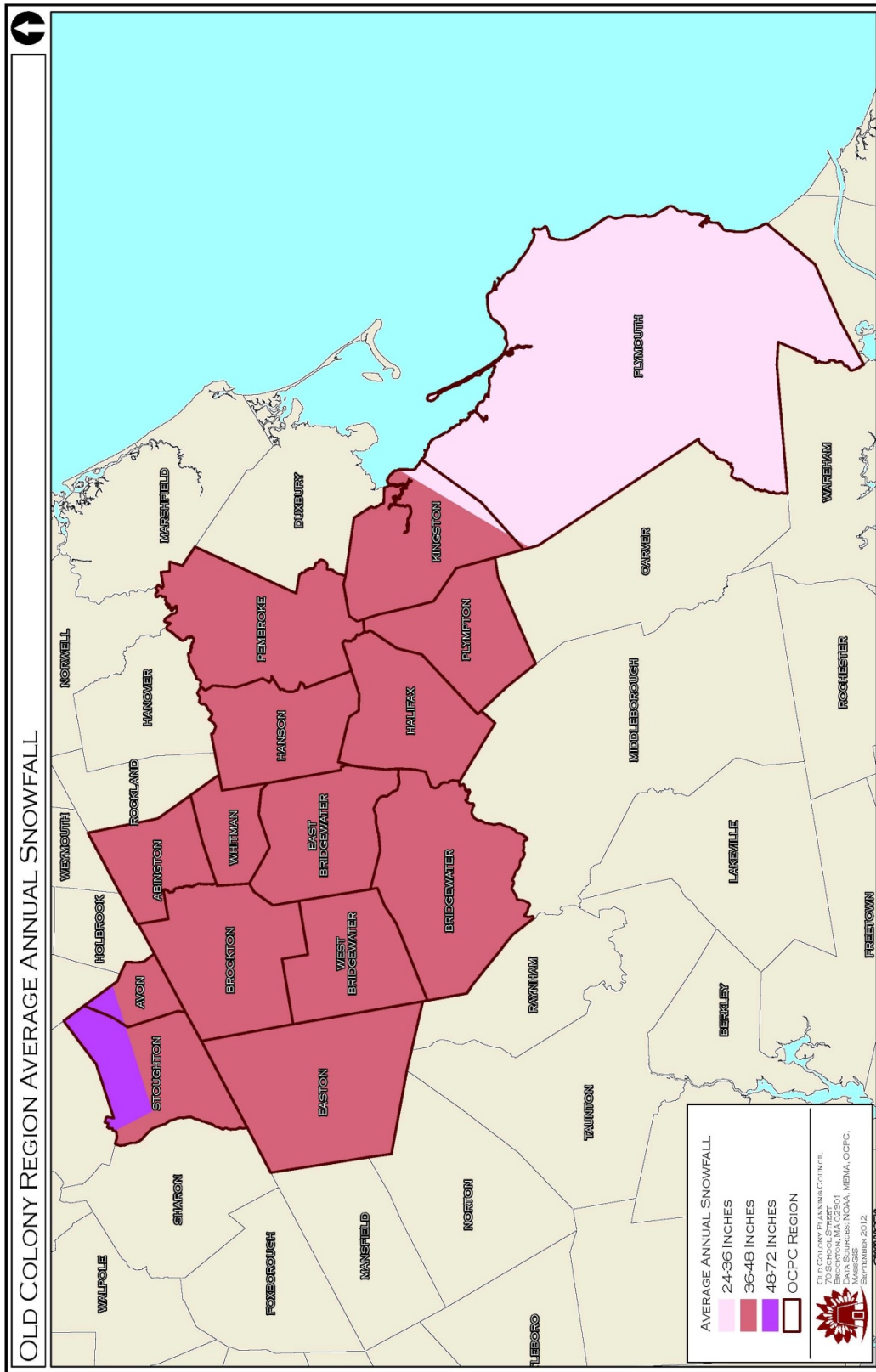
The Old Colony region has experienced a number of severe winter storms in the region over the past half century, but was hard to measure the impact and rank each winter storm until Paul Kocin of The Weather Channel and Louis Uccellini of the National Weather Service created the Northeast Snowfall Impact Scale or NESIS (as shown in Table 26) in 2004. NESIS is used much like the Fujita Tornado Scale and Saffir-Simpson Hurricane Scale that measures tornadoes and hurricanes respectively. The scale consists of five categories that range from notable to extreme. A winter storms' NESIS value is calculated by an equation using a variety of factors including the size of the area that is affected by the storm, the population living in the area affected by the storm and the amount of snowfall that has occurred during a given storm.

Table 26: Northeast Snowfall Impact Scale (NESIS) Categories⁴⁰

Category	NESIS Value	Description
1	1-2.499	Notable
2	2.5-3.99	Significant
3	4-5.99	Major
4	6-9.99	Crippling
5	10.0+	Extreme

⁴⁰ National Oceanic and Atmospheric Administration National Centers for Environmental Information: The Northeast Snowfall Impact Scale: <http://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis>

Figure 11: Old Colony Region Average Annual Snowfall



Previous Occurrences of Winter Storms

Using the Northeast Snowfall Impact Scale (NESIS) Table 27 lists high-impact winter storms that have resulted in the accumulation of 10” of snow or more in the Old Colony region since 1956. Of the 28 high-impact winter storms one was extreme, eight were crippling, nine were major, six were significant, and four were notable.

Table 27: High-Impact Snowstorms affecting the Old Colony Region 1956-2014⁴¹

Rank	Year	Date	NESIS	Category	Description
1	1996	January 6-8	11.78	5	Extreme
2	1960	March 2-5	8.77	4	Crippling
3	2003	February 15-18	7.5	4	Crippling
4	1961	February 2-5	7.06	4	Crippling
5	1964	January 11-14	6.91	4	Crippling
6	2005	January 21-24	6.8	4	Crippling
7	1978	January 19-21	6.53	4	Crippling
8	1958	February 14-17	6.25	4	Crippling
9	1983	February 10-12	6.25	4	Crippling
10	1978	February 5-7	5.78	3	Major
11	1994	February 8-12	5.39	3	Major
12	2011	January 9-13*	5.31	3	Major
13	2010	December 24-28*	4.92	3	Major
14	1960	December 11-13	4.53	3	Major
15	2013	February 7-10	4.35	3	Major
16	1969	February 22-28	4.29	3	Major
17	2006	February 12-13	4.1	3	Major
18	1961	January 18-21	4.04	3	Major
19	2009	December 18-21	3.99	2	Significant
20	1969	February 8-10	3.51	2	Significant
21	1967	February 5-8	3.5	2	Significant
22	1982	April 6-7	3.35	2	Significant
23	2013-2014	December 30-January 3	3.31	2	Significant
24	2013	March 4-9	3.05	2	Significant
25	1997	March 31-April 1	2.29	1	Notable
26	2011	January 26-27*	2.17	1	Notable
27	1956	March 18-19	1.87	1	Notable
28	2014	January 20-22	1.26	1	Notable

⁴¹ *Ibid.*

There have been a number of severe winter storms in the region over the past century, but the most significant winter storm in recent history was the “Blizzard of 1978” which brought the state to a standstill (as seen in Figures 12 & 13). The blizzard dumped 27 inches of snow in Boston and the Old Colony region, with some parts of southeastern Massachusetts receiving more than 30 inches of snow. The blizzard along with its intense snowfall also featured hurricane force winds and tides which were 16 feet above normal. This combination of snow, wind and high tides resulted in hundreds of motorists abandoning their cars on Route 128, roads being closed for up to one week due to the amount and intensity of the snowfall, as well as number of homes on the coast being destroyed by the high tides and the associated beach erosion. The “Blizzard of 1978” was responsible for 73 deaths and over \$500 million of damage in the state of Massachusetts alone.

Figure 12: Blizzard of 1978: Route 128



Figure 13: Blizzard of 1978: Boston



Probability of Future Winter Storms

Winter storms are not uncommon in Massachusetts, as 1-2 major winter storms on average make landfall annually in Massachusetts. In terms of more intense and high impact winter storms there have been 28 over the past 58 years that have measured on the Northeast Snowfall Impact Scale. This indicates that there is an approximately 48% chance that there will be a NESIS ranked winter storm event in the Old Colony region in any given year. In seven of those years, there was more than one winter storm, which suggests that there is an approximately 12% chance that there will be more than one NESIS ranked winter storm event in any given year within the Old Colony region.

Coastal Hazards (Shoreline Change & Erosion)

Description of Coastal Hazards

According to the Massachusetts Office of Coastal Zone Management (CZM) coastal shorelines change from the impacts of wind, waves, tides, sea level fluctuation, seasonal and climatic variation, human alteration, and other factors that influence the movement of sand and material within a shoreline system. The loss (erosion) and gain (accretion) of coastal land are visible results of the way shorelines are reshaped by these dynamic conditions. Warmer temperatures associated with climate change will likely increase the number and severity of storm events in the future, thereby increasing coastal erosion and the shorelines around the world.⁴²

Impacts of Coastal Hazards

While erosion and flooding are necessary and natural, they do have the potential to damage coastal property and related infrastructure, particularly when development is sited in unstable or low-lying areas. These dynamic and powerful processes can expose septic systems and sewer pipes, contaminate shellfish beds and other resources; release oil, gasoline, and other toxins to the marine environment; and sweep construction materials and other debris out to sea. Public safety is also jeopardized when buildings collapse or water supplies are contaminated.⁴³

Shoreline change along beaches and coastlines and the undermining of sea walls, some of which are many decades old, can result in significant economic and emotional loss in a system of fixed property lines and ownership. Sea walls protect the buildings behind them from storm damage and their failure can lead to increased property damage. Similarly, intact barrier beaches with dunes dissipate wave energy, protecting buildings behind them. As the beaches erode away, this protection is lost. In some cases, sea walls can accelerate beach erosion. In April of 2010, 500 feet of sea wall in the nearby community of Marshfield collapsed due to undermining of its foundation from erosion. Attempting to halt the natural process of erosion with seawalls and other hard structures, however, simply shifts the problem, subjecting down drift property owners to similar losses.

FEMA has indicated in their latest rules that post hazard event reconstruction or repair funding for coastal protection structures will only be made available where the damage can be directly attributed to the storm event. Therefore, in order to receive this funding, it is imperative the each community maintain records of maintenance and repair activities that demonstrate the status of each structure.

Also, without the sediment transport associated with erosion, some of the Commonwealth's greatest assets and attractions--beaches, dunes, barrier beaches, salt marshes, and estuaries—are threatened and will slowly disappear as the sand sources that feed and sustain them are eliminated.

⁴² Massachusetts Office of Coastal Zone Management (CZM): StormSmart Coasts-Massachusetts Shoreline Change Project: <http://www.mass.gov/eea/agencies/czm/program-areas/stormsmart-coasts/shoreline-change/>

⁴³ *Ibid.*

Extent of Coastal Hazards

The Town of Plymouth has developed a Flood Management Plan which describes how the town’s shoreline has changed over a 147-year period with a fairly low rate of erosion. Statistics produced from the data show that 33% of the coastline is stable (up to ± 0.5 feet/year), 41% has had less than 1.5 feet of erosion/year, 19% has had between 1.5-3.5 feet of erosion/year, 2% has had greater than 3.5 feet of erosion/year, and 5% have accreted. These are measurements of the Mean High Water position. If one assumes a maximum erosion rate of 1.5 feet per year, since 74% of the shoreline in Plymouth erodes at this rate and that the top of coastal banks erodes at an equivalent rate, there is currently one home in danger within 1-5 years, two homes will be in danger within 6-10 years, there are no homes in imminent danger, and 26 homes will be in danger within the next 60 years.⁴⁴

Vulnerability to Coastal Hazards

The towns of Kingston and Plymouth are the only coastal communities in the Old Colony region and therefore the only communities vulnerable to coastal hazards. With many miles of tidal shoreline between the two communities, they are aware of the challenges presented by erosion and shoreline change. A majority of the shoreline in each community is dominated by private residences, but is dotted with public beaches, restaurants and marinas. Kingston’s smaller coastline is better protected than Plymouth’s coastline due to the presence of two barrier beaches: the three-mile Plymouth Beach to the south and the seven-mile Saquish Neck to the north. The two beaches almost touch and leave just a mile wide opening. This small opening protects Kingston’s coastline from damage caused by severe coastal hazards.

Previous Occurrences of Coastal Hazards

Coastal hazards occur naturally throughout time, but can be further exacerbated by hurricanes and winter storms. Two of the most significant coastal storms to hit the Massachusetts coast occurred in 1991. Hurricane Bob and an October nor’easter (The Perfect Storm) caused a combined total of \$49 million in damage statewide to uninsured property and infrastructure in addition to the nearly \$125 million paid out statewide by the National Flood Insurance Program (NFIP) in flood insurance claims. Another coastal storm in December 1992 caused \$12.6 million in damages to public infrastructure statewide and resulted in \$12.7 million in NFIP claims statewide.⁴⁵ Table 28 is a list of coastal storms resulting in hazardous conditions along the coast of the Old Colony region.

Table 28: Coastal Hazard Events in the Old Colony Region 1954-2013

Previous Occurrences	Date Occurred	FEMA Disaster Declaration
Hurricanes Carol & Edna	September 1954	DR-22
Coastal Storm, Flood, Ice, Snow “Blizzard of 78”	February 1978	DR-546
Hurricane Bob	August 1991	DR-914
Severe Coastal Storm “Perfect Storm”	October-November 1991	DR-920
Coastal Storm	December 1992	DR-975

⁴⁴ Town of Plymouth. (2009). *Flood Management Plan*. Plymouth, MA

⁴⁵ Massachusetts Emergency Management Agency (MEMA) (2010) *Commonwealth of Massachusetts State Hazard Mitigation Plan*. Boston, MA

Previous Occurrences	Date Occurred	FEMA Disaster Declaration
Severe Storms and Flooding	March-April 2001	DR-1364
Nor'easter	January 2005	None Declared
Severe Storms & Inland Coastal Flooding	April 2007	DR-1701
Tropical Storm Irene	August 2011	DR-4028
Hurricane Sandy	October-November 2012	DR-4097

Figure 14: Coastal Erosion from the “Perfect Storm” in Plymouth



Probability of Future Coastal Hazards

Coastal hazards will always threaten the communities of Kingston and Plymouth. A number of precautions have been taken to guard against the impacts of future coastal hazards, as a number of seawalls, bulkheads, revetments, groins, breakwaters, and jetties have all been constructed to defend against the threat of coastal hazards.

It is extremely difficult to predict the probability of future incidents of coastal hazards, although it is something that is always occurring due to impacts from wind, waves, tides, sea level fluctuation, seasonal and climatic variations. When examining previous occurrences of major coastal hazards in the region (10 events in the past 59 years), the probability of coastal hazards being experienced in the region is approximately one event every six years. In the future, the warmer predicted temperatures associated with climate change will likely increase the number and severity of storm events, likely increasing coastal erosion and the shorelines around the world.

Fire-Related Hazards

Wildfires

Description of Wildfires

A wildfire can be described as any non-structure fire that occurs in the countryside or wilderness area. Wildfires can occur for a variety of reasons including naturally occurring wildfires, which are primarily caused by lightning; arson; carelessness by humans; and prescribed burning, which is used to manage the health of a forest. Drought conditions can greatly increase the potential for wildfires, which can be further exacerbated by the makeup of the surrounding area, especially if the wooded area consists of more flammable vegetation types, such as pitch pine and scrub oak which can act as a fuel to the fire.

Impacts of Wildfires

Wildfires can be highly destructive and unpredictable and anyone near it can fall victim to this deadly hazard, either through being burned or through carbon monoxide poisoning from the smoke generated by the wildfire. This smoke deteriorates the air quality which can be dangerous especially to people who have any type of lung or cardio-pulmonary conditions. Both people in the immediate area and people who are further away from the fire can be subject to the smoke of a wildfire due to the wind direction at the time of a wildfire. Wildfires are also dangerous to motorists, as the smoke from a wildfire can impede motorist's visibility and cause traffic accidents. Additional impacts caused by wildfires can include devastating ecological effects, as some wildfires can destroy vast amounts of animal and plant habitats, some of which some may be threatened or endangered.

Vulnerability to Wildfires

Southeastern Massachusetts is more vulnerable to wildfires than the rest of the state because of the availability more flammable vegetation types, impact from offshore winds, and increasing development within the wildland areas, as shown in Figure 15. Portions of southeastern Massachusetts are also classified as "pine barrens". Historically these austere communities were called "barrens" because the soil was considered too poor or barren to support agriculture. These soils are not only extremely dry but also strongly acidic, which limits the decomposition of pine needles, sticks and leaves, leading to the accumulation of additional flammable materials for a wildfire. The Town of Plymouth in particular, is very vulnerable to wildfires, particularly in the scrub pine and oak forest in the southern and western portions of Plymouth and in down-wind neighborhoods to the east of these areas. The summer's prevailing westerly winds can fan and spread a fire rapidly. There is also the threat for a major wildfire to occur in the Pine Hills area of Plymouth and in the 14,600 acres Myles Standish State Forest.

In many places throughout the Old Colony region the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels, also known as the Wildland-Urban Interface (WUI) is becoming increasingly dangerous as ongoing development pushes further into former wildlands. The WUI is visible in Plymouth and the other communities that border the 14,600 acre Myles Standish State Forest, as well as in the out-of-region but nearby 5,400 acre Fall River/Freetown State Forest and 1,500 acre Massasoit State Forest in Taunton. According to State Fire Suppression staff, southeastern Massachusetts is the

third most hazardous wildfire-interface area in the country, with fires able to spread over 40 acres in a minute.

Extent of Wildfires

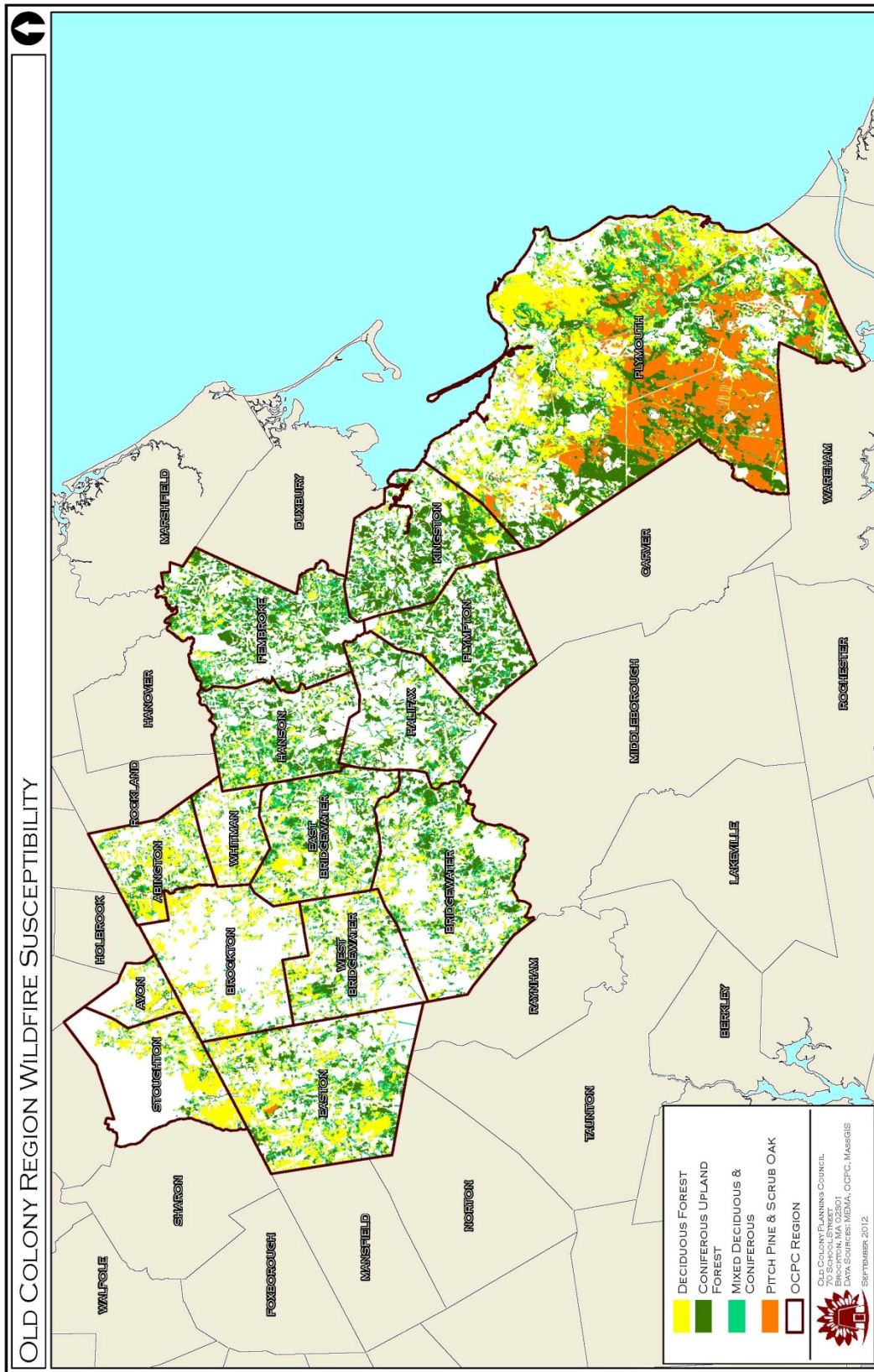
The extent of a wildfire is measured by the number of acres burned. The National Wildfire Coordinating Group has developed a way of measuring the extent of wildfires based on the number of acres burned (as shown in Table 29). In the Old Colony region, the worst case scenario for a wildfire in the region is the 15,000 acre wildfire that occurred in Plymouth in May 1957. The fire began in the Myles Standish State Forest in Carver and ended 12 miles away at the Atlantic Ocean in the Manomet section of Plymouth.

Table 29: Wildfire Size Class⁴⁶

Class	Number of Acres Burned
Class A	One quarter acre or less
Class B	More than a quarter acre, but less than 10 acres
Class C	10 acres or more, but less than 100 acres
Class D	100 acres or more, but less than 300 acres
Class E	300 acres or more, but less than 1,000 acres
Class F	1,000 acres or more, but less than 5,000 acres
Class G	5,000 acres or more

⁴⁶ National Wildfire Coordinating Group (NWCG): Glossary of Wildland Fire Terminology: http://www.nwcg.gov/pms/pubs/glossary/s.htm#Size_Class_of_Fire

Figure 15: Old Colony Region Wildfire Susceptibility



Previous Occurrences of Wildfires

As was previously noted, one of the largest wildfires in Massachusetts history occurred in Plymouth in May 1957. This catastrophic fire began in the Myles Standish State Forest in Carver and ended 12 miles away at the Atlantic Ocean in the Manomet section of Plymouth. This fast moving fire burned more than 15,000 acres and had a 10 mile front, which was assisted by the highly flammable vegetation in the area and a brisk southwesterly wind. This catastrophic wildfire had a 35 mile perimeter and destroyed more than 40 homes and cottages in its path.

While there have been other wildfires in the Old Colony region, the largest and most devastating have all occurred in Plymouth; either within the Myles Standish State Forest or the Pine Hills section of Plymouth-both known for their highly flammable vegetation. Using information from both the U.S. Fish & Wildlife Service as well as a map from the DCR District 2 Headquarters in Myles Standish State Forest, Table 30 below shows the largest wildfires that have occurred in Plymouth over the past 57 years.

Table 30: History of Wildfires in Plymouth, Massachusetts

Date	Acres Burned	Wildfire Size Class
May 8, 1957	15,000	Class G
April 28, 1963	530	Class E
May 25, 1964	5,500	Class G
May 5, 1966	535	Class E
April 19, 1970	450	Class E
May 15, 1971	165	Class D
April 21, 1975	250	Class D
May 23, 1976	160	Class D
May 1, 1977	735	Class E
April 11, 1991	1,200	Class F

Probability of Future Wildfires

While it is extremely difficult to predict the probability of future wildfires, as the causes of wildfires (naturally occurring wildfires, arson, carelessness by human beings and prescribed burning) are variable and unpredictable, the probability of wildfires occurring in the region are high due to amount of forested land. However the intensity and extent of wildfires in the future will most likely be lower than in the past due to a variety of reasons, including fire department being better trained and able to respond more quickly; the ability of the public to become fire spotters and report fires via cell phones; the use of prescribed burns, which reduce the likelihood of wildfires and promote ecological balance. As a result of these measures a mature forest has grown throughout Myles Standish State Forest, with the taller trees reducing the flammable understory and with it the fuel the fire needs to spread. As can be seen from Table 30 above, there has only been one major wildfire in the area since 1978.

Major Urban Fires

Description of a Major Urban Fire

A major urban fire or conflagration is a large destructive, often uncontrollable, fire that spreads substantial destruction. These fires are most likely the result of arson, accidents, or electrical malfunctions. Major urban fires can spread rapidly due to the adjacency of structures in urban or densely populated areas.

Impacts of Major Urban Fires

Major urban fires are capable of causing death or injury to people who are exposed to the fire's smoke and flames, resulting in smoke inhalation and burns. Wood framed and timber structures are far more combustible than brick and mortar, steel and concrete structures, making them more susceptible to fires, especially when clustered together when fires can easily spread between buildings. Over the past one hundred years, major urban fires have become less common and smaller due to the implementation and enforcement of building codes, increased fire-fighting technology and the widespread use of more fire-resistant building materials.

Vulnerability to Major Urban Fires

Major urban fires are likely to occur in areas where there are larger concentrations of wood frame structures and in former mill communities, where many of the former mills and warehouses are vacant or abandoned, making them susceptible to vandalism or accidental fires. In the Old Colony region, the City of Brockton is most vulnerable to a major urban fire. Once known as the "Shoe Capital of the World", Brockton contains many old abandoned mills and warehouses, most of which are clustered in the downtown section of the city. These are particularly vulnerable due to the construction materials which were used at the time (sawdust insulation, etc.), the original electrical wiring, and minimum spaces between buildings. Other communities in the region that are vulnerable to major urban fires include the densely developed downtown areas of Plymouth, Stoughton and Whitman.

Extent of Major Urban Fires

Unlike hurricanes (Saffir-Simpson Scale) and tornadoes (Fujita Scale), there is no hard and fast way to measure the strength or magnitude of a fire. Instead, the magnitude of a fire is often measured by the number of deaths and injuries, the number of structures damaged or destroyed and the number of alarms needed to respond to the fire.

Previous Occurrences of Major Urban Fires

Brockton was the site one of the deadliest urban fires for firefighters in state history. On March 10, 1941 the Strand Theater fire (Figure 16) in downtown Brockton killed thirteen firefighters and injured 20 more when firefighters who were attempting to douse the blaze were caught inside the theater when its roof collapsed. No definitive cause of the fire was ever discovered. A more recent large urban fire occurred February 15, 1987 at the London Clothing Factory building in downtown Brockton. The timber structure was quickly engulfed and the wind-whipped flames also destroyed several nearby buildings as well as a Brockton Fire Department ladder truck.

Figure 16: Strand Theater Fire, Brockton



While there have not been any major urban fires in the region since the Strand Theater Fire in 1941, there have been a number of major urban fires across the state since that time. Some of the more notable ones include the 1942 Cocoanut Grove Nightclub Fire in Boston that killed 492 people; the 1972 Hotel Vendome Fire that killed nine firefighters; the 1973 Chelsea Fire that destroyed 18 city blocks; the 1981 Lynn Fire that destroyed 17 downtown buildings; and the 1999 Worcester Cold Storage Warehouse Fire that killed six firefighters.

Probability of Future Major Urban Fires

There is no accurate way to predict future major urban fires in the region, although wood frame construction homes and businesses are more likely to experience a large destructive fire.

Geologic-Related Hazards

Earthquakes

Description of Earthquakes

FEMA defines an earthquake as ground shaking caused by a sudden movement of rock in the Earth's crust. Such movements occur along faults, which are thin zones of crushed rock separating blocks of crust. When one block suddenly slips and moves relative to the other along a fault, the energy released creates vibrations called seismic waves that radiate up through the crust to the Earth's surface, causing the ground to shake, which can damage structures. Earthquakes can occur anytime of the year and can last from just seconds to several minutes.⁴⁷

Impacts of Earthquakes

Impacts from an earthquake can be wide-ranging and devastating. People exposed to earthquakes can be killed or seriously injured as a result of collapsing buildings, which are common during earthquakes. Earthquakes are so disruptive that they can trigger a number of other natural hazards, such as tsunamis, landslides and fires. While the threat of a major earthquake striking the region is low, most homes, buildings and infrastructure in the region are vulnerable to considerable devastation if a medium to large earthquake does strike, because Massachusetts did not introduce earthquake design requirements into their building code until 1975. Buildings, bridges, water supply lines, electrical power lines and facilities built before 1975 may not have been designed to withstand the forces of an earthquake.

Vulnerability to Earthquakes

The New England epicenters do not follow the major mapped faults of the region, nor are they confined to particular geologic structures or terrain. As opposed to plate boundary regions like California where many earthquakes align along known geologic faults, New England's earthquakes so far have not aligned along faults that have been mapped by geologists. Because earthquakes have occurred all over New England, seismologists suspect that a strong earthquake could be centered anywhere in the region. Therefore, all of the communities in the region are vulnerable to earthquakes.

It should be noted that most of the region is located in a Peak Ground Acceleration (PGA) Zone 4, while most of Plymouth is located in Zone 3. PGA is a measure of earthquake acceleration on the ground and unlike the Richter scale, it is not a measure of the total energy (magnitude, or size) of an earthquake, but rather of how hard the earth shakes in a given area. Potential earthquake damage is lower in Plymouth than it is in the rest of the region due to Plymouth's sandy soils.

Extent of Earthquakes

The two most common ways an earthquake is measured is by the magnitude of the earthquake and the intensity of the earthquake. The magnitude of an earthquake is measured by the seismic energy it generates and is often calculated using a seismograph and reported using the Richter Scale (as shown in Table 31). The Richter Scale magnitude is a number between 1 and 10,

⁴⁷ Federal Emergency Management Agency (FEMA): Why Earthquakes Occur:
<http://www.fema.gov/earthquake/why-earthquakes-occur>

followed by a decimal. It is a base 10 logarithmic scale, meaning a magnitude 4.0 earthquake is ten times more intense than a magnitude 3.0, and a 5.0 is ten times more intense than 4.0, etc.

The intensity of an earthquake is measured by Modified Mercalli Intensity Scale (as shown in Table 32), which consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally - total destruction. The scale is composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction and is designated by Roman numerals. It does not have a mathematical basis; instead it is an arbitrary ranking based on observed effects.

Table 31: Richter Magnitude Scale Compared to Modified Mercalli Intensity⁴⁸

Richter Magnitude Scale	Typical Maximum Modified Mercalli Intensity
1.0 to 3.0	I
3.0 to 3.9	II to III
4.0 to 4.9	IV to V
5.0 to 5.9	VI to VII
6.0 to 6.9	VII to IX
7.0 and Higher	VIII or Higher

Table 32: Defined Modified Mercalli Intensity Scale Rating⁴⁹

Mercalli Intensity Scale	Earthquake Effects
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

⁴⁸ United States Geological Survey (USGS): Earthquake Hazards Program, Magnitude/Intensity Comparison: http://earthquake.usgs.gov/learn/topics/mag_vs_int.php

⁴⁹ *Ibid.*

Mercalli Intensity Scale	Earthquake Effects
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Previous Occurrences of Earthquakes

Massachusetts has a long history of earthquakes, beginning with events that were recorded by the nation’s earliest settlers in the seventeenth century. Between 1638 and February 2014 there were 472 earthquakes recorded in Massachusetts. Although earthquakes are rare in the OCPC region, there have been 16 recorded earthquakes in the Old Colony region and the surrounding area from 1697 to February 2014 as shown in Table 33 and Figure 17. The United States Geological Services (USGS) confirms that the region is at low risk for earthquakes, though small ones are common.⁵⁰

Table 33: Earthquakes in the Old Colony Region & Surrounding Area 1697-2013⁵¹

Date	Community/Location	Magnitude
2/20/1697	Plympton	3.0
12/25/1800	Taunton	Unknown
2/3/1881	Kingston	Unknown
6/25/1893	Middleboro	Unknown
10/25/1926	Brockton	Unknown
12/20/1977	Wareham	3.1
12/20/1977	Middleboro	2.0
1/27/1982	Middleboro	3.0
11/1/1982	2 Miles off the Coast of Duxbury	2.3
7/18/1984	1 Mile off the Coast of Marshfield	1.7
10/11/1990	3 Miles off the Coast of Plymouth	3.2
7/22/1993	Abington	2.7
11/17/2005	Plymouth	2.3

Source: <http://www.bc.edu/research/westonobservatory/>

Probability of Future Earthquakes

The USGS has created a website, <http://eqint.cr.usgs.gov/eqprob/2002/index.php>, where one may request a customized earthquake probability map for a specific latitude and longitude or zip code. This website will provide a probability estimate based on the most currently available earthquake rate and probability models derived from earthquake rate, location, and magnitude data from the USGS National Seismic Hazard Mapping Project. According to the USGS National Seismic Hazard Mapping Project there is a .06 and .08 % chance of an earthquake of 4.75 or greater striking the Old Colony region over the next 100 years.

⁵⁰ Massachusetts Emergency Management Agency (MEMA) (2010) *Commonwealth of Massachusetts State Hazard Mitigation Plan*. Boston, MA

⁵¹ Boston College Weston Observatory: <http://www.bc.edu/research/westonobservatory/>

It should also be noted that according to a 1994 report by the USGS, a meeting of experts at the Massachusetts Institute of Technology, found that the probability of a magnitude 5.0 or greater earthquake centered somewhere in New England in a 10-year period is about 10%-15%. This probability rises to about 41% to 56% for a 50-year period. The last earthquake with a magnitude above 5.0 that was centered in New England took place in the Ossipee Mountains of New Hampshire in 1940.

Landslides

Description of Landslides

According to the United States Geological Survey (USGS), the term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over steepened slope is the primary reason for a landslide, there are other contributing factors. Among these are: erosion by rivers, glaciers, or ocean waves create over steepened slopes; rock and soil slopes weakened through saturation by snowmelt or heavy rains; earthquakes creating stresses that make weak slopes fail; and excess weight from accumulation of rain or snow, stockpiling of rock or ore, from waste piles, or from man-made items.⁵²

Impacts of Landslides

People who are in the path of a landslide are at great risk of death or severe injury, as the moving ground can bury people under feet or dirt, sand or rock. Property and infrastructure in the path of a landslide are also at great risk from being destroyed or heavily damaged.

Vulnerability to Landslides

A majority of the Old Colony region is at a relatively low risk from landslides, which can be attributed to the relatively level terrain of the region. However parts of the communities of Bridgewater, East Bridgewater, Halifax, Kingston, Plymouth, Plympton, and West Bridgewater are considered to be at moderate susceptibility/low incidence of landslides. Also at risk from the threat of landslides from coastal erosion are the steep sand cliffs along the shores of southern Plymouth. One neighborhood that is at particular risk is the Nameloc Drive neighborhood whose homes are adjacent to the sandy cliffs and are vulnerable to the threat of landslides in the future.

Extent of Landslides

Unlike earthquakes (Richter Scale) and tornadoes (Fujita Scale), there is no one specific well-known scale to measure the magnitude of a landslide. However, there is a scale to measure the velocity of a landslide and the corresponding human response (as seen in Table 34). The Landslide Velocity Scale was developed by David Cruden and David Varnes as published in *Landslides: Investigation and Mitigation*.

When landslides do occur, their extent is usually measured by the volume of Earth moved. It can also be measured by the extent of damage it causes, in terms of lives lost and/or damage to property.

⁵² United States Geological Survey: Landslide Hazards Program: <http://landslides.usgs.gov/learn/>

Table 34: Landslide Velocity Scale⁵³

Velocity Class	Description	Velocity (mm/sec)	Typical Velocity	Human Response
7	Extremely Rapid			Nil
	-----	5×10^3	5 m/sec	
6	Very Rapid			Nil
	-----	5×10^1	3 m/min	
5	Rapid			Evacuation
	-----	5×10^{-1}	1.8 m/hr	
4	Moderate			Evacuation
	-----	5×10^{-3}	13 m/month	
3	Slow			Maintenance
	-----	5×10^{-5}	1.6 m/year	
2	Very Slow			Maintenance
	-----	5×10^{-7}	16 mm/year	
1	Extremely Slow			Nil

Previous Occurrences of Landslides

While landslides are more common in the more mountainous region of western Massachusetts, one location where landslides have become problematic in the region are the bluffs along the aforementioned Nameloc Drive in southern Plymouth, where the retreating cliff is leaving houses at great risk. While the cliffs may exist only because coastal drumlins have been eroded to their present shape, residents naturally want the process to stop. Various hard and soft solutions to stabilize the slope or protect the houses continue to be proposed and tried. These include protective planting, use of gabions (heavy wire mesh bags of stone), or concrete elements penetrating the surface and balanced by replenished sand, or simply moving the houses back from the advancing cliff when space allows. Besides this area in Plymouth, there have been no other documented occurrences of landslides in the region.

Probability of Future Landslides

The probability of future landslides occurring in the region, (with the exception of the aforementioned area in Plymouth) is extremely low, due to the general level terrain of the region and the lack of any previously documented occurrences. In the aforementioned area in Plymouth, the risk is higher, where landslides can occur as a result of gravity over time, or can be exasperated as a result of other natural hazards, such as flooding, hurricanes and winter storms.

⁵³ Transportation Research Board (TRB). (1996). *Landslides: Investigation and Mitigation. Chapter 3 - Landslide Types and Processes*. Washington, D.C.

Tsunamis

Description of Tsunamis

Tsunamis can be described as a string of waves created by an underwater disturbance such as an earthquake, landslide, volcanic eruption, or impact from a meteorite. An earthquake can give rise to a tsunami if the earthquake causes major vertical movements of the sea floor. The series of waves from a tsunami can move hundreds of miles per hour in the open ocean and can come ashore with waves as high as 100 feet or more. The height of a tsunami wave that comes ashore is related to the strength of the source that generated the tsunami and to the configuration of the ocean bottom along the shore affected by the tsunami.⁵⁴

Impacts of Tsunamis

Drowning is the most common cause of death associated with a tsunami. Tsunami waves and the receding water are very destructive to structures in the run-up zone. Other hazards include flooding, contamination of drinking water, and fires from gas lines or ruptured tanks.

Extent of Tsunamis

To assist in monitoring the threat of tsunamis, the National Oceanic and Atmospheric Administration (NOAA) has developed and deployed the Deep-ocean Assessment and Reporting of Tsunamis (DART) system. The DART system consists of a system of more than 39 high-tech buoys stationed along earthquake fault lines across the Pacific and Atlantic Oceans. When a tsunami event occurs, the first information available about the source of the tsunami is the available seismic information for the earthquake event. As the tsunami wave propagates across the ocean and successively reaches the DART systems, these systems report sea level information measurements back to the Tsunami Warning Centers, where the information is processed to produce a new and more refined estimate of the tsunami source. The result is an increasingly accurate forecast of the tsunami that can be used to issue watches, warnings or evacuations.

Vulnerability to Tsunamis

The Old Colony region has only two coastal towns: Kingston and Plymouth. These towns are most vulnerable to the threat of tsunamis.

Previous Occurrences of Tsunamis

While there have been no recorded tsunamis in Massachusetts, there have been two historic earthquakes that have caused tsunamis in the Atlantic Ocean. In 1755, an estimated 8.7 magnitude earthquake off the coast of Lisbon, Portugal caused a major tsunami to inflict massive damage along the Portuguese coast; and in 1929, a magnitude 7.3 earthquake off the coast of Newfoundland triggered a submarine landslide that caused a major tsunami which killed residents and inundated fishing villages off the coast of Newfoundland.

Tsunamis in the Pacific Ocean, while still rare, are common than in the Atlantic Ocean due to the fact that the entire Pacific Ocean is surrounded by tectonic plates. When these tectonic plates move, earthquakes result and that is when a majority of tsunamis occur. A recent example of a

⁵⁴ Massachusetts Emergency Management Agency (MEMA) (2010) *Commonwealth of Massachusetts State Hazard Mitigation Plan*. Boston, MA

Pacific Ocean tsunami is the March 2011 9.0 magnitude earthquake and tsunami off the coast of Japan. The resulting tsunami killed more than 15,000 and caused massive destruction to the country's infrastructure including major damage at the Fukushima Daiichi Nuclear Power Plant in the coastal town of Fukushima. The waves from the resulting tsunami were more than 45 feet high and disabled the emergency generators which resulted in the failure to cool the reactors and caused a meltdown. In light of the recent Japanese earthquake and tsunami causing a meltdown to the Plant, protective measures should be taken to protect the Pilgrim Nuclear Power Station on Plymouth's coast in the event a tsunami occurs.

Probability of Future Tsunamis

According to the 2013 Massachusetts State Hazard Mitigation Plan it is unknown at what the probability is of a tsunami damaging the coast of Massachusetts.

Other Natural Hazards

Extreme Temperatures

Description of Extreme Temperatures

Extreme temperatures may be defined as those that fall far outside of normal ranges in a given season. The climate of Massachusetts consists of four separate, distinct seasons; winter, spring, summer and autumn. While it is possible to have extreme temperatures in any season, the summer and winter seasons are the most likely seasons to experience extreme temperatures.

Impacts of Extreme Temperatures

Extreme cold poses a great risk to individuals who are outside for any length of time, such as homeless persons, persons who work outside or persons who live in homes that are poorly insulated or do not have heat. Dangers that can result from being exposed to extreme cold temperatures include frostbite and hypothermia. These dangers can occur in as little as five minutes, depending on the temperature, wind speed and how adequately the person is clothed or protected from the extreme cold.

Extreme heat can also pose great risks, especially to the elderly, children and people who have been exposed to it for a long period of time, such as those who work outside; construction workers, roofers, etc. Extreme heat, for this climatic region, is usually defined as a period of at least three consecutive days with the temperature above 90⁰F. Dangers that can result from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. These dangers occur as a result of overexposure to extremely hot temperatures and result in the loss of bodily fluids causing weakness, dizziness and nausea.

Vulnerability to Extreme Temperatures

Extreme temperatures can occur anywhere in the Old Colony region. Extreme temperatures are usually more common in higher elevations and in more inland locations whereas coastal communities usually experience more moderate temperatures. While the Old Colony Region does have both inland and coastal communities, the temperature difference on a given day between the two cannot be categorized as “extreme” and usually only differ a few degrees. Given the fact that extreme temperatures are not limited to particular areas of the region and can affect the entire region, the vulnerability to extreme temperatures is the same across the entire region.

Extent of Extreme Temperatures

Extreme cold and hot temperatures are measured by the National Weather Service (NWS) via the Wind Chill Temperature Index and the Heat Index. The Wind Chill Temperature Index is used to calculate how cold air feels on human skin. The Index includes a frostbite indicator showing the points where temperature, wind speed and exposure time will produce frostbite on humans. For example, a temperature of 0°F and a wind speed of 25 mph will produce a wind chill temperature of -24°F. Under these conditions, exposed skin can freeze in 30 minutes. The NWS issues Wind Chill Advisories when wind chill temperatures are potentially hazardous and Wind Chill Warnings when wind chill temperatures are life threatening.

Similar to the Wind Chill Temperature Index to measure extreme cold, the NWS created the Heat Index to measure extreme heat. The Heat Index is an indicator of how hot it really feels when relative humidity is factored with the actual air temperature. The Index includes the likelihood of heat disorders with prolonged exposure or strenuous activity. For example, if the air temperature is 92°F and the relative humidity is 60%, the heat index--how hot it feels--is 105°F. Under these conditions one is considered to be in “Danger” of succumbing to a heat disorder. The NWS issues Excessive Heat Outlooks when the potential exists for an excessive heat event in the next 3-7 days; Excessive Heat Watches when conditions are favorable for an excessive heat event in the next 24 to 72 hours and; Excessive Heat Warnings when an excessive heat event is expected in the next 36 hours.

Previous Extreme Temperatures

According to the Weather Channel, the months of January and July are the coldest and warmest months of the year in the Old Colony region. January is the month with the lowest average temperature at 17°F and July is the month with the highest average high temperature at 82°F. The most extreme temperatures ever recorded in the region were -21°F in Stoughton in February 1934 and 104°F in Brockton in August 1948.

Probability of Future Extreme Temperature Events

It is extremely difficult to predict the probability of future extreme temperatures within the region, but according to the National Climactic Data Center the number of days in Massachusetts with subzero readings average only a few per year near the coast, but increase in number of occurrences farther inland from five to 15 annually. The number of hot days, those with maxima of 90°F or higher, generally average from five to 15 per year. The number of 90°F days varies considerably from place to place, but also from year to year. They can range from only a few days in cool summers to 25 or more in hot summers. The record number of 90°F or higher days was experienced during summer of 1983 when 20 - 30 days were observed across the state.

Climate Change

While not a natural hazard itself, climate change is expected to increase the frequency and severity of weather-related natural hazard events. The climate of the Northeastern United States is already changing, as the U.S. Environmental Protection Agency (EPA) notes that since 1970, the average annual temperature in the Northeast has risen by 2°F and the average winter temperature has increased by 4°F. It should also be noted by the fact that 11 of the 12 warmest years on record have occurred between 1995 and 2006. These increasing temperatures will increase evaporation from the oceans and land, leading to more overall precipitation, which will increase the risk of both riverine and coastal flooding.

Higher temperatures will also negatively affect air quality and human health. More frequent heat waves and lower air quality can threaten the most vulnerable populations, including the elderly, children and especially those with respiratory illnesses, such as asthma. Increasing temperatures and precipitation also create more favorable environments for mosquitos, which carry a variety of dangerous diseases such as West Nile Virus and Eastern Equine Encephalitis, which are already prevalent in this region.

Climate change can also negatively affect the agriculture and food supply. Increasing temperatures and precipitation events in the long term will not be suitable for traditional New England crops, such as cranberries, apples, blueberries and maple syrup. Additionally, the already battered Massachusetts fishing industry could also suffer as a result of climate change, as traditional fishing stocks such as cod, haddock and lobster will move further north to more preferable colder water habitats.

The aforementioned rising temperatures associated with climate change will also affect the forests throughout the region, as heat stress and decreased soil moisture are likely to negatively affect the productive ability of several tree types, potentially killing off many types of trees that are native to the area. These changing forests will also impact the habitats of many animals, insects and plant species that live in these forests.

While efforts are being made now by the state and federal government to combat the causes of climate change, OCPC encourages communities to take the potential effects of climate change into account when developing their mitigation plans for the future. Decisions made today will shape the future of communities' ability to deal with effects of climate change. Also by addressing the potential impacts of climate change now, communities will have the time to implement needed changes and projects and be pro-active instead of reactive when hazards do strike.

CHAPTER 5: COMMUNITY HAZARD VULNERABILITY/RISK ASSESSMENT

A community hazard vulnerability/risk assessment has been developed for each of the 15 communities in the Old Colony region to determine their vulnerabilities and risks from a variety of natural hazards. Each community hazard vulnerability/risk assessment consists of the following:

Community Profile: A brief description of the community noting important geographic and demographic data as well as describing the major land uses, natural features and locations of major development in the community.

Relationship of Critical Facilities to Hazard Areas: Each community was asked to identify the facilities they deemed critical to their community. Generally, critical facilities included sites deemed vital to the safety and operation of local governments; sites that serve the community at-large; all the bridges and dams in the community; sites that provide water and sewer service; sites that are responsible for the provision of energy; sites that are responsible for the relay of communications; and sites that use or store hazardous chemicals/materials.

Explanation of Columns in Relation of Critical Facilities to Hazard Areas Tables

Column 1: ID #: The first column is an ID number which appears on the maps that are part of this plan. See Appendix 4.

Column 2: Facility: The second column indicates what type of facility it is.

Column 3: Name: The third column is the name of the facility.

Column 4: Address: The fourth column indicates the address of the site, if applicable.

Column 5: FEMA Flood Zone: The fifth column addresses the risk of flooding. A “No” entry in this column means that the site is not within any of the mapped risk zones on the Flood Insurance Rate Maps (FIRM maps). If there is an entry in this column, it indicates the flood zone it is located in.

Column 6: Locally-Identified Flood Area: The sixth column notes if any of the facilities are in locally identified flood areas. These areas do not necessarily coincide with the flood zones from the FIRM maps. They may be areas that flood due to inadequate drainage systems or other local conditions. The ID# corresponds to the numbers on Map 8, “Hazard Areas”.

Column 7: Landslide Risk: The seventh column indicates the degree of landslide risk for that site. This information came from NESEC. The landslide information shows areas with either a low susceptibility or a moderate susceptibility to landslides based on mapping of geological formations. This mapping is highly general in nature. For more information on how landslide susceptibility was mapped, refer to <http://pubs.usgs.gov/pp/p1183/pp1183.htm>

Once a list of critical facilities was gathered from each community, OCPC GIS staff geocoded each facility and conducted an overlay analysis of each facility with a variety of natural hazard layers, such as flood zones, snowfall zones, earthquake zones, landslide risks among others to determine if a facility is at risk from natural hazard(s). With this information communities can then take the appropriate actions needed to mitigate the risk posed to critical facilities by natural hazards.

Flood Prone Areas: This section lists the flood prone areas in a community, according to both FEMA Flood Insurance Rate Maps (FIRM) as well as information provided by community officials.

Repetitive Flood Loss Properties: This section reviews the number of repetitive flood loss properties located in a community as well as the number and amount of claims that have been paid to these properties.

Hazard Potential of Bridges: This section reviews the status of each of the bridges in the community, highlighting the year it was built/rebuilt, the AASHTO rating and the deficiency (if any).

Hazard Potential of Dams: This section reviews the status of each of the dams in the community, highlighting information such as the impoundment name, size, hazard code, inspection condition and owner.

Vulnerability Risk Assessment: This section examines the vulnerabilities of each natural hazard in a community, focusing on the both the frequency and severity of a hazard. Please see Table 35: Hazard Frequency Categorization and Table 36: Hazard Severity Categorization for a detailed description of the frequency and severity of a hazard.

Based on the identification and profile of natural hazards that have occurred and may occur in the Old Colony region, vulnerability risk assessment tables have been developed for individual communities. OCPC utilized evaluation criteria contained within the Massachusetts Hazard Mitigation Plan to determine the frequency and severity of each hazard. To determine the overall hazard ranking for each community, a point scale was developed and assigned, as shown in the tables below.

Table 35: Hazard Frequency Categorization

Category	Description	Points
Very Low	Events that occur less frequently than once in 100 years. (Less than 1% per year)	1
Low	Events that occur from once in 50 years to once in 100 years. (1% to 2% per year)	2
Medium	Events that occur from once in 5 years to once in 50 years. (2% to 20% per year)	3
High	Events that occur more frequently than once in 5 years. (More than 20% per year)	4

Table 36: Hazard Severity Categorization

Category	Description	Points
Minor	Limited and scattered property damage; limited damage to public infrastructure and essential services not interrupted; limited injuries or fatalities.	1
Serious	Scattered major property damage; some minor infrastructure damage; essential services are briefly interrupted; some injuries and/or fatalities.	2
Extensive	Widespread major property damage; major public infrastructure damage (up to several days for repairs); essential services are interrupted from several hours to several days; many injuries and/or fatalities.	3
Catastrophic	Property and public infrastructure destroyed; essential services stopped; numerous injuries and fatalities.	4

Town of Abington Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Abington is located within the “Greater Brockton” area of the Old Colony region approximately 20 miles southeast of Boston. It is bordered by Holbrook and Weymouth to the north, Rockland to the east, Whitman to the south, and Brockton to the west.

Abington covers an area of 10.19 square miles and has a population of 15,985 persons, according to the 2010 U.S. Census. The town’s population density was 1,568.70 persons per square mile in 2010. Abington’s population increased by 9.45% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Abington was 39.5 years, with 11.9% of the population being 65 years of age or older. Approximately 3.8% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 6,377 housing units in town, with the average housing unit sheltering 2.50 persons. There is an average of 625.81 housing units per square mile. Abington’s public school system had an enrollment of 1,954 students for the 2013-2014 academic year and includes three elementary schools, one middle school and one high school.

Abington is primarily a residential community with the predominant land uses being forest (36.3%), residential (34.4%) and wetlands and water (15.8%). Two protected areas of note in Abington include the 700+ acre Ames Nowell State Park in the western part of town and the historic 38 acre Island Grove Pond and 11 acre Island Grove Park in the eastern part of town, which is considered by many to be the “Crown Jewel of Abington”. Abington is primarily drained by two waterways; Beaver Brook in the western part of town and the Shumatuscasant River in the eastern part of town.

Abington’s rapid population growth over the past decade can be attributed to the number of large condominium/apartment developments that have been constructed, including the 250 unit The Gables development, the 192 unit Woodlands at Abington Station development and the 180 unit Abington Woods development. Abington’s major retail/commercial corridors are located along the north-south Route 18 and the east-west Route 123. Over the next decade Abington will see continued development, especially in the northern part of town due to the redevelopment of the former South Weymouth Naval Air Station, of which a small portion is located in Abington.

Abington’s municipal drinking water supply is managed by the Abington/Rockland Joint Water Works and is drawn from a combination of four wells around Myers Avenue in Abington as well as from two surface-water sources-Great Sandy Bottom Pond in Pembroke and the Hingham Street Reservoir in Rockland. The wells are protected by a Zone II wellhead protection area and by Abington’s Watershed Protection District. Approximately 98% of Abington has access to municipal wastewater services, which is due to agreements with the city of Brockton and the Town of Rockland. Brockton can accept up to one million gallons per day (gpd) of wastewater and Rockland can accept up to 110,000 gpd of wastewater. This availability of both municipal drinking water and wastewater services has allowed Abington to have continued growth over the years.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as more recent input received from town officials. The updated list of critical facilities is shown in Table 37 below. Located in Appendix 4 are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 37: Relationship of Abington’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Adams Street Bridge (Shumatuscacant River)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
2	Bridge	Central Street Bridge (Shumatuscacant River)	N/A	AE	No	120 MPH	36”-48”	N/A	Low	Zone 4
3	Dam	Ames Pond Dam (Cleveland Pond)	N/A	ANI	No	110 MPH	36”-48”	N/A	Low	Zone 4
4	Dam	Cushing Pond Dam (Cushing Pond)	N/A	N/A	No	110 MPH	36”-48”	Mixed Deciduous/ Coniferous	Low	Zone 4
5	Dam	Island Grove Pond Dam (Island Grove Pond)	N/A	AE	No	120 MPH	36”-48”	Coniferous Upland Forest	Low	Zone 4
6	Dam	Ralph Hewlard Dam (Shumatuscacant River)	N/A	AE	No	120 MPH	36”-48”	N/A	Low	Zone 4
7	Fuel Station, Tier II Site	Abington Gas & Auto	225 Brockton Ave.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
8	Fuel Station, Tier II Site	Borderland Service	171 North Quincy St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
9	Fuel Station, Tier II Site	Citgo	115 Brockton Ave.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
10	Fuel Station, Tier II Site	Gas and Go	164 North Ave.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
11	Fuel Station, Tier II Site	Mobil	906 Bedford St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
12	Fuel Station, Tier II Site	Route 18 Superstore	336 Washington St.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
13	Fuel Station, Tier II Site	Sunoco	907 Bedford St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
14	Fuel Station, Tier II Site	Sunoco	336 Centre Ave.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
15	Fuel Storage, Tier II Site	FedEx	1555 Bedford St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
16	Fuel Storage, Tier II Site	South Shore Terminal	1431 Bedford St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
17	Fuel Storage, Tier II Site	Strawberry Valley Golf Course	164 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
18	National Grid Substation, Tier II Site	National Grid Substation	60 John St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
19	National Grid Substation, Tier II Site, Antenna	National Grid Substation	1090 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
20	Tier II Site	Abington Pool Place	1500 Bedford St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
21	Tier II Site	National Grid	19 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
22	Tier II Site	New England Art Services	10 Railroad Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
23	Tier II Site	Precast Specialties	999 Adams St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
24	Tier II Site	Walmart	777 Brockton Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
25	Library	Abington Public Library	600 Gliniewicz Way	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
26	Library/ Historical Society	Dyer Memorial Library	28 Centre Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
27	School, Mass Care Shelter	Woodsdale School	128 Chestnut St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
28	Public Works, Fuel Storage, Tier II Site	Highway Department	225 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
29	School, Mass Care Shelter, Food Storage Facility	Abington High School	201 Gliniewicz Way	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
30	School, Mass Care Shelter	Beaver Brook Elementary School	1 Ralph Hamlin Way	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
31	School, Mass Care Shelter	Center School	65 Thaxter Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
32	School, Mass Care Shelter, Food Storage Facility	Frolio Middle School	1071 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
33	Cultural Resource, School	St. Bridget Church & School	455 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
34	Senior Center, Mass Care Shelter	Council on Aging	441 Summer St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
35	Senior Housing	Chestnut Glen	585 Chestnut St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
36	Town Hall	Town Hall	500 Gliniewicz Way	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
37	Water Department	Water Department	336 Center Ave. (Rockland)	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
38	Fire, Health & Medical Facility	Fire Station #1	1040 Bedford St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
39	Fire, Health & Medical Facility	Fire Station #2	5 Rockland St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
40	Health & Medical Facility	Abington Animal Hospital	19 Randolph St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
41	Health & Medical Facility	Abington Dental Center & Abington Medical Associates	673 Bedford St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
42	Health & Medical Facility	Angel's Neurological Associates	536 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
43	Health & Medical Facility	Signature Healthcare Nursing	360 Brockton Ave.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/ Coniferous	Low	Zone 4
44	Police, Emergency Operations Center, Health/ Medical Facility, Public Safety Repeater Site	Police Station	215 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
45	Childcare	A Child's Dream Preschool & Daycare, Inc.	21 S. Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
46	Childcare	Christian Children's Center	219 Adams St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
47	Childcare	Eager Beaver Day Camp	Park Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
48	Childcare	Lasting Impressions	90 North Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
49	Childcare	Lasting Impressions	90 Ralph Hamlin Way	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
50	Childcare	Lasting Impressions School Age Program	396 Ashland St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
51	Childcare	Little Stars Academy	634 Richard A. Fitts Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
52	Childcare	Pre-School Playmates	681 Richard A. Fitts Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
53	Cultural Resource	Ames Nowell State Park	739 Linwood St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
54	Cultural Resource	First Baptist Church of Abington	219 Adams St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
55	Cultural Resource	Hillside Cemetery	Randolph St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
56	Cultural Resource	Island Grove Pond	Park Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
57	Cultural Resource	Joy in Christ Lutheran Church	21 South Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
58	Cultural Resource	Lively Stones Christian Center	127 North Quincy St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
59	Cultural Resource	Lowe's Home Improvement Store	400 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
60	Cultural Resource	Mount Vernon Cemetery	Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
61	Cultural Resource	Rock/Life Giving Church	728 Brockton Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
62	Cultural Resource	South Shore Community Church	104 North Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
63	Cultural Resource, Fuel Station, Tier II Site	Stop & Shop Supermarket	375 Centre Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
64	Cultural Resource	Target Department Store	385 Centre Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
65	Cultural Resource	Trucchi's Supermarket	858 Bedford St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
66	Cultural Resource, Childcare	United Church of Christ in Abington & Humpty Dumpty Nursery School	10 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
67	Housing Authority	Abington Housing Authority-Levitt Terrace	100 Lincoln Blvd.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
68	Housing Authority	Abington Housing Authority-Vinson Blanchard Garden	71 Shaw Ave.	N/A	No	110 MPH	36"-48"	Deciduous Forest	Low	Zone 4
69	Mortuary	Quealy Funeral Home	116 Adams St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
70	Nursing Facility	Kindred Nursing & Rehabilitation-Colony House	277 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
71	Postal & Shipping	USPS Abington Center Office	24 Brockton Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
72	Postal & Shipping	USPS North Abington Office	16 Harrison Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
73	Railroad	MBTA Abington Station	231 Centre Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
74	Railroad, Tier II Site	MBTA Maintenance Facility	120 Monroe St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
75	Towing	Bailey's Garage	9 Orange St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
76	Towing	Route 18 Auto Body	325 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
77	Towing	Universal Auto Body	288 North Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
78	Antenna	American Tower	380 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
79	Antenna, Public Safety Repeater Site	Filibrown Tower, Inc.	585 North Quincy St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
80	Antenna	Johnson & McGill Tower	1457 Bedford St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
81	Antenna, Tier II Site	Verizon Wireless	706 Brockton Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
82	Cable Television	Abington Community Access & Media	43 Highland Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
83	Sewer Pumping Station	Abington Sewer Pumping Station	350 Summer St.	AE	No	120 MPH	36"-48"	Mixed Deciduous/ Coniferous	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
84	Water Department, Water Filtration Plant, Tier II Site	Abington Water Department & Filtration Plant	Myers Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
85	Water Supply Tank	Chestnut Street Water Storage Tank	Chestnut St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
86	Water Supply Tank, Public Safety Repeater Site	Lincoln Street Water Storage Tank	Lincoln St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

Natural Hazard Risk Assessment

Table 38 summarizes the hazard risks for Abington. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Abington’s vulnerability to each of these hazards is below.

Table 38: Abington Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Abington and is the most frequent hazard affecting Abington. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Abington are areas along the Shumatuscacant River and Beaver Brook. In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which flooded as a result of the March 2010 floods:

- Central Street at an Unnamed Stream
- Wyman Road to Summit Road
- Behind the Frolio Middle School
- Mill Street at Beaver Brook

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 1,388 acres, or 20.5%, of Abington is within a 100-year floodplain. Based on additional analysis, 169 acres, or 12.7%, of the floodplain is developed. To limit additional development from occurring within floodplains, Abington adopted a Flood Plain and Wetland Protection District. The district is intended to protect and preserve the marshes, bogs, ponds, water courses and their adjoining wetlands;

reduce the hazards of floods upon the public health, safety and general welfare; to protect flood plain occupants from a flood that is or may be caused by their own land use and that is or may be undertaken without full realization of the dangers therein; to protect the public from the burden of extraordinary financial expenditure for flood control relief; to protect the capacity of flood plain and wetland areas to absorb, transmit and store runoff; to assure retention of sufficient floodway area to convey flows which can reasonably be expected to occur.

Of the 86 critical facilities identified in Abington, only four (two dams, a bridge and a sewer pumping station) are located within a 100-year floodplain, although none have experienced damage due to flooding. It should also be noted that none of the critical facilities are located in any of the locally identified flood areas.

According to MEMA, there are currently 31 National Flood Insurance Program (NFIP) policies in-force in Abington, with a total of 12 claims being made from 1978 to November 2013, totalling \$27,650. It should be noted that there are no Repetitive Loss (RL) or Severe Repetitive Loss Properties (SRL) in Abington.

Bridges

Table 39 indicates that there are two bridges in Abington that span waterways according to the Massachusetts Department of Transportation (MassDOT). Both span the Shumatuscacant River, but neither is known to be at risk from or create flooding hazards.

Table 39: Abington Bridges Spanning Waterways

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Adams Street	Shumatuscacant River	1956	--	80.4	--
Central Street	Shumatuscacant River	1956	--	49.3	SD

Dams

Table 40 indicates that there are four dams in Abington according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. Overall the risk of serious dam failures is unlikely in Abington, as both the Ames Pond and Island Grove Pond Dams are relatively modern and there is little development downstream from both, with the exception of the long-established industrial area below the Island Grove Pond Dam. The Abington Highway Department stated that they have occasionally adjusted the boards at the Island Grove Pond Dam in response to complaints from citizens who own waterfront property, as high water tables flooded their yards.

Table 40: Abington Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Ames Pond Dam	Cleveland Pond	Beaver Brook	Significant	State
Cushing Pond Dam	Cushing Pond	Beaver Brook	Low	Town
Island Grove Pond Dam	Island Grove Pond	Shumatuscacant River	Significant	Town
Ralph Hewlard Dam	Shumatuscacant River	Shumatuscacant River	Significant	Under Review

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Abington. Abington receives an average of 36"-48" of snow annually, with there being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Abington. Abington is most vulnerable to hurricanes/tropical storms during the summer and early autumn months. While Abington has never been in the direct path of a hurricane or tropical storm, it has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees and localized flooding from the wind and rain that accompany hurricanes/tropical storms are the most common problems in Abington. They can block roadways as well as down power lines, cutting off electricity to homeowners and businesses for multiple days. During Tropical Storm Irene in August 2011 more than half of the town lost power due to the heavy winds that felled trees onto power lines. When hurricanes/tropical storms do occur, the entire community is vulnerable to the storm's impacts.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Abington. Abington is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Abington. As a mature suburban community, the town is well-developed, with the exception of the heavily forested 700+ acre Ames Nowell State Park on the western edge of town. While a significant wildfire has not occurred within the state park, it does remain vulnerable to the threat of wildfires due to its sheer size and mature forest. Also of potential concern is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the eastern and western edges of the state park, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Abington. While Abington has never experienced a recorded tornado, several communities surrounding Abington have. Most of the tornadoes that have occurred in the region were low in intensity, with most being an EF-0 or EF-1 on the Enhanced Fujita Scale. Additionally, most of the tornadoes only lasted for a short period of time before they dissipated, limiting the amount of damage they caused. Based on historical events, future tornadoes in the Old Colony region will also likely be EF-0 or EF-1 tornadoes. Due the historic nature of the town (settled in 1668) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, the entire community is vulnerable to the impacts.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Abington. Abington has only experienced one recorded earthquake. On July 22, 1993 a 2.7 magnitude earthquake struck Abington. While the earthquake did not cause any damages, it did startle and frighten many people in Abington and the adjacent communities. Based on the fact that earthquakes that have occurred in Abington and other communities in the Old Colony region, they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Abington. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Landslides

Landslides represent a very low frequency, minor hazard for Abington. Abington has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to Abington, as there are no major urban areas in town.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to Abington, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to Abington, as it is not located along the coast.

Town of Avon Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Avon is located within the “Greater Brockton” area of the Old Colony region approximately 17 miles south of Boston. It is bordered by Randolph to the north, Holbrook to the east, Brockton to the south, and Stoughton to the west.

Avon covers an area of 4.54 square miles and has a population of 4,356 persons, according to the 2010 U.S. Census. The town’s population density was 959.47 persons per square mile in 2010. Avon’s population decreased 1.96% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Avon was 44 years, with 17% of the population being 65 years of age or older. Approximately 1.4% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 1,769 housing units in town, with the average housing unit sheltering 2.46 persons. There is an average of 389.65 housing units per square mile. Avon’s public school system had an enrollment of 740 students for the 2013-2014 academic year and includes one elementary school and one middle-high school.

Predominant land uses in Avon are forests (37.2%), residential (22.6%) and commercial and industrial (15.7%). The two areas that make up a majority of the forested and wetland areas in Avon are the 737 acre D.W. Field Park that Avon shares with Brockton, and the area in the northeast portion of Avon bounded by Page Street to the west, Wales Avenue to the north, and Main Street to the south. The soil in this area of town is mapped as Freetown Muck, which is a very deep, nearly level, poorly drained soil that limits development as it has severe limitations for on-site sewage disposal.

The town of Avon while small in size is home to two of the region’s largest commercial and industrial parks. Taking advantage of its close proximity to Route 24, the town has two major commercial and industrial centers, one just east of Exit 19 and one just west of Exit 19. The Avon Industrial Park, located just east of Exit 19 is home to more than 100 industrial and warehouse type businesses that employ more than 3,000 people. Merchants Park, located just west of Exit 19 is a hub of retail stores anchored by a number of “big box” retailers.

Avon’s municipal drinking water supply is drawn from seven wells in Avon. The wells are protected by Zone II wellhead protection areas and by Avon’s Water Supply Protection District. Almost of all Avon’s wastewater is disposed of via on-site septic systems, except for a small commercial area on Memorial Drive (Route 28) near the Brockton city line, which is connected to Brockton’s municipal wastewater system. The combination of Avon’s small size with limited amounts of land available to develop and lack of municipal sewer service has kept Avon’s population stagnant in recent years.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 41 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 41: Relationship of Avon’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Pond Street Bridge (Route 24)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
2	Bridge	Route 24 Bridge (South Street)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
3	Dam	Brockton Reservoir Dam (Brockton Reservoir)	N/A	N/A	No	110 MPH	36”-48”	Coniferous Upland Forest	Low	Zone 4
4	Fuel Station	Sunoco	284 East Main St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
5	Fuel Station	Super Petroleum	273 East Main St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
6	Fuel Storage	Cuming Corporation	225 Bodwell St.	X500	No	110 MPH	36”-48”	N/A	Low	Zone 4
7	Fuel Storage, Tier II Site	Estes Express Lines	215 Bodwell St.	X500	No	110 MPH	36”-48”	N/A	Low	Zone 4
8	Fuel Storage	Horizon Beverage	80 Stockwell Dr.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
9	Fuel Storage, Tier II Site	RoadSafe Traffic Systems	55 Bodwell St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
10	Fuel Storage, Tier II Site	T.L. Edwards, Inc.	100R Wales Ave.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
11	Tier II Site	Dresser Masoneilan	85 Bodwell St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
12	Tier II Site	National Grid Substation 28	Old Pond St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
13	Tier II Site	National Grid Substation 68	283 East Main St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
14	Library	Avon Public Library	280 West Main St.	N/A	Within 200 Feet	110 MPH	36”-48”	N/A	Low	Zone 4
15	Public Works	Highway Department	1 Avon Place	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
16	School, Mass Care Shelter	Avon Middle-High School	285 West Main St.	N/A	Within 400 Feet	110 MPH	36”-48”	N/A	Low	Zone 4
17	School, Mass Care Shelter, Childcare	Ralph D. Butler Elementary School	1 Patrick Clark Dr.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
18	Town Hall, Senior Center	Town Hall & Council on Aging	65 East Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
19	Ambulance Depot	American Medical Response	45 Bodwell St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
20	Police, Fire & Emergency Operations Center	Police Station & Fire Station	150 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
21	Childcare	Avon Children's Center	152 Highland St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
22	Childcare	Avon Nursery School	119 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
23	Cultural Resource, Mass Care Shelter	Avon Baptist Church	119 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
24	Cultural Resource	Blanchard H.L. Museum	188 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
25	Cultural Resource	Blanchard's Tavern	98 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
26	Cultural Resource, Mass Care Shelter	Church of Christ	156 South Street	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
27	Cultural Resource, Tier II Site	Costco Wholesale	120 Stockwell Dr.	N/A	No	110 MPH	36"-72"	N/A	Low	Zone 4
28	Cultural Resource, Tier II Site	Home Depot	60 Stockwell Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
29	Cultural Resource	New Jerusalem Tabernacle of Prayer	139 Memorial Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
30	Cultural Resource, Mass Care Shelter	St. Michael's Church	87 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
31	Cultural Resource	Walmart	30 Memorial Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
32	Housing Authority	Avon Housing Authority	1 Fellowship Cir.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
33	Postal & Shipping	USPS Avon Office	8 East Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
34	Special Needs	Grow Associates	101 Wales Ave.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
35	Waste Management, Tier II Site	Waste Management, Inc.	40 Ledin Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
36	Cable Television	Avon Community Access & Media	2 East Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
37	Cellular Phone Facility, Tier II Site	AT&T Mobility	185 Bodwell St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
38	Water Well & Pumping Station, Water Filtration Plant	Memorial Drive Water Well, Pumping Station, Filtration Plant	140 Memorial Dr.	N/A	No	110 MPH	36"-48"	Coniferous Upland Forest	Low	Zone 4
39	Water Supply Tank	Central Street Water Supply Tank	Antone Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
40	Water Supply Tank, Public Safety Repeater Site	Page Street Water Supply Tank	212 Page St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
41	Water Wells, Water Treatment Plant	Trout Brook Water Well & Treatment Plant	Argyle Ave.	N/A	No	110 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
42	Water Well & Pumping Station	Connolly Road Well & Pumping Station	Connolly Rd.	AE	No	110 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
43	Water Well & Pumping Station	Porter Well & Pumping Station	Avon Pl.	N/A	No	110 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4

Natural Hazard Risk Assessment

Table 42 summarizes the hazard risks for Avon. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Avon’s vulnerability to each of these hazards is below.

Table 42: Avon Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Avon and is the most frequent hazard affecting Avon. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Avon are areas along Beaver Brook and Trout Brook, the Brockton Reservoir and Waldo Lake in D.W. Field Park and northeast Avon (particularly the area east of Page Street to the Randolph town line). In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which flooded as a result of the March 2010 floods:

- Parking Lot of the Avon Public Library
- Kiddie Drive
- West Main Street, south of South Street
- Doherty Avenue
- West High Street at Old Pratt Street

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 541 acres, or 18.6%, of Avon is within a 100-year floodplain. Based on additional analysis, 96 acres, or 17.8%, of the

floodplain is developed. To limit additional development from occurring within floodplains, Avon adopted a Floodplain District. The district is intended to ensure public safety through reducing the threats to life and personal injury; eliminate new hazards to emergency response officials; prevent the occurrence of public emergencies resulting from water quality, contamination, and pollution due to flooding; avoid the loss of utility services which if damaged by flooding would disrupt or shut down the utility network and impact regions of the community beyond the site of flooding; eliminate costs associated with the response and cleanup of flooding conditions; reduce damage to public and private property resulting from flooding waters.

Of the 43 critical facilities identified in Avon, only one is located within a 100-year floodplain-the Connolly Road Well and Pumping Station, although it has not experienced damage due to flooding. It should be noted that two critical facilities, the Avon Public Library and the Avon Middle-High School, are located within 200 and 400 feet respectively of where flooding has historically occurred - the Parking Lot of the Avon Public Library as noted above.

According to MEMA, there are currently 17 National Flood Insurance Program (NFIP) policies in-force in Avon, with a total of two claims being made from 1978 to November 2013, totalling \$717. It should be noted that there are no Repetitive Loss (RL) or Severe Repetitive Loss Properties (SRL) in Avon.

Bridges

There are no bridges in Avon that span waterways according to the Massachusetts Department of Transportation (MassDOT).

Dams

Table 43 indicates that there is one dam in Avon according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. The Brockton Reservoir Dam is a fixed concrete structure with a stone spillway that holds water at its normal level and discharges it to a stream running to Waldo Lake. The controlled release of water from the reservoir is by three gates taking water from two screened openings in the face of the dam or from a system of stone encased perforated pipes just above the reservoir bottom. Water taken from these goes to the water treatment plant or to a piped bypass spillway discharging to the stream flowing to Waldo Lake. The dam also has a toe drain system in the bottom of its downstream face to catch any potentially damaging seepage.

Presently the Reservoir cannot be raised to hold stormwater, but it can be lowered before a storm via the bypass spillway in order to hold or delay much of the storm flow. In the past the Brockton dam has not been used for flood control because much of the flow in the downstream Salisbury Brook comes from intervening streams. It could be done however, given good forecasts and coordination with downstream operators of dams in Brockton’s portion of D.W. Field Park. In all the dam does not appear to be threatened by flooding or downstream interests and it may have the potential to help protect those interests.

Table 43: Avon Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Brockton Reservoir Dam	Brockton Reservoir	Beaver Brook	Significant	City of Brockton

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Avon. Avon receives an average of 36"-72" of snow annually, with there being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Avon. Avon is most vulnerable to hurricanes/tropical storms during the summer and early autumn months. While Avon has never been in the direct path of a hurricane or tropical storm, it has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees and localized flooding from the wind and rain that accompany hurricanes/tropical storms are the most common problems in Avon. They can block roadways as well as down power lines, cutting off electricity to homeowners and businesses for multiple days. During Tropical Storm Irene in August 2011 parts of the town were without electricity for a week. When hurricanes/tropical storms do occur, the entire community is vulnerable to the storm's impacts.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Avon. Avon is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Avon. The two areas of town most vulnerable to wildfire is the D.W. Field Park area in the southwest portion of town and an undeveloped forest/wetlands area in the northeast corner of town. While a significant wildfire has not occurred in either area, it does remain vulnerable to the threat of wildfires due to its sheer size. Also of potential concern is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the edges of these areas, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Avon. While Avon has never experienced a recorded tornado, several communities surrounding Avon have. Most of the tornadoes that have occurred in the region were low in intensity, with most being an EF-0 or EF-1 on the Enhanced Fujita Scale. Additionally, most of the tornadoes only lasted for a short period of time before they dissipated, limiting the amount of damage they caused. Based on historical events, future tornadoes in the Old Colony region will also likely be EF-0 or EF-1 tornadoes. Due the historic nature of the town (settled in 1700) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, the entire community is vulnerable to the impacts.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Avon. Although the town has not experienced a recorded earthquake, earthquakes have occurred in other communities in the Old Colony region and they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Avon. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Landslides

Landslides represent a very low frequency, minor hazard for Avon. Avon has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to Avon, as there are no major urban areas in town.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to Avon, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to Avon, as it is not located along the coast.

Town of Bridgewater Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Bridgewater is located within the “Greater Brockton” area of the Old Colony region and is approximately 8 miles south of Brockton and 28 miles south of Boston. It is bordered by East Bridgewater and West Bridgewater to the north, Halifax to the east, Middleborough to the south, and Raynham to the west.

Bridgewater covers an area of 28.36 square miles and has a population of 26,563 persons, according to the 2010 U.S. Census. The town’s population density was 936.63 persons per square mile in 2010. Bridgewater’s population increased by 5.47% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Bridgewater was 36.7 years, with 10.4% of the population being 65 years of age or older. Approximately 5.6% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 8,336 housing units in town, with the average housing unit sheltering 3.18 persons. There is an average of 293.94 housing units per square mile. Bridgewater is part of the Bridgewater-Raynham Regional School District, which had an enrollment of 5,400 for the 2013-2014 academic school year. The district includes four elementary schools, two middle schools and one high school. Bridgewater is also home to Bridgewater State University, which had an enrollment of nearly 11,500 undergraduate and graduate students in the Fall of 2012.

Bridgewater is primarily a residential community with the predominant land uses in town being forest (35.7%), wetlands and water (24.4%), and residential (20.2%). Bridgewater’s natural features include the 354 acre Lake Nippenicket and parts of the 16,950 acre Hockomock Swamp Area of Critical Environmental Concern (ACEC). The Hockomock Swamp and associated wetlands and waterbodies create a unique environmental habitat in southeastern Massachusetts.

The majority of Bridgewater’s commercial development is concentrated around the intersection of Routes 18 and 28 in downtown Bridgewater. Other areas of commercial development in Bridgewater are scattered along the southern part of Route 18 south of the downtown Bridgewater as well as more recently the area of Route 104 and Route 24 in the western part of town.

Bridgewater’s municipal drinking water supply is drawn from nine wells at two locations in Bridgewater. One location consists of four wells off of High Street near the Matfield River and the other location consists of five wells located in the vicinity of Carver’s Pond. The wells are protected by a Zone II wellhead protection area and by Bridgewater’s Aquifer Protection District. Bridgewater does have access to municipal wastewater services and a wastewater treatment plant that can treat up to 1.44 million gallons per day (gpd), but is currently operating at 70% capacity, or one million gpd. Municipal wastewater services originally only served the traditional town center, but demand for services has increased over time as the town continues to grow.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 44 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 44: Relationship of Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Bedford Street (Taunton River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
2	Bridge	Bridge Street (Matfield River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
3	Bridge	Broad Street (Town River)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
4	Bridge	Cherry Street (Taunton River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
5	Bridge	Green Street (Taunton River)	N/A	AE	No	120 MPH	36"-48"	N/A	Low	Zone 4
6	Bridge	Hayward Street (Town River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
7	Bridge	High Street (Matfield River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
8	Bridge	High Street (MBTA & CSX Railroad)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
9	Bridge	Interstate 495 NB (Route 24 SB)	N/A	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
10	Bridge	Interstate 495 SB (Route 24 SB)	N/A	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
11	Bridge	Oak Street (Town River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
12	Bridge	Pleasant Street (Route 24)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
13	Bridge	Plymouth Street (Taunton River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
14	Bridge	Route 24 NB (Interstate 495)	N/A	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
15	Bridge	Summer Street (MBTA & CSX Railroad)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
16	Bridge	Summer Street (Taunton River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
17	Bridge	Titicut Street (Taunton River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
18	Bridge	Vernon Street (Taunton River)	N/A	AE	No	120 MPH	36"-48"	N/A	Low	Zone 4
19	Dam	Blood Pond Dam (Blood Pond)	N/A	A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
20	Dam	Carver Pond Dam (Carver Pond)	N/A	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Moderate	Zone 4
21	Dam	High Street-Jenkins Pond Channel Dam (Town River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
22	Dam	Jenkins Pond Dam	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
23	Dam	Mill Street Dam (Town River Pond)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
24	Dam	South Brook Dam (South Brook)	N/A	AE	No	120 MPH	36"-48"	Coniferous Upland Forest	Moderate	Zone 4
25	Dam	South Street Pond Dam (South Street Pond)	N/A	AE	No	120 MPH	36"-48"	Coniferous Upland Forest	Low	Zone 4
26	Explosives Storage	Dyno New England	1965 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
27	Fuel Station	A&A Gas	1001 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
28	Fuel Station	BP	724 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
29	Fuel Station	Cumberland Farms	33 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
30	Fuel Station	Irving	1385 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
31	Fuel Station	Joe's Gas	380 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
32	Fuel Station	Lucky Star Gas	28 Central Sq.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
33	Fuel Station	Mobil	Route 24 NB	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
34	Fuel Station	Mobil	Route 24 SB	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
35	Fuel Station	Prime Energy	124 Broad St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
36	Fuel Station	Rapid Refill	155 Broad St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
37	NSTAR Electric Station	Mill Street Electric Power Substation	Mill St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
38	NSTAR Electric Station	Montaup Electric Power Station	1233 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
39	Library	Bridgewater Public Library	15 South St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
40	Mass Care Shelter	Tinsley Center	335 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
41	Public Works	Highway Department	151 High St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
42	School, Mass Care Shelter	Bridgewater-Raynham Regional High School	415 Center St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
43	Cultural Resource	Bridgewater Middle School	166 Mt. Prospect St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
44	School	Bridgewater State University Operations Center	200 Great Hill Dr.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
45	School, Mass Care Shelter	Mitchell Elementary School	500 South St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
46	School	Southbrook School	792 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
47	School, Mass Care Shelter	Williams Intermediate School	200 South St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
48	Senior Center	Council on Aging	10 Wally Krueger Way	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
49	Town Hall	Town Hall	64 Central Sq.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
50	Transfer Station	Transfer Station	1200 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
51	Emergency Operations Center	Emergency Operations Center	66 Central Square	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
52	Fire	Fire Station- Station #2	774 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
53	Fire	Fire Station- Headquarters	22 School St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
54	National Guard Armory	National Guard Armory	576 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
55	Police	Police Station	220 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
56	Prison	Bridgewater State Hospital	20 Administration Rd.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
57	Prison	Massachusetts Treatment Center	30 Administration Rd.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
58	Prison	Old Colony Correctional Center	1 Administration Rd.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
59	Childcare	America's Little Angels	340 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
60	Childcare	Bridgewater State University Children's Center	66 Hooper St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
61	Childcare	Day Care Plus	2103 Old Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
62	Childcare	Joyful Learning	792 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
63	Childcare	Pre-School Playmates, Inc.	244 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
64	Childcare	Sunshine Day Care Center	5 Wally Krueger Way, Ste. 5	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
65	Cultural Resource	Bridgewater United Methodist Church	35 School St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
66	Cultural Resource	Central Square Congregational Church	71 Central Sq.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
67	Cultural Resource	Christian Science Church	1 South St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
68	Cultural Resource	Faith Chapel Assemblies of God	340 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
69	Cultural Resource	First Baptist Church	20 Summer St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
70	Cultural Resource	First Parish Unitarian Universalist	50 School St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
71	Cultural Resource	New Jerusalem Church	88 Central Sq.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
72	Cultural Resource	Roche Bros. Supermarket	233 Broad St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
73	Cultural Resource	Scotland Congregational Church	1000 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
74	Cultural Resource	South Shore Community Church	415 Center St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
75	Cultural Resource	St. Thomas Aquinas	103 Center St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
76	Cultural Resource	Trinity Covenant Church	1095 South St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
77	Cultural Resource	Trinity Episcopal Church	91 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
78	Housing Authority	Bridgewater Housing Authority	0 Hemlock Dr.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
79	Housing Authority	Bridgewater Housing Authority	0 Heritage Cr.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
80	Nursing Facility	Bridgewater Nursing Home	16 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
81	Postal & Shipping	USPS Bridgewater Office	169 Broad St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
82	Postal & Shipping	USPS Elmwood Office	734 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
83	Railroad	MBTA Bridgewater Station	85 Burrill Ave.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
84	Cable Television	Bridgewater Cable Access	80 Spring St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
85	Wastewater Treatment Plant	Bridgewater Correctional Facility Plant	15 Administration Rd.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
86	Wastewater Treatment Plant	Bridgewater Wastewater Treatment Plant	100 Morris Ave.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
87	Water Supply Tank, Public Safety Repeater Site	Great Hill Water Tower	Great Hill Dr.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
88	Water Supply Tank, Public Safety Repeater Site	Sprague's Hill Water Tower	Broad St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
89	Water Supply Tanks	Bridgewater Correctional Facility Water Supply Tanks	Titicut St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
90	Water Well	Water Wells #1, 2, 4 & 5	100 Wellfield Dr. – 187R Conant St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
91	Water Well	Water Wells #3, 6, 8 & 9	1425 High St.	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
92	Water Well	Water Wells #10A & 10B	1729 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
93	Water Nitrate Plant	High Street Nitrate Plant	1400 High St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
94	Sewer Pumping Station	Dartmouth Road Pumping Station	Dartmouth Rd. & Colby Rd.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
95	Sewer Pumping Station	Elm Street Pumping Station	103 Elm St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
96	Sewer Pumping Station	Harvest Lane Pumping Station	185 Harvest Ln.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
97	Sewer Pumping Station	High Pond Estates Pumping Station	0 Country Dr.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
98	Sewer Pumping Station	Pleasant Street Pumping Station	1181 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
99	Sewer Pumping Station	Wally Krueger Way Pumping Station	Wally Krueger Way	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
100	Sewer Pumping Station	Water Street Pumping Station	7A Water St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
101	MEMA Region 2	MEMA Region 2	12-1 Rear Administration Rd.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
102	School	Bridgewater State University Conant Math & Science Building	24 Park Ave.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

Natural Hazard Risk Assessment

Table 45 summarizes the hazard risks for Bridgewater. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Bridgewater’s vulnerability to each of these hazards is below.

Table 45: Bridgewater Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Bridgewater and is the most frequent hazard affecting Bridgewater. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Bridgewater are areas along the Matfield River, Town River, Taunton River, Sawmill Brook, South Brook, Blood Pond, Craver Pond, Lake Nippenicket, as well as the Hockomock Swamp Wildlife Management Area in northwest Bridgewater. In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which flooded as a result of the March 2010 floods:

- Cherry Street at the Taunton River
- Summer Street at the Taunton River
- Titicut Street at the Taunton River
- Hayward Street at the Town River
- Hayward Street at the South Brook
- Water/Wood Street at the South Brook
- Cross Street at Snows Brook
- Roberts Street

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 4,373 acres, or 24.1%, of Bridgewater is within a 100-year floodplain. Based on additional analysis, 214 acres, or 4.9%, of the floodplain is developed. To limit additional development from occurring within floodplains, Bridgewater adopted a Floodplain District. The district is intended to provide that lands in the Town of Bridgewater subject to seasonal or periodic flooding as described hereinafter shall not be used for residence or other purposes in such a manner as to endanger the health or safety, of the occupants thereof or of the public generally, or as to burden the public with costs resulting from unwise individual choices of land use; to protect, preserve and maintain the water table and water recharge areas within the Town so as to preserve present and potential water supplies for the public health and safety; to assure the continuation of the natural flow pattern of the water courses within the Town in order to provide adequate and safe floodwater storage capacity to protect persons and property against the hazards of flood inundation.

Of the 102 critical facilities identified in Bridgewater, 18 are located within a 100-year floodplain, including eleven bridges, six dams, and one of the town’s water wells. There are no critical facilities located in any of the locally identified flood areas.

According to MEMA, there are currently 65 National Flood Insurance Program (NFIP) policies in-force in Bridgewater, with a total of 27 claims being made from 1978 to November 2013, totalling \$64,662. It should be noted that there are two residential Repetitive Loss (RL) properties in Bridgewater that have had four claims totalling \$17,160. There are no Severe Repetitive Loss Properties (SRL) in Bridgewater.

Bridges

Table 46 indicates that there are 12 bridges in Bridgewater that span waterways according to the Massachusetts Department of Transportation. A majority of these bridges span the Taunton River, which serves as the town line with Middleboro in the south and for southeastern portions of the town. While most of the bridges withstood the heavy rains during the March 2010 floods, the Bridge Street Bridge that crosses the Matfield River did not. Due to the heavy rains and flooding the bridge partially collapsed, which resulted in the bridge being closed for more than a year and a half while repairs were made to it.

Table 46: Bridgewater Bridges Spanning Waterways

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Bedford Street	Taunton River	2007	--	95.2	--
Bridge Street	Matfield River	1884	1978	74.4	FO
Broad Street	Town River	1926	--	91.6	--
Cherry Street	Taunton River	2002	--	90.2	--
Green Street	Taunton River	1922	--	65.1	FO
Hayward Street	Town River	1946	--	44.5	--
High Street	Matfield River	1886	1978	66.1	FO
Oak Street	Town River	1880	--	78.6	FO
Plymouth Street	Taunton River	1993	--	94.3	--
Summer Street	Taunton River	2011	--	79.1	--
Titicut Street	Taunton River	1850	1954	66.3	--

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Vernon Street	Taunton River	1956	--	74.8	FO

Dams

Table 47 indicates that there are seven dams in Bridgewater according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. Serious dam failures are unlikely in Bridgewater since only the Carver Pond Dam is listed as being in poor condition and most of the other dams hold back smaller ponds with less head and with minimally developed land immediately downstream. During heavy rain events the town takes proactive measures where appropriate (South Brook Dam) in lowering pond levels to accommodate the heavy rain, but in some instances that cannot be done (Carver Pond Dam, Jenkins Pond Dam), because the dams lowering mechanisms are inoperable due to age.

Table 47: Bridgewater Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Blood Pond Dam	Blood Pond	Tr-Taunton River	Significant	Private
Carver Pond Dam	Carver Pond	South Brook	Significant	Under Review
High Street-Jenkins Pond Channel Dam	Town River	Town River	Significant	Private
Jenkins Pond Dam	Not Applicable	Town River	Significant	Private
South Brook Dam	South Brook	South Brook	Significant	Town
South Street Pond Dam	South Street Pond	Not Applicable	Significant	Town

The dam listed below is considered non-jurisdictional and does not fall under the Mass. Office of Dam Safety's regulatory authority and therefore the information provided is limited.

Name	Impoundment	Waterway	Hazard Code	Owner
Mill Street Dam	Town River Pond	Town River	Not Available	Unknown

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Bridgewater. Bridgewater receives an average of 36"-48" of snow annually, with their being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Bridgewater. Bridgewater is most vulnerable to hurricanes/tropical storms during the summer and autumn months. Bridgewater was in the path of Hurricane Bob in 1991, which caused widespread damage throughout town from its considerable winds. While the town has not been

in the path of a hurricane or tropical storm since Hurricane Bob, it has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees are the most common problem associated with hurricanes/tropical storms that occur in Bridgewater. They can block roadways as well as down power lines, cutting of electricity to homeowners and businesses for up to multiple days. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Bridgewater. Bridgewater is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Bridgewater. While the town is moderately developed, there remains a considerable amount of forested land in town. Some of the more heavily forested areas that may be more vulnerable to wildfires include the Hockomock Swamp Wildlife Management Area in the western part of town and the forested land around the Bridgewater Correctional Complex in the southern part of town. While a significant wildfire has not occurred in either area, it does remain vulnerable to the threat of wildfires due to its sheer size. The largest threat of wildfire is in the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels).

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Bridgewater. While Bridgewater has never experienced a recorded tornado, several communities surrounding Bridgewater have. Most of the tornadoes that have occurred in the region were low in intensity, with most being an EF-0 or EF-1 on the Enhanced Fujita Scale. Additionally, most of the tornadoes only lasted for a short period of time before they dissipated, limiting the amount of damage they caused. Based on historical events, future tornadoes in the Old Colony region will also likely be EF-0 or EF-1 tornadoes. Due the historic nature of the town (settled in 1650) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, the entire community is vulnerable to the impacts.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Bridgewater. Although the town has not experienced a recorded earthquake, earthquakes have occurred in other communities in the Old Colony region and they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Bridgewater. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Landslides

Landslides represent a very low frequency, minor hazard for Bridgewater. Bridgewater has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to Bridgewater, as there are no major urban areas in town.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to Bridgewater, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to Bridgewater, as it is not located along the coast.

City of Brockton Natural Hazard Vulnerability/Risk Assessment

Community Profile

The City of Brockton is located within the “Greater Brockton” area of the Old Colony region and is approximately 25 miles south of Boston. It is bordered by Avon, Holbrook and Stoughton to the north, Abington, East Bridgewater and Whitman to the east, West Bridgewater to the south, and Easton to the west.

Brockton covers an area of 21.52 square miles and has a population of 93,810 persons, according to the 2010 U.S. Census. The city’s population density was 4,359.20 persons per square mile in 2010. Brockton’s population decreased by 0.52% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Brockton was 35.9 years, with 11.9% of the population being 65 years of age or older. Approximately 17.1% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 35,552 housing units in the city, with the average housing unit sheltering 2.63 persons. There is an average of 1,652.05 housing units per square mile. Brockton’s public school system had an enrollment of 17,011 students for the 2013-2014 academic year and includes eleven elementary schools, six middle schools, two high schools, two alternative schools and one pre-school. Brockton is also home to Massasoit Community College which had an enrollment of 8,209 students in the Fall of 2012.

Brockton is a thickly settled city with the predominant land uses being residential (46.5%), forest (20.4%) and commercial and industrial (12.3%). A former industrial city, that was once known as the “Shoe Capital of the World”, Brockton has long been the region’s most populated city and is one of the states ten most populous cities. Despite the large population of the city, Brockton does have a considerable amount of open space, led by the 756 acre D.W. Field Park. D.W. Field Park contains seven lakes and ponds, which is the source for many of the rivers in the city. Brockton also has several large natural conservation areas on its periphery; including the 118 acre Stone Farm near the Easton town line and the 218 acre Beaver Brook Conservation Land and 69 acre Washburn Meadow conservation lands on the Abington and Whitman town lines.

As a central city in southeastern Massachusetts, Brockton provides the region with a number of major commercial, educational, cultural, and medical resources such as the Westgate Mall, Massasoit Community College, the renowned Fuller Craft Museum and three hospitals.

Brockton’s municipal drinking water supply comes from two sources, Silver Lake in Kingston, Pembroke and Plympton (supplemented by diversions from Furnace Pond in Pembroke and Monponsett Pond in Halifax) and the Brockton Reservoir in Avon. Brockton also has the option of obtaining water from the Aquaria Water desalinization plant in North Dighton if needed. The entire city of Brockton as well as the adjacent communities of Abington and Whitman has public sewer service, via Brockton’s state of the art wastewater treatment plant that has a capacity of 18 million gallons per day (gpd). Brockton’s wastewater treatment plant also serves parts of Avon, Easton, Stoughton and West Bridgewater.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 48 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 48: Relationship of Brockton’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Allen Street Bridge (Salisbury Brook)	N/A	AE	No	110 MPH	36”-48”	N/A	Low	Zone 4
2	Bridge	Bartlett Street Bridge (Salisbury Brook)	N/A	AE	No	110 MPH	36”-48”	N/A	Low	Zone 4
3	Bridge	Belmont Avenue Bridge (Salisbury Brook)	N/A	AE	Within 100 Feet	110 MPH	36”-48”	N/A	Low	Zone 4
4	Bridge	Belmont Street Bridge (Route 24)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
5	Bridge	Belmont Street Bridge (Salisbury Brook)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
6	Bridge	Center Street Bridge (Trout Brook)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
7	Bridge	Crescent Street Bridge (Trout Brook)	N/A	AE	Within 100 Feet	110 MPH	36”-48”	N/A	Low	Zone 4
8	Bridge	D.W. Field Park Bridge (Porter Pond)	N/A	A	No	110 MPH	36”-48”	Coniferous Upland Forest	Low	Zone 4
9	Bridge	East Ashland Street Bridge (Trout Brook)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
10	Bridge	East Battles Street Bridge (MBTA/CSX Railroad)	N/A	N/A	Within 400 Feet	110 MPH	36”-48”	N/A	Low	Zone 4
11	Bridge	East Nilsson Street Bridge (MBTA/CSX Railroad)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
12	Bridge	Field Street Bridge (MBTA/CSX Railroad)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
13	Bridge	Forest Street Bridge (Salisbury Plain River)	N/A	AE	Within 200 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
14	Bridge	Grove Street Bridge (MBTA/CSX Railroad)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
15	Bridge	Grove Street Bridge (Salisbury Plain River)	N/A	AE	Within 100 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
16	Bridge	Howard Street Bridge (MBTA/CSX Railroad)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
17	Bridge	Main Street Bridge (Salisbury Brook)	N/A	AE	No	110 MPH	36"-48"	N/A	Low	Zone 4
18	Bridge	Montello Street Bridge (Salisbury Brook)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
19	Bridge	Otis Street Bridge (Salisbury Brook)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
20	Bridge	Perkins Avenue (MBTA/CSX Railroad)	N/A	N/A	Within 400 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
21	Bridge	Perkins Avenue Bridge (Salisbury Plain River)	N/A	AE	Within 100 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
22	Bridge	Perkins Street Bridge (Salisbury Brook)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
23	Bridge	Pine Avenue Bridge (Salisbury Plain River)	N/A	AE	Within 100 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
24	Bridge	Plain Street Bridge (MBTA/CSX Railroad)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
25	Bridge	Plain Street Bridge (Salisbury Plain River)	N/A	AE	Within 100 Feet	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
26	Bridge	Pleasant Street Bridge (Route 24)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
27	Bridge	Reynolds Memorial Highway Bridge (Route 24)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
28	Bridge	Route 24 Bridge (Oak Street)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
29	Bridge	Route 24 Bridge (Torrey Street)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
30	Bridge	Route 24 Bridge (West Chestnut Street)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
31	Bridge	Sargent's Way Bridge (MBTA/CSX Railroad)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
32	Bridge	Sargent's Way Bridge (Salisbury Plain River)	N/A	AE	Within 100 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
33	Bridge	Spring Street Bridge (Salisbury Brook)	N/A	AE	Within 100 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
34	Bridge	Summer Street Bridge (Trout Brook)	N/A	AE	Within 200 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
35	Bridge	Warren Avenue Bridge (Salisbury Brook)	N/A	AE	No	110 MPH	36"-48"	N/A	Low	Zone 4
36	Bridge	West Chestnut Street Bridge (Cowesett Brook)	N/A	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
37	Bridge	White Avenue Bridge (Salisbury Brook)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
38	Dam	Bigney Pond Dam (Bigney Pond)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
39	Dam	Cross Pond Dam (Cross Pond)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
40	Dam	Ellis Brett Pond Dam (Ellis Brett Pond)	N/A	A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
41	Dam	Hunts Pond Dam (Hunts Pond)	N/A	A	No	110 MPH	36"-48"	Coniferous Upland Forest	Low	Zone 4
42	Dam	Leonard Pond Dam (Leonard Pond)	N/A	N/A	Within 100 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
43	Dam	Lower Porter Pond Dam (Lower Porter Pond)	N/A	A	No	110 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
44	Dam	Thirty Acre Pond Dam (Thirty Acre Pond)	N/A	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
45	Dam	Trout Pond Dam (Trout Pond)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
46	Dam	Upper Porter Pond Dam (Upper Porter Pond)	N/A	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
47	Dam	VFW Pond Dam (VFW Pond)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
48	Dam	Waldo Lake Dam (Waldo Lake)	N/A	A	No	110 MPH	36"-48"	Coniferous Upland Forest	Low	Zone 4
49	Alternative Energy Source	Brockton Brightfields	Grove St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
50	Fuel Station	AMS Gas	1126 North Montello St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
51	Fuel Station	Awon's Auto Repair	514 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
52	Fuel Station	Best Gas	899 Belmont St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
53	Fuel Station	Campello-Keith Gas	74 Plain St.	AE	Within 100 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
54	Fuel Station	Champion Fuel	633 Warren Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
55	Fuel Station	City Gas	736 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
56	Fuel Station	CKML Gas	351 Belmont St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
57	Fuel Station	Cumberland Farms	1205 Belmont St.	N/A	Within 400 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
58	Fuel Station	Cumberland Farms	1813 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
59	Fuel Station	Cumberland Farms	660 Pleasant St.	N/A	Within 200 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
60	Fuel Station	Gas Depot	1123 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
61	Fuel Station	George's Service Station	74 Warren Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
62	Fuel Station	Hess	1234 Belmont St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
63	Fuel Station	Hess	1614 Main St.	N/A	Within 500 Feet	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
64	Fuel Station	Hess	261 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
65	Fuel Station	Hess	296 North Pearl St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
66	Fuel Station, Tier II Site	Irving/Speedee Oil Change	800 Crescent St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
67	Fuel Station	Irving	500 Pleasant St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
68	Fuel Station	Prestige Gas	409 Pleasant St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
69	Fuel Station	Mike's Gas	212 Torrey St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
70	Fuel Station	Mobil	1012 Belmont St.	N/A	Within 200 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
71	Fuel Station	Mobil	303 North Pearl St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
72	Fuel Station	Montello Express Gas	158 Montello St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
73	Fuel Station	Planet Petroleum	697 Centre St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
74	Fuel Station	Prestige Gas	64 North Montello St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
75	Fuel Station	Prestige Gas	761 Warren Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
76	Fuel Station	Prime Energy	1640 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
77	Fuel Station	Prime Energy	570 North Montello St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
78	Fuel Station	Saab Energy	1260 Main St.	N/A	Within 100 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
79	Fuel Station	Saab Energy	612 Oak St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
80	Fuel Station	Shell	620 Belmont St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
81	Fuel Station	Shell	945 Belmont St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
82	Fuel Station	Shell	253 East Ashland St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
83	Fuel Station	Star Gas	757 Crescent St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
84	Fuel Station	Stop-n-Gas	81 Warren Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
85	Fuel Station	Sunny's Auto	535 Westgate Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
86	Fuel Station	Sunoco	827 Belmont St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
87	Fuel Station	Sunoco	210 East Ashland St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
88	Fuel Station	Tedeschi Gas	563 Centre St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
89	Fuel Station	Trojan Gas	530 Centre St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
90	Fuel Storage, Tier II Site	Former Brockton Enterprise Building	60 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
91	Fuel Storage	Colonial Boco Truck	1029 Pearl St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
92	Fuel Storage, Tier II Site	First Student, Inc.	142 Oak Hill Way	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
93	Fuel Storage	J. Derenzo Co.	354 Howard St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
94	Fuel Storage, Tier II Site	Niccoli Bros. Oil	568 Montello St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
95	Fuel Storage	Salvation Army	281 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
96	Fuel Storage	Spectra Energy	Sargent's Way	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
97	Fuel Storage	Thorny Lea Golf Club	159 Torrey St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
98	Fuel Storage, Tier II Site	U.S. Postal Service	149 Crescent St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
99	Fuel Storage, Tier II Site	United Parcel Service	200 Oak Hill Way	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
100	Fuel Storage, Tier II Site	Verizon	65 Crescent St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
101	Fuel Storage, Tier II Site	Verizon	1690 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
102	Tier II Site	Acushnet Company	144 Field St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
103	Tier II Site	Barbour Corp.	1001 North Montello St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
104	Tier II Site	Columbia Gas	10 Oak Hill Way	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
105	Tier II Site	Concord Foods	10 Minuteman Way	X500	No	110 MPH	36"-48"	N/A	Low	Zone 4
106	Tier II Site	Home Depot	715 Crescent St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
107	Tier II Site	Lebaron Foundry	14 East Union St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
108	Tier II Site	Lowe's	135 Westgate Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
109	Tier II Site	Lyne Laboratories	10 Burke Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
110	Tier II Site	National Grid	100 East Ashland St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
111	Tier II Site	National Grid Substation #25	97 Ames St.	N/A	Within 100 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
112	Tier II Site	National Grid Substation #69	444 Court St.	X500	No	110 MPH	36"-48"	N/A	Low	Zone 4
113	Tier II Site	National Grid Substation #91	95 Ruppert Pl.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
114	Tier II Site	National Grid Substation #98	885 Belmont St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
115	Tier II Site	Uno Foods Inc.	180 Spark St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
116	Tier II Site	Vacant Warehouse	70 Brookside Ave.	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
117	Tier II Site	Vacant Warehouse	14 Florence St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
118	Tier II Site	Vacant Warehouse	173 Green St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
119	Tier II Site	Vacant Warehouse	10 Mupac Dr.	X500	No	110 MPH	36"-48"	N/A	Low	Zone 4
120	Tier II Site	Vacant Warehouse	1041 Pearl St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
121	Tier II Site	Walmart	700 Oak St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
122	Tier II Site	Zep Manufacturing	196 Manley St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
123	City Hall	City Hall	45 School St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
124	Library	East Branch Library	54 Kingman St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
125	Library	Main Branch Library	304 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
126	Library	West Branch Library	540 Forest Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
127	Public Works, Fuel Storage, Tier II Site	Highway Operations Department	301 Oak Hill Way	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
128	Public Works, Tier II Site	Wastewater Treatment Plant	303 Oak Hill Way	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
129	Public Works, Tier II Site	Water & Sewer Department	39 Montauk Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
130	School	Adult Learning Center	211 Crescent St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
131	School, Mass Care Shelter	Angelo School	472 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
132	School, Mass Care Shelter	Arnone School	135 Belmont St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
133	School	Ashfield Middle School	225 Coe Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
134	School	Baker School	45 Quincy St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
135	School	Brockton Champion High School	175 Warren Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
136	School	Brockton Christian School	1367 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
137	School, Mass Care Shelter	Brockton High School	470 Forest Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
138	School	Brookfield School	135 Jon Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
139	School	Cardinal Spellman High School	738 Court St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
140	School	Champions at Trinity Catholic Academy-Lower Campus	631 North Main St.	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
141	School	Champions at Trinity Catholic Academy-Upper Campus	37 Erie Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
142	School	Davis K-8 School	380 Plain St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
143	School	Downey School	55 Electric Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
144	School, Mass Care Shelter	East Middle School	464 Centre St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
145	School	George School	180 Colonel Bell Dr.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
146	School	Gilmore School Early Childhood Center	150 Clinton St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
147	School	Goddard Alternative School	20 Union St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
148	School	Hancock School	125 Pearl St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
149	School	Huntington School	1121 Warren Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
150	School	Kennedy School	900 Ash St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
151	School, Childcare, Fuel Storage	Massasoit Community College	1 Massasoit Blvd.	ANI	No	110 MPH	36"-48"	N/A	Low	Zone 4
152	School, Mass Care Shelter	North Middle School	108 Oak St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
153	School, Mass Care Shelter	Plouffe Academy	250 Crescent St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
154	School	Raymond K-8 School	125 Oak St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
155	School, Mass Care Shelter	South Middle School	105 Keith Ave. Ext.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
156	School	South Shore Christian School	899 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
157	School, Mass Care Shelter	West Middle School	271 West St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
158	Senior Center	Mary Cruise Kennedy Senior Center	10 Father Kenney Way	AE	No	110 MPH	36"-48"	N/A	Low	Zone 4
159	Courthouse	Brockton District Court	215 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
160	Courthouse	Brockton Superior Court	72 Belmont St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
161	District Attorney	Plymouth County District Attorney	32 Belmont St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
162	Ambulance Depot	American Medical Response	365 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
163	Fire, Fuel Storage	Fire Station #1	42 Pleasant St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
164	Fire	Fire Station #2	945 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
165	Fire	Fire Station #3	916 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
166	Fire, Fuel Storage	Fire Station #4	305 Crescent St.	No	Within 200 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
167	Fire, Fuel Storage	Fire Station #6 (Headquarters)	560 West St.	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
168	Fire, Fuel Storage	Fire Station #7	605 North Cary St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
169	Hospital	Brockton Neighborhood Health Center	63 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
170	Hospital, Fuel Storage, Tier II Site	Good Samaritan Medical Center	235 North Pearl St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
171	Hospital	Signature Healthcare-Brockton Hospital	680 Centre St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
172	Hospital, Emergency Operations Center, Fuel Storage, Tier II Site	V.A. Medical Center	940 Belmont St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
173	National Guard Armory, Fuel Storage, Tier II Site	National Guard Armory	98 Montauk Rd.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
174	Police	Police Station	7 Commercial St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
175	U.S. Army Reserve Center, Tier II Site	U.S. Army Reserve Center	124 Manley St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
176	U.S. Army Reserve Center, Tier II Site	U.S. Army Reserve Center	915 West Chestnut St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
177	Assisted Living	Douglas House Apartments	20 Haverhill St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
178	Assisted Living	Emmanuel House	25 East Nilsson St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
179	Assisted Living	Hamilton-Wade Apartments	5 Haverhill St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
180	Assisted Living	Heights Crossing	35 Christy Pl.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
181	Childcare	Agape Childcare & Family Life Center, Inc.	20 Oak St. Ext.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
182	Childcare	Brockton Day Nursery	243 Crescent St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
183	Childcare	Children's Ark Preschool	900 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
184	Childcare	Dovecrest Montessori Academy	460 Belmont St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
185	Childcare	Field House Day School	1100 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
186	Childcare	Kidde Haven Day Care	200 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
187	Childcare	Kidsland Daycare Center	1330 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
188	Childcare	LaBelle Day School	600 East Ashland St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
189	Childcare	Little Discoveries, Inc.	522 West Chestnut St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
190	Childcare	Little Lambs Christian Learning Center	421 Torrey St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
191	Childcare	Little Prince and Princess Day School	877 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
192	Childcare	Old Colony Y-Youth Division	465 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
193	Childcare	Old Colony Y Childcare	850 West Chestnut St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
194	Childcare	Start Right, Start Bright Child Care	856 North Montello St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
195	Childcare	The Pines Day Care Center	83 Reservoir St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
196	Childcare	The Tyke Site	940 Belmont St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
197	Childcare	Ulysses G. Shelton Headstart Center	370 Howard St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
198	Childcare	Westfield Child Center	470 Torrey St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
199	Cultural Resources	Above All Christian Center	288 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
200	Cultural Resources	Annunciation Greek Orthodox Church	457 Oak St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
201	Cultural Resources	Apostolic House of Prayer #5	848 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
202	Cultural Resources	Brockton Assembly of God	199 Warren Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
203	Cultural Resources	Brockton Foursquare Church	421 Torrey St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
204	Cultural Resources	Brockton French Seventh Day Adventist Church	237 Court St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
205	Cultural Resources	Brockton Historical Society	216 North Pearl St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
206	Cultural Resources	Brockton Portuguese Foursquare Church	105 Pleasant St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
207	Cultural Resources	Central United Methodist Church	65 West Elm St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
208	Cultural Resources	Chapel of our Savior Friars of the Atonement	475 Westgate Dr.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
209	Cultural Resources	Christ Congregational Church	1350 Pleasant St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
210	Cultural Resources	Christ the King Church	42 Wendell Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
211	Cultural Resources	Converge Christian Center	1367 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
212	Cultural Resources	CVS	555 Belmont St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
213	Cultural Resources	CVS	355 Centre St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
214	Cultural Resources	CVS	230 East Ashland St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
215	Cultural Resources	CVS	1933 Main St.	No	Within 500 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
216	Cultural Resources	CVS	316 North Pearl St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
217	Cultural Resources	CVS	240 Oak St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
218	Cultural Resources	First Baptist Church	10 Bouve Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
219	Cultural Resources	First Church of the Nazarene	89 North Pearl St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
220	Cultural Resources	First Evangelical Lutheran Church	900 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
221	Cultural Resources	Fuller Craft Museum	455 Oak St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
222	Cultural Resources	Gethsemane Nineth Day Adventist Church	34 Nilsson St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
223	Cultural Resources	Immanuel Baptist Church	92 Alger St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
224	Cultural Resources	Keys of the Kingdom Tabernacle of Prayer for all People	33 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
225	Cultural Resources	Dominion Christian Church	758 Crescent St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
226	Cultural Resources	Kingdom Hall of Jehovah's Witnesses	392 East Ashland St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
227	Cultural Resources	Kingdom Hall of Jehovah's Witnesses	444 Plain St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
228	Cultural Resources	Lincoln Congregational Church	13 Wales Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
229	Cultural Resources	Living Word World Outreach Church	1090 West Chestnut St.	No	Within 200 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
230	Cultural Resources	Messiah Baptist Church	80 Legion Pkwy.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
231	Cultural Resources	Mt. Moriah Baptist Church	24 Pleasant St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
232	Cultural Resources	New Life Christian Center	184 West Elm St.	No	Within 100 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
233	Cultural Resources	New Life Temple Brockton	15 Nilsson St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
234	Cultural Resources	Our Lady of Lourdes Church	439 West St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
235	Cultural Resources	Pearl Street United Methodist Church	415 Pearl St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
236	Cultural Resources	Portuguese Seventh Day Adventist Church	28 Warren Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
237	Cultural Resources	Price Rite Supermarket	21 Torrey St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
238	Cultural Resources, Mass Care Shelter	Prince of Peace Lutheran Church	906 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
239	Cultural Resources	Redeemed Christian Church of God	251 Crescent St.	No	Within 400 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
240	Cultural Resources	Rite-Aid	725 Centre St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
241	Cultural Resources	Salvation Army	216 Centre St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
242	Cultural Resources	Save-A-Lot Supermarket	240 East Ashland St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
243	Cultural Resources	Seventh Day Adventist Church	752 Oak St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
244	Cultural Resources	Shaw's Supermarket	641 Belmont St.	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
245	Cultural Resources	Shaw's Supermarket	715 Crescent St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
246	Cultural Resources	Sisters of Jesus Crucified	261 Thatcher St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
247	Cultural Resources	St. Edith Stein Church	71 East Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
248	Cultural Resources	St. Paul's Anglican Church	701 Pleasant St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
249	Cultural Resources	St. Theresa Maronite Church	343 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
250	Cultural Resources	Stop & Shop Supermarket	683 Belmont St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
251	Cultural Resources, Fuel Station	Stop & Shop Supermarket	932 North Montello St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
252	Cultural Resources	Teen Challenge New England	1315 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
253	Cultural Resources	Temple Beth Emunah	479 Torrey St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
254	Cultural Resources	The Rock-First Brockton Haitian Church	940 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
255	Cultural Resources	Universalist Unitarian Church	325 West Elm St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
256	Cultural Resources	Vicente's Tropical Grocery	689 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
257	Cultural Resources	Walgreens	771 Centre St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
258	Cultural Resources	Walgreens	1101 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
259	Cultural Resources	Walgreens	880 North Montello St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
260	Cultural Resources	Walgreens	25 Oak St. Ext.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
261	Cultural Resources	Walgreens	610 Pleasant St.	No	Within 500 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
262	Cultural Resources	War Memorial Building	156 West Elm St.	No	Within 400 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
263	Cultural Resources	Warren Avenue Baptist Church	1153 Warren Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
264	Cultural Resources	Westgate Mall	200 Westgate Dr.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
265	Homeless Shelter	MainSpring House	54 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
266	Housing Authority	Ann L. Ward Congregate House	629 North Main St.	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
267	Housing Authority	Belair Heights	Earle St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
268	Housing Authority	Belair Towers	105 Belair St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
269	Housing Authority	Caffrey Towers	755 Crescent St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
270	Housing Authority	Campello High Rise	1380 Main St.	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
271	Housing Authority	Crescent Court	Stillman Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
272	Housing Authority	Crosby Gardens	25 North Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
273	Housing Authority	Golden Circle	Golden Circle	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
274	Housing Authority	Hillside Village	Hill St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
275	Housing Authority	Kennedy Drive	Kennedy Dr.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
276	Housing Authority	Manning Towers	45 Goddard Rd.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
277	Housing Authority	Rainbow Terrace	Hawley St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
278	Housing Authority	Roosevelt Heights	Arthur Paquin Way	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
279	Housing Authority	Sullivan Towers	140 Colonel Bell Dr.	ANI	No	110 MPH	36"-48"	N/A	Low	Zone 4
280	Housing Authority	Walnut-Crowell	Walnut & Crowell St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
281	Housing Authority	Washburn Heights	North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
282	Nursing Facility	Baypointe Rehab. & Skilled Care Center	50 Christy Pl.	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
283	Nursing Facility	Braemoor Rehab. & Nursing Center	34 North Pearl St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
284	Nursing Facility	Champion Rehabilitation & Health Center	2 Beaumont Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
285	Nursing Facility	St. Joseph Manor Health Care	215 Thatcher St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
286	Nursing Facility	The Guardian Center Skilled Nursing, Rehab. & Alzheimer's Center	888 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
287	Nursing Facility	West Acres Rehabilitation & Nursing Center	804 Pleasant St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
288	Postal & Shipping	USPS Brockton Office	120 Commercial St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
289	Postal & Shipping	USPS Campello Station	1104 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
290	Postal & Shipping	USPS Montello Station	200 Oak St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
291	Postal & Shipping, Tier II Site	USPS Processing Facility	225 Liberty St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
292	Railroad	MBTA Brockton Station	7 Commercial St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
293	Railroad	MBTA Campello Station	30 Riverside Ave.	No	Within 500 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
294	Railroad	MBTA Montello Station	150 Spark St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
295	Transportation	BAT Administrative Offices	155 Court St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
296	Transportation	BAT Intermodal Centre	10 Commercial St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
297	Transportation, Fuel Storage	BAT Maintenance Garage	1442 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
298	Antenna	Acme Commercial Properties	11 Bedford St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
299	Antenna	American Towers	995 Belmont St.	No	Within 400 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
300	Antenna	American Towers	110 Mulberry St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
301	Antenna	American Towers	541 Walnut St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
302	Antenna, Tier II Site	Comcast	821 Centre St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
303	Antenna	Global Towers	433 Forest Ave.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
304	Antenna	Hispanic Broadcasters	288 Linwood St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
305	Antenna, Tier II Site	Joseph Stadelmann Electric	44 High St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
306	Antenna, Tier II Site	National Grid	161 Mulberry St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
307	Antenna	Verizon	180 Court St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
308	Cable Television	Brockton Community Access	1 North Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
309	Radio	WXBR-AM	60 Main St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
310	Wastewater Pumping Station	Bangor Street Wastewater Pumping Station	Bangor Street	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
311	Wastewater Pumping Station	Beaver Brook Wastewater Pumping Station	541 Thatcher St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
312	Wastewater Pumping Station	Cowesett Wastewater Pumping Station	1165 West Chestnut St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
313	Water Pumping Station	Oak Street Pumping Station	385 Oak Street	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
314	Water Pumping Station	Browns Crossing Pumping Station	17 Pine St. East Bridgewater, MA	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
315	Water Pumping Station	East Ashland Pumping Station	640 East Ashland St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
316	Water Supply Tank	Brockton Heights Tank	Irving Avenue	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
317	Water Supply Tank	Cary Hill Tank	North Cary St.	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
318	Water Supply Tank	East & West Twin Tanks	South St. Avon, MA	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
319	Water Supply Well	Hubbard Avenue Well	54 Hubbard Ave.	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
320	Water Treatment Plant	Brockton Reservoir Water Treatment Plant	South St. Avon, MA	A	No	110 MPH	36"-48"	N/A	Low	Zone 4
321	Water Treatment Plant	Silver Lake Water Treatment Plant	1 Silver Lake Rd. Pembroke, MA	A	Within 400 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
322	Diversion Structure	Furnace Pond Diversion Structure	421 Center St. Pembroke, MA	No	No	110 MPH	36"-48"	N/A	Low	Zone 4
323	Diversion Structure	Monponsett Pond Diversion Structure	53 Holmes St. Halifax, MA	No	Within 500 Feet	110 MPH	36"-48"	N/A	Low	Zone 4
324	Reservoir Gatehouse	Brockton Reservoir Gatehouse	South St. Avon, MA	No	No	110 MPH	36"-48"	N/A	Low	Zone 4

Natural Hazard Risk Assessment

Table 49 summarizes the hazard risks for Brockton. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Brockton’s vulnerability to each of these hazards is below.

Table 49: Brockton Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Major Urban Fires	Medium	Serious	5
Wildfires	Low	Minor	3
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Brockton and is the most frequent hazard affecting Brockton. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Brockton are areas along the Salisbury Plain River, Trout Brook, Searles Brook, Beaver Brook, Edson Brook, West Meadow Brook, Salisbury Brook, Lovett’s Brook, the Beaver Brook Conservation Land, as well as Upper Porter Pond, Lower Porter Pond, Thirty Acre Pond, Ellis Brett Pond and Cross Pond, each of which are in D.W. Field Park. In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which flooded as a result of the March 2010 floods:

- Area on either side of the Salisbury Plain River from Grove Street southward to the West Bridgewater line
- Area east of North Montello Street and north of East Ashland Street near the Trout Brook
- Area between Court Street and Benham Street eastward to Sheridan Street
- Area along Dorchester Brook from the intersection of Belmont & Pearl Streets to College Drive

- Area along the Salisbury Plain River from Belmont Avenue to Newbury Street, including the nearby roads of Carlton Street, Ellsworth Street, Fenway Circle, Highland Terrace, Green Street, North Arlington Street, Park Road, Poplar Road, Silver Road, Spring Street, and Sycamore Avenue
- Brook Street, Dover Street and Fuller Street surrounding Edgar’s Playground
- Area along the Searles Brook south of Rutland Street to Vine Avenue including Porter Street Price Avenue and Holbrook Avenue
- Area east of Pondview Circle to Circle Drive, including the southern end of Braemoor Road and Fairview Avenue
- Area along Westgate Drive just north of the intersection of Reynolds Memorial Highway and Pleasant Street
- Meadowbrook Road
- K-Mart Plaza on Main Street
- Teele Street and Puffer Playground along Trout Brook
- Intersection of Ames Street, Spark Street and Intervale Street
- Trinity Village Apartment Complex on Grove Street along the Salisbury Plain River
- Perkins Avenue at the Walkover Commons Apartment Complex
- Campus of the Gilmore Academy School on Clinton Street
- Perkins Avenue at Riverview Street
- Perkins Avenue at Clinton Street
- Clifton Avenue at Churchill Avenue
- Tukis Playground on Melrose Street
- Keith Avenue at Warren Avenue adjacent to the Nelson Playground
- Crescent Street adjacent to Snow Park
- Melrose Cemetery
- Brookville Avenue at Boundary Street
- Rangely Avenue at Darren Drive and Albany Street
- Tribou Street at Warren Avenue
- Linwood Street, just north of West Chestnut Street
- Liberty Street, just north of West Chestnut Street
- Manley Street, just south of Belmont Street
- Tiffany Drive at the Cowesett Brook
- Bates Road, just north of Court Street
- Claremont Avenue, just east of Howard Street
- Boyle Road at Stephen Drive
- Paula Road at Scott Road and Stephen Drive
- Northern end of Willams Avenue and Taber Avenue
- Northern end of Haskell Street and Prescott Street
- Etrick Street, just north of West Chestnut Street
- Falconer Avenue, just north of West Chestnut Street
- Ash Street adjacent to the Bent Playground
- Boylston Street, just south of Spring Street
- Alger Street to the East Bridgewater town line
- Prospect Street at the Salisbury Plain River

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 1,550 acres, or 11.3%, of Brockton is within a 100-year floodplain. Based on additional analysis, 630 acres, or 40.7%, of the floodplain is developed. To limit additional development from occurring within floodplains, Brockton adopted a Floodplain, Watershed and Wetland Protection Zone. The zone is intended to limit the type and amount of development occurring within floodplains.

Of the 324 critical facilities identified in Brockton, 36 are located within a 100-year floodplain and include sixteen bridges, six dams, as well as the highway operations department, a school, the council on aging, a fire station, two public housing complexes, two water treatment plants and the city’s sole wastewater treatment plant. There are also a number critical facilities located near a number of the locally identified flood areas, but none have been significantly impacted by flooding.

According to MEMA, there are currently 469 National Flood Insurance Program (NFIP) policies in-force in Brockton, with a total of 315 claims being made from 1978 to November 2013, totalling \$1,855,888. It should be noted that there are 39 residential Repetitive Loss (RL) properties in Brockton that have resulted in 102 two claims totalling \$766,784. Additionally, there is one residential Severe Repetitive Loss Property (SRL) in Brockton. This property has resulted in four claims totalling \$37,574.

Bridges

Table 50 indicates that there are 23 bridges in Brockton that span waterways according to the Massachusetts Department of Transportation. In 2010 work began on the two most structurally deficient rated bridges-the Bartlett Street Bridge and the White Avenue Bridge. The Bartlett Street Bridge was completed in 2011, and the White Avenue Bridge was completed in the spring of 2012. In total 16 of the 23 bridges are located within a 100-year floodplain.

Table 50: Brockton Bridges Spanning Waterways

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Allen Street	Salisbury Brook	2002	--	76.0	FO
Bartlett Street	Salisbury Brook	2011	--	80.6	--
Belmont Avenue	Salisbury Brook	1850	1938	71.8	--
Belmont Street	Salisbury Brook	1850	1924	88.7	--
Center Street	Trout Brook	1901	1993	93.5	--
Crescent Street	Trout Brook	1976	--	95.9	--
D.W. Field Park	Porter Pond	1940	--	64.9	FO
East Ashland Street	Trout Brook	1937	--	81.2	--
Forest Street	Salisbury Plain River	1999	--	89.0	--
Grove Street	Salisbury Plain River	1910	--	78.6	--
Main Street	Salisbury Brook	1997	--	96.0	--
Montello Street	Salisbury Brook	1889	--	78.8	FO
Otis Street	Salisbury Brook	1913	1973	75.0	--
Perkins Avenue	Salisbury Plain River	1995	--	96.5	--
Perkins Street	Salisbury Brook	1914	--	64.9	FO
Pine Avenue	Salisbury Plain River	1999	--	92.8	--

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Plain Street	Salisbury Plain River	1988	--	94.1	--
Sargent's Way	Salisbury Plain River	1988	--	95.7	--
Spring Street	Salisbury Brook	2005	--	100	--
Summer Street	Trout Brook	1976	--	78.6	--
West Chestnut Street	Cowesett Brook	1970	--	91.5	--
Warren Avenue	Salisbury Brook	1913	--	84.1	--
White Avenue	Salisbury Brook	2012	--	85.7	--

Dams

Table 51 indicates that there are 11 dams in Brockton according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. The majority of the dams in Brockton are located in and around the lakes and ponds of D.W. Field Park. These dams are critically important to the city as they hold water from rushing downstream to the heavily populated areas along the banks of the Salisbury Brook and Salisbury Plain River. In an effort to better prepare the city if a dam was to fail, the city commissioned the consulting firm Fuss & O'Neill to create Emergency Action Plans for the Ellis Brett Pond Dam, Thirty Acre Pond Dam and Waldo Lake Dam.

Table 51: Brockton Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Bigney Pond Dam	Bigney Pond	Dorchester Brook	Low	Under Review
Cross Pond Dam	Cross Pond	Beaver Brook	Significant	City
Ellis Brett Pond Dam	Ellis Brett Pond	Lovetts Brook	High	City
Hunts Pond Dam	Hunts Pond	Beaver Brook	Significant	Town of Abington
Lower Porter Pond Dam	Lower Porter Pond	Beaver Brook	Significant	City
Thirty Acre Pond Dam	Thirty Acre Pond	Beaver Brook	High	City
Upper Porter Pond	Upper Porter Pond	Beaver Brook	Significant	City
Waldo Lake Dam	Waldo Lake	Beaver Brook	High	City

The dam listed below is considered non-jurisdictional and does not fall under the Mass. Office of Dam Safety's regulatory authority and therefore the information provided is limited.

Name	Impoundment	Waterway	Hazard Code	Owner
Leonard Pond Dam	Leonard Pond	Not Applicable	Not Available	Unknown
Trout Pond Dam	Trout Pond	Trout Brook	Not Available	Unknown
VFW Pond Dam	VFW Pond	Tr-Beaver Brook	Not Available	Unknown

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Brockton. Brockton receives an average of 36"-48" of snow annually, with there being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing

roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Brockton. Brockton is most vulnerable to hurricanes/tropical storms during the summer and autumn months. The city was in the path of one hurricane/tropical storm-Tropical Storm Barry in 2007, but by the time it reached Brockton, it lost much of its strength and only resulted in a moderate amount of rainfall. Brockton however has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees are the most common problem associated with hurricanes/tropical storms that occur in Brockton. They can block roadways as well as down power lines, cutting of electricity to homeowners and businesses for up to multiple days. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Brockton. Brockton is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Major Urban Fires

Major urban fires represent a medium frequency, serious severity hazard for Brockton. The City of Brockton is most vulnerable community in the region to a major urban fire. Once known as the “Shoe Capital of the World”, the city contains many abandoned mills and warehouses, most of which are clustered in the downtown section of the city. These are particularly vulnerable due to the construction materials which were used at the time (sawdust insulation, etc.), the original electrical wiring, and minimum spaces between buildings. Brockton was the site one of the deadliest urban fires for firefighters in state history. On March 10, 1941 the Strand Theater fire in downtown Brockton killed thirteen firefighters and injured 20 more when firefighters who were attempting to douse the blaze were caught inside the theater when its roof collapsed. No definitive cause of the fire was ever discovered. Another notable urban fire occurred February 15, 1987 at the London Clothing Factory building in downtown Brockton. The timber structure was quickly engulfed and the wind-whipped flames also destroyed several nearby buildings as well as a Brockton Fire Department ladder truck. A more recent urban fire occurred on April 8,

2008, when an electrical fire at a business office injured seven firefighters and caused \$1.8 million in damages.

Wildfires

Wildfires represent a low frequency, minor severity hazard for Brockton. While the large majority of the city is heavily developed, the last remaining undeveloped areas include the 750+ acre D.W. Field Park in the northwest part of the city, the Beaver Brook Conservation Land in the eastern part of the city and the Mass Audubon Recreation land in the western part of the city. While a significant wildfire has not occurred in any of these areas, it does remain vulnerable to the threat of wildfires due to its sheer size. The largest threat of wildfire is in the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels).

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Brockton. Brockton has experienced only recorded tornado, an F1 tornado that occurred in the downtown on July 10, 1989. This tornado was part of the larger 1989 Northeastern United States tornado outbreak that affected many states in the northeastern US. Luckily damage was minimal, although one injury was reported. Like the Brockton tornado, most tornadoes that have occurred in the region are low in intensity, as most are EF-0 and EF-1 on the Enhanced Fujita Scale. In addition most of the tornadoes only lasted for a small duration of time before they dissipated, limiting the amount of damage they caused. Based on historical events, tornadoes in the Old Colony region will likely be EF-0 and EF-1 on the Enhanced Fujita Scale and short in duration. Due the historic nature of the region and the town (settled in 1700) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures in town that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, it is a natural hazard that can occur anywhere, making no location in Brockton more vulnerable than others to tornadoes.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Brockton. Brockton has only experienced one recorded earthquake. On October 25, 1926 an earthquake of an unknown magnitude earthquake struck the city. It is not known what damages, if any, were caused by the earthquake. Based on the fact that earthquakes that have occurred in Brockton and other communities in the Old Colony region, they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the magnitude 2-3 range. According to the USGS earthquake damage usually occurs with earthquakes in the magnitude 4-5 range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the region and the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Brockton. As it is impossible to predict the exact locations of future earthquakes, it is a natural hazard that can occur anywhere, making no location in Brockton more vulnerable than others to earthquakes.

Landslides

Landslides represent a very low frequency, minor hazard for Brockton. Brockton has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to Brockton, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to Brockton, as it is not located along the coast.

Town of East Bridgewater Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of East Bridgewater is located within the “Greater Brockton” area of the Old Colony region and is approximately 27 miles southeast of Boston. It is bordered by Brockton and Whitman to the north, the Halifax and Hanson to the east, Bridgewater to the south, and West Bridgewater to the west.

East Bridgewater covers an area of 17.54 square miles and has a population of 13,794 persons, according to the 2010 U.S. Census. The town’s population density was 786.43 persons per square mile in 2010. East Bridgewater’s population increased 6.32% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in East Bridgewater was 40.5 years, with 13% of the population being 65 years of age or older. Approximately 7.1% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 4,906 housing units in town, with the average housing unit sheltering 2.81 persons. There is an average of 279.70 housing units per square mile. East Bridgewater’s public school system had an enrollment of 2,297 students for the 2013-2014 academic year and includes one elementary school, one middle school and one high school.

East Bridgewater is primarily a residential community with the predominant land uses being forest (40.9%), residential (23.3%), wetlands and water (20.5%). East Bridgewater’s natural features include the 124 acre Robbins Pond in the southeastern corner of town, as well as the Satucket River, Matfield River and Meadow Brook.

East Bridgewater’s commercial development is concentrated along the north-south Route 18 corridor. The heavily travelled Route 18 corridor is home to a variety of uses, including the town center, which serves as the town’s commercial hub.

East Bridgewater’s municipal drinking water supply is drawn from five wells in East Bridgewater. The wells are protected by Zone II wellhead protection areas and by East Bridgewater’s Floodplain and Watershed Protection District. East Bridgewater does not have municipal wastewater service, therefore requiring wastewater be disposed of via on-site septic systems.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 52 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 52: Relationship of East Bridgewater’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Bedford Street Bridge (Forge Pond)	N/A	N/A	Within 200 Feet	120 MPH	36”-48”	N/A	Low	Zone 4
2	Bridge	Bedford Street Bridge (Matfield River)	N/A	A	Within 100 Feet	120 MPH	36”-48”	Mixed Deciduous/Coniferous	Moderate	Zone 4
3	Bridge	Bridge Street Bridge (Satucket River)	N/A	A	No	120 MPH	36”-48”	N/A	Moderate	Zone 4
4	Bridge	North Central Street Bridge (Matfield River)	N/A	A	No	120 MPH	36”-48”	N/A	Low	Zone 4
5	Bridge	Pleasant Street Bridge (Salisbury Plain River)	N/A	A	No	120 MPH	36”-48”	Mixed Deciduous/Coniferous	Low	Zone 4
6	Bridge	Plymouth Street Bridge (Satucket River)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
7	Bridge	Spring Street Bridge (Matfield River)	N/A	A	Within 100 Feet	120 MPH	36”-48”	Mixed Deciduous/Coniferous	Low	Zone 4
8	Bridge	Washington Street Bridge (Satucket River)	N/A	N/A	Within 100 Feet	120 MPH	36”-48”	N/A	Moderate	Zone 4
9	Bridge	West Union Street Bridge (Matfield River)	N/A	A	No	120 MPH	36”-48”	N/A	Low	Zone 4
10	Bridge	West Union Street Bridge (MBTA-Railroad)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
11	Dam	Brockton Edison Dam	N/A	A	No	120 MPH	36”-48”	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
12	Dam	Cotton Gin Pond Dam (Cotton Gin Pond)	N/A	AE	No	120 MPH	36"-48"	N/A	Low	Zone 4
13	Dam	Forge Pond Dam (Forge Pond)	N/A	N/A	Within 200 Feet	120 MPH	36"-48"	N/A	Low	Zone 4
14	Fuel Station	Cumberland Farms	143 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
15	Fuel Station	Cumberland Farms	1055 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
16	Fuel Station	Hi-Lo Gas	475 N. Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
17	Fuel Station	Irving	60 Franklin St.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/ Coniferous	Low	Zone 4
18	Fuel Station	Mobil	210 Pond St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
19	Fuel Station	Mutual Gas	117 N. Bedford St.	N/A	Within 400 Feet	120 MPH	36"-48"	N/A	Low	Zone 4
20	Fuel Station	Prime Energy	49 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
21	Fuel Storage	Alvin Hollis	444 Walnut St.	N/A	Within 300 Feet	120 MPH	36"-48"	N/A	Low	Zone 4
22	Fuel Storage	Forni Bros.	563 Spring St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
22	Tier II Sites	Gas Recovery Systems	234 Thatcher St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
24	Tier II Sites	Mueller Corporation	530 Spring St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
25	Tier II Sites	National Grid Substation	358 Spring St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
26	Tier II Sites	Verizon	126 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
27	Library	East Bridgewater Public Library	32 Union St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
28	Mass Care Shelter	Commercial Club	1 Neilson St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
29	Mass Care Shelter, Tier II Site	Harte-Hanks Direct Marketing	600 North Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
30	Mass Care Shelter	Johnny Macaroni's	1300 Plymouth St.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/ Coniferous	Moderate	Zone 4
31	Mass Care Shelter	Ridder Country Club	399 Oak St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
32	Mass Care Shelter	T.J. Smith's Victorian House	13 Cross St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
33	Mass Care Shelter	Verizon Warehouse	140 Laurel St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
34	Public Works	Department of Public Works	100 Willow Ave.	AE	Within 500 Feet	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
35	School, Mass Care Shelter	Central Elementary School	107 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
36	School, Mass Care Shelter, Cable Access	East Bridgewater High School	143 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
37	School, Mass Care Shelter	Gordon W. Mitchell Middle School	435 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
38	School, Childcare	Metro South Academy	450 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
39	Senior Center	Council on Aging	355 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
40	Town Hall, Emergency Operations Center	Town Hall	175 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
41	Transfer Station	Transfer Station	Bridge St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
42	Fire	Fire Station	268 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
43	Health/Medical Facility	Compass Medical	1 Compass Way	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
44	Police	Police Station	153 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
45	Childcare	Busy Bee Preschool	119 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
46	Childcare	Busy Bee Preschool Babies	349 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
47	Childcare	Our Magical Beginnings	231 Highland St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
48	Cultural Resource	Abundant Faith Family Church	23 N. Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
49	Cultural Resource	Community Covenant Church	400 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
50	Cultural Resource	East Bridgewater United Methodist Church	54 N. Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
51	Cultural Resource	Grace Bible Church	234 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
52	Cultural Resource	Hoyts Cinemas	225 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
53	Cultural Resource	Jehovah's Witness Bridgewater Congregation	215 Whitman St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
54	Cultural Resource, Mass Care Shelter, Childcare	Old Colony YMCA	635 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
55	Cultural Resource	St. John Catholic Church	210 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
56	Cultural Resource	Union Congregational Church	105 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
57	Housing Authority	East Bridgewater Housing Authority	5 Riddell Rd.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
58	Housing Authority	East Bridgewater Housing Authority	100 Prospect St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
59	Nursing Facility	Kindred Transitional Care & Rehabilitation-Sachem	66 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
60	Nursing Facility	Westview Nursing Home	446 West St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
61	Postal & Shipping	USPS East Bridgewater Office	63 W. Union St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
62	Special Needs	Group Home	30/44 Prospect St.	N/A	Within 500 Feet	120 MPH	36"-48"	N/A	Low	Zone 4
63	Special Needs	Group Home	150 West St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
64	Antenna	American Tower, Inc.	231 Highland St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
65	Antenna	J & F Realty Trust	394 Spring St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
66	Antenna	Mobilite Investments	1034 Central St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
67	Private Wastewater Treatment Plant	Harmony Crossing	Rodeo Dr.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
68	Private Wastewater Treatment Plant	Irving	60 Franklin St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
69	Private Wastewater Treatment Plant	White Pines Village	Carina Way	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
70	Water Department Garage	Water Department Garage	49 Dean Pl.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
71	Water Supply Tank, Antenna,	Water Supply Tank	319R Highland St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
72	Water Supply Well	Water Supply Well	1835 Washington St.	N/A	Within 200 Feet	120 MPH	36"-48"	N/A	Moderate	Zone 4
73	Water Supply Well	Water Supply Well	635 Pond St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
74	Water Supply Well	Water Supply Well	Poor Meadow Dr.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
75	Water Treatment Plant & Well Site	Treatment Plant & Well Site	54 Leo Way	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
76	Water Treatment Plant & Well Site	Treatment Plant & Well Site	795 Crescent Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

Natural Hazard Risk Assessment

Table 53 summarizes the hazard risks for East Bridgewater. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of East Bridgewater’s vulnerability to each of these hazards is below.

Table 53: East Bridgewater Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for East Bridgewater and is the most frequent hazard affecting East Bridgewater. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in East Bridgewater are areas along Beaver Brook, Black Brook, Matfield River, Meadow Brook, Poor Meadow Brook, Satucket River and the area south of Route 106 and west of Route 18 to the Bridgewater and West Bridgewater town lines. In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which flooded as a result of the March 2010 floods:

- Willow Avenue at Highway Garage
- Pond Street at Robbins Pond and Poor Meadow Brook
- Plymouth Street (Route 106) at the Halifax Town Line
- Cedar Street at Margot Lane
- Harvard Street at Coots Pits
- Washington Street at Well #3 (Satucket River)
- Walnut Street at Kennelworth Drive

- South Street-Area around #122
- Hobart Street at Skylur Path and Maple Avenue
- Village Drive
- Spring Street at the Matfield River
- West Union Street at Oregon Street
- Belmont Street-Area around #179
- Belmont Street-Area around #551
- Summer Street at Winter Street
- Winter Street-Area around #480
- Bedford Street (Route 18) at Whitman Street (Route 106)
- North Bedford Street (Route 18) at Water Street

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 1,977 acres, or 17.6%, of East Bridgewater is within a 100-year floodplain. Based on additional analysis, 69 acres, or 3.5%, of the floodplain is developed. To limit additional development from occurring within floodplains, East Bridgewater adopted a Floodplain and Wetlands Protection District. The district is intended to protect and preserve the marshes, bogs, ponds, watercourses and their adjoining wetlands; to reduce the hazards of floods upon the public health, safety and general welfare; to protect floodplain occupants from a flood that is or may be caused by their own land use and that is or may be undertaken without full realization of the dangers therein; to protect the public from the burden of extraordinary financial expenditures for flood control and relief; to protect the capacity of floodplain, watershed, and wetland areas to absorb, transmit, and store runoff; to assure retention of sufficient floodway area to convey flows which can reasonably be expected to occur.

Of the 76 critical facilities identified in East Bridgewater, nine are located within a 100-year floodplain, including six bridges, two dams, and the town's public works facility. There are no critical facilities located in any of the locally identified flood areas, there are ten critical facilities located within 500 feet of where flooding has historically occurred, most notably near the Public Works Department.

According to MEMA, there are currently 33 National Flood Insurance Program (NFIP) policies in-force in East Bridgewater, with a total of eight claims being made from 1978 to November 2013, totalling \$50,650. It should be noted that there is one residential Repetitive Loss (RL) property in East Bridgewater that has had two claims totalling \$29,878. There are no Severe Repetitive Loss Properties (SRL) in East Bridgewater.

Bridges

Table 54 indicates that there are nine bridges in East Bridgewater that span waterways according to the Massachusetts Department of Transportation. While six of the nine bridges are located within a floodplain, none of these bridges are known to create flooding hazards or be at risk from high water or forest fires.

Table 54: East Bridgewater Bridges Spanning Waterways

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Bedford Street	Forge Pond	1893	1940	73.9	--
Bedford Street	Matfield River	1880	1930	73.3	FO
Bridge Street	Satucket River	1970	--	99.2	--
North Central Street	Matfield River	1921	1929	81.9	--
Pleasant Street	Salisbury Plain River	1921	--	77.5	FO
Plymouth Street	Satucket River	1971	--	91.5	--
Spring Street	Matfield River	1946	--	55.7	FO
Washington Street	Satucket River	1927	--	77.6	FO
West Union Street	Matfield River	1902	--	77.5	FO

Dams

Table 55 indicates that there are three dams in East Bridgewater according to the Massachusetts Department of Conservation & Recreation’s Office of Dam Safety. The risk at the Cotton Gin Pond Dam is moderate since there is a limited amount of development directly downstream, and as a stone and concrete structure it is less likely to be breached and fail than an earthen dam. The leaks around the sluice gate pass some water continuously and the owner reportedly keeps the gate open at the direction of the Mass. Office of Dam Safety. Keeping the gate open allows the impoundment to have a low water level before a storm and gives it the capacity to fill during storms creating valuable short-term flood storage. If the open gate policy changes, it would be beneficial for local emergency management staff to have keys as well as access to the lower the pond in an emergency situation.

Table 55: East Bridgewater Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Cotton Gin Pond Dam	Cotton Gin Pond	Satucket River	Significant	Private
Forge Pond Dam	Forge Pond	Tr-Plain River	Significant	Town

The dam listed below is considered non-jurisdictional and does not fall under the Mass. Office of Dam Safety’s regulatory authority and therefore the information provided is limited.

Name	Impoundment	Waterway	Hazard Code	Owner
Brockton Edison Dam	Not Applicable	Matfield River	Not Available	Unknown

Winter Storms

Winter storms represent a high frequency, serious severity hazard for East Bridgewater. East Bridgewater receives an average of 36”-48” of snow annually, with their being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for East Bridgewater. East Bridgewater is most vulnerable to hurricanes/tropical storms during the summer and autumn months. East Bridgewater was in the path of Hurricane Bob in 1991, which caused damage throughout town from its considerable winds. While the town has not been in the path of a hurricane or tropical storm since Hurricane Bob, it has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees are the most common problem associated with hurricanes/tropical storms that occur in East Bridgewater. They can block roadways as well as down power lines, cutting off electricity to homeowners and businesses for up to multiple days. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for East Bridgewater. East Bridgewater is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for East Bridgewater. While the town is moderately developed, there remains a considerable amount of forested land in town. Some of the more heavily forested areas of town that may be more vulnerable to wildfires include the Beaver Brook Beagle Club in the northwest part of town and the forested land north of Robbins Pond in the southeast part of town. While a significant wildfire has not occurred in either area, it does remain vulnerable to the threat of wildfires due to its sheer size. Also of potential concern is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the edges of these undeveloped areas, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for East Bridgewater. While East Bridgewater has never experienced a recorded tornado, several communities surrounding East Bridgewater have. Most of the tornadoes that have occurred in the region were low in intensity, with most being an EF-0 or EF-1 on the Enhanced Fujita Scale. Additionally, most of the tornadoes only lasted for a short period of time before they dissipated, limiting the amount of damage they caused. Based on historical events, future tornadoes in the Old Colony region will

also likely be EF-0 or EF-1 tornadoes. Due the historic nature of the town (settled in 1630) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, the entire community is vulnerable to the impacts.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for East Bridgewater. Although the town has not experienced a recorded earthquake, earthquakes have occurred in other communities in the Old Colony region and they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in East Bridgewater. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Landslides

Landslides represent a very low frequency, minor hazard for East Bridgewater. East Bridgewater has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to East Bridgewater, as there are no major urban areas in town.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to East Bridgewater, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to East Bridgewater, as it is not located along the coast.

Town of Easton Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Easton is located within the “Greater Brockton” area of the Old Colony region approximately 27 miles south of Boston. It is bordered by Sharon and Stoughton to the north, Brockton and West Bridgewater to the east, Raynham, Taunton and Norton to the south, and Mansfield to the west.

Easton covers an area of 29.23 square miles and has a population of 23,112 persons, according to the 2010 U.S. Census. The town’s population density was 790.70 persons per square mile in 2010. Easton’s population increased by 3.65% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Easton was 39.5 years, with 12.1% of the population being 65 years of age or older. Approximately 2.4% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 8,155 housing units in town, with the average housing unit sheltering 2.83 persons. There is an average of 278.99 housing units per square mile. Easton’s public school system had an enrollment of 3,867 students for the 2013-2014 academic year and includes five elementary schools, one middle school and one high school. Easton is also home to Stonehill College, which had an enrollment of nearly 2,500 undergraduate students in 2014.

While Easton has experienced moderate growth over the past two decades, the town has committed to preserve open space in the community which has resulted in approximately 15% of the land in town being dedicated as conservation land. Overall the predominant land uses in town are forests (44.6%), wetlands and water (23.1%) and residential (20.1%). Easton’s natural features include a strong north-south drainage pattern reflecting 15 ponds of various sizes, almost all of which are impounded former mill ponds or remnants of sand and gravel operations. The lack of natural ponds reflects the town’s well-drained north-south glacial topography. Easton is also home to parts of the 1,773 acre Borderland State Park and 16,950 acre Hockomock Swamp Area of Critical Environmental Concern (ACEC).

Easton’s commercial development is spread throughout the town, but is mostly concentrated along the north-south Route 138 corridor as well as at the intersections of state numbered routes, such as Route 106 and Route 123, Route 106 & Route 138 and Route 123 & Route 138. Additional commercial development is located at the Easton/Brockton town line and at the Easton/Stoughton town line.

Easton’s municipal drinking water supply is drawn from six wells in Easton. The wells are protected by Zone II wellhead protection areas and by Easton’s Aquifer Protection District. Easton does not have municipal wastewater service, therefore requiring all of Easton’s wastewater be disposed of via on-site septic systems (with the exception of Stonehill College). The town however has completed a Comprehensive Wastewater Management Plan and adopted a Sewer District, which identifies the five areas of highest need for a municipal wastewater system. The first area of need that is being addressed is North Easton Village, which is coinciding with the redevelopment of the historic Ames Shovel Shop factory into a new residential complex.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 56 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 56: Relationship of Easton’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Central Street Bridge (Queset Brook)	N/A	AE	No	110 MPH	36”-48”	N/A	Low	Zone 4
2	Bridge	Depot Street & Washington Street Bridge (Queset Brook)	N/A	AE	No	110 MPH	36”-48”	N/A	Low	Zone 4
3	Bridge	Sullivan Avenue & Mechanic Street Bridge (Queset Brook)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
4	Dam	Ames Pond Dam (Ames Pond)	N/A	A	No	110 MPH	36”-48”	Coniferous Upland Forest	Low	Zone 4
5	Dam	Flyaway Pond Dam (Flyaway Pond)	N/A	N/A	No	110 MPH	36”-48”	Mixed Deciduous/ Coniferous	Low	Zone 4
6	Dam	French Pond Dam (French Pond)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
7	Dam	Langwater Pond Dam (Langwater Pond)	N/A	N/A	No	110 MPH	36”-48”	Coniferous Upland Forest	Low	Zone 4
8	Dam	Long Pond Dam (Long Pond)	N/A	AE	No	110 MPH	36”-48”	N/A	Low	Zone 4
9	Dam	Monte Pond Dam (Monte Pond)	N/A	A	No	110 MPH	36”-48”	Mixed Deciduous/ Coniferous	Low	Zone 4
10	Dam	Morse Pond Dam (Morse Pond)	N/A	AE	No	110 MPH	36”-48”	N/A	Low	Zone 4
11	Dam	New Pond Dam (New Pond)	N/A	AE	No	110 MPH	36”-48”	N/A	Low	Zone 4
12	Dam	Old Cabot Pond Dam (Old Cabot Pond)	N/A	A	No	110 MPH	36”-48”	Coniferous Upland Forest	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
13	Dam	Parker Pond Dam (Parker Pond)	N/A	AE	No	110 MPH	36"-48"	N/A	Low	Zone 4
14	Dam	Picker Pond Dam (Picker Pond)	N/A	N/A	No	110 MPH	36"-48"	Coniferous Upland Forest	Low	Zone 4
15	Dam	Pud's Pond Dam (Pud's Pond)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
16	Dam	Shovelshop Pond Dam (Hoeshop Pond)	N/A	N/A	No	110 MPH	36"-48"	Coniferous Upland Forest	Low	Zone 4
17	Dam	Ward Pond Dam (Ward Pond)	N/A	A	No	110 MPH	36"-48"	Coniferous Upland Forest	Low	Zone 4
18	Fuel Station	7-Eleven	460 Turnpike St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
19	Fuel Station	BP	675 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
20	Fuel Station	Citgo	74 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
21	Fuel Station	Citgo	666 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
22	Fuel Station	Conco	559 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
23	Fuel Station	Easton Gas	200 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
24	Fuel Station	Five Corners Petroleum	490 Foundry St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
25	Fuel Station	Mobil	491 Foundry St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
26	Fuel Station	Sunoco	720 Depot St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
27	Fuel Storage	Columbia Gas	102 Eastman St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
28	Library	Ames Free Library of Easton	53 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
29	Public Works	Department of Public Works	130 Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
30	School, Childcare, Mass Care Shelter	Easton Center School	388 Depot St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
31	School	Easton Middle School	98 Columbus Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
32	School, Childcare, Mass Care Shelter	F.L. Olmstead/ H.H. Richardson School	101 Lothrop St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
33	School, Childcare, Mass Care Shelter	Moreau Hall Elementary School	360 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
34	School, Mass Care Shelter	Oliver Ames High School	100 Lothrop St.	N/A	No	110 MPH	36"-48"	Deciduous Forest	Low	Zone 4
35	School, Childcare	Parkview School	50 Spooner St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
36	School, Mass Care Shelter	Southeastern Regional Voc. Tech. High School	250 Foundry St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
37	Senior Center	Council on Aging	15 Barrows St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
38	Town Hall	Town Hall	136 Elm St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
39	Water Department	Water Department	417 Bay Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
40	Fire	Fire Station 1	48 Lothrop St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
41	Fire	Fire Station 2	85 Depot St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
42	Fire, Emergency Operations Center	Fire Station 3	413 Bay Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
43	Police	Police Station	46 Lothrop St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
44	Childcare	Creative World Children's Learning Center	130 Depot St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
45	Childcare	Easton Country Day School	91 Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
46	Childcare	Easton Learning Adventures Preschool	115 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
47	Childcare	KinderCare Learning Center #1377	533 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
48	Childcare	Maplewood Enrichment Center	150 Foundry St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
49	Childcare	Old Colony YMCA	18 Oliver St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
50	Childcare	Shining Wonders Preschool	77 Turnpike St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
51	Childcare	Stonehill College Child Care Center	45 Bristol Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
52	Childcare	The Learning Experience	639 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
53	Childcare	Tiny Tots Nursery School	204 Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
54	Cultural Resource	Children's Museum in Easton	9 Sullivan Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
55	Cultural Resource	Christian & Missionary Alliance	34 Central St.	N/A	No	110 MPH	36"-48"	Mixed Deciduous/ Coniferous	Low	Zone 4
56	Cultural Resource	Covenant Congregational Church	204 Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
57	Cultural Resource	Easton Baptist Church	197 Bay Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
58	Cultural Resource	Easton Historical Society	80 Mechanic St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
59	Cultural Resource	Evangelical Congregational Church of Easton	351 Depot St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
60	Cultural Resource	Free Evangelical Fellowship	604 Foundry St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
61	Cultural Resource	Good Shepherd Presbyterian Church	701 Foundry St.	N/A	No	110 MPH	36"-48"	Deciduous Forest	Low	Zone 4
62	Cultural Resource	Holy Cross Family Ministries	518 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
63	Cultural Resource	Holy Trinity Lutheran Church	143 Lincoln St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
64	Cultural Resource	Immaculate Conception Parish	193 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
65	Cultural Resource	New Hope Christian Chapel	6 Meadowhill Ct.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
66	Cultural Resource	Roche Bros. Supermarket	25 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
67	Cultural Resource	Shaw's Supermarket	690 Depot St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
68	Cultural Resource	St. Mark's Episcopal Church-North Easton	91 Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
69	Cultural Resource, Mass Care Shelter, Tier II Site	Stonehill College	320 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
70	Cultural Resource	Unity Unitarian Universalist Church of Easton	9 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
71	Housing Authority	Easton Housing Authority	Elise Cir.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
72	Housing Authority	Easton Housing Authority	Parker Ter.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
73	Mobile Home Park	Easton Mobile Home Community	305 Turnpike St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
74	Nursing Facility	Southeast Health Medical Center	184 Lincoln St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
75	Nursing Facility	Village Rest Home	22 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
76	Postal & Shipping	USPS Easton Office	670 Depot St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
77	Postal & Shipping	USPS North Easton Office	300 Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
78	Postal & Shipping	USPS South Easton Office	704 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
79	Antenna	Mobilitie Investments II	227 Bay Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
80	Antenna	New Cingular Wireless PCS	102 Eastman St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
81	Cable Television	Easton Community Access Television	50 Oliver St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
82	Private Wastewater Treatment Plant	Ames Shovel Shop Apartments	Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
83	Water Pump	Water Pump #1	Gary Ln.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
84	Water Pump	Water Pump #2	425R Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
85	Water Pump	Water Pump #3	Red Mill Ln.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
86	Water Pump	Water Pump #4	425R Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
87	Water Pump	Water Pump #5	Red Mill Ln.	N/A	No	110 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
88	Water Pump	Water Pump #6	Bay Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
89	Water Supply Tank	Water Supply Tank	Off Bay Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
90	Water Supply Tower	Water Supply Tower	Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
91	Tier II Site	Verizon	64 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
92	Tier II Site	Pharmasol	1 Norfolk Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
93	Tier II Site	Target	Robert Drive	N/A	No	110 MPH	36"-48"	Deciduous Forest	Low	Zone 4
94	Tier II Site	Boro Sand & Gravel	87 Eastman St.	N/A	No	110 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
95	Tier II Site	National Grid	555 Depot St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
96	Tier II Site	Columbia Gas	Eastman St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
97	Tier II Site	Resin Technology	28 Norfolk Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

Natural Hazard Risk Assessment

Table 57 summarizes the hazard risks for Easton. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Easton’s vulnerability to each of these hazards is below.

Table 57: Easton Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Easton and is the most frequent hazard affecting Easton. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Easton are areas along Black Brook, Dorchester Brook, Mulberry Brook, Poquanticut Brook, Whitman Brook, Little Cedar Swamp, and the Hockomock Swamp ACEC. In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which flooded as a result of the March 2010 floods:

- Bay Road between Highland Street and Dean Street
- Union Street at French’s Pond
- Depot Street between Blackbrook Road and Center Street
- Elm Street near Whitman Brook Drive
- Chestnut Street
- Canton Street near the Stoughton Town Line
- Purchase Street near the Easton Country Club
- Prospect Street near the Railroad Right-of-Way
- Norton Avenue

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 4,379 acres, or 23.4%, of Easton is within a 100-year floodplain. Based on additional analysis, 186 acres, or 4.3%, of the floodplain is developed. To limit additional development from occurring within floodplains, Easton adopted a Floodplain District. The district is intended to preserve and protect streams, brooks, ponds, lakes, and other water courses and their adjoining lands within the town; to protect the health and safety of persons and property against the hazards of flooding; to preserve the natural flood control characteristics, and the flood storage capacity of the flood plain, and to preserve and maintain the ground water table and water recharge areas within the flood plain; to protect the community against the detrimental use and the development of lands adjoining such water courses and to conserve the watershed areas of the town for the health, safety, and welfare of the public.

Of the 97 critical facilities identified in Easton, ten are located within a 100-year floodplain, and include two bridges and eight dams. It should also be noted that there are no critical facilities located in any of the locally identified flood areas.

According to MEMA, there are currently 98 National Flood Insurance Program (NFIP) policies in-force in Easton, with a total of 23 claims being made from 1978 to November 2013, totalling \$120,299. It should be noted that there are two residential Repetitive Loss (RL) properties in Easton that have had four claims totalling \$25,920. There are no Severe Repetitive Loss Properties (SRL) in Easton.

Bridges

Table 58 indicates that there are three bridges in Easton that span waterways according to the Massachusetts Department of Transportation. Each traverse Queset Brook and none of the bridges are known to create flooding hazards or to be at risk from high water or forest fire. The Central Street Bridge which had an AASHTO rating of 28.0 and was deemed Structurally Deficient in the 2005 edition of the Old Colony Hazard Mitigation Plan was rebuilt in 2008 and now has an AASHTO score of 72.4.

Table 58: Easton Bridges Spanning Waterways

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Central Street	Queset Brook	2008	--	72.4	--
Sullivan Avenue & Mechanic Street	Queset Brook	1969	--	81.6	--
Depot Street & Washington Street	Queset Brook	1988	--	69.2	FO

Dams

Table 59 indicates that there are 14 dams in Easton according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. The Easton Department of Public Works reports that they rarely need to adjust boards before storms or to otherwise actively manage their dams in order to protect lives and property. In the past they have occasionally adjusted the boards at the privately owned Shovelshop Pond at the owners request as well as at Old Pond and

New Pond when requested by downstream cranberry growers. Overall, available data suggests that Easton’s dams are generally in adequate condition.

Table 59: Easton Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Ames Pond Dam	Ames Pond	Daley Brook	Low	Private
French Pond Dam	French Pond	Tr-Dorchester Brook	Significant	Under Review
Langwater Pond Dam	Langwater Pond	Whitman Brook	Significant	Town
Long Pond Dam	Long Pond	Queset Brook	Significant	Town
Morse Pond Dam	Morse Pond	Queset Brook	High	Under Review
New Pond Dam	New Pond	Poquanticut Brook	Significant	Town
Old Cabot Pond Dam	Old Cabot Pond	Beaver Brook	Significant	Town
Pud’s Pond Dam	Pud’s Pond	Tr-Poquanticut Brook	Low	State
Shovelshop Pond Dam	Hoeshop Pond	Queset Brook	Low	Private

The dam listed below is considered non-jurisdictional and does not fall under the Mass. Office of Dam Safety’s regulatory authority and therefore the information provided is limited.

Name	Impoundment	Waterway	Hazard Code	Owner
Flyaway Pond Dam	Flyaway Pond	Not Applicable	Not Available	Unknown
Monte Pond Dam	Monte Pond	Dorchester Brook	Not Available	Unknown
Parker Pond Dam	Parker Pond	Not Applicable	Not Available	Unknown
Picker Pond Dam	Picker Pond	Queset Brook	Not Available	Unknown
Ward Pond Dam	Ward Pond	Mulberry Brook	Not Available	Unknown

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Easton. Easton receives an average of 36”-48” of snow annually, with their being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Easton. Easton is most vulnerable to hurricanes/tropical storms during the summer and autumn months. The town was in the path of one hurricane/tropical storm-Tropical Storm Barry in 2007, but by the time it reached Easton, it lost much of its strength and only resulted in a moderate amount of rainfall. Easton has however has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees are the most

common problem associated with hurricanes/tropical storms that occur in Easton. They can block roadways as well as down power lines, cutting of electricity to homeowners and businesses for up to multiple days. During Tropical Storm Irene in August 2011, almost 70% of the town lost electricity. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Easton. Easton is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Easton. While the town is moderately developed, there remains a considerable amount of forested land in town. Some of the more heavily forested areas of town that may be more vulnerable to wildfires include Borderland State Park and the Town Forest in the northwest part of town, forested land north within the Hockomock Swamp in the southeast part of town, as well as a number of community-owned conservation areas throughout town. While a significant wildfire has not occurred in these areas, it does remain vulnerable to the threat of wildfires due to its sheer size. Also of potential concern is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the edges of these undeveloped areas, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Easton. While Easton has never experienced a recorded tornado, several communities surrounding Easton have. Most of the tornadoes that have occurred in the region were low in intensity, with most being an EF-0 or EF-1 on the Enhanced Fujita Scale. Additionally, most of the tornadoes only lasted for a short period of time before they dissipated, limiting the amount of damage they caused. Based on historical events, future tornadoes in the Old Colony region will also likely be EF-0 or EF-1 tornadoes. Due to the historic nature of the town (settled in 1694) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, the entire community is vulnerable to the impacts.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Easton. Although the town has not experienced a recorded earthquake, earthquakes have occurred in other communities in the Old Colony region and they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Easton. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Landslides

Landslides represent a very low frequency, minor hazard for Easton. Easton has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to Easton, as there are no major urban areas in town.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to Easton, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to Easton, as it is not located along the coast.

Town of Halifax Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Halifax is located within the “Lakes Region” area of the Old Colony region and is approximately 13 miles southeast of Brockton and 28 miles southeast of Boston. It is bordered by Hanson and Pembroke to the north, Plympton to the east, Middleboro to the south, and Bridgewater and East Bridgewater to the west.

Halifax covers an area of 17.39 square miles and has a population of 7,518 persons, according to the 2010 U.S. Census. The town’s population density was 432.32 persons per square mile in 2010. Halifax’s population increased 0.24% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Halifax was 42.8 years, with 14% of the population being 65 years of age or older. Approximately 4.4% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 3,014 housing units in town, with the average housing unit sheltering 2.49 persons. There is an average of 173.32 housing units per square mile. Halifax is part of the Silver Lake Regional School District along with the communities of Kingston and Plympton. The Silver Lake Regional School District had an enrollment of 3,831 students for the 2013-2014 academic school year. The district includes four elementary schools, one middle school and one high school.

Halifax is one of the more rural communities in the Old Colony region, with the predominant land uses in town being wetlands and water (35.9%), forest (27.7%), and agriculture (16.6%). Halifax’s natural features include the 528 acre Monponsett Ponds and the 1,625 acre Burrage Pond Wildlife Management Area, which contains Burrage Pond, Stump Pond and the Great Cedar Swamp. Halifax also contains the headwaters of the Stump Brook which drains the Monponsett Ponds and the northern part of town to the Taunton River. The southern and eastern part of town drains to the Taunton River by the Palmer Mill Brook via the Winnetuxet River.

Halifax’s commercial development is centered at the intersection of Routes 58 and 106 and consists of a variety of stores, restaurants and a number of small shops and professional offices. There is also a small concentration of commercial and industrial uses near the East Bridgewater town line at the Halifax Industrial Park.

Halifax’s municipal drinking water supply is drawn from four wells in Halifax. Two of the wells are located near Richmond Park and the other two are located off of Lingan Street. The wells are protected by Zone II wellhead protection areas and by Halifax’s Conservancy District. Halifax does not have municipal wastewater service, requiring that all wastewater be disposed of via on-site septic systems. The town’s many streams, major natural ponds and coarse sandy soils interwoven with tight glacial soils and wetlands underlain with peat limit on-site disposal opportunities and groundwater yields, which in turn limits the amount of habitable land in town, which has limited its growth over the years.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 60 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 60: Relationship of Halifax’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	River Street Bridge (Winnetuxet River)	N/A	AE	Within 200 Feet	120 MPH	36”-48”	N/A	Moderate	Zone 4
2	Bridge	South Street Bridge (Winnetuxet River)	N/A	AE	Within 100 Feet	120 MPH	36”-48”	N/A	Moderate	Zone 4
3	Bridge	Thompson Street Bridge (Bartlett Brook)	N/A	AE	Within 200 Feet	120 MPH	36”-48”	N/A	Moderate	Zone 4
4	Bridge	Thompson Street Bridge (Winnetuxet River)	N/A	AE	Within 200 Feet	120 MPH	36”-48”	N/A	Moderate	Zone 4
5	Dam	Burrage Pond Lower Reservoir Dike A (Burrage Pond)	N/A	N/A	No	120 MPH	36”-48”	N/A	Moderate	Zone 4
6	Dam	Burrage Pond Lower Reservoir Dike B (Burrage Pond)	N/A	N/A	No	120 MPH	36”-48”	N/A	Moderate	Zone 4
7	Dam	Burrage Pond Upper Reservoir Flume B (Burrage Pond)	N/A	N/A	No	120 MPH	36”-48”	N/A	Moderate	Zone 4
8	Dam	Cross Street Pond Dam (Cross Street Pond)	N/A	A	No	120 MPH	36”-48”	Coniferous Upland Forest	Low	Zone 4
9	Dam	Furnace Street Flume A (Unknown)	N/A	N/A	No	120 MPH	36”-48”	Mixed Deciduous/ Coniferous	Moderate	Zone 4
10	Dam	Furnace Street Flume B (Unknown)	N/A	N/A	No	120 MPH	36”-48”	N/A	Moderate	Zone 4
11	Dam	Indian Trail Reservoir #1 Dam (Indian Trail Reservoir)	N/A	N/A	No	120 MPH	36”-48”	Coniferous Upland Forest	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
12	Dam	Indian Trail Reservoir #2 Dam (Indian Trail Reservoir)	N/A	N/A	No	120 MPH	36"-48"	Coniferous Upland Forest	Moderate	Zone 4
13	Dam	Indian Trail Reservoir #3 Dam (Indian Trail Reservoir)	N/A	N/A	No	120 MPH	36"-48"	Deciduous Forest	Moderate	Zone 4
14	Dam	Robbins Reservoir Dam at Rt. 106 (Robbins Reservoir)	N/A	A	No	120 MPH	36"-48"	Deciduous Forest	Moderate	Zone 4
15	Dam	Stump Brook Dam (Stump Brook)	N/A	A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
16	Dam	Stump Pond Dam (Stump Pond)	N/A	A	No	120 MPH	36"-48"	Coniferous Upland Forest	Moderate	Zone 4
17	Fuel Station	Cumberland Farms	292 Plymouth St.	N/A	Within 200 Feet	120 MPH	36"-48"	N/A	Moderate	Zone 4
18	Fuel Station	Mobil	576 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
19	Fuel Storage	Greeley's Oil Storage Facility	490 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
20	Tier II Site	BFI Electric Generation Plant	27 Laurel St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
21	Water Filtration Plant, Tier II Site	City of Brockton Water Filtration Plant	55 Cinder Ln.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
22	Library	Holmes Public Library	470 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
23	Public Works	Highway Department	60 Hemlock Ln.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
24	School, Mass Care Shelter	Halifax Elementary School	464 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
25	Senior Center	Council on Aging	506 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
26	Town Hall	Town Hall	499 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
27	Transfer Station	Transfer Station	917 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
28	Fire, Emergency Operations Center, Public Safety Repeater Site	Fire Station	438 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
29	Police	Police Station	540 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
30	Airport	Monponsett Pond Seaplane Base	Monponsett Pond	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
31	Childcare	Kids Kastle Kingdom	933 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
32	Childcare	T.L.C. Country Day School	441 South St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
33	Childcare	The Magical Years Early Learning Center	150B Industrial Dr.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
34	Childcare	Winnetuxet Children's Place	3 East St.	X500	Within 400 Feet	120 MPH	36"-48"	N/A	Moderate	Zone 4
35	Cultural Resource	Halifax Congregational Church	503 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
36	Cultural Resource	Museum of Halifax	516 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
37	Cultural Resource	Our Lady of the Lake Church	580 Monponsett St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
38	Cultural Resource	Stop & Shop	341 Plymouth St.	N/A	Within 500 Feet	120 MPH	36"-48"	N/A	Moderate	Zone 4
39	Cultural Resource, Tier II Site	Walmart	295 Plymouth St.	N/A	Within 400 Feet	120 MPH	36"-48"	N/A	Moderate	Zone 4
40	Housing Authority	Halifax Housing Authority	1 Parsons Lane	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
41	Mobile Home Park	Halifax Mobile Home Park	50 Sycamore Dr.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
42	Postal & Shipping	Halifax Post Office	551 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
43	Postal & Shipping	Monponsett Post Office	935 Monponsett St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
44	Railroad	MBTA Halifax Station	6 Garden Rd.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
45	Antenna	American Tower, Inc	Monponsett St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
46	Antenna	Industrial Comm. & Electronics, Inc.	926 Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
47	Cable Television	Halifax-Plympton Public Access	290 Plymouth St.	N/A	Within 200 Feet	120 MPH	36"-48"	N/A	Moderate	Zone 4
48	Water Pumping Station	Lingan Street Pumping Station	206 Lingan St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
49	Water Pumping Station	Plymouth Street Pumping Station	172 Plymouth St.	N/A	No	120 MPH	36"-48"	Coniferous Upland Forest	Low	Zone 4
50	Water Pumping Station	Silver Lake Pumping Station	53 Holmes St.	A	No	120 MPH	36"-48"	N/A	Low	Zone 4
51	Water Supply Tank, Public Safety Repeater Site	Plymouth Street Water Tower	Plymouth St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
52	Water Treatment Plant	City of Brockton Water Treatment Plant	886 Holmes St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

Natural Hazard Risk Assessment

Table 61 summarizes the hazard risks for Halifax. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Halifax’s vulnerability to each of these hazards is below.

Table 61: Halifax Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Halifax and is the most frequent hazard affecting Halifax. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Halifax are areas along the Monponsett Brook, Monponsett Ponds, Winnetuxet River, and Great Cedar Swamp. In addition to these areas, town officials also noted the following locations where flooding has historically occurred:

- Aldana Road at Oak Street
- East Street at the Winnetuxet River
- Franklin Street from Monponsett Brook to Old Franklin Street
- Hayward Street at Hilda Lane
- Hayward Street at Monponsett Brook
- Hayward Street from Franklin Street to Monponsett Brook
- Hemlock Lane at the Halifax Highway Department (60 Hemlock Lane)
- Lake Street at Stetson Brook
- Monponsett Street (Route 58) at the culvert connecting East and West Monponsett Ponds
- Plymouth Street (Route 58) at Cumberland Farms (292 Plymouth Street)

- Plymouth Street (Route 58) at Stop & Shop (341 Plymouth Street)
- River Street at Wood Street at the Winnetuxet River
- South Street at the Winnetuxet River, Monponsett Brook and Colchester Brook
- South Street from Hayward Street to East Street
- Thompson Street (Route 105) at Pratt Street at Winnetuxet River and Bartlett’s Brook
- Thompson Street (Route 105) across from Thompson Cemetery
- Twelfth Avenue
- Wood Street at Ravin Brook

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 3,027 acres, or 27.2%, of Halifax is within a 100-year floodplain. Based on additional analysis, 62 acres, or 2%, of the floodplain is developed. To limit additional development from occurring within floodplains, Halifax adopted a Floodplain District. The district is intended to limit the type and amount of development occurring within floodplains.

Of the 52 critical facilities identified in Halifax, nine are located within a 100-year floodplain and consist of four bridges, four dams and a water pumping station. While there are no critical facilities located within any of the locally identified flood areas, there are four facilities located within a few hundred feet of the locally identified flood area at the intersection of Routes 58 and 106. None of the facilities have recorded any damage from the flooding, as it the flooding results from ponding on the roadways during extreme rain events.

According to MEMA, there are currently 16 National Flood Insurance Program (NFIP) policies in-force in Halifax, with a total of six claims being made from 1978 to November 2013, totalling \$9,231. It should be noted that there are no Repetitive Loss (RL) or Severe Repetitive Loss Properties (SRL) in Halifax.

Bridges

Table 62 indicates that there are four bridges in Halifax that span waterways according to the Massachusetts Department of Transportation (MassDOT). Three of these bridges span the Winnetuxet River. All of the bridges in town, with the exception of the River Street Bridge, have either been built or rebuilt within the past 30 years. The 63 year old River Street Bridge also has the lowest AASHTO rating of the four bridges in town, but is in good overall condition.

Table 62: Halifax Bridges Spanning Waterways

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
River Street	Winnetuxet River	1951	--	65.6	FO
South Street	Winnetuxet River	1931	1985	80.7	--
Thompson Street	Winnetuxet River	1992	--	76.4	FO
Thompson Street	Bartlett Brook	1992	--	78.3	FO

Dams

Table 63 indicates that there are 13 dams in Halifax according to the Massachusetts Department of Conservation & Recreation’s Office of Dam Safety. A majority of the dams in Halifax are

either privately owned or are considered non-jurisdictional and do not fall under the purview of the Mass. Office of Dam Safety, so not much is known about them.

Serious dam failures however are unlikely in Halifax since the only sizable dam (the Stump Brook Dam) is reported to be in good condition and is upstream of extensive wetlands with two small impoundments and one major one between the dam and any potentially vulnerable development in the neighborhoods around Robbins Pond in East Bridgewater. The Stump Brook Dam is a major concrete structure with flashboards, spillway, fish ladder and operable sluice gate to control flows. While the dam is in good condition, there is some controversy about its operation, diversions from Monponsett Pond and the appropriate level at which to hold the pond. The City of Brockton, which owns the dam, sometimes diverts water from Monponsett Pond to Silver Lake to keep up with the city’s water demands. These diversions can affect the natural height of Monponsett Pond, appropriate flows in Stump Brook, and the best use for water diverted for flood control.

A committee representing various interests was studying the issue, but has long since disbanded. These issues remain, but may not be crucial to seasonal flood control, as there is little development downstream and the several controlled ponds between Stump Brook Dam minimize downstream risks. Still in an extreme situation it may be useful to drop the Monponsett Ponds before a major storm to stop flows from the Ponds until downstream flood risks have passed.

There are also many small control structures impounding small ponds and controlling flows between cranberry bog reservoirs and the bogs. The bog reservoirs are commonly controlled by such structures combined with pumping/lift stations to raise water from low-lying sources, generally for subsequent gravity flows through gated sluices, dams, and weirs. These structures generally have slots for boards to adjust the flow.

In sum, the town’s main dam, at Stump Brook is in good condition, while the smaller dams present little threat to downstream properties. Use of the smaller dams for flood control would require considerable repair and upgrading to ensure that the control systems are appropriately designed and in good enough condition to be used if needed, along with suitable coordination between the towns and private owners.

Table 63: Halifax Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Burrage Pond-Lower Reservoir Dike A	Burrage Pond	Tr-Winnetuxet River	Low	State
Robbins Reservoir Dam	Robbins Reservoir	Tr-Winnetuxet River	Low	Private
Robbins Reservoir Dam at Route 106	Robbins Reservoir	Tr-Winnetuxet River	Significant	Under Review
Stump Brook Dam	Stump Brook	Stump Brook	Low	City of Brockton

The dams listed below are considered non-jurisdictional and do not fall under the Mass. Office of Dam Safety's regulatory authority and therefore the information provided is limited.

Name	Impoundment	Waterway	Hazard Code	Owner
Burrage Pond Lower Reservoir Dike B	Burrage Pond	Tr-Winnetuxet River	Not Available	Unknown
Burrage Pond Upper Reservoir Flume B	Burrage Pond	Tr-Stump Brook	Not Available	Unknown
Cross Street Pond Dam	Cross Street Pond	Not Applicable	Not Available	Unknown
Furnace Street Flume A	Unknown	Tr-Winnetuxet River	Not Available	Unknown
Furnace Street Flume B	Unknown	Tr-Winnetuxet River	Not Available	Unknown
Indian Trail Reservoir #1 Dam	Indian Trail Reservoir	Not Applicable	Not Available	Unknown
Indian Trail Reservoir #2 Dam	Indian Trail Reservoir	Tr-Winnetuxet River	Not Available	Unknown
Indian Trail Reservoir #3 Dam	Indian Trail Reservoir	Tr-Winnetuxet River	Not Available	Unknown
Stump Pond Dam	Stump Pond	Tr-Winnetuxet River	Not Available	Unknown

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Halifax. Halifax receives an average of 36"-48" of snow annually, with their being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Halifax. Halifax is most vulnerable to hurricanes/tropical storms during the summer and autumn months. While Halifax has not been in the direct path of a hurricane or tropical storm for more than 90 years it has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees are the most common problem associated with hurricanes/tropical storms that occur in Halifax. They can block roadways as well as down power lines, cutting of electricity to homeowners and businesses for up to multiple days. During Tropical Storm Irene in August 2011 parts of the town were without electricity for a week. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Halifax. Halifax is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Halifax. While the town is somewhat developed, there remains a considerable amount of forested land and wetlands in town. Some of the larger undeveloped areas of town that may be more vulnerable to wildfires include the Burrage Pond Wildlife Management Area/Great Cedar Swamp in the northwest part of town, Peterson Swamp in the northeast part of town, and the larger undeveloped areas in the southern part of town. While a significant wildfire has not occurred in these areas, it does remain vulnerable to the threat of wildfires due to its sheer size. Also of potential concern is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the edges of these undeveloped areas, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Halifax. Halifax has only experienced one recorded tornado, an F2 tornado that occurred on November 18, 1967. The tornado was brief in nature and occurred away from people and property causing very minimal damage. Several other communities surrounding Halifax have also experienced tornadoes, but all have been low in intensity, as most were EF-0 and EF-1 on the Enhanced Fujita Scale. In addition most of the tornadoes only lasted for a small duration of time before they dissipated, limiting the amount of damage they caused. Based on historical events, tornadoes in the Old Colony region will likely be EF-0 and EF-1 on the Enhanced Fujita Scale and short in duration. Due the historic nature of the region and the town (settled in 1669) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures in town that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, it is a natural hazard that can occur anywhere, making no location in Halifax more vulnerable than others to tornadoes.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Halifax. Although the town has not experienced a recorded earthquake, earthquakes have occurred in other communities in the Old Colony region and they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance

from the epicenter, etc. Due the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Halifax. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Landslides

Landslides represent a very low frequency, minor hazard for Halifax. Halifax has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to Halifax, as there are no major urban areas in town.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to Halifax, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to Halifax, as it is not located along the coast.

Town of Hanson Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Hanson is located within the “Lakes Region” area of the Old Colony region and is approximately 9 miles east of Brockton and 18 miles southeast of Boston. It is bordered by Hanover and Rockland to the north, Pembroke to the east, Halifax to the south, and East Bridgewater and Whitman to the west.

Hanson covers an area of 15.73 square miles and has a population of 10,209 persons, according to the 2010 U.S. Census. The town’s population density was 649.02 persons per square mile in 2010. Hanson’s population increased 7.52% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Hanson was 40.4 years, with 11.4% of the population being 65 years of age or older. Approximately 2.5% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 3,589 housing units in town, with the average housing unit sheltering 2.84 persons. There is an average of 228.16 housing units per square mile. Hanson is part of the Whitman-Hanson Regional School District and had an enrollment of 4,165 students for the 2013-2014 academic year. The district includes four elementary schools, two middle schools and one high school.

Hanson is primarily a residential community with the predominant land uses being forest (41.2%), wetlands and water (26.2%), and residential (21.4%). Hanson’s natural features include numerous brooks, streams, rivers and ponds. The main ponds in Hanson include the 121 acre Indian Head Pond, 62 acre Wompatuck Pond, and 48 acre Maquan Pond. Hanson is also home to part of the 1,625 acre Burrage Pond Wildlife Management Area and Great Cedar Swamp.

Hanson’s commercial development is scattered through town, but the major retail center is located along Liberty Street (Route 58) near Town Hall. Limited commercial development also exists in the area around the commuter rail station in South Hanson as well as along the Pembroke town line in the Bryantville section of Hanson. Industrial development in Hanson is limited to two small industrial parks-the 34 acre Hanson Commerce Center off of Route 27 on the East Bridgewater Town Line and the Station Street Industrial Park near the commuter rail station in South Hanson.

Hanson’s municipal drinking water supply is drawn from four wells in Hanson as well as from the City of Brockton on an as needed basis. The wells are protected by Zone II wellhead protection areas and by Hanson’s Aquifer and Well Protection District. Halifax does not have municipal wastewater service, therefore requiring wastewater be disposed of via on-site septic systems.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 64 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 64: Relationship of Hanson’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Main Street Bridge (Poor Meadow Brook)	N/A	AE	No	120 MPH	36”-48”	Mixed Deciduous/Coniferous	Low	Zone 4
2	Bridge	State Street Bridge (Indian Head River)	N/A	AE	No	120 MPH	36”-48”	N/A	Low	Zone 4
3	Dam	Burrage Pond Dam (Burrage Pond)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
4	Dam	Burrage Upper Reservoir Dam (Burrage Pond)	N/A	N/A	No	120 MPH	36”-48”	Coniferous Upland Forest	Low	Zone 4
5	Dam	Chandler Mill Pond Dam (Chandler Mill Pond)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
6	Dam	Factory Pond Dam (Factory Pond)	N/A	AE	No	120 MPH	36”-48”	N/A	Low	Zone 4
7	Dam	Indian Head Dam (Indian Head River)	N/A	AE	No	120 MPH	36”-48”	N/A	Low	Zone 4
8	Dam	Wampatuck Pond Dam (Wampatuck Pond)	N/A	AE	No	120 MPH	36”-48”	Mixed Deciduous/Coniferous	Low	Zone 4
9	Fuel Station	Cumberland Farms	2 Main St.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
10	Fuel Station	Hess	318 Main St.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
11	Fuel Station	Main Street Auto	1158 Main St.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
12	Fuel Station	Sunoco	527 Liberty St.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
13	Fuel Station	Super Petroleum	507 Monponsett St.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
14	Fuel Storage	Hanson Fuel	1158 Main St.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
15	Tier II Site	Verizon	162 Industrial Blvd.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
16	Library	Hanson Public Library	132 Maquan St.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
17	Public Works	Highway Department	797 Indian Head St.	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
18	School, Mass Care Shelter	Hanson Middle School	111 Liberty St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
19	School, Childcare	Indian Head School	726 Indian Head St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
20	School, Childcare	Maquan Elementary School	38 School St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
21	School	Whitman-Hanson Regional High School	600 Franklin St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
22	Senior Center	Council on Aging	132 Maquan St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
23	Town Hall	Town Hall	542 Liberty St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
24	Transfer Station	Transfer Station	201 Franklin St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
25	Fire, Emergency Operations Center	Fire Station	505 Liberty St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
26	Fire Tower	Bonney Hill Fire Tower	N/A	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
27	Health/Medical Facility	Southeastern Medical Center	104 Liberty St.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
28	Police	Police Station	775 Main St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
29	Airport	Cranland Airport	777 Monponsett St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
30	Childcare	First Step Preschool	56 Jerrold St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
31	Childcare	Honey Tree Childcare Center, Inc.	287 Liberty St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
32	Childcare	Kid's Country	572 Maquan St.	N/A	Within 200 Feet	120 MPH	36"-48"	N/A	Low	Zone 4
33	Childcare	Little Treasures Early Learning Center	27 George St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
34	Cultural Resource	Calvary Baptist Church	429 Monponsett St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
35	Cultural Resource, Childcare	First Baptist Church & Christian Childcare Center	214 Main St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
36	Cultural Resource	First Congregational Church	639 High St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
37	Cultural Resource	Hanson Historical Society	565 Main St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
38	Cultural Resource	Shaw's Supermarket	476 Liberty St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
39	Cultural Resource	St. Joseph the Worker Church	1 Maquan St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
40	Housing Authority	Hanson Housing Authority	0 Meetinghouse La.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
41	Postal & Shipping	USPS Hanson Office	270 Main St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
42	Railroad	MBTA Hanson Station	1070 Main St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
43	Special Needs	Cardinal Cushing Centers	613 Pleasant St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
44	Special Needs	Cardinal Cushing Centers	5 Sydney Ln.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
45	Special Needs	South Shore Housing	53 West Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
46	Special Needs	Southeastern Residential Service	111 Nina Dr.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
47	Special Needs	Vinfen	132 Woodbine Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
48	Antenna	SBA Towers II LLC	100 Hawks Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
49	Water Supply Tank	Water Supply Tank	252 High St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
50	Water Supply Well	Crystal Springs Well Field	1625 Main St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

Natural Hazard Risk Assessment

Table 65 summarizes the hazard risks for Hanson. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Hanson’s vulnerability to each of these hazards is below.

Table 65: Hanson Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Hanson and is the most frequent hazard affecting Hanson. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks and overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Hanson are areas along the Indian Head Brook, Indian Head River, Poor Meadow Brook and the Shumatuscasant River. In addition to these areas, town officials also noted the following locations where flooding has historically occurred:

- Maquan Street (Route 14) from Rollercoaster Road to the Pembroke Town Line
- East Washington Street at the Pembroke town line (Rocky Run Brook)
- West Washington Street near Pennsylvania Avenue

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 453 acres, or 4.5%, of Hanson is within a 100-year floodplain. Based on additional analysis, 14 acres, or 3.2%, of the floodplain is developed. To limited additional development from occurring within floodplains, Hanson adopted a Floodplain District. The district is intended to ensure public safety through reducing the threats to life and personal injury; eliminate new hazards to emergency response

officials; prevent the occurrence of public emergencies resulting from water quality, contamination, and pollution due to flooding; avoid the loss of utility services which if damaged by flooding would disrupt or shut down the utility network and impact regions of the community beyond the site of flooding; eliminate costs associated with the response and cleanup of flooding conditions; reduce damage to public and private property resulting from flooding waters.

Of the 50 critical facilities identified in Hanson, only five are located within a 100-year floodplain and consist of three dams and two bridges. While there are no critical facilities located within any of the locally identified flood areas, only one facility - Kid’s Country is within 200 feet of a locally identified flood area.

According to MEMA, there are currently two National Flood Insurance Program (NFIP) policies in-force in Hanson, with a total of eight claims being made from 1978 to November 2013, totalling \$13,078. It should be noted that there are no Repetitive Loss (RL) or Severe Repetitive Loss Properties (SRL) in Hanson.

Bridges

Table 66 indicates that there are two bridges in Hanson that span waterways according to the Massachusetts Department of Transportation (MassDOT), though neither are known to be at risk from or create flooding hazards.

Table 66: Hanson Bridges Spanning Waterways

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Main Street	Poor Meadow Brook	1850	1937	49.9	FO
State Street	Indian Head River	1995	--	77.6	FO

Dams

Table 67 indicates that there are six dams in Hanson according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. Serious dam failures are unlikely in Hanson and there is very little sensitive development along the floodplain immediately downstream. The town’s Highway Surveyor lifts a few boards to drop the pond’s level before a major storm. This protects pond-side property (including the Town Hall parking lot) from flooding and protects downstream interests to an extent by delaying flood flows while the Pond fills up again. There is question as to whether the dam’s control system is of suitable design and condition to be used for optimal flood management purposes if needed, and if suitable coordination mechanisms can be developed to maximize these benefits. Ownership of this dam is currently under review by the Massachusetts Office of Dam Safety.

Table 67: Hanson Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Burrage Upper Reservoir Dam	Burrage Pond	Tr-Stump Brook	Significant	State
Chandler Mill Pond Dam	Chandler Mill Pond	Not Applicable	Low	Private
Factory Pond Dam	Factory Pond	Drinkwater River	Significant	Town

Name	Impoundment	Waterway	Hazard Code	Owner
Indian Head Dam	Indian Head River	Indian Head River	Low	Town of Hanover
Wampatuck Pond Dam	Wampatuck Pond	Indian Head Brook	Significant	Under Review

The dams listed below are considered non-jurisdictional and do not fall under the Mass. Office of Dam Safety's regulatory authority and therefore the information provided is limited.

Name	Impoundment	Waterway	Hazard Code	Owner
Burrage Pond Dam	Burrage Pond	Great Cedar Swamp	Not Available	Unknown

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Hanson. Hanson receives an average of 36"-48" of snow annually, with their being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Hanson. Hanson is most vulnerable to hurricanes/tropical storms during the summer and autumn months. Hanson was in the path of Hurricane Bob in 1991, which caused widespread damage throughout town from its considerable winds. While the town has not been in the path of a hurricane or tropical storm since Hurricane Bob, it has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees are the most common problem associated with hurricanes/tropical storms that occur in Hanson. They can block roadways as well as down power lines, cutting of electricity to homeowners and businesses for up to multiple days. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Hanson. Hanson is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat

cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Hanson. While the town is somewhat developed, there remains a considerable amount of forested land and wetlands in town. Some of the larger undeveloped areas of town that may be more vulnerable to wildfires include the Burrage Pond Wildlife Management Area/Great Cedar Swamp in the southern part of town, Little Cedar Swamp in the northern part of town, and the Camp Kiwanee/Rainbow Camp areas in the eastern part of town. While a significant wildfire has not occurred in these areas, it does remain vulnerable to the threat of wildfires due to its sheer size. Also of potential concern is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the edges of these undeveloped areas, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Hanson. While Hanson has never experienced a recorded tornado, several communities surrounding Hanson have. Most of the tornadoes that have occurred in the region were low in intensity, with most being an EF-0 or EF-1 on the Enhanced Fujita Scale. Additionally, most of the tornadoes only lasted for a short period of time before they dissipated, limiting the amount of damage they caused. Based on historical events, future tornadoes in the Old Colony region will also likely be EF-0 or EF-1 tornadoes. Due the historic nature of the town (settled in 1632) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, the entire community is vulnerable to the impacts.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Hanson. Although the town has not experienced a recorded earthquake, earthquakes have occurred in other communities in the Old Colony region and they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Hanson. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Landslides

Landslides represent a very low frequency, minor hazard for Hanson. Hanson has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to Hanson, as there are no major urban areas in town.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to Hanson, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to Hanson, as it is not located along the coast.

Town of Kingston Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Kingston is located within the “South Coastal” area of the Old Colony region and is approximately 18 miles southeast of Brockton and 35 miles southeast of Boston. It is bordered by Duxbury and Pembroke to the north, the Atlantic Ocean to the east, Carver and Plymouth to the south, and Plympton to the west.

Kingston covers an area of 19 square miles and has a population of 12,629 persons, according to the 2010 U.S. Census. The town’s population density was 664.68 persons per square mile in 2010. Kingston’s population increased 7.21% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Kingston was 42.3 years, with 15.1% of the population being 65 years of age or older. Approximately 5.5% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 5,010 housing units in town, with the average housing unit sheltering 2.52 persons. There is an average of 263.68 housing units per square mile. Kingston is part of the Silver Lake Regional School District along with the communities of Halifax and Plympton. The Silver Lake Regional School District had an enrollment of 3,831 students for the 2013-2014 academic school year. The district includes four elementary schools, one middle school and one high school.

Kingston is primarily a residential community, with the predominant land uses in town being forests (46.1%), residential (20.7%) and wetlands and water (16.1%). Kingston’s natural features include a number of lakes, ponds and streams with the most notable being a portion of the 640 acre Silver Lake, which also serves as the headwaters of the Jones River. The seven mile long Jones River picks up flows from the north via a number of tributaries which all empty into Kingston Bay. Some of the larger natural ponds in Kingston include Blackwater Pond in the northern half of town as well as Muddy Pond, Indian Pond and Smelt Pond in the southern half of town.

Kingston’s commercial development is primarily in three areas. The oldest section of commercial development stretches from Kingston Town Center, where the post office and several businesses serving primarily local customers are clustered, and north on Route 3A to the newer shopping plazas at the junction of Routes 3A and 53. The second area is in the eastern section of town in the form of classic strip development, including an auto service mall, from the junction of Routes 3 and 3A at Exit 9 to the Plymouth town line. The third area is west of Route 3 at the intersection of Route 3 and Smith Lane. This area contains a large regional shopping mall among other varied businesses.

Kingston’s municipal drinking water supply is drawn from five wells in Kingston. The wells are protected by Zone II wellhead protection areas and by Kingston’s Water Resource Overlay District. Kingston provides municipal wastewater service to approximately 1,563 residential and commercial properties. The wastewater treatment facility has a design capacity of 375,000 gallons per day.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 68 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 68: Relationship of Kingston’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Elm Street Bridge (Jones River)	N/A	AE	No	120 MPH	36”-48”	N/A	Moderate	Zone 4
2	Bridge	Grove Street Bridge (MBTA-Railroad)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
3	Bridge	Howlands Lane Bridge (MBTA-Railroad)	N/A	N/A	No	120 MPH	24”-36”	N/A	Low	Zone 4
4	Bridge	Landing Road Bridge (Stoney Brook)	N/A	AE	No	120 MPH	36”-48”	N/A	Low	Zone 4
5	Bridge	Main Street Bridge (Route 3)	N/A	N/A	No	120 MPH	36”-48”	N/A	Moderate	Zone 4
6	Bridge	Pembroke Street Bridge (MBTA-Railroad)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
7	Bridge	Route 3 Bridge (Jones River)	N/A	AE	No	120 MPH	36”-48”	N/A	Low	Zone 4
8	Bridge	Route 3 Bridge (MBTA-Railroad)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
9	Bridge	Route 3 Bridge (Landing Road)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
10	Bridge	Route 80 Bridge (Route 44)	N/A	N/A	No	120 MPH	36”-48”	Mixed Deciduous/Coniferous	Moderate	Zone 4
11	Bridge	Smith’s Lane Bridge (Route 3)	N/A	N/A	No	120 MPH	24”-36”	N/A	Moderate	Zone 4
12	Bridge	Wapping Road Bridge (Jones River)	N/A	AE	No	120 MPH	36”-48”	N/A	Low	Zone 4
13	Dam	Bailey Dam	N/A	X500	No	120 MPH	36”-48”	N/A	Low	Zone 4
14	Dam	Brackett’s Pond Dam (Brackett’s Pond)	N/A	AE	Within 500 Feet	120 MPH	36”-48”	N/A	Low	Zone 4
15	Dam	Brook Street Dam	N/A	N/A	No	120 MPH	36”-48”	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
16	Dam	Bryant Mill Pond Dam (Mill Pond)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
17	Dam	DeLorenzo Reservoir Dam (Delorenzo Reservoir)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
18	Dam	Elm Street Dam (Jones River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
19	Dam	Foundry Pond Dam (Foundry Pond)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
20	Dam	Kelleher Dam (Reed Mill Pond)	N/A	A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
21	Dam	LaGreca Dam	N/A	X500	No	120 MPH	36"-48"	N/A	Low	Zone 4
22	Dam	Maple Street Dam (Mill Pond)	N/A	AE	No	120 MPH	36"-48"	N/A	Low	Zone 4
23	Dam	Mile Brook Dam (Mile Brook)	N/A	AE	No	120 MPH	36"-48"	N/A	Low	Zone 4
24	Dam	Reed Mill Pond Dam (Reed Mill Pond)	N/A	N/A	No	120 MPH	36"-48"	Coniferous Upland Forest	Low	Zone 4
25	Dam	Russell Pond Dam (Russell Pond)	N/A	N/A	No	120 MPH	36"-48"	Coniferous Upland Forest	Moderate	Zone 4
26	Dam	Sealund Reservoir Dam (Sealund Reservoir)	N/A	X500	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Moderate	Zone 4
27	Dam	Silver Lake Dam (Silver Lake)	N/A	A	No	120 MPH	36"-48"	N/A	Low	Zone 4
28	Dam	Soule's Pond Dam (Soule's Pond)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
29	Dam	Sylvia Place Pond Dam (Sylvia Place Pond)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
30	Dam	Wapping Road Dam on Jones River (Jones River)	N/A	AE	No	120 MPH	36"-48"	N/A	Low	Zone 4
31	Fuel Station	Cumberland Farms	41 Main St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
32	Fuel Station	Cumberland Farms	2 Pembroke St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
33	Fuel Station	Gulf	183 Summer St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
34	Fuel Station	Hess	165 Summer St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
35	Fuel Station	Mobil	130 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
36	Fuel Station	Randy's Gas	65 Main St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
37	Fuel Station	Super Petroleum	129 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
38	Fuel Storage, Tier II Site	Kingston Propane	104 Pembroke St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
39	Wind Turbine	Wind Turbine	6 Cranberry Dr.	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
40	Wind Turbine	Wind Turbine	60 Marion Dr.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
41	Tier II Site	Clean Harbors	30 Joseph St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
42	Tier II Site	Lowe's	32 William Gould Way	N/A	No	120 MPH	24"-36"	Coniferous Upland Forest	Moderate	Zone 4
43	Tier II Site	NStar Station 722	47 Landing Rd.	X500	No	120 MPH	36"-48"	N/A	Low	Zone 4
44	Tier II Site	NStar Station 735	136 Pembroke St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
45	Tier II Site	Verizon	195 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
46	Library	Kingston Public Library	6 Green St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
47	Public Works	Streets, Trees & Parks Dept.	32 Evergreen St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
48	Recreation Department	Reed Community Building	33A Summer St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
49	School	Kingston Elementary School	150 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
50	School, Childcare, Mass Care Shelter	Kingston Intermediate School	65 Second Brook St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
51	School	Sacred Heart Elementary School	329 Bishop's Highway	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
52	School, Mass Care Shelter	Sacred Heart High School	399 Bishop's Highway	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 3
53	School	Sacred Heart Pre-Primary School	363 Bishop's Highway	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
54	School	Silver Lake Regional High School	260 Pembroke St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
55	School, Mass Care Shelter	Silver Lake Regional Middle School	256 Pembroke St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
56	Senior Center	Council on Aging	30 Evergreen St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
57	Town Hall	Town Hall	26 Evergreen St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
58	Transfer Station	Transfer Station	8 Cranberry Rd.	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
59	Water Department	Water Department	22 Elm St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
60	Fire, Emergency Operations Center	Fire Station	105 Pembroke St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
61	Fire	Fire Station #2	82 Smith Ln.	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
62	Fire Tower	Monk's Hill-State Tower #8	Monks Hill Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Moderate	Zone 4
63	Harbormaster	Harbormaster	45 River St.	N/A	Within 200 Feet	120 MPH	36"-48"	N/A	Low	Zone 4
64	Police	Police Station	244 Main St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
65	Public Safety Repeater Site	Public Safety Repeater-Channel 1	80 Monks Hill Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Moderate	Zone 4
66	Assisted Living	Inn at Silver Lake	21 Chipman Way	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
67	Childcare	Crayon College	24 Main St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
68	Childcare	Growth Unlimited Preschool	7 Green St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
69	Childcare	Little People's Country Day Care	25 Wapping Rd.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
70	Childcare	South Shore Community Action Council	142 Pembroke St.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
71	Childcare	Wooded Acres Preschool	168 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
72	Cultural Resource	Camp Norse	112 Parting Ways	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Moderate	Zone 3
73	Cultural Resource	Church of Christ	50 Pembroke St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
74	Cultural Resource	First Parish Unitarian Universalist	222 Main St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
75	Cultural Resource	Frederick C. Adams Town Museum	33 Summer St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
76	Cultural Resource	Hannaford Supermarket	182 Summer St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
77	Cultural Resource	Independence Mall	101 Independence Mall Way	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
78	Cultural Resource	Jones River Landing	55 Landing Rd.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
79	Cultural Resource	Kingston Baptist Church	211 Main St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
80	Cultural Resource	Major John Bradford House	50 Landing Rd.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
81	Cultural Resource	Mayflower Congregational Church	207 Main St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
82	Cultural Resource	St. Joseph Parish	270 Main St.	N/A	Within 200 Feet	120 MPH	36"-48"	N/A	Low	Zone 4
83	Cultural Resource	St. Mark's Orthodox Church	261 Main St.	N/A	Within 500 Feet	120 MPH	36"-48"	N/A	Low	Zone 4
84	Cultural Resource	Super Stop & Shop	160 Summer St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
85	Cultural Resource	The Vineyard Community Church-Kingston Campus	8 Hilltop Ave,	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
86	Housing Authority	Kingston Housing Authority	15 Hillcrest Rd.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
87	Housing Authority	Kingston Housing Authority	237 Pembroke St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
88	Mobile Home Park	Conifer Green	80 Oldfield Dr.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
89	Mobile Home Park	Town & Country Estates	43 Mountain Ash Dr.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
90	Nursing Facility	Kingston Place	15 Foster Ln.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
91	Nursing Facility	Wingate Healthcare-Silver Lake Campus	17 Chipman Way	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
92	Postal & Shipping	USPS Kingston Office	74 Summer St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
93	Railroad	MBTA Kingston Station	194 Marion Dr.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
94	Special Needs	Plymouth Area Coalition for the Homeless	149 Bishop's Highway	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
95	Special Needs	Providence House	363 Bishop's Highway	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 3
96	Special Needs	Vinfen Evergreen House	23 Evergreen St.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
97	Antenna	Global Tower	125 Pottle St.	AE	No	120 MPH	36"-48"	Coniferous Upland Forest	Low	Zone 4
98	Antenna	Industrial Comm. & Electronics, Inc.	31 Monks Hill Rd.	N/A	No	120 MPH	24"-36"	Pitch Pine & Scrub Oak	Moderate	Zone 4
99	Antenna	Industrial Comm. & Electronics, Inc.	Off South St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
100	Wastewater Treatment Plant	Kingston Wastewater Treatment Plant	12 Cranberry Rd.	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
101	Water Pumping Station	Soule's Pond Water Pumping Station	Soule's Pond	N/A	No	120 MPH	36"-48"	Coniferous Upland Forest	Moderate	Zone 4
102	Water Pumping Station	Water Pumping Station	103 South St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
103	Water Supply Tank	Water Supply Tank	451 Elm St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
104	Water Supply Tank	Water Supply Tank	25 Independence Mall Way	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
105	Water Supply Tank, Public Safety Repeater Site	Water Supply Tank	254 Pembroke St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
106	Water Supply Well & Pumping Station	Grassy Hole Water Supply Well & Water Pumping Station	102 Independence Mall Way	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
107	Water Supply Well & Pumping Station	Town Well & Water Pumping Station	9-11 Winthrop St.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
108	Water Supply Well & Pumping Stat.	Trackle Pond Water Supply Well & Water Pumping Station	147 Bishop's Highway	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Moderate	Zone 4

Natural Hazard Risk Assessment

Table 69 summarizes the hazard risks for Kingston. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Kingston’s vulnerability to each of these hazards is below.

Table 69: Kingston Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Coastal Erosion & Shoreline Change	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Tsunamis	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Kingston and is the most frequent hazard affecting Kingston. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks and overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Kingston are areas along Barrows Brook, Bassett Brook, Hall’s Brook, Jones River, Mile Brook, Pine Brook, Smelt Brook, Blackwater Pond, Indian Pond, Muddy Pond, Reeds Mill Pond, and Smelt Pond. In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which occurred as a result of the March 2010 floods:

- Main Street (Route 106) at St. Joseph’s Church
- Brookdale Street at Halls Brook
- Summer Street (Route 3A) at Stoney Brook
- Grove Street at Pine Brook
- West Street at Barrows Brook
- Boundary Lane (Coastal Area)
- Marsh Road (Coastal Area)
- May Avenue (Coastal Area)

- River Street (Coastal Area)
- Wharf Lane (Coastal Area)

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 1,363 acres, or 11.2%, of Kingston is within a 100-year floodplain. Based on additional analysis, 82 acres, or 5.9%, of the floodplain is developed. To limit additional development from occurring within floodplains, Kingston adopted a Floodplain Overlay District. The district is intended to protect the public health, safety, and general welfare; protect human life and property from the hazards of periodic flooding; preserve the natural flood control characteristics and the flood storage capacity of the flood plain; and preserve and maintain the ground water table and water recharge areas within the flood plain.

Of the 108 critical facilities identified in Kingston, twelve are located within a 100-year floodplain and consist of four bridges, seven dams, and one antenna. It should also be noted that only four critical facilities are located within the locally identified flood areas.

According to MEMA, there are currently 69 National Flood Insurance Program (NFIP) policies in-force in Kingston, with a total of 18 claims being made from 1978 to November 2013, totalling \$72,912. It should be noted that there are no Repetitive Loss (RL) or Severe Repetitive Loss Properties (SRL) in Kingston.

Bridges

Table 70 indicates that there are four bridges in Kingston that span waterways according to the Massachusetts Department of Transportation (MassDOT). One of the two structurally deficient bridges that span a waterway-the Elm Street Bridge over the Jones River, was recently replaced via funding from the Old Colony Transportation Improvement Program (TIP). By their nature most bridges that span a waterway are subject flood flows, but are designed to withstand them, and are at little risk from Kingston’s modest flows.

Table 70: Kingston Bridges Spanning Waterways

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Elm Street	Jones River	1988	--	55.2	SD
Landing Road	Stoney Brook	1954	--	81.5	--
Route 3	Jones River	1955	1978	73.0	SD
Wapping Road	Jones River	1971	--	93.5	--

Dams

Table 71 indicates that there are 18 dams in Kingston according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. According to Fire Chief/Emergency Management Director Robert Heath the two most problematic dams are the privately owned Sylvia Place Pond Dam and Russell Pond Dam. Chief Heath stated the town has been and will continue to work with the owners of both dams to improve their conditions so they are not threats to the both the immediate surrounding areas as well as areas downstream. Key questions are whether the various dams’ control systems are of suitable design and in good

enough condition to be used for flood control purposes if needed, and if suitable coordination mechanisms can be developed.

Table 71: Kingston Dams in Kingston

Name	Impoundment	Waterway	Hazard Code	Owner
Elm Street Dam	Jones River	Jones River	Significant	Town
Foundry Pond Dam	Foundry Pond	Smelt Brook	Significant	Private
Kelleher Dam	Reed Mill Pond	Pine Brook	Low	Town
Reed Mill Pond Dam	Reed Mill Pond	Pine Brook	Significant	Under Review
Russell Pond Dam	Russell Pond	Tr-Furnace Brook	High	Private
Sealund Reservoir Dam	Sealund Reservoir	Not Applicable	Significant	Private
Silver Lake Dam	Silver Lake	Jones River	Low	City of Brockton
Sylvia Place Pond Dam	Sylvia Place Pond	Tr-Furnace Brook	Significant	Private
Wapping Road Dam on Jones River	Jones River	Jones River	Low	Private

The dams listed below are considered non-jurisdictional and do not fall under the Mass. Office of Dam Safety’s regulatory authority and therefore the information provided is limited.

Name	Impoundment	Waterway	Hazard Code	Owner
Bailey Dam	Bailey Dam	Not Applicable	Not Applicable	Unknown
Brackett’s Pond Dam	Bracketts Pond	Halls Brook	Not Applicable	Unknown
Brook Street Dam	Not Applicable	Not Applicable	Not Applicable	Unknown
Bryant Mill Pond Dam	Mill Pond	Not Applicable	Not Applicable	Unknown
Delorenzo Reservoir Dam	Delorenzo Reservoir	Not Applicable	Not Applicable	Unknown
La Greca Dam	Not Applicable	Not Applicable	Not Applicable	Unknown
Maple Street Dam	Mill Pond	Stoney Brook	Not Applicable	Unknown
Mile Brook Dam	Mile Brook	Mile Brook	Not Applicable	Unknown
Soule’s Pond Dam	Soule’s Pond	Furnace Brook	Not Applicable	Unknown

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Kingston. Kingston receives an average of 24”-48” of snow annually, with their being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change represent a high frequency, serious severity hazard for Kingston. As one of two coastal communities in the region, Kingston’s shoreline is susceptible to the impacts of wind, waves and tides along its coastline, especially in the Rocky Nook

neighborhood. Compared to Plymouth's larger coastline Kingston's smaller coastline is better protected due to the presence of two barrier beaches: the three-mile Plymouth Beach to the south and the seven-mile Saquish Neck to the north. The two beaches almost touch and leave an opening just a mile wide. This small opening has played a vital role in minimizing damage to its coastline. Statistics from the National Flood Insurance Program (NFIP) backup this claim, as there are only 69 NFIP policies in-force in Kingston, with a total of only 18 claims being made from 1978 to November 2013, totalling \$72,912, which is an average of a little more than \$4,050 per claim. It should also be noted that there are no Repetitive Loss (RL) or Severe Repetitive Loss Properties (SRL) in Kingston.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Kingston. Kingston is most vulnerable to hurricanes/tropical storms during the summer and autumn months. The town was in the path of one hurricane/tropical storm-Tropical Storm Hermine in 2004, but by the time it reached Kingston, it lost much of its strength and only resulted in a moderate amount of rainfall. Kingston has however has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees are the most common problem associated with hurricanes/tropical storms that occur in Kingston. They can block roadways as well as down power lines, cutting of electricity to homeowners and businesses for up to multiple days. During Tropical Storm Irene in August 2011 more than half of homes and business lost power, with some losing power for days. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Kingston. Kingston is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Kingston. While the town is moderately developed, there remains a considerable amount of undeveloped open space in town. Areas of town most vulnerable to wildfire are the State Forest and the surrounding areas in southern Kingston, forested areas on both sides of Route 27, and the forested area west of Route 80 in the southwestern part of town. While a significant wildfire has not occurred in either area, it does remain vulnerable to the threat of wildfires due to its sheer size. Also of potential concern

is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the edges of these areas, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Kingston. While Kingston has never experienced a recorded tornado, several communities surrounding Kingston have. Most of the tornadoes that have occurred in the region were low in intensity, with most being an EF-0 or EF-1 on the Enhanced Fujita Scale. Additionally, most of the tornadoes only lasted for a short period of time before they dissipated, limiting the amount of damage they caused. Based on historical events, future tornadoes in the Old Colony region will also likely be EF-0 or EF-1 tornadoes. Due the historic nature of the town (settled in 1620) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, the entire community is vulnerable to the impacts.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Kingston. Kingston has only experienced one recorded earthquake. On February 3, 1881 an earthquake of an unknown magnitude earthquake struck Kingston. It is not known what damages, if any, were caused by the earthquake, but if damages did occur, they were most likely minimal due to the sparse population of the town. Based on the fact that earthquakes that have occurred in Kingston and other communities in the Old Colony region, they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the magnitude 2-3 range. According to the USGS earthquake damage usually occurs with earthquakes in the magnitude 4-5 range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the region and the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Kingston. As it is impossible to predict the exact locations of future earthquakes, it is a natural hazard that can occur anywhere, making no location in Kingston more vulnerable than others to earthquakes.

Tsunamis

Tsunamis represent a very low frequency, serious hazard for Kingston. While Kingston has never experienced a recorded tsunami, the possibility of a tsunami occurring off Massachusetts is extremely rare. The frequency of tsunamis occurring is related to the frequency of the events that cause them, so it is similar to the frequency of seismic or volcanic activities or landslides, all of which are rare along the East Coast of the United States. According to the 2013 Massachusetts State Hazard Mitigation Plan, “all coastal areas are exposed to threat of tsunamis. However, at the present time it is unknown what the probability is of a damaging tsunami along the Massachusetts coast.”

Landslides

Landslides represent a very low frequency, minor hazard for Kingston. Kingston has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to Kingston, as there are no major urban areas in town.

Town of Pembroke Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Pembroke is located within the “Lakes Region” area of the Old Colony region and is approximately 14 miles east of Brockton and 26 miles south of Boston. It is bordered by Hanover and Norwell to the north, Duxbury and Marshfield to the east, Halifax, Kingston and Plympton to the south, and Hanson to the west.

Pembroke covers an area of 23.55 square miles and has a population of 17,837 persons, according to the 2010 U.S. Census. The town’s population density was 757.41 persons per square mile in 2010. Pembroke’s population increased 5.38% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Pembroke was 40.8 years, with 11.2% of the population being 65 years of age or older. Approximately 3.3% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 6,552 housing units in town, with the average housing unit sheltering 2.72 persons. There is an average of 278.22 housing units per square mile. Pembroke’s public school system had an enrollment of 3,272 students for the 2013-2014 academic year and includes three elementary schools, one middle school and one high school.

While Pembroke’s population has increased substantially over the years, the town still has a large amount of undeveloped space, as the predominant land uses in town are forests (40.9%), wetlands and water (21.3%) and residential (21.3%). Pembroke’s geography could be divided in half, as the eastern and northern half of town is dominated by rivers and streams and forest and swamp land, including the Indian Head River, Pudding Brook, North River and Cedar Swamp, whereas the western and southern half of town is dominated by a number of lakes and ponds. Some of the larger lakes and ponds in Pembroke include Furnace Pond, Stetson Pond, Little Sandy Bottom Pond, Great Sandy Bottom Pond, Oldham Pond and Silver Lake. Oldham Pond and Silver Lake are the largest bodies of water in Pembroke, with Oldham Pond covering 235 acres and Silver Lake covering 640 acres (Silver Lake is also located within the communities of Kingston and Plympton).

Pembroke’s commercial development is mainly concentrated within two areas-the traditional town center at the intersection of Routes 14 and 36 and the area around the Route 3 interchange on Route 139. The traditional town center serves as the traditional downtown area and includes a number of town offices and small shops. The commercial activity around the Route 3 interchange on Route 139 has increased dramatically in recent years and includes two industrial parks and number of commercial retail plazas.

Pembroke’s municipal drinking water supply is drawn from a number of sources including five wells in Pembroke as well as from the Marshfield Water Department, Halifax Water Department and the Abington/Rockland Joint Water Works. The wells are protected by a Zone II wellhead protection area and by Pembroke’s Water Resource and Groundwater Protection District. Pembroke does not have municipal wastewater service, therefore requiring wastewater be disposed of via on-site septic systems.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 72 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 72: Relationship of Pembroke’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Route 3 NB Bridge (Church Street)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
2	Bridge	Route 3 SB Bridge (Church Street)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
3	Dam	Arnold Reservoir Dam (Arnold Reservoir)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
4	Dam	Hill Pond Dam (Hill Pond)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
5	Dam	Iacobucci Dam	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
6	Dam	Lower Chandler Pond Dam (Lower Chandler Pond)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
7	Dam	Mill Pond/ Furnace Pond Dam (Mill Pond)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
8	Dam	Mill Pond Upper Dam (Mill Pond)	N/A	AE	No	120 MPH	36”-48”	Mixed Deciduous/ Coniferous	Low	Zone 4
9	Dam	Monroe Street Bog East Dam (Monroe Street Bog)	N/A	A	No	120 MPH	36”-48”	Coniferous Upland Forest	Low	Zone 4
10	Dam	Monroe Street Bog West Dam (Monroe Street Bog)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4
11	Dam	Pleasant Street Pond Dam (Pleasant Street Pond)	N/A	N/A	No	120 MPH	36”-48”	Coniferous Upland Forest	Low	Zone 4
12	Dam	Randall Pond Dam (Randall Pond)	N/A	N/A	No	120 MPH	36”-48”	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
13	Dam	Stump Pond Dam (Stump Pond)	N/A	A	No	120 MPH	36"-48"	N/A	Low	Zone 4
14	Dam	Stumpy Pond Lower Dam (Stumpy Pond)	N/A	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
15	Dam	Stumpy Pond Upper Dam (Stumpy Pond)	N/A	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
16	Dam	Trout Pond Dam (Trout Pond)	N/A	N/A	No	120 MPH	36"-48"	Mixed Deciduous/ Coniferous	Low	Zone 4
17	Dam	Upper Chandler Pond Dam (Upper Chandler Pond)	N/A	N/A	No	120 MPH	36"-48"	Coniferous Upland Forest	Low	Zone 4
18	Dam	Washington Street Pond Dam (Washington Street Pond)	N/A	A	No	120 MPH	36"-48"	Deciduous Forest	Low	Zone 4
19	Fuel Station	Stop & Shop	125 Church St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
20	Fuel Station	Cumberland Farms	137 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
21	Fuel Station	Mobil	145 Church St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
22	Fuel Station	Firehouse Gas	154 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
23	Fuel Station	Mobil	208 Church St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
24	Fuel Station	Gulf	226 Church St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
25	Fuel Station	Shell	243 Church St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
26	Fuel Station	Sunoco	355 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
27	Library, Mass Care Shelter	Pembroke Public Library	142 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
28	Library	Lydia Drake Library	340 High St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
29	Library	Cobb Library	9 Union Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
30	Mass Care Shelter	Hobomock Arena	132 Hobomock St.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/ Coniferous	Low	Zone 4
31	Cultural Resource, Mass Care Shelter	St. Thecla's Church	145 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
32	Mass Care Shelter	Bethel Chapel	155 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
33	Mass Care Shelter	North Pembroke Community Club	27 Taylor Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
34	Public Works	Department of Public Works	387 Mattakeesett St.	N/A	No	120 MPH	36"-48"	Deciduous Forest	Low	Zone 4
35	Recycling Center	Recycling Center	158B Hobomock St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
36	School, Childcare, Mass Care Shelter	Bryantville Elementary School	29 Gurney Dr.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
37	School, Mass Care Shelter	Pembroke Community Middle School	559 School St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
38	School, Mass Care Shelter	North Pembroke Elementary School	72 Pilgrim Rd.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
39	School, Mass Care Shelter	Pembroke High School	80 Learning Ln.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
40	School, Mass Care Shelter	Hobomock Elementary School	81 Learning Ln.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
41	Senior Center	Pembroke Council on Aging	144 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
42	Town Hall, Mass Care Shelter	Town Hall	100 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
43	Fire, Mass Care Shelter	Pembroke Center Fire Station	172 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
44	Fire	North Pembroke Fire Station	380 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
45	Hospital	Pembroke Hospital	199 Oak St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
46	Police, Emergency Operations Center	Police Station	80 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
47	Airport	Allen B. Sherman	210 Barker St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
48	Childcare	Community Nursery Kindergarten	105 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
49	Childcare	Center Pre-School & Child Care	128 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
50	Childcare	Kids Time Preschool & Daycare, Inc.	17 Lilah Ln.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
51	Childcare	The Magical Years Early Learning Center, Inc.	256 Church St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
52	Childcare	Little Neighbors Early Childhood Center	280 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
53	Childcare	Kidbridge Learning Centers, LLC	300 Oak St. Unit 1660	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
54	Childcare	Bright Horizons Early Education & Child Care	334 Old Oak St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
55	Childcare	Here We Grow Day Care, Inc.	42 Mattakeesett St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
56	Childcare	Early Bird Academy, Inc.	482 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
57	Cultural Resources	First Church in Pembroke	105 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
58	Cultural Resources	Pembroke Historical Society	116 Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
59	Cultural Resources	North River Community Church	334 Old Oak St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
60	Cultural Resources	Bryantville United Methodist Church	546 Mattakeesett St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
61	Cultural Resources	Pembroke Assembly of God	786 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
62	Cultural Resources	Adah F. Hall House	Barker St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
63	Cultural Resources	Quaker Meeting House	Schoosett St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
64	Housing Authority	Pembroke Housing Authority	0 Kilcommons Dr.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
65	Postal & Shipping	USPS Bryantville Office	13 School St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
66	Postal & Shipping	USPS N. Pembroke Office	288 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
67	Postal & Shipping	USPS Pembroke Office	3 Elliot Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
68	Special Needs	New England Village	664 School Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
69	Special Needs	Road to Responsibility	7 Lydia Ford Rd.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
70	Antenna	American Towers, Inc.	171 Mattakeesett St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
71	Antenna	Sprint/Nextel	380 Washington Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
72	Antenna	Industrial Tower & Wireless, LLC	47 School St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
73	Antenna	T-Mobile Northeast	Birch St. Park	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
74	Antenna	Sprint, T-Mobile & Metro PCS	High Street Tank	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
75	Water Tank	Oak Street Tank	196 Oak Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
76	Water Tank	High Street Tank	303 High Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
77	Water Tank	West Elm Street Tank	64 West Elm Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
78	Water Tank	Learning Lane Tank	95 Learning Lane	N/A	No	120 MPH	36"-48"	Deciduous Forest	Low	Zone 4
79	Well	G.P.W. #1	356 Center Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
80	Well	G.P.W. #2	570 Center Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
81	Well	G.P.W. #3	316 School Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
82	Well	G.P.W. #4 Filtration Plant	35 Sandy Lane	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
83	Well	G.P.W. #5	100 Ridge Road	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

Natural Hazard Risk Assessment

Table 73 summarizes the hazard risks for Pembroke. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Pembroke’s vulnerability to each of these hazards is below.

Table 73: Pembroke Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Pembroke and is the most frequent hazard affecting Pembroke. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Pembroke are areas along Cedar Swamp Brook, Little Pudding Brook, North River, Pudding Brook, Robinson Creek, Tubbs Meadow Brook, Furnace Pond, Great Sandy Bottom Pond, Little Sandy Bottom Pond, Oldham Pond, Silver Lake, and Cedar Swamp. In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which flooded as a result of the March 2010 floods:

- Mill Pond Road
- Glenwood Road
- Center Street (Route 36) at Hobomock Street, south to where Herring Brook flows under Center Street
- Brenda Lane at Plymouth Street
- Dwelley Street at the Hanson Town Line
- Birch Street at the Duxbury Town Line
- Mill Street (Low point at House #54 and #66)

- Lake Shore Drive at Lower Chandler Pond culvert
- Mill Pond off Hobomock Street
- Indian Head River dam at West Elm Street at the Hanover Town Line
- Valley Street at Duxbury Town Line-Upper Chandler Pond

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 2,665 acres, or 17.7%, of Pembroke is within a 100-year floodplain. Based on additional analysis, 64 acres, or 2.4%, of the floodplain is developed. To limit additional development from occurring within floodplains, Pembroke adopted a Floodplain and Watershed Protection District. The district is intended to protect the health and safety of persons against the hazards of flooding, to conserve the value of land and buildings, to facilitate the adequate provision of a water supply through preservation and of the ground water table, to protect and preserve the marshes, bogs, ponds and watercourses and their adjoining wetlands, to protect the town’s significant environmental features by reducing the sources and possibilities of pollution, sedimentation and destruction of water bodies, to encourage the most appropriate use of land, and to preserve and increase the amenities of the town.

Of the 83 critical facilities identified in Pembroke, only four (four dams) are located within a 100-year floodplain. It should also be noted that there are no critical facilities located within any of the locally identified flood areas.

According to MEMA, there are currently 39 National Flood Insurance Program (NFIP) policies in-force in Pembroke, with a total of 11 claims being made from 1978 to November 2013, totalling \$21,590. It should be noted that there are no Repetitive Loss (RL) or Severe Repetitive Loss Properties (SRL) in Pembroke.

Bridges

There are no bridges in Pembroke that span waterways according to the Massachusetts Department of Transportation (MassDOT).

Dams

Table 74 indicates that there are 17 dams in Pembroke according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. The Pembroke Highway Department has previously reported that they rarely, if ever, have had to adjust the boards at any of the small dams for flood control. Brockton can operate the upper and lower gates of the Mill Pond Dam to control flooding around the pond, but it is quicker to lower the Pond by diversion to the Silver Lake reservoir.

Table 74: Pembroke Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Arnold Reservoir Dam	Arnold Reservoir	Tr-Pudding Brook	Low	Private
Lower Chandler Pond Dam	Lower Chandler Pond	Pine Brook	Significant	Town of Duxbury
Mill Pond Dam	Mill Pond	Dorchester Brook	Low	City of Brockton
Mill Pond Lower Dam	Mill Pond	Herring Brook	Low	Private

Name	Impoundment	Waterway	Hazard Code	Owner
Monroe Street Bog East Dam	Monroe Street Bog	Not Applicable	Low	Private
Trout Pond Dam	Trout Pond	Rocky Run	Low	Private
Upper Chandler Pond Dam	Upper Chandler Pond	Tr-Pine Brook	Low	Private

The dams listed below are considered non-jurisdictional and do not fall under the Mass. Office of Dam Safety's regulatory authority and therefore the information provided is limited.

Name	Impoundment	Waterway	Hazard Code	Owner
Hill Pond Dam	Hill Pond	Tr-Jones River	Not Applicable	Unknown
Iabucci Dam	Not Applicable	Not Applicable	Not Applicable	Unknown
Mill Pond Upper Dam	Mill Pond	Herring Brook	Not Applicable	Unknown
Monroe Street Bog West Dam	Monroe Street Bog	Not Applicable	Not Applicable	Unknown
Pleasant Street Pond Dam	Pleasant Street Pond	Pudding Brook	Not Applicable	Unknown
Randall Pond Dam	Randall Pond	Not Applicable	Not Applicable	Unknown
Stump Pond Dam	Stump Pond	Pudding Brook	Not Applicable	Unknown
Stumpy Pond Lower Dam	Stumpy Pond	Tubbs Meadow Brook	Not Applicable	Unknown
Stumpy Pond Upper Dam	Stumpy Pond	Tr-Tubbs Meadow Brook	Not Applicable	Unknown
Washington Street Pond Dam	Washington Street Pond	Pudding Brook	Not Applicable	Unknown

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Pembroke. Pembroke receives an average of 36"-48" of snow annually, with there being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Pembroke. Pembroke is most vulnerable to hurricanes/tropical storms during the summer and autumn months. The town was in the path of one hurricane/tropical storm-Tropical Storm Hermine in 2004, but by the time it reached Pembroke, it lost much of its strength and only resulted in a moderate amount of rainfall. Pembroke has however has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees are the most common problem associated with hurricanes/tropical storms that

occur in Pembroke. They can block roadways as well as down power lines, cutting of electricity to homeowners and businesses for up to multiple days. During Tropical Storm Irene in August 2011 more than half of homes and business lost power, with some losing power for days. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Pembroke. Pembroke is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Pembroke. While the town is moderately developed, there remains a considerable amount of forested land and wetlands in town. Some of the larger undeveloped areas of town that may be more vulnerable to wildfires include Cedar Swamp in the northwest part of town and the Town Forest and surrounding areas in the southeastern part of town. While a significant wildfire has not occurred in these areas, it does remain vulnerable to the threat of wildfires due to its sheer size. Also of potential concern is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the edges of these undeveloped areas, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Pembroke. Pembroke has only experienced one recorded tornado, an F1 tornado that occurred on July 4, 1964. The tornado was ten feet and wide and travelled 2.3 miles to the east before ending at Route 139 in Marshfield. There were no injuries or fatalities as a result of this tornado, but there was moderate property damage; estimated at between \$50,000 and \$500,000. This tornado is similar to that of other tornadoes that have occurred in the region - low in intensity, as most were EF-0 and EF-1 on the Enhanced Fujita Scale. In addition most of the tornadoes only lasted for a small duration of time before they dissipated, limiting the amount of damage they caused. Based on historical events, tornadoes in the Old Colony region will likely be EF-0 and EF-1 on the Enhanced Fujita Scale and short in duration. Due the historic nature of the region and the town (first settled in 1650) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures in town that were constructed prior to the establishment of building codes. It is impossible to predict the exact locations of future tornadoes

as they are natural hazards that can occur anywhere; therefore, no location in Pembroke is more vulnerable than any other.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Pembroke. Although the town has not experienced a recorded earthquake, earthquakes have occurred in other communities in the Old Colony region and they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Pembroke. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Landslides

Landslides represent a very low frequency, minor hazard for Pembroke. Pembroke has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to Pembroke, as there are no major urban areas in town.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to Pembroke, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to Pembroke, as it is not located along the coast.

Town of Plymouth Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Plymouth is located within the “South Coastal” area of the Old Colony region and is approximately 24 miles southeast of Brockton and 40 miles southeast of Boston. It is bordered by Kingston to the north, the Atlantic Ocean to the east, Bourne and Wareham to the south, and Carver to the west.

Plymouth covers an area of 102.77 square miles and has a population of 56,468 persons, according to the 2010 U.S. Census. The town’s population density was 549.46 persons per square mile in 2010. Plymouth’s population increased 9.22% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Plymouth was 41.4 years, with 14.1% of the population being 65 years of age or older. Approximately 6.4% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 24,800 housing units in town, with the average housing unit sheltering 2.27 persons. There is an average of 241.32 housing units per square mile. Plymouth’s public school system had an enrollment of 7,802 students for the 2013-2014 academic year and includes eight elementary schools, two middle schools, two high schools and one preschool.

Even with its explosive growth over the past 50 years, a large portion of the Plymouth (almost two-thirds) remains forested, with Pine Barrens found throughout the southern part of Plymouth. The predominant land uses in Plymouth are forests (63.36%), residential (13.36%) and wetlands and water (8.71%). The major contributor to the large amount of forested land in town is the 14,635 acre Myles Standish State Forest, of which the vast majority is located in the western half of town, with rest being in nearby Carver. In addition to having thousands of acres of preserved forest, Plymouth’s other natural features include 21 miles of coastline and the Pinehills. The Pinehills area is the most dominant landscape feature in town, which consists of hills that rise from the coastline to an elevation of more than 395 feet, making it the highest point on the Atlantic Coast outside of Maine.

Development in Plymouth has experienced an explosive amount of growth over the past 50 years. The construction of Route 3, the Pilgrim Nuclear Power Plant and industrial parks brought employment, commercial activity and people to Plymouth. A majority of the commercial development in Plymouth is located in the northern part of town, particularly in Downtown Plymouth as well as the interchange areas around Exits 2, 5, 6 and 7 off of Route 3. Plymouth was and remains attractive to residents and businesses because of its large tracts of developable land, lack of septic limitations, rural character, proximity to Boston and increasing amount of transportation options, such as Routes 3 and 44 as well as two public transit options- GATRA and the MBTA Commuter Rail.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 75 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 75: Relationship of Plymouth’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Clark Road Bridge (Route 3)	N/A	N/A	No	120 MPH	24”-36”	N/A	Low	Zone 3
2	Bridge	Commerce Way Bridge (P.A. Landers Access Road)	N/A	N/A	No	120 MPH	24”-36”	N/A	Moderate	Zone 4
3	Bridge	Commerce Way Bridge (Route 44)	N/A	N/A	No	120 MPH	24”-36”	N/A	Moderate	Zone 4
4	Bridge	Jordan Road Bridge (Route 3 NB)	N/A	N/A	No	120 MPH	24”-36”	N/A	Low	Zone 3
5	Bridge	Jordan Road Bridge (Route 3 SB)	N/A	N/A	No	120 MPH	24”-36”	N/A	Low	Zone 3
6	Bridge	Main Street Bridge (Town Brook)	N/A	AE	No	120 MPH	24”-36”	N/A	Low	Zone 3
7	Bridge	Market Street Bridge (Town Brook)	N/A	N/A	No	120 MPH	24”-36”	N/A	Low	Zone 3
8	Bridge	Plimoth Plantation Highway Bridge (Clifford Road)	N/A	N/A	No	120 MPH	24”-36”	N/A	Low	Zone 3
9	Bridge	Plimoth Plantation Highway Bridge (Eel River)	N/A	AE	No	120 MPH	24”-36”	N/A	Low	Zone 3
10	Bridge	River Street Bridge (Eel River)	N/A	AE	No	120 MPH	24”-36”	N/A	Low	Zone 3
11	Bridge	River Street Bridge (Plimoth Plantation Highway)	N/A	N/A	No	120 MPH	24”-36”	N/A	Low	Zone 3
12	Bridge	Route 25 EB Bridge (Bourne Road)	N/A	N/A	No	120 MPH	24”-36”	N/A	Low	Zone 3
13	Bridge	Route 25 WB Bridge (Bourne Road)	N/A	N/A	No	120 MPH	24”-36”	N/A	Low	Zone 3

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
14	Bridge	Route 3 Bridge (Long Pond Road)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
15	Bridge	Route 3 NB Bridge (Billington Street)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
16	Bridge	Route 3 NB Bridge (Cherry Street)	N/A	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
17	Bridge	Route 3 NB Bridge (Eel River)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
18	Bridge	Route 3 NB Bridge (Hedges Pond Road)	N/A	N/A	No	120 MPH	24"-36"	Pitch Pine & Scrub Oak	Low	Zone 3
19	Bridge	Route 3 NB Bridge (Herring Pond Road)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
20	Bridge	Route 3 NB Bridge (Plimoth Plantation Highway)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
21	Bridge	Route 3 NB Bridge (Route 44)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
22	Bridge	Route 3 SB Bridge (Billington Street)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
23	Bridge	Route 3 SB Bridge (Cherry Street)	N/A	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
24	Bridge	Route 3 SB Bridge (Eel River)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
25	Bridge	Route 3 SB Bridge (Hedges Pond Road)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
26	Bridge	Route 3 SB Bridge (Herring Pond Road)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
27	Bridge	Route 3 SB Bridge (Route 44)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
28	Bridge	Route 44 Bridge (Cherry Street)	N/A	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
29	Bridge	Route 44 EB Bridge (Industrial Park Road)	N/A	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
30	Bridge	Route 44 EB Bridge (Route 3)	N/A	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
31	Bridge	Route 44 WB Bridge (Industrial Park Road)	N/A	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
32	Bridge	Route 44 WB Bridge (Route 3)	N/A	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
33	Bridge	Sandwich Road Bridge (Plimoth Plantation Highway)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
34	Bridge	Ship Pond Road Bridge (Route 3 NB)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
35	Bridge	Ship Pond Road Bridge (Route 3 SB)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
36	Bridge	Summer Street Bridge (Route 3)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
37	Bridge	Warren Avenue Bridge (Eel River)	N/A	AO	Within 100 Feet	120 MPH	24"-36"	N/A	Low	Zone 3
38	Bridge	Warren Avenue Bridge (Plimoth Plantation Highway)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
39	Dam	8 Acre Reservoir Dam (8 Acre Reservoir)	N/A	A	No	120 MPH	24"-36"	N/A	Low	Zone 3
40	Dam	Beaver Dam Pond Dam (Beaver Pond Dam)	N/A	A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
41	Dam	Besse Bog Reservoir Dam (Besse Bog Reservoir)	N/A	A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
42	Dam	Billington Sea Dam (Billington Sea)	N/A	AE	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
43	Dam	Briggs Reservoir Dam #1 (Briggs Reservoir)	N/A	A	No	120 MPH	24"-36"	N/A	Low	Zone 3
44	Dam	Briggs Reservoir Dam #2 (Briggs Reservoir)	N/A	A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
45	Dam	C.C. of America Dam #1	N/A	X500	No	120 MPH	24"-36"	N/A	Low	Zone 3

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
46	Dam	Clifford Road Dam (Howland Pond)	N/A	AE	No	120 MPH	24"-36"	N/A	Low	Zone 3
47	Dam	Cold Bottom Pond Dam (Cold Bottom Pond)	N/A	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
48	Dam	Cooks Pond Dam (Cooks Pond)	N/A	N/A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
49	Dam	Cordage Pond Dam (Cordage Pond)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
50	Dam	Darby Pond Outlet (Darby Pond)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
51	Dam	Darby Pond West Outlet (Darby Pond)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
52	Dam	Eagle Hill Reservoir Dam (Eagle Reservoir)	N/A	X500	No	120 MPH	24"-36"	N/A	Low	Zone 3
53	Dam	Fawn Pond Dam (Fawn Pond)	N/A	A	No	120 MPH	24"-36"	N/A	Low	Zone 3
54	Dam	Federal Pond Dam (Federal Pond)	N/A	A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
55	Dam	Five Mile Pond Dam (Five Mile Pond)	N/A	N/A	No	120 MPH	24"-36"	Pitch Pine & Scrub Oak	Low	Zone 3
56	Dam	Forge Pond Dam (Forge Pond)	N/A	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
57	Dam	Four Mile Brook Dam (Four Mile Brook)	N/A	X500	No	120 MPH	24"-36"	N/A	Low	Zone 3
58	Dam	Fresh Pond Dam (Fresh Pond)	N/A	A	No	120 MPH	24"-36"	N/A	Low	Zone 3
59	Dam	Frogfoot Reservoir Dam (Frogfoot Brook)	N/A	A	No	120 MPH	24"-36"	N/A	Low	Zone 3
60	Dam	Grassy Pond Dam (Grassy Pond)	N/A	X500	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
61	Dam	Hayden Pond Dam (Hayden Pond)	N/A	AE	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
62	Dam	Hedges Pond Dam (Hedges Pond)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
63	Dam	Holmes Playground Dam (Town Brook)	N/A	AE	No	120 MPH	24"-36"	N/A	Low	Zone 3
64	Dam	Indian Brook Dam (Indian Brook Pond)	N/A	A	No	120 MPH	24"-36"	Mixed Deciduous/ Coniferous	Low	Zone 3
65	Dam	Island Pond Dam (Island Pond)	N/A	N/A	No	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
66	Dam	Jackson Brook Dam (Jackson Brook)	N/A	N/A	No	120 MPH	24"-36"	Mixed Deciduous/ Coniferous	Low	Zone 3
67	Dam	Jenny (Arms House) Pond Dam (Arms House Pond)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
68	Dam	Kennard Reservoir Dam (Kennard Reservoir)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
69	Dam	Little Grassy Pond Dam (Little Grassy Pond)	N/A	X500	No	120 MPH	24"-36"	Mixed Deciduous/ Coniferous	Low	Zone 3
70	Dam	Little Hedge Pond Dam (Little Hedge Pond)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
71	Dam	Long Island Pond Dam (Long Island Pond)	N/A	A	No	120 MPH	24"-36"	N/A	Low	Zone 3
72	Dam	Nye Bog Reservoir Dam (Nye Bog Reservoir)	N/A	X500	No	120 MPH	24"-36"	N/A	Low	Zone 3
73	Dam	Russell Pond Dam (Russell Mill Pond)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
74	Dam	Saw Mill Pond Dam (Saw Mill Pond)	N/A	A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
75	Dam	Shallow Pond Dam (Shallow Pond)	N/A	A	No	120 MPH	24"-36"	N/A	Low	Zone 3
76	Dam	Standish Mill Pond Dam (Standish Mill Pond)	N/A	AE	No	120 MPH	24"-36"	Mixed Deciduous/ Coniferous	Low	Zone 3
77	Dam	Store Pond Dam (Store Pond)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
78	Dam	The Arm Pond Dam (The Arm Pond)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
79	Dam	Town Brook #1 Dam (Town Brook)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
80	Dam	Town Brook #2 Dam (Town Brook)	N/A	AE	No	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
81	Dam	United Cape Cod Cranberry Co. #1 Dam (United Cape Cod Pond)	N/A	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
82	Dam	Warren Wells Pond Dam (Warren Wells Pond)	N/A	A	No	120 MPH	24"-36"	N/A	Low	Zone 3
83	Dam	Water Street Dam (Town Brook)	N/A	AE	Within 100 Feet	120 MPH	24"-36"	N/A	Low	Zone 3
84	Dam	Whipple Reservoir Dam (Whipple Reservoir)	N/A	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
85	Dam	Frogfoot Reservoir Dam (Frogfoot Reservoir)	N/A	A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
86	Dam	Sawmill Pond Dam (Sawmill Pond)	N/A	X500	No	120 MPH	24"-36"	N/A	Low	Zone 3
87	Fuel Pipeline Terminal	Spectra Energy	134 Samoset St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
88	Fuel Station	7-Eleven	507 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
89	Fuel Station	Mobil	131 Commerce Way	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
90	Fuel Station	Cumberland Farms	154 Samoset St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
91	Fuel Station	Gulf	102 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
92	Fuel Station	Hess Express	105 Samoset St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
93	Fuel Station	Mayflower Station	164 South St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
94	Fuel Station	Mobil	2235 State Rd.	N/A	Within 500 Feet	120 MPH	24"-36"	N/A	Low	Zone 3
95	Fuel Station	Shell	2 Home Depot Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
96	Fuel Station	Sunoco	2306 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
97	Fuel Station	Route 44 Gasoline	34 Samoset St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
98	Fuel Station	Mobil	140 Samoset St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
99	Fuel Station	Citgo	227 South Meadow Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
100	Fuel Station	Super Petroleum	86 Sandwich St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
101	Fuel Station	Town Brook Service Station	14 Water St.	AE	Within 400 Feet	120 MPH	24"-36"	N/A	Low	Zone 3
102	Fuel Station	Town Wharf Enterprises	10 Town Wharf	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
103	Fuel Station	Mobil	109 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
104	Fuel Storage	Dunlaps Oil Service	20 Holman Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
105	Fuel Storage	Volta Oil	1 Robert's Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
106	NSTAR Electric Station, Tier II Site	NSTAR Station 715	975 Bourne Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
107	NSTAR Electric Station, Tier II Site	NSTAR Station 721	40 Minuteman Ln.	N/A	No	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
108	NSTAR Electric Station, Tier II Site	NSTAR Station 734	266 Standish Ave.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
109	NSTAR Electric Station, Tier II Site	NSTAR Station 736	736 Newfield St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
110	NSTAR Electric Station, Tier II Site	NSTAR Station 737	140 Federal Furnace Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
111	NSTAR Electric Station, Tier II Site	NSTAR Station 742	Samoset St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
112	NSTAR Electric Station, Tier II Site	Plymouth Regional Service Center	273 Summer St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
113	Nuclear Power Plant	Entergy Offices / JIC	71 Armstrong Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
114	Nuclear Power Plant	Entergy Training Facility	46 Sandwich Rd.	N/A	No	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
115	Nuclear Power Plant, Private WWTP, Tier II Site	Pilgrim Nuclear Power Station	600 Rocky Hill Rd.	N/A	No	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
116	Nuclear Power Plant-EOC	Entergy EOC	44 Obery St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
117	Fuel Storage, Tier II Site	Churchills Oil & Gas Facility	727 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
118	Fuel Storage, Tier II Site	Churchills Propane Storage Facility	172 Camelot Dr.	X500	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
119	Tier II Site	Comcast	40 Grissom Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
120	Tier II Site	DCR John Armstrong Ice Rink	103 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
121	Fuel Storage, Tier II Site	Dunlaps Propane Storage Facility	81 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
122	Tier II Site, Private WWTP	Electropolishing Systems	24 Aldrin Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
123	Tier II Site	First Student Transportation	2235 State Rd.	N/A	Within 500 Feet	120 MPH	24"-36"	N/A	Low	Zone 3
124	Tier II Site	First Student Transportation	19 Natalie Way	N/A	No	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
125	Tier II Site	T.L. Edwards, Inc.	226 Nicks Rock Rd.	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
126	Tier II Site, Private WWTP	Tech Etch	45 Aldrin Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
127	Tier II Site	Trugreen Chemlawn	20 Raffaele Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
128	Tier II Site	Waste Management of MA, Inc.	264 Nicks Rock Rd.	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
129	Library	Manomet Branch Library	12 Strand Ave.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
130	Public Works	MassDOT District 5 Substation	81 Obery St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
131	Municipal Archives	Department of Public Works	91 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
132	School, Childcare	Cold Spring Elementary School	25 Alden St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
133	School, Childcare	Federal Furnace Elementary School	860 Federal Furnace Rd.	N/A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
134	School, Childcare	Hedge Elementary School	258 Standish Ave.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
135	School, Childcare	Indian Brook Elementary School	1181 State Road	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
136	School, Childcare	Manomet Elementary School	70 Manomet Point Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
137	School	Mount Pleasant School	22 Whiting St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
138	School, Childcare	Nathaniel Morton Elementary School	6 Lincoln St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
139	School	Pilgrim Academy	42 Industrial Park Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Moderate	Zone 4
140	School	Plymouth Community Intermediate School	117 Long Pond Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
141	School, Mass Care Shelter	Plymouth North High School	41 Obery St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
142	School	Plymouth Public School Admin.	253 South Meadow Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
143	School, Mass Care Shelter	Plymouth South High School	490 Long Pond Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
144	School, Mass Care Shelter	Plymouth South Middle School	488 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
145	School	Rising Tide Public Charter School	6 Resnick Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
146	School, Childcare	South Elementary School	178 Bourne Rd.	N/A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
147	School	The Baird Center	900 Ship Pond Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
148	School	The New Testament Christian School	1120 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
149	School, Childcare	West Elementary School	170 Plympton Rd.	N/A	No	120 MPH	24"-36"	Deciduous Forest	Moderate	Zone 3
150	Senior Center	Council on Aging	44 Nook Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
151	Town Hall, Municipal Archives	Town Hall	11 Lincoln St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
152	Monument & Icons	Mayflower II	77 Water St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
153	Monument & Icons	National Forefathers Monument	Allerton St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
154	Monument & Icons	Pilgrim Hall Museum	75 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
155	Monument & Icons	Plimoth Plantation	137 Warren Ave.	N/A	Within 100 Feet	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
156	Monuments & Icons	Plymouth Rock	77 Water St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
157	Monument & Icons	Myles Standish State Forest	Alden Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
158	Courthouse	Plymouth Trial Court	52 Obery St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
159	District Attorney	Plymouth County District Attorney	16 Main St. Ext.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
160	Ambulance Depot	American Medical Response	16R Obery Street	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
161	Fire	Fire Station #1	114 Sandwich St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
162	Fire	Fire Station #2	240 Samoset St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
163	Fire	Fire Station #3	12 Pinehills Dr.	N/A	No	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
164	Fire	Fire Station #4	533 Bourne Rd.	N/A	No	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
165	Fire	Fire Station #5	827 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
166	Fire, Emergency Operations Center, Municipal Archives	Fire Station #6	2209 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
167	Fire	Fire Station #7	0 Spooner St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
168	Fire Tower	DCR Fire Tower	250 Old Sandwich Rd.	N/A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
169	Harbormaster	Harbormaster	11 Town Wharf	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
170	Hospital, Tier II Site	Jordan Hospital	275 Sandwich St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
171	Municipal Archives	Department of Public Works	7 Russell St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3

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172	Public Works	Department of Public Works	159-165 Camelot Dr.	X500	No	120 MPH	24"-36"	N/A	Low	Zone 3
173	Library, Municipal Archives	Main Branch Library	132 South St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
174	Police, Antenna	Police Station	20 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
175	Prison	MCI Plymouth	1 Bumps Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
176	Prison	Plymouth County Correctional Facility	26 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
177	Sheriff	Plymouth County Sheriff's Dept.	24 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
178	Airport, Fuel Storage	Plymouth Municipal Airport	246 South Meadow Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
179	Assisted Living	Emeritus at Plymouth Beach	97 Warren Ave.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
180	Assisted Living	Plymouth Crossings	157 South St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
181	Assisted Living	Stafford Hill Assisted Living	60 Stafford St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
182	Childcare	Bright Ideas Childcare	12 Hedges Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
183	Childcare	Children's Creative Learning Center	41 Westerly Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
184	Childcare	Community Care ASP	118 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
185	Childcare	Compass Zone Program	9 Resnik Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
186	Childcare	Crayon College at Plymouth	98 Nicks Rock Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
187	Childcare	Garden of Knowledge	40 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
188	Childcare	Hop, Skip & Jump, Inc.	One Park Pl.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
189	Childcare	Kinder Kollege	478 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
190	Childcare	KinderCare Learning Center	24 Pilgrim Hill Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
191	Childcare	KinderCare Learning Center	15 Richards Rd.	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 3
192	Childcare	Leaping Frogs Preschool	3 Old Colony Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3

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193	Childcare	Learning Safari	8 Natalie Way	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
194	Childcare	Methodist Nursery School	29 Carver Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
195	Childcare	Miss JoAnne's Bright Beginnings	200R South Meadow Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
196	Childcare	Pinewood School of Montessori	586 Federal Furnace Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
197	Childcare	Room-2-Grow Nursery School	8 Spring Ln.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
198	Childcare	Small Scholars Preschool	8 Town Sq.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
199	Childcare	South Shore Community Action Council	196 South Meadow Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
200	Childcare	The Pond's Child Care Center, Inc.	133 Raymond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
201	Childcare	Tiny Town Children's Center	1226 State Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
202	Childcare	Woodside School	34 Southers Marsh Ln.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
203	Cultural Resources	Bethel AME Church	6 Sever St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
204	Cultural Resources	Bible Baptist Church	377 Court St.	A	No	120 MPH	24"-36"	N/A	Low	Zone 4
205	Cultural Resources	Blessed Kateri Roman Catholic Church	126 South Meadow Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
206	Cultural Resources	Capeway Baptist Church	128 Herring Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
207	Cultural Resources	Chiltonville Congregational Church	6 River St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
208	Cultural Resources	Christ Episcopal Church	149 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
209	Cultural Resources	Christian Science Church	5 Main St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
210	Cultural Resources	Church of Jesus Christ of LDS	430 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
211	Cultural Resources	Church of the Pilgrimage UCC	8 Town Sq.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3

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212	Cultural Resources	Congregation Beth Jacob Synagogue	8 Pleasant St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
213	Cultural Resources	Emmaus Bible Church	17 Church St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
214	Cultural Resources	Faunce Memorial Church	158 Halfway Pond Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/ Coniferous	Low	Zone 3
215	Cultural Resources	First Baptist Church of Plymouth	41 Westerly Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
216	Cultural Resources	Manomet Bible Church	1214 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
217	Cultural Resources	New Testament Church	1120 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
218	Cultural Resources	Plymouth Methodist Church	29 Carver Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
219	Cultural Resources	Plymouth Rock Bible Church	267 Carver Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
220	Cultural Resources	Plymouth Rock Holiness Church	1 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
221	Cultural Resources	Plymouth Spiritualist Church	131 Standish Ave.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
222	Cultural Resources	Plymouth United Pentecostal Church	78 Andrews Way	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
223	Cultural Resources	St. Bonaventure Roman Catholic Church	807 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
224	Cultural Resources	St. Mary's Roman Catholic Church	313 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
225	Cultural Resources	St. Peter Roman Catholic Church	10 Memorial Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
226	Cultural Resources	Zion Lutheran Church	384 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
227	Mobile Home Park	Long Pond Village	54 Headlands Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
228	Mobile Home Park	Mayflower Mobile Estates	Minuteman Ln.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
229	Mobile Home Park	Pinehurst Mobile Home Village	173 South Meadow Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/ Coniferous	Low	Zone 3
230	Mobile Home Park	Plymouth Commons Co-op	1-A Community Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3

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231	Mobile Home Park	Plymouth Mobile Estates Co-op	213 Pilgrim Ter.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
232	Nursing Facility	Golden Living Center-Plymouth	19 Obery St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
233	Nursing Facility	Life Care Center of Plymouth	94 Obery St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
234	Nursing Facility	Newfield House	19 Newfield St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
235	Nursing Facility	Radius HealthCare Center/Pediatric Center at Plymouth	123 South St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
236	Postal & Shipping	USPS Main Street Office	6 Main St. Ext.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
237	Postal & Shipping	USPS Manomet Office	12 Manomet Point Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
238	Postal & Shipping	USPS North Plymouth Office	283 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
239	Postal & Shipping	USPS Pinehills Office	3 Village Green	N/A	No	120 MPH	24"-36"	Pitch Pine & Scrub Oak	Low	Zone 3
240	Postal & Shipping	USPS Plymouth Postal Facility	100 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
241	Postal & Shipping	USPS White Horse Beach Office	119 White Horse Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
242	Railroad	MBTA Plymouth Station	385 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 4
243	Transportation, Tier II Site	Plymouth & Brockton Bus Lines	8 Industrial Park Rd.	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 3
244	Transportation	Plymouth to Provincetown Ferry	77 Water St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
245	Cable Television, Antenna	Comcast	35 Resnik Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
246	Cable Television	Comcast Offices	7 Richards Rd.	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 3
247	Cable Television	PACTV	4 Collins Ave.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
248	Govt. Comm. Tower	Plymouth County Public Safety Comms.	250 Old Sandwich Rd.	N/A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
249	Radio/EAS	WPLM-FM/AM	17 Columbus Rd.	N/A	No	120 MPH	24"-36"	Deciduous Forest	Moderate	Zone 4

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250	Telephone, Tier II Site	Verizon Manomet CO	746 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
251	Telephone, Tier II Site	Verizon Plymouth CO	33 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
252	Telephone (Wireless)	AT&T Wireless Cell Site	5 Shore Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
253	Telephone (Wireless)	AT&T Wireless, Metro PCS & Sprint Cell Site	83 Jordan Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
254	Telephone (Wireless)	Sprint PCS & T-Mobile Wireless Cell Site	20 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
255	Telephone (Wireless)	Sprint PCS Wireless Cell Site	40 Lantern Ln.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
256	Telephone (Wireless)	T-Mobile & Verizon Wireless Cell Site	83 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
257	Telephone (Wireless)	T-Mobile Wireless Cell Site	490 Long Pond Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
258	Telephone (Wireless)	TowerCo Wireless Cell Site	1181 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
259	Telephone (Wireless)	Verizon Wireless Cell Site	265 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
260	Telephone (Wireless)	Verizon Wireless Cell Site	30 Caleb Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
261	Telephone (Wireless)	Verizon Wireless Cell Site	1247 Old Sandwich Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/Coniferous	Low	Zone 3
262	(Private) Water Pumping Station, Private WWTP	Pinehills Water Company	431 Beaver Dam Rd.	N/A	No	120 MPH	24"-36"	Pitch Pine & Scrub Oak	Low	Zone 3
263	(Private) Water Supply Tank	Pinehills Water Supply Tank	250 Old Sandwich Rd.	N/A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
264	(Private) Water Supply Well	Plymouth Water Company Well 1	18 Lynn Cir.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
265	(Private) Water Supply Well	Plymouth Water Company Well 2	Lunn's Way	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
266	(Private) WWTP	Ocean Point WWTP	182 Manomet Point Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3

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267	(Private) WWTP	Summer Hill Condominiums WWTP	293 Summer St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
268	(Private) WWTP	Suncor Stainless WWTP	70 Armstrong Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
269	(Private) WWTP	White Cliffs Condominiums WWTP	White Cliffs Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
270	Odor Control Station	Odor Control Station	Westerly Road	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
271	Odor Control Station	Odor Control Station	Braley Road	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
272	Wastewater Pumping Station	Plymouth Wastewater Pumping Station	197 Water St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
273	Wastewater Treatment Plant	Plymouth Wastewater Treatment Plant	131 Camelot Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
274	Water Pumping Station	Cedarville BPS (inactive)	1649 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
275	Water Pumping Station	Deep Water BPS	Billington St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
276	Water Pumping Station	Hedge Road PS	55 Hedge Rd.	X500	No	120 MPH	24"-36"	N/A	Low	Zone 4
277	Water Pumping Station	Holmes Point PS	168 Sandwich St.	A	No	120 MPH	24"-36"	N/A	Low	Zone 3
278	Water Pumping Station	Industrial Park PS	136 Industrial Park Rd.	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 3
279	Water Pumping Station	Long Pond Road PS	112 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
280	Water Pumping Station	Long Pond Road Septic Station	87 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3

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281	Water Pumping Station	Nook Road BPS	45 Nook Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
282	Water Pumping Station	Pine Hills BPS	238 Warren Ave.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
283	Water Pumping Station	Winter Street PS	Winter St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
284	Water Supply Tank	Cedarville Reservoir	20 Buckskin Path	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
285	Water Supply Tank	Chiltonville Standpipe	351 Sandwich St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
286	Water Supply Tank	Harrington Standpipe	Lantern Ln.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
287	Water Supply Tank	Indian Hill Reservoir	5 Shore Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
288	Water Supply Tank, Water Pumping Station, Water Supply Well (Inactive)	Lout Pond Reservoir	262 Billington St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
289	Water Supply Tank	North Pinehills Reservoir	209 State Rd.	N/A	No	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
290	Water Supply Tank	North Plymouth Reservoir	Armstrong Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
291	Water Supply Tank	Samoset Street Standpipe	Samoset St./ Marc Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
292	Water Supply Tank	South Pinehills Reservoir	378 State Rd.	N/A	No	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
293	Water Supply Tank	Stafford Street Reservoir	Stafford St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
294	Water Supply Well	Bradford Well	17R Natalie Way	N/A	No	120 MPH	24"-36"	Deciduous Forest	Low	Zone 3
295	Water Supply Well	Darby Pond Well	119 Graffam Rd.	N/A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3
296	Water Supply Well	Ellisville Well	1649 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
297	Water Supply Well	Federal Furnace Road Well	454 Federal Furnace Rd.	N/A	No	120 MPH	24"-36"	Coniferous Upland Forest	Low	Zone 3

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
298	Water Supply Well	John Holmes/ Savory Pond Well	61R Quail Run	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
299	Water Supply Well	North Plymouth Well	80 Industrial Park Rd.	N/A	No	120 MPH	24"-36"	N/A	Moderate	Zone 4
300	Water Supply Well	Ship Pond Well	137 Ship Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
301	Water Supply Well	South Pond Wells	116 Rocky Pond Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/ Coniferous	Low	Zone 3
302	Water Supply Well	Wannos Pond Well	20 Acacia Rd.	N/A	No	120 MPH	24"-36"	Mixed Deciduous/ Coniferous	Low	Zone 3
303	Telephone (Wireless)	Industrial Communications & Electronics	969 Federal Furnace Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
304	Telephone (Wireless)	Verizon Wireless Cell Site	1247 Old Sandwich Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
305	Telephone (Wireless)	Verizon Wireless Cell Site	30 Caleb Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
306	Telephone (Wireless)	T-Mobile & Verizon Wireless Cell Site	83 Court St.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
307	Telephone (Wireless)	Industrial Tower & Wireless	17 Tanglewood Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
308	Telephone (Wireless)	Sprint Wireless Cell Site	12 Richards Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
309	Telephone (Wireless)	Verizon Wireless Cell Site	265 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
310	Telephone (Wireless)	AT&T Wireless, Metro PCS & Sprint Cell Site	83 Jordan Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
311	Telephone (Wireless)	Sprint PCS & T-Mobile Wireless Cell Site	20 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
312	Telephone (Wireless)	Sprint Spectrum LLP	1197 State Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
313	Telephone (Wireless)	T-Mobile Wireless Cell Site	490 Long Pond Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
314	Telephone (Wireless)	Sprint PCS Wireless Cell Site	40 Lantern Ln.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
315	Telephone (Wireless)	Telecorp PCS Inc.	State Rd-White Cliffs Golf Course	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
316	Telephone (Wireless)	Omnipoint	5 Cedar Hill Park Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
317	Telephone (Wireless)	Sprint Spectrum	295 Bourne Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
318	Telephone (Wireless)	AT&T Wireless Cell Site	5 Shore Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
319	Telephone (Wireless)	Entergy	680 Rocky Hill Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
320	Telephone (Wireless)	Plymouth Rock Broadcasting	14 Seven Hills Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
321	Telephone (Wireless)	Metro PCS	4 Cedar Hill Park Dr.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3
322	Telephone (Wireless)	Omnipoint Communications, Inc.	104 Pinewood Rd.	N/A	No	120 MPH	24"-36"	N/A	Low	Zone 3

Natural Hazard Risk Assessment

Table 76 summarizes the hazard risks for Plymouth. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Plymouth’s vulnerability to each of these hazards is below.

Table 76: Plymouth Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Coastal Erosion & Shoreline Change	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Major Urban Fires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Tsunamis	Very Low	Serious	3
Landslides	Very Low	Minor	2

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Plymouth and is the most frequent hazard affecting Plymouth. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks and overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Plymouth are areas along the Agawam River, Beaver Dam Brook, Harlow Brook, Indian Brook, Eel River, Town Brook, Wankinco River, Billington Sea, Charge Pond, Great Herring Pond, Great South Pond, Halfway Pond, Little Herring Pond, and Long Pond. In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which flooded as a result of the March 2010 floods:

- Water Street
- Hedge Road
- Long Beach
- Warren Avenue
- Taylor Avenue
- Massasoit Drive
- Seaview Drive
- Fisherman’s Lane

- Bayberry Road
- Saquish
- Gurnet Point
- Federal Furnace Road
- Saby's Pond
- Kings Pond
- Curlew Pond
- Bartlett Pond
- Micajah Pond
- Little Micajah Pond
- Widgeon Pond
- Big West Pond
- Little West Pond
- Little Sandy Pond
- Big Sandy Pond
- Bay Shore Drive (Coastal Bluff Area)
- John Alden Road (Coastal Bluff Area)
- Center Hill Road (Coastal Bluff Area)
- Shoreline Way (Coastal Bluff Area)
- Shore Drive (Coastal Bluff Area)
- Seaview Drive (Coastal Bluff Area)
- Manomet Point Road (Coastal Bluff Area)
- Manomet Drive (Coastal Bluff Area)
- Ellisville Road (Coastal Bluff Area)
- Wamsutta Avenue (Coastal Bluff Area)
- Oak Bluff Circle (Coastal Bluff Area)
- Monisa Kay Drive (Coastal Bluff Area)
- Old County Road (Coastal Bluff Area)
- Nameloc Road (Coastal Bluff Area)
- Menotomy Road (Coastal Bluff Area)
- Pawtuxet Road (Coastal Bluff Area)
- Priscilla Beach Road (Coastal Bluff Area)
- Sanderson Drive (Coastal Bluff Area)
- Whitney Lane (Coastal Bluff Area)

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 4,978 acres, or 7.6%, of Plymouth is within a 100-year floodplain. Based on additional analysis, 177 acres, or 3.6%, of the floodplain is developed. To limit additional development from occurring within floodplains, Plymouth adopted a Floodplain District that is intended to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to protect human life and health; to minimize expenditures of public money for costly flood-control projects; to minimize the need for rescue and relief efforts associated with flooding; to ensure that those who occupy areas of special flood hazard assume responsibility for their actions.

Of the 322 critical facilities identified in Plymouth, 29 are located within a 100-year floodplain with the vast majority of the facilities (23) consisting of dams.

According to MEMA, there are currently 432 National Flood Insurance Program (NFIP) policies in-force in Plymouth, with a total of 416 claims being made from 1978 to November 2013, totalling \$5,998,847. It should be noted that there are 39 residential Repetitive Loss (RL) properties in Plymouth that have resulted in 113 two claims totalling \$3,557,186. Additionally, there are three (two residential and one commercial) Severe Repetitive Loss Properties (SRL) in Plymouth. These properties have resulted in 19 claims totalling \$1,144,322.

Bridges

Table 77 indicates that there are seven bridges in Plymouth that span waterways according to the Massachusetts Department of Transportation. Five of the bridges span the Eel River, while the other two span Town Brook. The bridges all have a good AASHTO rating and none were categorized as being deficient. None of these bridges is known to create flooding hazards or to be at risk from high water.

Table 77: Plymouth Bridges Spanning Waterways

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Main Street	Town Brook	1908	1919	86.0	--
Market Street	Town Brook	1964	--	95.0	--
Plimoth Plantation Highway	Eel River	1951	--	83.5	--
Route 3 NB	Eel River	1955	--	85.0	--
Route 3 SB	Eel River	1955	--	85.0	--
River Street	Eel River	2004	--	82.9	--
Warren Avenue	Eel River	1958	--	93.1	--

Dams

Table 78 indicates that there are 48 dams in Plymouth according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. The Plymouth Department of Public Works reports that they actively manage some dams such as the Holmes Playground Dam and other dams along Town Brook by raising or lowering the boards to control the flooding. The town is also concerned about a number of other problem dams but is limited in its actions as most are privately owned.

Table 78: Plymouth Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Clifford Road Dam	Howland Pond	Tr-Eel River	Low	Town
Fresh Pond Dam	Fresh Pond	Tr-Beaver Dam Brook	Significant	Town
Hayden Pond Dam	Hayden Pond	Eel River	Low	Private
Holmes Playground Dam	Town Brook	Town Brook	High	Town
Indian Brook Dam	Indian Brook Pond	Indian Brook	High	State
Island Pond Dam	Island Pond	Not Applicable	Low	Town

Name	Impoundment	Waterway	Hazard Code	Owner
Jenny (Arms House) Pond Dam	Arms House Pond	Town Brook	Significant	Town
Russell Pond Dam	Russell Mill Pond	Not Applicable	Significant	Town
Standish Mill Pond Dam	Standish Mill Pond	Town Brook	Significant	Private
Store Pond Dam	Store Pond	Brook	Significant	Town
Town Brook Dam #1	Town Brook	Town Brook	Significant	Town
Warren Wells Pond Dam	Warren Wells Pond	Not Applicable	Low	Private

The dams listed below are considered non-jurisdictional and do not fall under the Mass. Office of Dam Safety's regulatory authority and therefore the information provided is limited.

Name	Impoundment	Waterway	Hazard Code	Owner
8 Acre Reservoir Dam	8 Acre Reservoir	Tr-Weweantic River	Not Applicable	Unknown
Beaver Dam Pond	Beaver Dam Pond	Not Applicable	Not Applicable	Unknown
Besse Bog Reservoir Dam	Besse Bog Reservoir	Agawam River	Not Applicable	Unknown
Billington Sea Dam	Billington Sea	Town Brook	Not Applicable	Unknown
Briggs Reservoir Dam #1	Briggs Reservoir	Tr-Town Brook	Not Applicable	Unknown
Briggs Reservoir Dam #2	Briggs Reservoir	Tr-Indian Brook	Not Applicable	Unknown
C.C. of America Dam #1	Unknown	Tr-Weweantic River	Not Applicable	Unknown
Cold Bottom Pond Dam	Cold Bottom Pond	Tr-Eel River	Not Applicable	Unknown
Cooks Pond Dam	Cooks Pond	Tr-Town Brook	Not Applicable	Unknown
Cordage Pond Dam	Cordage Pond	Not Applicable	Not Applicable	Unknown
Darby Pond Outlet	Darby Pond	Tr-Town Brook	Not Applicable	Unknown
Darby Pond West Outlet	Darby Pond	Tr-Meadow Brook	Not Applicable	Unknown
Eagle Hill Reservoir Dam	Eagle Reservoir	Not Applicable	Not Applicable	Unknown
Fawn Pond Dam	Fawn Pond	Not Applicable	Not Applicable	Unknown
Federal Pond Dam	Federal Pond	Not Applicable	Not Applicable	Unknown
Five Mile Pond Dam	Five Mile Pond	Not Applicable	Not Applicable	Unknown
Forge Pond Dam	Forge Pond	Tr-Eel River	Not Applicable	Unknown
Four Mile Brook Dam	Four Mile Brook	Four Mile Brook	Not Applicable	Unknown
Frogfoot Reservoir Dam	Frogfoot Brook	Frogfoot Brook	Not Applicable	Unknown
Frogfoot Reservoir Dam	Frogfoot Reservoir	Not Applicable	Not Applicable	Unknown
Grassy Pond Dam	Grassy Pond	Not Applicable	Not Applicable	Unknown
Hedges Pond Dam	Hedges Pond	Brook	Not Applicable	Unknown
Jackson Brook Dam	Jackson Brook	Jackson Brook	Not Applicable	Unknown
Kennard Reservoir Dam	Kennard Reservoir	Not Applicable	Not Applicable	Unknown
Little Grassy Pond Dam	Little Grassy Pond	Not Applicable	Not Applicable	Unknown

Name	Impoundment	Waterway	Hazard Code	Owner
Little Hedge Pond Dam	Little Hedge Pond	Not Applicable	Not Applicable	Unknown
Long Island Pond Dam	Long Island Pond	Tr-Indian Brook	Not Applicable	Unknown
Nye Bog Reservoir Dam	Nye Bog Reservoir	Weeks Brook	Not Applicable	Unknown
Saw Mill Pond Dam	Saw Mill Pond	Not Applicable	Not Applicable	Unknown
Sawmill Pond Dam	Sawmill Pond	Brook	Not Applicable	Unknown
Shallow Pond Dam	Shallow Pond	Not Applicable	Not Applicable	Unknown
The Arm Pond Dam	The Arm Pond	Tr-Beaver Dam Brook	Not Applicable	Unknown
Town Brook #2 Dam	Town Brook	Town Brook	Not Applicable	Unknown
United Cape Cod Cranberry Co. #1 Dam	United Cape Cod Pond	Not Applicable	Not Applicable	Unknown
Water Street Dam	Town Brook	Town Brook	Not Applicable	Unknown
Whipple Reservoir Dam	Whipple Reservoir	Tr-Eel River	Not Applicable	Unknown

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Plymouth. Plymouth receives an average of 24”-48” of snow annually, with their being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change represent a high frequency, serious severity hazard for Plymouth. Plymouth has a 36.9 mile coastline that is subject to flooding from storm surges caused by hurricanes and northeasters that have caused damage to its coastline. Some of the low-lying coastal areas are protected from damage from waves; however the buildup of stormwaters (wave upon wave) causes high flood levels throughout the coastline. According to Plymouth’s Coastal Flood Management Plan some of the more destructive storms in recent memory include “The Blizzard of 78” which generated flood levels ranging from 11.9 to 21.1 feet in exposed coastal locations and caused \$6,182,800.00 in property damage. Other large storms of note include “The Perfect Storm” of October 1991, which resulted in a high tide of 9.4 feet and “The Blizzard of 92” which also resulted in a high tide of 9.4 feet with 12 to 25 foot waves, all of which battered and bruised Plymouth’s coastline.

According to Plymouth’s Coastal Flood Management Plan shoreline change data mapped over a 147-year period shows a fairly low rate of erosion has been determined. Statistics produced from the data show 33% of the coastline is stable (up to ± 0.5 feet/year), 41% has had less than 1.5 feet of erosion/year, 19% has had between 1.5-3.5 feet of erosion/year, 2% has had greater than

3.5 feet of erosion/year, and 5% have accreted. If one assumes a maximum erosion rate of 1.5 feet per year, since 74% of the shoreline in Plymouth erodes at this rate and that the top of coastal banks erodes at an equivalent rate, there is currently one home in danger within 1-5 years, two homes will be in danger within 6-10 years, there are no homes in imminent danger, and 26 homes will be in danger within the next 60 years. The most vulnerable areas in town include the lowest-lying coastal areas, such as Plymouth Beach, Saquish/Gurnet Point and White Horse Beach.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Plymouth. Plymouth is most vulnerable to hurricanes/tropical storms during the summer and autumn months. The town has been in the path of two hurricanes/tropical storms in the past 50 years- Tropical Storm Alma in 1966 and Tropical Storm Gordon in 2000, but by the time it reached Plymouth it had lost much of its strength and only resulted in a moderate amount of rainfall. Plymouth has however has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Plymouth (as well as Kingston) is more vulnerable to hurricanes and tropical storms than other community's in the region due to the fact it is on the coast, where hurricanes/tropical storms are typically stronger than when they are inland. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees, coastal flooding and coastal erosion are the most common problems associated with hurricanes/tropical storms that occur in Plymouth. They can block roadways, down power lines and flood homes and businesses on the coast. During Hurricane Sandy in October 2012 the storm surge breached Plymouth Beach, forcing the closure of a stretch of Warren Avenue (Route 3A) for several hours during the storm. The storms winds resulted in 6,000 customers losing power. Luckily the outages were not lengthy and most customers had power restored within 24 hours. When hurricanes/tropical storms do occur, they affect the entire town, but the coastline, especially the low-lying coastline is more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Plymouth. Plymouth is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Plymouth. Plymouth is the largest community in the state in terms of overall size, with large portions permanently protected, like Myles Standish State Forest and other portions quite underdeveloped, like southern

Plymouth. With its ever increasing population, due to the amount of developable land remaining in town, Plymouth's Wildland-Urban Interface (WUI) area (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) is ever increasing.

This increased WUI in Plymouth is of particular concern, due to the presence of the highly flammable pitch pine and scrub oak vegetation in town. Historically these austere areas of vegetation were called "barrens" because the soil was considered too poor or barren to support agriculture. These soils are not only extremely dry but also strongly acidic, which limits the decomposition of pine needles, sticks and leaves, leading to the accumulation of additional flammable materials for a wildfire. The summer's prevailing westerly winds can fan and spread a fire rapidly.

Due to the number of historic wildfires that have occurred in Plymouth, including the historic May 1957 fire that scorched 15,000 acres, and a number of other smaller wildfires that plagued Plymouth in the 1960s and 1970s, the danger of a large wildfire remains. The most vulnerable areas in Plymouth include the 14,600 acres Myles Standish State Forest and the Pine Hills of Plymouth due to the presence of the aforementioned flammable vegetation. Other vulnerable areas include the WUI that border the Myles Standish State Forest, as well as in the out-of-region but nearby 5,400 acre Fall River/Freetown State Forest and 1,500 acre Massasoit State Forest in Taunton.

Major Urban Fires

Major Urban Fires represent a medium frequency, minor severity hazard for Plymouth. As the largest community in Massachusetts in terms of size, development is spread out, with the exception of historic Downtown Plymouth, most notably a 12-15 block area along Court Street (Route 3A) and Water Street near Plymouth Rock and the Mayflower. This area houses a number of shops, restaurants, hotels, museums and private residences (and some of the oldest structures in America). This densely developed area consists of minimum spacing between buildings, many wood structures and some structures that were built prior to the creation of standard building codes.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Plymouth. Plymouth has experienced two recorded tornados since 1950, one in August 1997 and another on July 24, 2012. Both were F0 tornadoes that caused no injuries and very little damage. The tornado that occurred on July 24, 2012 occurred during a period of violent thunderstorms in the Manomet section of Plymouth along White Horse Beach. The tornado started as one of three waterspouts not far from shore. While two of the waterspouts dissipated before they reached the shore, one waterspout made landfall for approximately 45 yards causing very minimal damage to umbrellas, windows and awnings in the immediate area. These tornados like most others that have occurred in the region were low in intensity, as most were EF-0 and EF-1 on the Enhanced Fujita Scale. In addition most of the tornadoes only lasted for a small duration of time before they dissipated, limiting the amount of damage they caused. Based on historical events, tornadoes in the Old Colony region will likely be EF-0 and EF-1 on the Enhanced Fujita Scale and short in duration. Due the historic nature of the region and the town (settled in 1620) there is the potential for a

prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures in town that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, it is a natural hazard that can occur anywhere, making no location in Stoughton more vulnerable than others to tornadoes.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Plymouth. Plymouth has only experienced two recorded earthquakes. One occurred in October 1990, while the most recent one occurred on November 17, 2005. The 2.3 magnitude earthquake struck at 12:40 PM two miles south of the town's center. While the earthquake did startle and frighten a few people it did not cause any damages or injuries according to local emergency management officials. Based on the fact that earthquakes that have occurred in Plymouth and other communities in the Old Colony region, they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Plymouth. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Tsunamis

Tsunamis represent a very low frequency, serious hazard for Plymouth. While Plymouth has never experienced a recorded tsunami, the possibility of a tsunami occurring off Massachusetts is extremely rare. The frequency of tsunamis occurring is related to the frequency of the events that cause them, so it is similar to the frequency of seismic or volcanic activities or landslides, all of which are rare along the East Coast of the United States. According to the 2013 Massachusetts State Hazard Mitigation Plan, "all coastal areas are exposed to threat of tsunamis. However, at the present time it is unknown what the probability is of a damaging tsunami along the Massachusetts coast."

Landslides

Landslides represent a very low frequency, minor hazard for Plymouth. One particular location where landslides have become problematic in Plymouth are the bluffs along Nameloc Drive in southern Plymouth. Continuing coastal erosion along the bluff is leaving houses at great risk. Various hard and soft solutions to stabilize the slope and protect the houses continue to be proposed and tried and include protective planting, the use of gabions, and concrete elements. As a last resort, residents are forced to move their houses back from the advancing cliff when space allows.

Town of Plympton Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Plympton is located within the “Lakes Region” area of the Old Colony region and is 16 miles southeast of Brockton and 35 miles southeast of Boston. It is bordered by Pembroke to the north, Kingston to the east, Carver and Middleboro to the south, and Halifax to the west.

Plympton covers an area of 15.11 square miles and has a population of 2,820 persons, according to the 2010 U.S. Census. The town’s population density was 186.63 persons per square mile in 2010. Plympton’s population increased 6.94% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Plympton was 44.4 years, with 13.6% of the population being 65 years of age or older. Approximately 4.5% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 1,043 housing units in town, with the average housing unit sheltering 2.70 persons. There is an average of 69.03 housing units per square mile. Plympton is part of the Silver Lake Regional School District along with the communities of Halifax and Kingston. The Silver Lake Regional School District had an enrollment of 3,831 students for the 2013-2014 academic school year. The district includes four elementary schools, one middle school and one high school.

Plympton is the most rural community in the region with the predominant land uses being forests (41.1%), wetlands and water (30.1%) and agriculture (12.8%). Plympton’s natural features include one of the headwaters of the Jones River, the Jones River Brook, and the upper reaches of the Winnetuxet River, a Taunton River tributary rising in the adjacent town of Carver. Other features in Plympton include the southern end of Silver Lake and the western quarter of Indian Pond which is primarily in Kingston. Plympton also has a scattering of impounded former mill ponds and cranberry reservoirs including Dennetts Pond on the Jones River and Bonney Pond on Colchester Brook.

Factors contributing to its rural character and lack of development can be attributed to its lack of buildable land – the topography and soils in Plympton restrict growth with almost one third of Plympton having wetland areas, high water tables or soils too tight for private subsurface sewage disposal systems according to the Plympton Open Space and Recreation Plan. This is particularly important since the town relies exclusively on on-site private water-supply wells and on-site wastewater disposal. Town officials state that the numerous cranberry bogs in town is a plus from both an agricultural perspective and from a water management perspective, as these bogs hold a lot of water, which can help limit the amount of flooding in town.

Plympton’s limited commercial development is centered in the downtown area along Route 58, and consists of a gas station, restaurant, convenience store and a few small shops. In May 2011 a major food service distribution company broke ground on a 133 acre industrial park adjacent to Route 44 in the southeastern portion of town.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 79 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 79: Relationship of Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Parsonage Road Bridge (Winnetuxet River)	N/A	AE	No	120 MPH	36"-48"	Mixed Deciduous/ Coniferous	Moderate	Zone 4
2	Bridge	Winnetuxet Road Bridge (Winnetuxet River)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
3	Dam	Annasnappet Brook Dam (Annasnappet Brook)	N/A	A	No	120 MPH	36"-48"	Coniferous Upland Forest	Moderate	Zone 4
4	Dam	Annasnappet Brook Reservoir (Annasnappet Brook)	N/A	A	No	120 MPH	36"-48"	Coniferous Upland Forest	Moderate	Zone 4
5	Dam	B&B Atwood Bog Dam (Prospect Bog)	N/A	A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
6	Dam	Bay State Company Dam (Bog)	N/A	A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
7	Dam	Bonney Pond Dam (Bonney Pond)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
8	Dam	Dennett's Pond Dam (Dennett's Pond)	N/A	A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
9	Dam	Johnson Pond Dam (Johnson Pond)	N/A	A	No	120 MPH	36"-48"	Deciduous Forest	Low	Zone 4
10	Dam	Mill Pond Dam (Mill Pond)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
11	Dam	Parkers Forge Pond Dam (Sherman Pond)	N/A	AE	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
12	Dam	Rogers Reservoir Dam (Rogers Reservoir)	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
13	Dam	United Cape Cod Cranberry Co. #1 Dam (Plympton Bog)	N/A	A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
14	Dam	United Cape Cod Cranberry Co. #2 Dam (Plympton Bog)	N/A	A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
15	Dam	Whiting Reservoir Dam	N/A	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
16	Dam	Winnetuxet Road Pond Dam (Winnetuxet Road Pond)	N/A	AE	No	120 MPH	36"-48"	Mixed Deciduous/ Coniferous	Moderate	Zone 4
17	Fuel Station	Mobil	280 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
18	Fuel Storage	Plympton Sand & Gravel	190 Brook St.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/ Coniferous	Moderate	Zone 4
19	Tier II Site	Lawrence Ready Mix Concrete	71 Spring Street	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
20	Library	Plympton Public Library	248 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
21	Public Works	Highway Department	23 Palmer Rd.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
22	School, Mass Care Shelter	Dennett Elementary School	80 Crescent St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
23	Town Hall, Police Station, Senior Center, Mass Care Shelter	Town Hall, Police Station & Council on Aging	5 Palmer Rd.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
24	Transfer Station	Transfer Station	Ring Rd.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
25	Fire, Emergency Operations Center	Fire Station	3 Palmer Rd.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
26	Childcare	Puddle Jumpers Learning Center-LLC	256 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
27	Cultural Resource	First Congregational Church of Plympton	254 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
28	Cultural Resource	New Covenant Fellowship Church	129 Lake St.	N/A	Within 200 Feet	120 MPH	36"-48"	N/A	Low	Zone 4
29	Cultural Resource	Plympton Historical Society	189 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
30	Cultural Resource	Silver Lake Chapel	33 Lake St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
31	Cultural Resource, Fuel Storage, Private Wastewater Treatment Plant & Water Supply Tank	Sysco	Joe Freitas Way	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
32	Cultural Resource	Tractor Supply Co.	406 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
33	Postal & Shipping	USPS Plympton Office	284 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
34	Special Needs	Brockton Area Multi-Services Inc.	14 Colchester St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
35	Special Needs	Community Systems	68 Main St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
36	Antenna	Industrial Comm. & Electronics, Inc.	7 Joey Cir.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Moderate	Zone 4
37	Antenna	Industrial Comm. & Electronics, Inc.	Off County Rd.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
38	Private Water Supply Tank	Lite Control	65 Spring St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4
39	Private Water Supply Well	Rocky Harvest, LLC	182 Brook St.	N/A	No	120 MPH	36"-48"	N/A	Moderate	Zone 4

Natural Hazard Risk Assessment

Table 80 summarizes the hazard risks for Plympton. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Plympton’s vulnerability to each of these hazards is below.

Table 80: Plympton Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Plympton and is the most frequent hazard affecting Plympton. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Plympton are areas along the Annasnappet Brook, Barrows Brook, Colchester Brook, Jones River Brook, and the Winnetuxet River. In addition to these areas, town officials also noted the following locations where flooding has historically occurred:

- Intersection of Elm Street, West Street, and Winnetuxet Road
- Lake Street between County Road and the intersection of Lake Street and Oak Street
- Prospect Road between Winnetuxet Road and Marie Elaine Drive

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 2,738 acres, or 28.3%, of Plympton is within a 100-year floodplain. Based on additional analysis, just 26 acres, or 0.9%, of the floodplain is developed. To limit additional development from occurring within floodplains, Plympton adopted a Floodplain and Watershed Protection District. The district is intended to protect the health and safety of persons against the hazards of flooding, to conserve the value of

land and buildings, to facilitate the adequate provision of a water supply through preservation and maintenance of the groundwater table, to protect and to preserve the marshes, bogs, ponds and water courses and their adjoining wetlands, to encourage the most appropriate use of wetlands, to encourage the most appropriate use of the land and to preserve and increase the amenities of the Town.

Of the 39 critical facilities identified in Plympton, twelve are located within a 100-year floodplain and consist of ten dams and two bridges. There are no critical facilities located in any of the locally identified flood areas, although one, the New Covenant Fellowship Church, is located within 200 feet of where flooding has historically occurred on Lake Street, as noted above.

According to MEMA, there are currently seven National Flood Insurance Program (NFIP) policies in-force in Plympton, with a total of six claims being made from 1978 to November 2013, totalling \$64,937. It should be noted that there are no Repetitive Loss (RL) or Severe Repetitive Loss Properties (SRL) in Plympton.

Bridges

Table 81 indicates that there are two bridges in Plympton that span waterways according to the Massachusetts Department of Transportation (MassDOT). Both bridges span the Winnetuxet River. The Winnetuxet Road Bridge that was rebuilt in 2002 was rebuilt to a much greater capacity than the bridge it replaced, as it features more substantial components. The bridge does have posted weight restrictions and is subject to debris accumulating upstream of the support columns.

Table 81: Plympton Bridges Spanning Waterways

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Parsonage Road	Winnetuxet River	1973	--	99.8	--
Winnetuxet Road	Winnetuxet River	1923	2002	49.7	FO

Dams

Table 82 indicates that there are 14 dams in Plympton according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. These 14 dams are all privately owned except for the town-owned but unrated Winnetuxet Road Pond Dam. This is an approximately twelve-year old concrete structure abutting the Winnetuxet Road Bridge’s abutments. There are no control boards or gates at the bridge. Instead part of the flow goes through a separate sluiceway to the brook downstream. The sluiceway reportedly has provisions for boards, but the structure is relatively inaccessible and, according to the Highway Surveyor, is rarely used. The sluice is at a lower level than the dam’s spillway so that the pond is normally at a lower level than the dam.

In contrast, the privately owned Dennett’s Pond Dam is in very poor condition. The former stone mill structure is in ruins and the more recent concrete dam is cracked and settling. There is still provision for adjusting the boards but the surrounding deteriorated structure does not appear to be very tight. The town reports that water rises to the top of the boards and flows over them right after a major storm and then continues to seep through the deteriorated structure so that the pond

soon becomes little more than a brook. In all, the dams appear to threaten downstream properties less than those in more developed communities.

Table 82: Plympton Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Dennett's Pond Dam	Dennett's Pond	Jones River	Significant	Private
Parkers Forge Pond Dam	Sherman Pond	Winnetuxet River	Significant	Private
Winnetuxet Road Pond Dam	Winnetuxet Road Pond	Not Applicable	Significant	Town

The dams listed below are considered non-jurisdictional and do not fall under the Mass. Office of Dam Safety's regulatory authority and therefore the information provided is limited.

Name	Impoundment	Waterway	Hazard Code	Owner
Annasnappet Brook Dam	Annasnappet Brook	Annasnappet Brook	Not Available	Unknown
Annasnappet Brook Reservoir	Annasnappet Brook	Annasnappet Brook	Not Available	Unknown
Bay State Company Dam	Bog	Tr-Jones River	Not Available	Unknown
B&B Atwood Bog Dam	Prospect Bog	Tr-Winnetuxet River	Not Available	Unknown
Bonney Pond Dam	Bonney Pond	Colchester Brook	Not Available	Unknown
Johnson Pond Dam	Johnson Pond	Not Applicable	Not Available	Unknown
Mill Pond Dam	Mill Pond	Not Applicable	Not Available	Unknown
Rogers Reservoir Dam	Rogers Reservoir	Not Applicable	Not Available	Unknown
United Cape Cod Cranberry Co. #1 Dam	Plympton Bog	Tr-Colchester Brook	Not Available	Unknown
United Cape Cod Cranberry Co. #2 Dam	Plympton Bog	Tr-Colchester Brook	Not Available	Unknown
Whiting Reservoir Dam	Not Applicable	Not Applicable	Not Available	Unknown

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Plympton. Plympton receives an average of 36"-48" of snow annually, with there being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Plympton. Plympton is most vulnerable to hurricanes/tropical storms during the summer and autumn months. The town was in the path of one hurricane/tropical storm-Tropical Storm Hermine in 2004, but by the time it reached Plympton, it lost much of its strength and only resulted in a

moderate amount of rainfall. Plympton has however has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees are the most common problem associated with hurricanes/tropical storms that occur in Plympton. They can block roadways as well as down power lines, cutting of electricity to homeowners and businesses for up to multiple days. During Tropical Storm Irene in August 2011 parts of the town were without electricity for a week. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Plympton. Plympton is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Plympton. While the town is largely undeveloped, it lacks the presence of the highly flammable pitch pine and scrub oak forest that is prevalent in nearby Plymouth. Areas of town most vulnerable include an area of conservation land on the western edge of town, the Town Forest located just outside the center of town and the undeveloped edges of town. While a significant wildfire has not occurred in either area, it does remain vulnerable to the threat of wildfires due to its sheer size. Also of potential concern is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the edges of these areas, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Plympton. While Plympton has never experienced a recorded tornado, several communities surrounding Plympton have. Most of the tornadoes that have occurred in the region were low in intensity, with most being an EF-0 or EF-1 on the Enhanced Fujita Scale. Additionally, most of the tornadoes only lasted for a short period of time before they dissipated, limiting the amount of damage they caused. Based on historical events, future tornadoes in the Old Colony region will also likely be EF-0 or EF-1 tornadoes. Due the historic nature of the town (settled in 1662) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures that were constructed prior to the establishment of building

codes. As it is impossible to predict the exact locations of future tornadoes, the entire community is vulnerable to the impacts.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Plympton. Plympton has only experienced one recorded earthquake. On February 20, 1697 a 3.0 magnitude earthquake struck Plympton. It is not known what damages, if any, were caused by the earthquake, but if damages did occur, they were most likely minimal due to the sparse population of the town. Based on the fact that earthquakes that have occurred in Plympton and other communities in the Old Colony region, they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the magnitude 2-3 range. According to the USGS earthquake damage usually occurs with earthquakes in the magnitude 4-5 range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the region and the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Plympton. As it is impossible to predict the exact locations of future earthquakes, it is a natural hazard that can occur anywhere, making no location in Plympton more vulnerable than others to earthquakes.

Landslides

Landslides represent a very low frequency, minor hazard for Plympton. Plympton has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to Plympton, as there are no major urban areas in town.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to Plympton, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to Plympton, as it is not located along the coast.

Town of Stoughton Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Stoughton is located within the “Greater Brockton” area of the Old Colony region and is approximately 15 miles south of Boston. It is bordered by Canton and Randolph to the north, Avon to the east, Brockton and Easton to the south, and Sharon to the west.

Stoughton covers an area of 16.47 square miles and has a population of 26,962 persons, according to the 2010 U.S. Census. The town’s population density was 1,637.04 persons per square mile in 2010. Stoughton’s population decreased 0.69% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Stoughton was 42.9 years, with 16.4% of the population being 65 years of age or older. Approximately 7.5% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 10,787 housing units in town, with the average housing unit sheltering 2.49 persons. There is an average of 654.95 housing units per square mile. Stoughton’s public school system had an enrollment of 3,651 students for the 2013-2014 academic year and includes five elementary schools, one pre-school, one middle school and one high school.

Stoughton is a residential town with the predominant land uses being forests (41.1%), residential (31.4%), wetlands and water (12.3%) and commercial and industrial (7.4%). While Stoughton is densely populated in certain areas, such as the downtown, the town does have a significant amount of open space and conservation land, particularly in the southwest and northeast sections of town. These areas include the town-owned 492 acre Stoughton Conservation Memorial Land, the 152 acre Ames Pond area and the privately owned 155 acre Ames Rifle & Gun Club in the southwest section of town. The northeast section of town features the Bear Swamp situated west of Route 24 and south of Route 139.

Downtown Stoughton, which is situated at the confluence of Routes 27, 138 and 139 is the town’s commercial and civic center. Stoughton Center, as it is called, is home to a number of stores, restaurants and professional offices, as well as the Stoughton Commuter Rail Station. Other areas of commercial activity in town include development along the aforementioned routes-27, 138, and 139, as well as the newly developed area around the Route 24 interchange at Exit 20-the location the recently developed Shoppes at Paige Pointe and Technology Center Drive. Industrial development in Stoughton is concentrated in the towns two industrial parks: the AMB Business Park and the Tosca Drive Industrial Park, both of which are located just off Route 27.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 83 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 83: Relationship of Stoughton’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Lindelof Ave. Bridge (Route 24)	N/A	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
2	Bridge	Route 24 Bridge (Page Street)	N/A	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
3	Fuel Station	BP	663 Washington St.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
4	Fuel Station	Citgo	1002 Park St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
5	Fuel Station	Cumberland Farms	309 Park St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
6	Fuel Station	Cumberland Farms	1634 Turnpike St.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
7	Fuel Station	Cumberland Farms	499 Washington St.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
8	Fuel Station	Getty	452 Canton St.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
9	Fuel Station	Getty	669 Washington St.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
10	Fuel Station	Gulf	28 Dykeman Way	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
11	Fuel Station	Gulf	1580 Turnpike St.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
12	Fuel Station	Mobil	145 Sharon St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
13	Fuel Station	Mobil	372 Washington St.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
14	Fuel Station	Petro Plus	990 Washington St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
15	Fuel Station	Shell	130 Central St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
16	Fuel Station	Shell	140 Sharon St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
17	Fuel Station	Stoughton Gas	645 Washington St.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
18	Hospital	New England Sinai Hospital	150 York St.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
19	Courthouse	Stoughton District Court	1288 Central St.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
20	Fire Station	Fire Station #1	30 Freeman St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
21	Fire Station, Emergency Operations Center	Fire Station #2	1550 Central St.	N/A	No	110 MPH	48”-72”	N/A	Low	Zone 4
22	Housing Authority	Stoughton Housing Authority	4 Capen St.	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
23	Housing Authority	Stoughton Housing Authority	LaCivita Ct.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
24	Housing Authority	Stoughton Housing Authority	78 Memorial Dr.	A	No	110 MPH	48"-72"	N/A	Low	Zone 4
25	Housing Authority	Stoughton Housing Authority	44 Pleasant St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
26	Library	Stoughton Public Library	84 Park St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
27	Police	Police Station	26 Rose St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
28	Postal & Shipping	USPS Sheldonville Office	1063 West St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
29	Postal & Shipping	USPS Stoughton Office	31 Porter St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
30	Public Works	Public Works	950 Central St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
31	School, Childcare, Mass Care Shelter	Edwin A. Jones Early Childhood Center	137 Walnut St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
32	School, Childcare, Mass Care Shelter	Helen H. Hansen Elementary School	1800 Central St.	AE	No	110 MPH	48"-72"	N/A	Low	Zone 4
33	School, Childcare, Mass Care Shelter	Joseph H. Gibbons Elementary School	235 Morton St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
34	School, Childcare, Mass Care Shelter	Joseph R. Dawe, Jr. Elementary School	131 Pine St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
35	School, Childcare, Mass Care Shelter	South Elementary School	171 Ash St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
36	School, Childcare, Mass Care Shelter	West Elementary School	1322 Central St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
37	School, Mass Care Shelter	O'Donnell Middle School	211 Cushing St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
38	School, Mass Care Shelter	Stoughton High School	232 Pearl St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
39	Senior Center	Council on Aging	110 Rockland St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
40	Town Hall	Town Hall	10 Pearl St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
41	Assisted Living	Arbors at Stoughton	2121 Central St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
42	Childcare	Academy Preschool	808 West St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
43	Childcare	Crayon College Too, Inc.	71 Freeman St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
44	Childcare	Creative Preschool	78 Howland Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
45	Childcare	Hugs Plus Learning Center	681 Central St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
46	Childcare	Kiddie Academy of Stoughton	1202 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
47	Childcare	Kidsports Educational Child Care Center	57 French St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
48	Childcare	Old Colony Y-Striar Child Care	445 Central St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
49	Childcare	Shaloh House Pre-school & Kindergarten	50 Ethyl Way	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
50	Cultural Resources	Ahavath Torah Congregation	1179 Central St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
51	Cultural Resources	Christadelphian Church	48 Freeman St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
52	Cultural Resources	Faith Baptist Church	18 Stoughton St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
53	Cultural Resources	First Parish Universalist Church	790 Washington St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
54	Cultural Resources	First United Methodist Church	103 Pleasant St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
55	Cultural Resources	Grace Church	421 Page St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
56	Cultural Resources	House of God Church	1271 Park St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
57	Cultural Resources	Immaculate Conception Church	122 Canton St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
58	Cultural Resources	Jubilee Christian Church	1278 Park St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
59	Cultural Resources	Kingdom Hall of Jehovah's Witnesses	638 Pearl St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
60	Cultural Resources	Sha'Ar Hashamayim Messianic Congregation	2 Canton St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
61	Cultural Resources	St. James Catholic Church	560 Park St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
62	Cultural Resources	Stoughton Historical Society	6 Park St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
63	Cultural Resources, Childcare	First Congregational Church	76 Pierce St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
64	Cultural Resources, Childcare	Trinity Episcopal Church	414 Sumner St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
65	Mobile Home Park	Kelley's Trailer Park	1156 Park St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
66	Nursing Facility	Brockton Goddard Kidney Center	907 Sumner St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
67	Nursing Facility	Copley at Stoughton Nursing Care & Rehab. Center	380 Sumner St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
68	Nursing Facility	Kindred Nursing & Rehabilitation-Blue Hills	1044 Park St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
69	Nursing Facility	Kindred Nursing & Rehabilitation-Goddard	909 Sumner St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
70	Nursing Facility	Weekes Rest Home	239 Pleasant St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
71	Antenna	SBA Towers II	76 Jordan Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
72	Cable Television	Stoughton Media Access Corp.	451 Page St.	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
73	Railroad	MBTA Stoughton Station	45 Wyman St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
74	Well & Pumping Station	Fennel Well & Pumping Station	King St.	N/A	No	110 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
75	Well & Pumping Station	Goddard Well & Pumping Station	Benson Rd.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
76	Well & Pumping Station	Gurney Well & Pumping Station	Off Plain St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
77	Well & Pumping Station	Harris Pond Well & Pumping Station	Hillwood Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
78	Well & Pumping Station	McNamara Well & Pumping Station	King St.	N/A	No	110 MPH	36"-48"	Mixed Deciduous/ Coniferous	Low	Zone 4
79	Well & Pumping Station	Muddy Pond Well & Pumping Station	Muddy Pond	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4
80	Well & Pumping Station	Muddy Pond Well & Pumping Station	Muddy Pond	N/A	No	110 MPH	48"-72"	N/A	Low	Zone 4

Natural Hazard Risk Assessment

Table 84 summarizes the hazard risks for Stoughton. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Stoughton’s vulnerability to each of these hazards is below.

Table 84: Stoughton Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Very Low	Minor	2
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Stoughton and is the most frequent hazard affecting Stoughton. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Stoughton are areas along Meadow Brook, Steep Hill Brook, Whitman Brook, Ames Long Pond, Town Pond, Woods Pond, and Bear Swamp. In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which flooded as a result of the March 2010 floods:

- Summer Avenue
- Kay Way
- Pleasant Street by the Stoughton Armory
- Central Street by the Holy Sepulchre Cemetery
- Lincoln Street at Pleasant Street
- Plain Street at West Street
- West Street at Gibson Way
- West Street by Lake Drive
- Shirley Road

- Pratt's Court
- Turnpike Street

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 1,274 acres, or 12.1%, of Stoughton is within a 100-year floodplain. Based on additional analysis, 135 acres, or 10.6%, of the floodplain has been developed. To limit additional development from occurring within floodplains, Stoughton adopted a Wetland, Flood Hazard and Watershed District. The district is intended to provide lands subject to seasonal or periodic flooding, shall not be used in such a manner as to endanger the health or safety of the occupants or neighbors thereof; to protect, preserve and maintain the water table and water recharge areas within the Town so as to preserve existing and potential public and private water supplies thereby assuring the public health and safety of the residents of the town; to assure the continuation of the natural flow pattern of the water courses within the town in order to provide adequate and safe floodwater storage capacity to protect persons and property against the hazards of flood inundation; to protect the community against costs and hazards to life, health and safety which may be incurred when unsuitable development occurs in watershed areas and in swamps, marshes, bogs, wet meadows, and other wetlands, along water courses, or in areas subject to floods; to protect existing property owners from damages arising out of the development of Watershed Areas, Flood Hazard Areas and Wetland Areas including damages consequent to the obstruction of flood run-off and consequent to the disruption of the natural water table resulting from the alteration of existing surface or subsurface water flows; to protect future property owners who, but for these regulations, would purchase, develop or use for residential, business, industrial or recreational purposes, areas subject to periodic damage by flooding; to protect the town from individual choices in the use of land which would likely require significant and extraordinary subsequent public expenditures for public works or disaster relief; to conserve in those areas not suitable for the purposes prohibited natural condition, wildlife and open spaces for the general health, safety, and welfare of the public.

Of the 80 critical facilities identified in Stoughton, two are located within a 100-year floodplain and consists of an elementary school and housing authority complex. None of the critical facilities were located in any of the locally identified flood areas.

According to MEMA, there are currently 145 National Flood Insurance Program (NFIP) policies in-force in Stoughton, with a total of 33 claims being made from 1978 to November 2013, totalling \$64,924. It should be noted that there is one residential Repetitive Loss (RL) property in Stoughton that has had three claims totalling \$8,793. There are no Severe Repetitive Loss Properties (SRL) in Stoughton.

Bridges

There are no bridges in Stoughton that span waterways according to the Massachusetts Department of Transportation (MassDOT).

Dams

There are no dams in Stoughton according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety.

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Stoughton. Stoughton receives an average of 36"-72" of snow annually, with there being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Stoughton. Stoughton is most vulnerable to hurricanes/tropical storms during the summer and autumn months. While Stoughton has not been in the direct path of a hurricane or tropical storm for more than 125 years it has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees are the most common problem associated with hurricanes/tropical storms that occur in Stoughton. They can block roadways as well as down power lines, cutting off electricity to homeowners and businesses for up to multiple days. During Tropical Storm Irene in August 2011 many homes and businesses were without power for days. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Stoughton. Stoughton is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Stoughton. As a mature suburban community, a large majority of the town has been developed with the exception of the southern part of town, where the nearly 500 acre Stoughton Memorial Conservation Lands are located. While this area of open space consists of a combination of forest and wetlands, a significant wildfire has not occurred there. The last reported fire there occurred in April 2012, a

small 1.5 acre brush fire. Although the last fire was not large, it does remain vulnerable to the threat of wildfires due to its sheer size. Also of potential concern is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the edges of these undeveloped areas, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Stoughton. Stoughton has experienced one recorded tornado, an F0 tornado that occurred on May 9, 2013 at the intersection of Route 138 and Atkinson Drive. While it was very brief in nature and caused no injuries, it did cause approximately \$20,000 in damage, with most of the damage stemming from the tornado picking up and moving recreational vehicle trailers. This tornado like most others, that have occurred in the region were low in intensity, as most were EF-0 and EF-1 on the Enhanced Fujita Scale. In addition most of the tornadoes only lasted for a small duration of time before they dissipated, limiting the amount of damage they caused. Based on historical events, tornadoes in the Old Colony region will likely be EF-0 and EF-1 on the Enhanced Fujita Scale and short in duration. Due the historic nature of the region and the town (settled in 1713) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures in town that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, it is a natural hazard that can occur anywhere, making no location in Stoughton more vulnerable than others to tornadoes.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Stoughton. Although the town has not experienced a recorded earthquake, earthquakes have occurred in other communities in the Old Colony region and they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Stoughton. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Landslides

Landslides represent a very low frequency, minor hazard for Stoughton. Stoughton has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major Urban Fires represent a very low frequency, minor severity hazard for Stoughton. As a small suburban community consisting of primarily single-family housing and highway-commercial economic activity, the only area in town that is vulnerable to the threat of a major urban fire is that of Downtown Stoughton (the intersection of Routes 27, 138 and 139) and the

immediate surrounding area. The area consists of minimum spacing between buildings, many wood structures and structures that were built prior to the creation of standard building codes.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to Stoughton, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to Stoughton, as it is not located along the coast.

Town of West Bridgewater Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of West Bridgewater is located within the “Greater Brockton” area of the Old Colony region and is approximately 25 miles south of Boston. It is bordered by Brockton to the north, East Bridgewater to the east, Bridgewater and Raynham to the south, and Easton to the west.

West Bridgewater covers an area of 15.67 square miles and has a population of 6,916, according to the 2010 U.S. Census. The town’s population density was 441.35 persons per square mile in 2010. West Bridgewater’s population increased 4.25% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in West Bridgewater was 43.9 years, with 18.2% of the population being 65 years of age or older. Approximately 5.3% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 2,669 housing units in town, with the average housing unit sheltering 2.59 persons. There is an average of 170.33 housing units per square mile. West Bridgewater’s public school system had an enrollment of 1,324 students for the 2013-2014 academic year and includes three elementary schools and one middle-high school.

West Bridgewater is primarily a residential community, mixed with pockets of commercial and industrial development. The predominant land uses in town are wetlands and water (34.8%), forests (28.8%) and residential (15.1%). There are two large areas in West Bridgewater that are protected and remain untouched by development. One area consists of almost 1,200 acres of the larger 16,950 acre Hockomock Swamp Wildlife Management Area (WMA). The second area is the West Meadow Pond Wildlife Management Area (WMA) and adjacent West Bridgewater State Forest, which together create another two hundred plus acres that remain untouched by development. The main river corridors in town are the Cowesett Brook in the western part of town and the Town River in the southern part of town.

West Bridgewater’s commercial development is located along the two main transportation corridors in town; the east-west Route 106 and the north-south Route 28, both of which have experienced an increasing amount of development in recent years. At the intersection of these two main transportation corridors is West Bridgewater’s traditional town center, which consists of a combination of town offices and retail and commercial establishments. West Bridgewater’s industrial development is primarily located in the western part of town on Manley Street and United Drive, which is adjacent to the Route 24 interchange in West Bridgewater.

West Bridgewater’s municipal drinking water supply is drawn from four wells in West Bridgewater. Three of the four wells are protected by Zone II wellhead protection areas, while all of the wells are protected by West Bridgewater’s Water Resource Protection District. Almost of all West Bridgewater’s wastewater is disposed of via on-site septic systems, except for a small area consisting of a shopping center and a two mobile home parks on North Main Street (Route 28) near the Brockton city line, which is connected to Brockton’s municipal wastewater system.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 85 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 85: Relationship of West Bridgewater’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Bridge	Belmont Street Bridge (Salisbury Plain River)	N/A	AE	No	120 MPH	36”-48”	N/A	Low	Zone 4
2	Bridge	Forest Street Bridge (Town River)	N/A	AE	No	110 MPH	36”-48”	N/A	Low	Zone 4
3	Bridge	Forest Street Bridge (Town River)	N/A	AE	No	120 MPH	36”-48”	N/A	Moderate	Zone 4
4	Bridge	Route 24 Bridge (South Elm Street)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
5	Bridge	Route 24 Bridge (Town River)	N/A	A	No	110 MPH	36”-48”	N/A	Moderate	Zone 4
6	Bridge	Scotland Street Bridge (Town River)	N/A	A	No	110 MPH	36”-48”	N/A	Moderate	Zone 4
7	Bridge	South Main Street Bridge (Town River)	N/A	AE	No	120 MPH	36”-48”	N/A	Low	Zone 4
8	Bridge	South Street Bridge (Town River)	N/A	N/A	No	110 MPH	36”-48”	Coniferous Upland Forest	Low	Zone 4
9	Bridge	Walnut Street (Cowesett Brook)	N/A	A	No	110 MPH	36”-48”	N/A	Low	Zone 4
10	Bridge	Walnut Street Bridge (Route 24)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
11	Bridge	West Center Street Bridge (Hockomock River)	N/A	AE	No	110 MPH	36”-48”	N/A	Low	Zone 4
12	Bridge	West Center Street Bridge (Route 24)	N/A	N/A	No	110 MPH	36”-48”	N/A	Low	Zone 4
13	Bridge	West Street Bridge (Cowesett Brook)	N/A	AE	No	110 MPH	36”-48”	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
14	Bridge	West Street Bridge (Route 24)	N/A	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
15	Dams	Mill Pond Dam (Mill Pond)	N/A	AE	No	110 MPH	36"-48"	N/A	Low	Zone 4
16	Dams	War Memorial Park Dam (Memorial Park Pond)	N/A	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
17	Dams	West Meadow Dam (West Meadow Pond)	N/A	AE	No	110 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
18	Fuel Station	Cumberland Farms	8 North Main St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
19	Fuel Station	Hess	244 West Center St.	N/A	No	110 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
20	Fuel Station	Mobil	575 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
21	Fuel Station	Motion Gas	710 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
22	Fuel Station	Shell	506 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
23	Fuel Station	Tedeschi	397 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
24	Fuel Storage	ABF Freight	150 Manley St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
25	Fuel Storage, Antenna	J.P. Noonan Transportation	116 West St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
26	Fuel Storage	Ryder Truck	130 Manley St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
27	Library	West Bridgewater Public Library	80 Howard St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
28	Public Works	Highway Department	63 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
29	Schools, Mass Care Shelter	Howard Elementary School	70 Howard St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
30	Schools	Rose L. MacDonald Elementary School	1 Stepping Stone Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
31	Schools	Spring Street School	2 Spring St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
32	Schools	West Bridgewater Middle/Senior High School	155 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
33	Senior Center, Mass Care Shelter	Council on Aging	97 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
34	Town Hall	Town Hall	65 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
35	Transfer Station	Transfer Station	218 South Elm St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
36	Fire, Police & Emergency Operations Center	Fire Station & Police Station	99 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
37	Childcare	Children's Express Learning Center	359 Manley St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
38	Childcare	Cowlicks + Pigtaails Child Care Center	395 West St.	AE	No	110 MPH	36"-48"	N/A	Low	Zone 4
39	Childcare	Four Seasons Creative Learning Center	120 West Center St. Unit 8B	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
40	Childcare	KinderCare Learning Center	393 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
41	Childcare	KinderCare Learning Center #1318	199 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
42	Childcare	Magic Touch Nursery Preschool	387 East Center St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
43	Cultural Resource	Church of Jesus Christ of Latter Day Saints	574 Manley St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
44	Cultural Resource	Cochessett United Methodist Church	517 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
45	Cultural Resource, Antenna	First Church	29 Howard St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
46	Cultural Resource	Lowe's Home Improvement Store	724 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
47	Cultural Resource, School	New England Baptist Church & Academy	560 North Main St.	N/A	No	110 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
48	Cultural Resource	Old Bridgewater Historical Society	162 Howard St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
49	Cultural Resource	St. Ann's Catholic Church	103 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
50	Cultural Resource	Temple Baptist Church	540 Manley St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
51	Cultural Resource	West Bridgewater Baptist Church	83 North Elm St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
52	Housing Authority	West Bridgewater Housing Authority	7 Esther Dr.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
53	Mobile Home Park	Matfield Woods	775 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
54	Mobile Home Park	Westbridge Landing	855 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
55	Nursing Facility	Life Care Center of West Bridgewater	765 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
56	Postal & Shipping	USPS West Bridgewater Office	78 North Main St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
57	Special Needs	Brockton Area Multi-Services Inc.	5 Thomas Cir.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
58	Special Needs	Brockton Area Multi-Services Inc.	380 South Elm St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
59	Antenna	Crown Atlantic Company	45 Turnpike St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
60	Antenna	Industrial Comm. & Electronics, Inc.	70 Pleasant St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
61	Antenna	Mobilite Investments	1 Component Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
62	Antenna	National Grid	750 West Center St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
63	Water Storage Tank	Spring Street Water Storage Tank	Spring St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
64	Water Storage Tank	Walnut Street Water Storage Tank	359 Walnut St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
65	Water Treatment Facility	Water Treatment Facility	Manley St.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
66	Well & Pumping Station	Cyr Street Well & Pumping Station	29 Cyr. St.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4
67	Well & Pumping Station	Manley Street Well & Pumping Station	8 Manley St.	N/A	No	110 MPH	36"-48"	Deciduous Forest	Low	Zone 4
68	Well & Pumping Station	Norman Avenue Well & Pumping Station	Norman Ave.	N/A	No	110 MPH	36"-48"	Deciduous Forest	Low	Zone 4

Natural Hazard Risk Assessment

Table 86 summarizes the hazard risks for West Bridgewater. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of West Bridgewater’s vulnerability to each of these hazards is below.

Table 86: West Bridgewater Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for West Bridgewater and is the most frequent hazard affecting West Bridgewater. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in West Bridgewater are areas along the Black Betty Brook, Cowesett Brook, Meadow Brook, Salisbury Plain River, Town River, Willow Brook, Hockomock Swamp Wildlife Management Area, West Meadow Wildlife Management Area and the West Bridgewater State Forest. In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which flooded as a result of the March 2010 floods:

- Scotland Street
- Forest Street
- Manley Street Extension
- Forest Street and Clinton Road
- South Elm Street
- Ash Street
- Belmont Street and Matfield Street

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 3,034 acres, or 30.2%, of West Bridgewater is within a 100-year floodplain. Based on additional analysis, 148 acres, or 4.9%, of the floodplain is developed. To limit additional development from occurring within floodplains, West Bridgewater adopted a Floodplain District. The district is intended to protect the public health, safety, and general welfare, to protect human life and property from the hazards of periodic flooding, to preserve the natural flood control characteristics, and the flood storage capacity of the floodplain, and to preserve and maintain the ground water table and water recharge areas within the floodplain.

Of the 68 critical facilities identified in West Bridgewater, twelve are located within a 100-year floodplain and consist of nine bridges, two dams and a daycare center. None of the critical facilities are located in any of the locally identified flood areas.

According to MEMA, there are currently 33 National Flood Insurance Program (NFIP) policies in-force in West Bridgewater, with a total of six claims being made from 1978 to November 2013, totalling \$6,192. It should be noted that there are no Repetitive Loss (RL) or Severe Repetitive Loss Properties (SRL) in West Bridgewater.

Bridges

Table 87 indicates that there are ten bridges in West Bridgewater that span waterways according to the Massachusetts Department of Transportation. Since 2007 the Town of West Bridgewater has replaced two bridges: the South Street Bridge in 2008 and the Scotland Street Bridge in 2009. Both of these bridges were in dire need of replacement, as the South Street Bridge was slowly collapsing, which interrupted traffic and threatened flooding by blocking the flow of the Town River.

Table 87: West Bridgewater Bridges Spanning Waterways

Roadway	Waterway Spanned	Year Built	Year Rebuilt	AASHTO Rating	Deficiency
Belmont Street	Salisbury Plain River	1875	--	64.0	FO
Forest Street	Town River	1968	--	79.9	--
Forest Street	Town River	1978	--	74.3	FO
Route 24	Town River	1952	1974	82.8	--
Scotland Street	Town River	2009	--	86.1	--
South Street	Town River	2008	--	79.4	--
South Main Street	Town River	1897	1947	76.4	--
West Center Street	Hockomock River	1948	--	62.2	--
Walnut Street	Cowesett Brook	1967	--	75.5	FO
West Street	Cowesett Brook	1935	--	78.2	FO

Dams

Table 88 indicates that there are three dams in West Bridgewater according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. Serious dam failures are unlikely in West Bridgewater, although the largest impoundment in town, the state-owned West Meadow Dam, located in the West Bridgewater State Forest is in need of repair according to town officials.

Table 88: West Bridgewater Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Mill Pond Dam	Mill Pond	West Meadow Brook	Significant	Private
West Meadow Dam	West Meadow Pond	West Meadow Brook	Significant	State
War Memorial Park Dam	Memorial Park Dam	Town River	Low	Town

Winter Storms

Winter storms represent a high frequency, serious severity hazard for West Bridgewater. West Bridgewater receives an average of 36”-48” of snow annually, with their being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for West Bridgewater. West Bridgewater is most vulnerable to hurricanes/tropical storms during the summer and early autumn months. While West Bridgewater has never been in the direct path of a hurricane or tropical storm, it has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees and localized flooding from the wind and rain that accompany hurricanes/tropical storms are the most common problems in West Bridgewater. They can block roadways as well as down power lines, cutting off electricity to homeowners and businesses for multiple days. During Tropical Storm Irene in August 2011 many homes and business were without power for days. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for West Bridgewater. West Bridgewater is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for West Bridgewater. As a mature suburban community, development in town is largely situated around the Routes 28 and 106 corridors as well as along the western side of Route 24. Large swaths of the town remain undeveloped due to the presence of the West Meadows Wildlife Management Area and the West Bridgewater State Forest in the northern part of town and the Hockomock Swamp Wildlife Management Area in the southern part of town. While these wildlife management areas consist of a combination of forest and wetlands, a significant wildfire has not occurred within either area, it does remain vulnerable to the threat of wildfires due to its sheer size. Also of potential concern is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the edges of these undeveloped areas, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for West Bridgewater. While West Bridgewater has never experienced a recorded tornado, several communities surrounding West Bridgewater have. Most of the tornadoes that have occurred in the region were low in intensity, with most being an EF-0 or EF-1 on the Enhanced Fujita Scale. Additionally, most of the tornadoes only lasted for a short period of time before they dissipated, limiting the amount of damage they caused. Based on historical events, future tornadoes in the Old Colony region will also likely be EF-0 or EF-1 tornadoes. Due the historic nature of the town (settled in 1651) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, the entire community is vulnerable to the impacts.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for West Bridgewater. Although the town has not experienced a recorded earthquake, earthquakes have occurred in other communities in the Old Colony region and they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in West Bridgewater. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Landslides

Landslides represent a very low frequency, minor hazard for West Bridgewater. West Bridgewater has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to West Bridgewater, as there are no major urban areas in town.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to West Bridgewater, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to West Bridgewater, as it is not located along the coast.

Town of Whitman Natural Hazard Vulnerability/Risk Assessment

Community Profile

The Town of Whitman is located within the “Greater Brockton” area of the Old Colony region and is approximately 24 miles south of Boston. It is bordered by Abington to the north, Rockland and Hanson to the east, East Bridgewater to the south, and Brockton to the west.

Whitman covers an area of 6.96 square miles and has a population of 14,489 persons, according to the 2010 U.S. Census. The town’s population density was 2,081.75 persons per square mile in 2010. Whitman’s population increased 4.37% between 2000 and 2010, compared to a population increase of 3.71% for the Old Colony region overall. In 2010 the median age in Whitman was 38.2 years, with 10.6% of the population being 65 years of age or older. Approximately 6.9% of the population’s income in the past twelve months was below the poverty level, according to the 2008-2012 American Community Survey.

In 2010 there were 5,522 housing units in town, with the average housing unit sheltering 2.62 persons. There is an average of 793.39 housing units per square mile. Whitman is part of the Whitman-Hanson Regional School District and had an enrollment of 4,165 students for the 2013-2014 academic year. The district includes four elementary schools, two middle schools and one high school.

As one of the more dense communities in the region, predominant land uses in Whitman are residential (36.4%), forest (28.5%) and wetlands and water (20.2%). The large percentage of residential land in town can be attributed to the town being almost built out. Whitman’s most significant natural features include the Shumatuscacant River and the two large 100+ acre meadows that run along the banks of the Shumatuscacant-Hobart Meadow and Bear Meadow.

The main north-south corridor that runs through Whitman, Route 18, has many stores, restaurants and services, but Whitman’s town center is located just off Route 18 and harkens back to a traditional New England town center, with many restaurants, shops and municipal offices all within walking distance of nearby neighborhoods. A recent project that only enhanced Whitman’s traditional town center was the renovation of a former shoe factory into 127 contemporary condominiums.

Whitman’s municipal drinking water is supplied by the City of Brockton via two sources, Silver Lake in Kingston, Pembroke and Plympton and the Brockton Reservoir in Avon. (Brockton also has the option of obtaining water from the Aquaria Water desalinization plant in North Dighton if needed.) The vast majority of Whitman has municipal wastewater service, due to agreements with the City of Brockton. Brockton can accept up to 1 million gallons per day (gpd) of wastewater, although in recent years Whitman has been averaging 0.871 million gpd.

Critical Facilities

The list of critical facilities has been updated since the completion of the previous plan, to reflect changes in the community as well as input received from town officials. The updated list of critical facilities is shown in Table 89 below. Located in Appendix 4 there are a series of five maps showing the relationship of these facilities to the following six hazards: flooding, hurricanes, snowfall, wildfire, landslide, and earthquakes.

Table 89: Relationship of Whitman’s Critical Facilities to Hazard Areas

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
1	Dam	Hobart Pond Dam (Hobart Pond)	N/A	AE	No	120 MPH	36"-48"	N/A	Low	Zone 4
2	Fuel Station	7-Eleven	359 Bedford St.	N/A	Within 300 Feet	120 MPH	36"-48"	N/A	Low	Zone 4
3	Fuel Station	Citgo	180 South Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
4	Fuel Station	Cumberland Farms	280 Temple St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
5	Fuel Station	Diamond Fuel	311 South Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
6	Fuel Station	Prime Energy	79 Temple St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
7	Tier II Site	Verizon	630-632 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
8	Library	Whitman Public Library	100 Webster St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
9	Public Works, Fuel Storage	Public Works	100 Essex St.	AE	No	120 MPH	36"-48"	Deciduous Forest	Low	Zone 4
10	School	Hope Christian School	503 South Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
11	School, Childcare, Antenna, Public Safety Repeater Site	John H. Duval, Jr. Elementary School	60 Regal St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
12	School, Childcare, Mass Care Shelter	Louise A. Conley Elementary School	100 Forest St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
13	School, Mass Care Shelter, Antenna, Public Safety Repeater Site	Whitman Middle School	100 Corthell Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
14	Senior Center	Council on Aging	16 Hayden Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
15	Town Hall	Town Hall	54 South Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
16	Fire, Emergency Operations Center, Antenna, Public Safety Repeater Site	Fire Station	56 Temple St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
17	Health/Medical Facility	Beth Israel Deaconess Medical	312 Bedford St.	N/A	Within 400 Feet	120 MPH	36"-48"	N/A	Low	Zone 4
18	Police, Antenna, Public Safety Repeater Site	Police Station	20 Essex St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
19	Childcare	A Child's Place Pre-School	49 School St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
20	Childcare	Busy Bee Pre-School #2	69 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
21	Childcare	Jack-n-Jill Child Care of Whitman	991 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
22	Childcare	Merry Deb Nursery School	127 Warren Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
23	Childcare	Self Help Inc. Head Start-Whitman	168 Whitman Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
24	Cultural Resources	All Saints Episcopal Church	44 Park Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
25	Cultural Resources	Congregational Church of Whitman	519 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
26	Cultural Resources	Holy Ghost Church	518 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
27	Cultural Resources	Methodist Church	503 South Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
28	Cultural Resource	South Shore Pentecostal Church	58 West Street	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
29	Cultural Resource, Fuel Station	Stop & Shop Supermarket	475 Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
30	Housing Authority	Whitman Housing Authority	101 Harvard Ct.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
31	Housing Authority	Whitman Housing Authority	0 Pine Cir.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
32	Housing Authority	Whitman Housing Authority	0 Stetson Ter.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
33	Postal & Shipping	USPS Whitman Office	64 South Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
34	Railroad	MBTA Whitman Station	383 South Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
35	Special Needs	Choice Residence	26 Park Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
36	Special Needs	Road to Responsibility	50 Paul St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
37	Special Needs	Special Needs	87 Stetson St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
38	Special Needs	Special Needs	207 Stetson St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
39	Special Needs	Vinyl Residence	777 Washington St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
40	Antenna	Commonwealth Building	7 Marble St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
41	Antenna	Franklin Street Cell Tower	Franklin St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
42	Antenna	Ridder Air	1 Castle Pl.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
43	Cable Television	Whitman Hanson Community Access TV	115 South Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
44	Sewer Pumping Station	Auburn Street #1050 East Station	Auburn St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
45	Sewer Pumping Station	Auburn Street #1266 West Station	Auburn St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
46	Sewer Pumping Station	Auburn Street P-48 Station	Auburn St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
47	Sewer Pumping Station	Bedford Street Station	Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
48	Sewer Pumping Station	Bedford Street Station (Chlorination)	Bedford St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
49	Sewer Pumping Station	Belcher Avenue Station	Belcher Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
50	Sewer Pumping Station	Bell Drive Station	Bell Dr.	N/A	No	120 MPH	36"-48"	Mixed Deciduous/Coniferous	Low	Zone 4

ID #	Facility	Name	Address	FEMA Flood Zone	Locally Identified Flood Area	100 Year Wind Event	Average Annual Snowfall	Wildfire Susceptibility (Vegetation)	Landslide Risk	Peak Ground Acceleration Zone
51	Sewer Pumping Station	Candlewick Lane Station	Candlewick Ln.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
52	Sewer Pumping Station	Commercial Street P31-A Station	Commercial St.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
53	Sewer Pumping Station	Kimberly Drive Station	Kimberly Dr.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
54	Sewer Pumping Station	Lombard Avenue Station	Lombard Ave.	N/A	No	110 MPH	36"-48"	N/A	Low	Zone 4
55	Sewer Pumping Station	Oakwood Avenue Station	Oakwood Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
56	Sewer Pumping Station	Old Coach Road Station	Old Coach Rd.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
57	Sewer Pumping Station	Old Colony Way Station	Old Colony Way	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4
58	Sewer Pumping Station	Pine Street Station	Pine St.	N/A	No	120 MPH	36"-48"	Deciduous Forest	Low	Zone 4
59	Sewer Pumping Station	Rowena Avenue Station	Rowena Ave.	N/A	No	120 MPH	36"-48"	Deciduous Forest	Low	Zone 4
60	Tier II Site	Whitman Co.	356 South Ave.	N/A	No	120 MPH	36"-48"	N/A	Low	Zone 4

Natural Hazard Risk Assessment

Table 90 summarizes the hazard risks for Whitman. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on input from the community team and utilizes the basis of the vulnerability assessment used in the 2013 Commonwealth of Massachusetts State Hazard Mitigation Plan. A brief description of Whitman’s vulnerability to each of these hazards is below.

Table 90: Whitman Vulnerability Risk Assessment

Hazard	Frequency	Severity	Hazard Ranking
Flooding	High	Serious	6
Winter Storms	High	Serious	6
Hurricanes/Tropical Storms	Medium	Serious	5
Extreme Temperatures	High	Minor	5
Wildfires	Medium	Minor	4
Tornadoes	Very Low	Serious	3
Earthquakes	Very Low	Serious	3
Landslides	Very Low	Minor	2
Major Urban Fires	Not Applicable	Not Applicable	Not Applicable
Coastal Erosion & Shoreline Change	Not Applicable	Not Applicable	Not Applicable
Tsunamis	Not Applicable	Not Applicable	Not Applicable

Vulnerability Analysis

Flooding

Flooding represents a high frequency, serious severity hazard for Whitman and is the most frequent hazard affecting Whitman. Flooding can occur as a result of strong tropical storms, winter storms, nor’easters, and periods of heavy rain during the spring and autumn months, all of which can produce very high volumes of rain, which can cause rivers and streams to overflow their banks as well as overwhelm the community’s stormwater infrastructure system. Impacts associated with minor flooding events typically include road closures and the flooding of recreational areas, whereas moderate flooding events can result in structures being flooded.

Flood Prone Areas

The areas identified as being most vulnerable to flooding are areas located within 100-year floodplains. According to FEMA Flood Insurance Rate Maps (FIRM), areas most vulnerable to flooding in Whitman are areas along the Meadow Brook, Shumatuscacant River, Bear Meadow, Hobart Meadow, and the area between Route 14 and Route 27. In addition to these areas, town officials also noted the following locations where flooding has historically occurred, some of which flooded as a result of the March 2010 floods:

- Auburn Street (Route 14) at Pine Haven Drive
- Bedford Street at Stop & Shop (at an unnamed brook, just north of May Street)
- Pond Street
- Woodlawn Circle at Pine Haven Drive
- Temple Street (Route 27) at Joyce Terrace
- Hogg Memorial Drive at Homeland Terrace
- Belmont Street at Meadow Brook
- Plymouth Street at Shumatuscacant River

Flooding Vulnerability Assessment

An analysis of FEMA flood hazard maps indicate that approximately 671 acres, or 15%, of Whitman is within a 100-year floodplain. Based on additional analysis, 25 acres, or 3.7%, of the floodplain is developed. To limit additional development from occurring within floodplains, Whitman adopted a Floodplain and Watershed Protection District. The district is intended to provide that lands in the Town of Whitman subject to seasonal or periodic flooding as described hereinafter shall not be used for residence or other purposes in such a manner as to endanger the health or safety of the occupants thereof, or the public generally, or as to burden the public with costs resulting from unwise individual choices of land use; to protect, preserve and maintain the water table and water recharge areas within the Town so as to preserve present and potential water supplies for the public health and safety; to assure the continuation of the natural flow pattern of the water courses within the Town in order to provide adequate and safe floodwater storage capacity to protect persons and property against the hazards of flood inundation.

Of the 60 critical facilities identified in Whitman, two are located within a 100-year floodplain and consist of the only dam in town and the public works facility. It should be noted that in the town’s action plan, one of the actions is to construct a new public works facility - outside of a floodplain. There are no critical facilities located in any of the locally identified flood areas, although there are two, the 7-Eleven and the Beth Israel Deaconess Medical Center, located within a couple hundred feet of where flooding has historically occurred on Route 14 at Pine Haven Drive, as noted above.

According to MEMA, there are currently 16 National Flood Insurance Program (NFIP) policies in-force in Whitman, with a total of 17 claims being made from 1978 to November 2013, totalling \$210,737. It should be noted that there is one residential Repetitive Loss (RL) property in Whitman that has had two claims totalling \$3,701. There are no Severe Repetitive Loss Properties (SRL) in Whitman.

Bridges

There are no bridges in Whitman that span waterways according to the Massachusetts Department of Transportation (MassDOT).

Dams

Table 91 indicates that there is one dam in Whitman according to the Massachusetts Department of Conservation & Recreation Office of Dam Safety. The Department of Public Works stated that the Shumatuscacant River sometimes rises several feet during major storms, coming close to nearby buildings and as well as South Avenue. This may suggest examining the height of the Hobart Pond Dam and of the provisions for adjusting the pond level before or during a storm, as there are provisions for control boards on the dam, which have not been used in years according to the Department of Public Works. The questions are whether the various dams control systems are of suitable design or are adaptable enough to be used for flood purposes

Table 91: Whitman Dams

Name	Impoundment	Waterway	Hazard Code	Owner
Hobart Pond Dam	Hobart Pond	Shumatuscacant River	Low	Town

Winter Storms

Winter storms represent a high frequency, serious severity hazard for Whitman. Whitman receives an average of 36"-48" of snow annually, with there being an approximately 48% chance of a NESIS ranked storm occurring annually. Winter storms are dangerous to the entire population, as the accumulation of snow and ice along with high winds can impact public safety as well as the local economy by disrupting transportation and commercial activities. The buildup on snow and ice on roadways also makes for dangerous travelling conditions. The accumulation of snow and ice on trees and power lines can cause them to sag and break, potentially closing roadways and cutting off electricity to homeowners and businesses. The accumulation of heavy snow over a long period of time can affect structures with flat roofs, as the weight of heavy snow can cause them to collapse. The entire community is vulnerable to the impacts of winter storms.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms represent a medium frequency, serious severity hazard for Whitman. Whitman is most vulnerable to hurricanes/tropical storms during the summer and early autumn months. While Whitman has never been in the direct path of a hurricane or tropical storm, it has experienced the high winds and heavy rains associated with hurricanes and tropical storms that have crossed other parts of the region. Impacts from hurricanes include high winds and heavy rain, which can impact public safety as well as the local economy by disrupting transportation and commercial activities. Downed trees and localized flooding from the wind and rain that accompany hurricanes/tropical storms are the most common problems in Whitman. They can block roadways as well as down power lines, cutting off electricity to homeowners and businesses for multiple days. During Tropical Storm Irene in August 2011 it destroyed a 70 foot tall, 200+ year old landmark oak tree, which was considered a centerpiece of the town's park. The heavy rain associated with hurricanes/tropical storms can also produce flooding, which affects homeowners and businesses located in floodplains. When hurricanes/tropical storms do occur, they affect the entire town, making no locations more vulnerable than others to hurricanes/tropical storms.

Extreme Temperatures

Extreme temperatures represent a high frequency, minor severity hazard for Whitman. Whitman is most vulnerable to extreme temperatures during the summer and winter months. Extreme temperatures represent the highest hazard to young children, the elderly and people who are outside for any length of time, such as homeless persons, or persons who work outside. Persons who live in poorly insulated homes are also subject to the dangers associated with extreme temperatures. Dangers that can result from being exposed to extreme cold temperatures include frostnip, frostbite and hypothermia. Dangers from being exposed to extreme heat include heat cramps, heat exhaustion and heat stroke. If people suffering from any of these conditions are not treated immediately, their conditions will only worsen. When extreme temperatures do occur, the entire community is vulnerable to the impacts.

Wildfires

Wildfires represent a medium frequency, minor severity hazard for Whitman. As a mature suburban community, the town is well-developed, with the exception of the two meadows in town - Bear Meadow in the northern part of town and Hobart Meadow in the southeastern part of town. While a significant wildfire has not occurred in these areas, it does remain vulnerable to

the threat of wildfires due to its sheer size. Also of potential concern is the Wildland-Urban Interface (WUI) (the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels) on the edges of these undeveloped areas, where residential housing is located.

Tornadoes

Tornadoes represent a very low frequency, serious severity hazard for Whitman. While Whitman has never experienced a recorded tornado, several communities surrounding Whitman have. Most of the tornadoes that have occurred in the region were low in intensity, with most being an EF-0 or EF-1 on the Enhanced Fujita Scale. Additionally, most of the tornadoes only lasted for a short period of time before they dissipated, limiting the amount of damage they caused. Based on historical events, future tornadoes in the Old Colony region will also likely be EF-0 or EF-1 tornadoes. Due to the historic nature of the town (settled in 1670) there is the potential for a prolonged and more intense tornado to cause a moderate amount of damage, due to the large number of structures that were constructed prior to the establishment of building codes. As it is impossible to predict the exact locations of future tornadoes, the entire community is vulnerable to the impacts.

Earthquakes

Earthquakes represent a very low frequency, serious severity hazard for Whitman. Although the town has not experienced a recorded earthquake, earthquakes have occurred in other communities in the Old Colony region and they are likely to occur in the future. Based on historical events, earthquakes in the Old Colony region will likely be in the 2-3 magnitude range. According to the USGS, earthquake damage usually occurs with earthquakes in the 4-5 magnitude range, but many variables affect damage, such as building age, soil type, distance from the epicenter, etc. Due to the historic nature of the town there is the potential for a moderate earthquake to do damage, especially to the older buildings in Whitman. As it is impossible to predict the exact locations of future earthquakes, the entire community is vulnerable to the impacts.

Landslides

Landslides represent a very low frequency, minor hazard for Whitman. Whitman has not experienced a recorded landslide and is not especially vulnerable to landslides due to its lack of hills and generally flat topography.

Major Urban Fires

Major urban fires do not pose a threat to Whitman, as there are no major urban areas in town.

Coastal Erosion & Shoreline Change

Coastal erosion and shoreline change do not pose a threat to Whitman, as it is not located along the coast.

Tsunamis

Tsunamis do not pose a threat to Whitman, as it is not located along the coast.

CHAPTER 6: EXISTING PROTECTION MEASURES

Each of the 15 communities in the Old Colony region has taken steps to protect themselves against the threat of natural hazards. The 15 tables below (Tables 92-106) provide an overview of the existing mitigation programs, plans, regulations and efforts in each of the communities within the Old Colony region.

Each of the existing protection measures is described in the following categories:

- Type of Existing Protection: Identifies the existing protection measure that a community has taken to defend itself against the threat of natural hazards.
- Description of Existing Protection: Describes each existing protection measure that is in place to prevent damage caused by natural hazards.
- Area Covered: Identifies the area of the community that is covered by a particular existing protection measure.
- Effectiveness: Describes the effectiveness of each existing protection measure.
- Improvements Needed (if any): Identifies what, if any, improvements are needed to make the existing protection measures as strong as possible.

Table 92: Abington Existing Protection Measures

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and manmade emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The town regularly participates in local and regional emergency planning committees.	Town-wide	Effective	None
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout the town.	Municipal Buildings	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Floodplain and Wetlands Protection District	This district protects and preserves the marshes, bogs, ponds, water courses and their adjoining wetlands; reduces the hazards of floods upon the public health, safety and general welfare; protects floodplain occupants from a flood that is or may be caused by their own land use and that is or may be undertaken without full realization of the dangers therein; protects the public from the burden of extraordinary financial expenditure for flood control and relief; protects the capacity of the floodplain and wetland areas to absorb, transmit and store runoff; assures the retention of sufficient floodway area to convey flows which can reasonably be expected to occur.	Floodplain and Wetlands Protection District	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Watershed Protection District	This district protects the public health by preventing contamination of the ground and surface water resources both existing and future which provide drinking water to the town. Because pollution of groundwater resources can occur as a result of the cumulative effect of many insignificant uses, there is a need to establish parameters for land use in these specific areas to avoid pollutants which would affect the water supplies.	Watershed Protection District	Effective	None
Wetlands Protection Bylaw	The town has adopted a wetlands protection bylaw that is more restrictive than the Mass. Wetlands Protection Act. The bylaw protects the wetlands and all resource areas in town, by controlling activities deemed to have a significant effect upon wetland values.	Town-wide	Effective	None
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins throughout town.	Town-wide	Effective	None
Street Sweeping	The town conducts street sweeping on an annual basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None
Cooling Centers	The town opens cooling centers as weather conditions warrant.	Town-wide	Effective	None

Table 93: Avon Existing Protection Measures

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The town regularly participates in local and regional emergency planning committees.	Town-wide	Effective	None
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout the town.	Municipal Buildings	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Floodplain District	This district preserves and protects the streams and other watercourses in town; protects the health and safety of persons and property against the hazards of flooding; preserves and maintains the groundwater table for water supply purposes; protects against the detrimental use and development of lands adjoining watercourses and conserves the watershed areas in town.	Floodplain District	Effective	None
Water Supply Protection District	This district promotes the health, safety and welfare of the town by protecting existing and potential water supplies through the preservation and maintenance of the groundwater table and surface waters.	Water Supply Protection District	Effective	None
Catch Basin & Culvert Maintenance	The town regularly cleans and maintains the catch basins and culverts throughout town.	Town-wide	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Street Sweeping	The town conducts street sweeping on an annual basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None

Table 94: Existing Protection Matrix-Bridgewater

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout the town and on the town's cable access station.	Municipal Buildings	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Floodplain District	This district provides that lands subject to seasonal or periodic flooding not be used for housing or other purposes as to endanger the health or safety of the public or burden the public with costs from unwise land choices; protects, preserves and maintains the water table and water recharge areas to preserve present and potential water supplies; assures the continuation of the natural flow of watercourses to provide for adequate and safe floodwater storage capacity.	Floodplain District	Effective	None
Aquifer Protection District	This district protects, preserves and maintains the existing and potential groundwater and surface water supplies; prevents pollution of ground and surface water supplies; assures the continued availability of the town's water supply; promotes and protects the health, safety and welfare of the town.	Aquifer Protection District	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Wetlands Protection Bylaw	The town has adopted a wetlands protection bylaw that is more restrictive than the Mass. Wetlands Protection Act. The bylaw protects the wetlands and all resource areas in town, by controlling activities deemed to have a significant effect upon wetland values.	Town-wide	Effective	None
Maintenance of Stormwater Drain Facilities Bylaw	This bylaw protects the public health, safety and welfare by ensuring the routine maintenance of detention basins and other open stormwater drainage facilities within subdivisions which have been approved under MGL Ch. 41	Town-wide	Effective	None
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins throughout town.	Town-wide	Effective	None
Street Sweeping	The town conducts street sweeping on a regular basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None
Cooling Centers	The town opens cooling centers as weather conditions warrant.	Town-wide	Effective	None
Green Community Designation	The town has been designated by the DOER as a Green Community. With that designation the community is working towards improving energy efficiency and reducing greenhouse gas emissions, both of which mitigate impacts associated with climate change.	Town-wide	Effective	None

Table 95: Existing Protection Matrix-Brockton

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	City-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	City-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The city regularly participates in local and regional emergency planning committees.	City-wide	Effective	None
Public Information & Outreach	The city provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout the city as well as on the city's website.	Municipal Buildings & City Website	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	City-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Floodplain, Watershed and Wetland Protection Zone	The district preserves and protects the ponds, brooks, marshes, swamps, bogs and other natural waterbodies, areas of high water table and key watershed areas; maintains and protects ground and surface water supplies; maintains the water storage and absorption capacity of wetlands and the capacity of floodways; reduces the hazards of flooding upon the public health and welfare and protects the health and safety of floodplain residents; protect the community from the expenses of flood relief; conserve natural conditions, wildlife and open space for general welfare.	Floodplain, Watershed and Wetland Protection Zone	Effective	None
Catch Basin Maintenance	The city regularly cleans and maintains the catch basins throughout city.	City-wide	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Street Sweeping	The city conducts street sweeping on a regular basis.	City-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	City-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	City-wide	Effective	None
Winter Storm Road Pre-Treatment	The city pre-treats roadways throughout the city to reduce the buildup of snow and ice.	City-wide	Effective	None
Cooling Centers	The city opens cooling centers as weather conditions warrant.	City-wide	Effective	None

Table 96: Existing Protection Matrix-East Bridgewater

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout town as well as on the town's website.	Municipal Buildings & Town Website	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Floodplain & Watershed Protection District	The district protects and preserves marshes, bogs ponds and wetlands; reduces the hazards of floods upon the public health, safety and welfare; protects floodplain occupants from flooding; protects the public from the costs of flood control and relief; protects the capacity of the floodplain, watershed and wetland areas to store runoff; assures the retention of sufficient floodway to convey flows which can occur.	Floodplain & Watershed Protection District	Effective	None
Stormwater Master Plan	The Stormwater Master Plan consists of public education and outreach, public involvement and participation, illicit discharge detection & elimination, construction site stormwater runoff control, post-construction stormwater management and pollution prevention.	Town-wide	Effective	None
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins throughout town.	Town-wide	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Street Sweeping	The town conducts street sweeping on a regular basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None
Cooling Centers	The town opens cooling centers as weather conditions warrant.	Town-wide	Effective	None

Table 97: Existing Protection Matrix-Easton

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The town regularly participates in local and regional emergency planning committees.	Town-wide	Effective	None
Public Information & Outreach	The town provides residents with information about potential natural hazards via the town's website, reverse 911 calls, brochures and flyers in Town Hall, the Town Crier and social media networks.	Municipal Buildings & Town Website	Effective	None
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Floodplain District	This district preserves and protects streams, brooks, ponds, lakes, and other watercourses and their adjoining lands within the town; protects the health and safety of persons and property against the hazards of flooding; preserves the natural flood control characteristics, and flood storage capacity of the floodplain and preserves and maintains the groundwater table and water recharge areas within the floodplain; protects the community against the detrimental use and the development of lands adjoining such watercourses and conserves the watershed areas of the town for the health, safety and welfare of the public.	Floodplain District	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Aquifer Protection District	This district protects existing and potential groundwater supplies and recharge areas, as groundwater is the sole source of drinking water in town. The bylaw is designed to protect groundwater supplies from detrimental development and land use practices, and to ensure the adequate quality and quantity of drinking water for distribution within town.	Aquifer Protection District	Effective	None
Stormwater Management Bylaw	The purpose of this bylaw is to eliminate non-stormwater discharges to the municipal storm drainage system and also to eliminate or reduce the adverse effects of soil erosion and sediments from contaminating town watercourses.	Town-wide	Effective	None
Wetlands Protection Bylaw	The town has adopted a wetlands protection bylaw that is more restrictive than the Mass. Wetlands Protection Act. The bylaw protects the wetlands and all resource areas in town, by controlling activities deemed to have a significant effect upon wetland values.	Town-wide	Effective	None
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins throughout town.	Town-wide	Effective	None
Street Sweeping	The town conducts street sweeping on a regular basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Mobile Home Tie-Down Regulations	The town requires and inspects that all mobile homes in town are tied down to protect against high winds.	Easton Mobile Home Park	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None
Green Community Designation	The town has been designated by the DOER as a Green Community. With that designation the community is working towards improving energy efficiency and reducing greenhouse gas emissions, both of which mitigate impacts associated with climate change.	Town-wide	Effective	None-Ongoing Program

Table 98: Existing Protection Measures-Halifax

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The town regularly participates in local and regional emergency planning committees.	Town-wide	Effective	None
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout town and on the town's website.	Municipal Buildings & Town Website	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Conservancy District	This district protects the town's wetlands, floodplains and bogs while allowing appropriate development. Most public and agricultural uses are allowed as of right, housing and institutions require special permits and business, commercial and recreation uses are prohibited.	Conservancy District	Effective	None
Floodplain District	This district preserves and protects streams and other watercourses in town and their adjoining lands; protects the health and safety of persons and property against the hazards of flooding; protects the community against the detrimental use and development of lands adjoining watercourses; conserves the watershed areas of town for the health and safety of the public.	Floodplain District	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Wetlands Protection Bylaw	The town has adopted a wetlands protection bylaw that is more restrictive than the Mass. Wetlands Protection Act. The bylaw protects wetlands, related water sources and adjoining land areas in town which may have or are likely to have any adverse or cumulatively adverse effect upon wetland values, including but not limited to the following: public or private water supply, groundwater, flood control, erosion and sedimentation control, storm damage prevention, water pollution, air pollution, noise pollution, fisheries, shellfish, wildlife habitat, recreation, aesthetics, agriculture and aquaculture values.	Town-wide	Effective	None
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins throughout town.	Town-wide	Effective	None
Street Sweeping	The town conducts street sweeping on a regular basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None
Cooling Centers	The town opens cooling centers as weather conditions warrant.	Town-wide	Effective	None

Table 99: Existing Protection Measures-Hanson

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The town regularly participates in local and regional emergency planning committees.	Town-wide	Effective	None
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout the town.	Municipal Buildings	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Agricultural-Recreation District	This district protects persons and property against hazards of flood water inundation and unsuitable and unhealthy development of unsuitable soils, swamp land, marsh land and water courses and to protect the balance of nature. Watershed and Wetland Areas are included in this District to facilitate the adequate protection of the natural storage capacity of the watershed, to protect, preserve and maintain the water table and water recharge areas.	Agricultural-Recreation District	Effective	None
Aquifer and Well Protection District	This district protects the public health by preventing the pollution of ground and surface water resources that provide the public water supply.	Aquifer and Well Protection District	Effective	None
National Flood Insurance District	This district insures proper floodplain management consistent with criteria established by the NFIP.	Special Flood Hazard Areas	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins throughout town.	Town-wide	Effective	None
Street Sweeping	The town conducts street sweeping on an annual basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None
Cooling Centers	The town opens cooling centers as weather conditions warrant.	Town-wide	Effective	None

Table 100: Existing Protection Measures-Kingston

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The town regularly participates in local and regional emergency planning committees.	Town-wide	Effective	None
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout the town.	Municipal Buildings	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Conservancy District	This district provides for the conservation of water resources and water bodies and the preservation of open space.	Conservancy District	Effective	None
Floodplain Overlay District	This district protects the public health, safety, and general welfare; protects human life and property from the hazards of periodic flooding; preserves the natural flood control characteristics and the flood storage capacity of the floodplain; preserves and maintains the groundwater table and water recharge areas within the floodplain.	Floodplain Overlay District	Effective	None
Water Resource Overlay District	This district preserves the quality and quantity of the town's groundwater and surface water resources in order to insure a safe, clean and healthy public water supply.	Water Resource Overlay District	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins throughout town.	Town-wide	Effective	None
Street Sweeping	The town conducts street sweeping on an annual basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Mobile Home Tie-Down Regulations	The town requires and inspects that all mobile homes in town are tied down to protect against high winds.	Mobile Home Parks-Conifer Green & Country Estates	Effective	None
Setback Minimums on Seawalls	The town has a minimum setback for all structures near seawalls.	Town-wide	Effective	None
Seawall System	The town has a system of seawalls to protect infrastructure and buildings near the coast.	Town-wide	Effective	Replace and repair seawalls as needed
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None
Cooling Centers	The town opens cooling centers as weather conditions warrant.	Town-wide	Effective	None
Green Community Designation	The town has been designated by the DOER as a Green Community. With that designation the community is working towards improving energy efficiency and reducing greenhouse gas emissions, both of which mitigate impacts associated with climate change.	Town-wide	Effective	None-Ongoing Program

Table 101: Existing Protection Measures-Pembroke

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The town regularly participates in local and regional emergency planning committees.	Town-wide	Effective	None
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout the town as well as on the town's website.	Municipal Buildings & Town Website	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Water Resource and Groundwater Protection District	This district preserves and protects the town's drinking water resources from the discharge of pollutants, which minimizes the risk to the public health and the environment due to such discharges.	Water Resource and Groundwater Protection District	Effective	None
Floodplain & Watershed Protection District	This district protects the health and safety of persons against the hazards of flooding; conserves the value of land and buildings; facilitates the adequate provision of the water supply through the preservation of the groundwater table; protects the marshes, bogs, ponds and watercourses and adjoining wetlands; protects the town's environmental features by reducing pollution, sedimentation and the destruction of town waterways.	Floodplain & Watershed Protection District	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Stormwater Management Bylaw	This bylaw regulates the illicit connections and discharges to storm drain systems, which is necessary for the protection of the town's water bodies and groundwater, and to safeguard the public health, safety, welfare, and the environment. The purpose of the bylaw is to address cases where stormwater may be discharged to the municipal storm drain system.	Town-wide	Effective	None
Wetlands Protection Bylaw	The town has adopted a wetlands protection bylaw that is more restrictive than the Mass. Wetlands Protection Act. The bylaw protects the wetlands and all resource areas in town, by controlling activities deemed to have a significant effect upon wetland values.	Town-wide	Effective	None
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins throughout town.	Town-wide	Effective	None
Street Sweeping	The town conducts street sweeping on a regular basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None

Table 102: Existing Protection Measures-Plymouth

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Massachusetts State Building Code	The town actively implements code enforcement for buildings and hazardous conditions with adopted codes. The Fire Department and Inspectional Service Department review, adopt and implement all current building and fire codes per state cycle.	Town-wide	Effective	None
Periodic Reviews of Flood Management Planning & Land Use Codes	The town periodically reviews its Flood Management Planning and Land Use Codes to ensure that potentially hazardous conditions are mitigated and in compliance with the CRS Program.	Town-wide	Effective	None
Participation in State & National Building Code Development Groups	The town actively participates in state and national building code development groups to ensure that development in hazard areas is properly addressed.	Town-wide	Effective	None
Monitoring of Underdeveloped or Unsustained Commercial & private properties	Documented an increased awareness of population increases, economic downturn, employment insecurity and underdeveloped or unsustained commercial and private properties which may amend building and fire codes to identify and improve buildings to mitigate hazards.	Town-wide	Effective	None
Continuous Update of Town's Emergency Operations Plan	The Office of Emergency Management (OEM) works to continually refine and update the town's Emergency Management Plan coordinating state, federal and local comprehensive hazards planning.	Town-wide	Effective	None
Conduct Local Emergency Planning Committee Meetings	The OEM conducts quarterly Local Emergency Planning Committee meetings, focusing on preparing for hazards which require advance preparedness training.	Town-wide	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Dam Removal Operations	The Department of Public Works has moved proactively in seeking state and federal funding to support the town's Dam Hazards removal operations.	Town-wide	Effective	Federal and State Funds to assist with the removal of dams throughout Plymouth
Enforce Compliance with MassDEP & Federal Environmental Quality Standards	The town offices of Environmental Management, Fire Prevention and Inspectional Services monitor and enforce compliance with MassDEP and federal environmental quality standards.	Town-wide	Effective	None
Drainage Improvements & Maintenance	The Department of Public Works maintains continuous drainage improvements with emphasis on flood prone and coastal downstream locations.	Town-wide	Effective	None
Evacuation Planning	The OEM conducts 3 year transportation estimates and emergency evacuation planning with Entergy Nuclear related to their Radiological Emergency Preparedness (REP) planning. Annual REP planning reviews support training and administrative updates for high priority emergency services and vulnerable operations in town.	Town-wide	Effective	None
Management of Greenbelt & Defensible Zone Firefighting Space	The Fire Dept. annually manages green-belt and defensible zone firefighting space areas along the suburban-wildland interface. The Fire Dept. contributes coordination, personnel and equipment to assisting state and federal wildland fire mitigation projects.	Town-wide	Effective	None
Management of Undeveloped Coastal, Commercial & Wildfire Interface Areas	Manage undeveloped coastal, commercial and wildfire interface areas through zoning regulations. Building codes and permitting processes. Implements and annually reviews a robust town wide GIS program.	Town-wide	Effective	None

Table 103: Existing Protection Measures-Plympton

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The town regularly participates in local and regional emergency planning committees.	Town-wide	Effective	None
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout the town.	Municipal Buildings	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Floodplain and Watershed Protection District	This district protects the health and safety of persons against the hazards of flooding; conserves the value of land and buildings, facilitates the adequate provision of a water supply through preservation and maintenance of the groundwater table; protects and preserves the marshes, bogs, ponds and watercourses and their adjoining wetlands; encourages the most appropriate use of wetlands; encourages the most appropriate use of the land to preserve and increase the amenities of the town.	Floodplain and Watershed Protection District	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Groundwater Protection District	To protect, preserve and maintain the existing and potential groundwater supply and recharge areas within the Town; to promote the health, safety and general welfare of the community; to create overlay districts which circumscribe aquifers and aquifer recharge areas and impose conditions, where such are necessary to accomplish the purpose of the groundwater protection districts.	Groundwater Protection District	Effective	None
Wetlands Protection Bylaw	The town has adopted a wetlands protection bylaw that is more restrictive than the Mass. Wetlands Protection Act. This bylaw protects wetlands, water resources, flood prone areas, and adjoining upland areas in the town. The bylaw controls activities determined by the Conservation Commission likely to have a significant or cumulative effect on resource area values.	Town-wide	Effective	None
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins throughout town.	Town-wide	Effective	None
Street Sweeping	The town conducts street sweeping on an annual basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None
Cooling Centers	The town opens cooling centers as weather conditions warrant.	Town-wide	Effective	None

Table 104: Existing Protection Measures-Stoughton

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The town regularly participates in local and regional emergency planning committees.	Town-wide	Effective	None
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout the town.	Municipal Buildings	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Wetland, Flood Hazard and Watershed District	This district protects, preserves and maintains the water table and water recharge areas in town; assures the continuation of the natural flow pattern of the water courses in town to provide adequate and safe floodwater storage capacity; protects against costs and hazards to life, health and safety when unsuitable development occurs in watershed areas and wetlands, or areas subject to floods; protects property owners from damages consequent to the obstruction of flood run-off; protects future property owners who would develop or use areas subject to periodic damage by flooding.	Wetland, Flood Hazard and Watershed District	Effective	None
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins throughout town.	Town-wide	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Street Sweeping	The town conducts street sweeping on an annual basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None
Cooling Centers	The town opens cooling centers as weather conditions warrant.	Town-wide	Effective	None

Table 105: Existing Protection Measures-West Bridgewater

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The town regularly participates in local and regional emergency planning committees.	Town-wide	Effective	None
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout the town.	Municipal Buildings	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Floodplain District	The district protects the public health, safety and general welfare; to protect life and property from the hazards of flooding; preserves the natural flood control characteristics and flood storage capacity of the floodplain; preserves and maintains the groundwater table and recharge areas within the floodplain.	Floodplain District	Effective	None
Water Resource Protection District	The district protects the public health from contamination of existing and potential public groundwater supplies and protects, preserves and maintains the aquifers and recharge areas of existing and potential groundwater supplies.	Water Resource Protection District	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Wetlands Protection Bylaw	The town has adopted a wetlands protection bylaw that is more restrictive than the Mass. Wetlands Protection Act. The bylaw protects the wetlands and all resource areas in town, by controlling activities deemed to have a significant effect upon wetland values.	Town-wide	Effective	None
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins throughout town.	Town-wide	Effective	None
Street Sweeping	The town conducts street sweeping on a regular basis.	Town-wide	Effective	None
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None
Cooling Centers	The town opens cooling centers as weather conditions warrant.	Town-wide	Effective	None

Table 106: Existing Protection Measures-Whitman

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Comprehensive Emergency Management Plan (CEMP)	The CEMP addresses mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies.	Town-wide	Effective	None
Emergency Power Generators	The town maintains emergency power generators in several important public facilities/ shelters.	Town-wide	Effective	Generators need to be maintained and replaced as needed
Regional & Local Emergency Planning Committees	The town regularly participates in local and regional emergency planning committees.	Town-wide	Effective	None
Public Information & Outreach	The town provides residents with information about potential natural hazards with leaflets and brochures in municipal buildings throughout the town.	Municipal Buildings	Somewhat Effective	Information could be updated and/or replaced on a regular basis
Natural Hazard Mitigation Plan	Update and adopt the Natural Hazard Mitigation Plan every five years.	Town-wide	Effective	None
Participation in the National Flood Insurance Program (NFIP)	Provides flood insurance for structures located within a floodplain.	FEMA Flood Zones	Effective	None
Floodplain & Watershed Protection District	This district provides that lands subject to seasonal or periodic flooding not be used for housing or other purposes as to endanger the health or safety of the public or burden the public with costs resulting from unwise land choices; protects, preserves and maintains the water table and water recharge areas to preserve present and potential water supplies; assures the continuation of the natural flow of watercourses to provide for adequate and safe floodwater storage capacity.	Floodplain & Watershed Protection District	Effective	None
Catch Basin Maintenance	The town regularly cleans and maintains the catch basins and culverts throughout the town on a semi-annual basis.	Town-wide	Effective	None
Street Sweeping	The town conducts street sweeping on a semiannual basis.	Town-wide	Effective	None

Type of Existing Protection	Description	Area Covered	Effectiveness	Improvements Needed
Enforcement of State Building Code	The Building Inspector enforces the state building code.	Town-wide	Effective	None
Tree Trimming	The town works with utility providers to trim trees that may impact utility lines.	Town-wide	Effective	None
Burn Permit	The town requires residents to obtain a burn permit from the Fire Department before conducting outdoor burns.	Town-wide	Effective	None
Fire Department Review of New Development	The Fire Department participates in the review of all new development in town.	Town-wide	Effective	None
Cooling Centers	The town opens cooling centers as weather conditions warrant.	Town-wide	Effective	None

CHAPTER 7: REGIONAL VULNERABILITY/RISK ASSESSMENT

Overall Vulnerability

Table 107 shows that since 1953 there have been twenty-three declared natural disasters that have occurred within one of three counties (Bristol, Norfolk & Plymouth) of the Old Colony region.

Table 107: FEMA Disaster Declarations in the Old Colony Region: 1953-2013⁵⁵

Incident Period	Disaster Number	Incident Description	OCPC Counties Affected
2/8/2013- 2/9/2013	FEMA-DR-4110	Severe Winter Storm, Snowstorm & Flooding	Bristol, Norfolk & Plymouth
10/27/2012- 11/8/2012	FEMA-DR-4097	Hurricane Sandy	Bristol & Plymouth
8/27/2011- 8/29/2011	FEMA-DR-4028	Tropical Storm Irene	Bristol, Norfolk & Plymouth
1/11/2011- 1/12/2011	FEMA-DR-1959	Severe Winter Storm & Snowstorm	Norfolk
3/12/2010- 4/26/2010	FEMA-DR-1895	Severe Storms & Flooding	Bristol, Norfolk & Plymouth
4/15/2007- 4/25/2007	FEMA-DR-1701	Severe Storms and Inland & Coastal Flooding	Plymouth
10/07/2005- 10/16/2005	FEMA-DR-1614	Severe Storms & Flooding	Bristol, Norfolk & Plymouth
4/1/2004- 4/30/2004	FEMA-DR-1512	Flooding	Norfolk
3/5/2001- 4/16/2001	FEMA-DR-1364	Severe Storms & Flooding	Bristol, Norfolk & Plymouth
6/13/1998- 7/6/1998	FEMA-DR-1224	Heavy Rain & Flooding	Bristol, Norfolk & Plymouth
10/20/1996- 10/25/1996	FEMA-DR-1142	Severe Storms & Flooding	Norfolk & Plymouth
1/7/1996- 1/13/1996	FEMA-DR-1090	Blizzard	Bristol, Norfolk & Plymouth
12/11/1992- 12/13/1992	FEMA-DR-975	Winter Coastal Storm	Norfolk & Plymouth
10/31/1991- 11/2/1991	FEMA-DR-920	Severe Coastal Storms	Norfolk & Plymouth
8/19/1991	FEMA-DR-914	Hurricane Bob	Bristol & Plymouth
3/30/1987- 4/13/1987	FEMA-DR-790	Severe Storms, Flooding	Norfolk
9/27/1985	FEMA-DR-751	Hurricane Gloria	Bristol, Norfolk & Plymouth
2/6/1978- 2/8/1978	FEMA-DR-546	Coastal Storms, Flood, Ice, Snow	Bristol, Norfolk & Plymouth
9/28/1972	FEMA-DR-357	Toxic Algae in Coastal Waters	
3/6/1972	FEMA-DR-325	Severe Storms, Flooding	Norfolk & Plymouth

⁵⁵ Federal Emergency Management Agency (FEMA): Disaster Declarations:
http://www.fema.gov/disasters/grid/state/2?field_disaster_type_term_tid_1=All

Incident Period	Disaster Number	Incident Description	OCPC Counties Affected
8/20/1955	FEMA-DR-43	Hurricane, Floods	
9/2/1954	FEMA-DR-22	Hurricanes	
6/11/1953	FEMA-DR-7	Tornado	

Based on the identification and profile of natural hazards that have occurred and may occur in the Old Colony region, natural hazard risk assessment tables have been developed for both individual communities as well as for the region. The natural hazard risk assessment tables for individual communities are contained within Chapter 5: Community Hazard Risk Assessment. The Regional Community Hazard Risk Assessment is located in Tables 108-111. OCPC utilized evaluation criteria contained within the Massachusetts Hazard Mitigation Plan to determine the frequency of occurrence, severity and the area of impact. To determine the overall hazard ranking for the region, the Multi-Hazard Community Planning Team (MHCPT) assigned a point scale to each of the categories below on a 1-4 scale, with 1 point being assigned to the least frequent, severe and damaging category to 4 points for the most frequent, severe and damaging category.

Table 108: Hazard Frequency Categorization

Category	Description	Points
Very Low	Events that occur less frequently than once in 100 years. (Less than 1% per year)	1
Low	Events that occur from once in 50 years to once in 100 years. (1% to 2% per year)	2
Medium	Events that occur from once in 5 years to once in 50 years. (2% to 20% per year)	3
High	Events that occur more frequently than once in 5 years. (Greater than 20% per year)	4

Table 109: Hazard Severity Categorization

Category	Description	Points
Minor	Limited and scattered property damage; limited damage to public infrastructure and essential services not interrupted; limited injuries or fatalities.	1
Serious	Scattered major property damage; some minor infrastructure damage; essential services are briefly interrupted; some injuries and/or fatalities.	2
Extensive	Widespread major property damage; major public infrastructure damage (up to several days for repairs); essential services are interrupted from several hours to several days; many injuries and/or fatalities.	3
Catastrophic	Property and public infrastructure destroyed; essential services stopped; numerous injuries and fatalities.	4

Table 110: Hazard Area of Impact

Category	Description	Points
Isolated	A single whole or partial community impacted.	1
Local	One community to several communities impacted.	2
Regional	Many communities to a county impacted.	3
Widespread	Multiple counties impacted.	4

Table 111: Hazards Affecting the Old Colony Region

Natural Hazard	Frequency	Severity	Area of Impact	Hazard Ranking
Flooding	High	Extensive	Regional	10
Winter Storms	High	Serious	Widespread	10
Hurricanes & Tropical Storms	Medium	Extensive	Widespread	10
Coastal Erosion & Shoreline Change	High	Serious	Local	8
Extreme Temperatures	Medium	Minor	Widespread	8
Tsunami	Very Low	Extensive	Widespread	8
Tornadoes	Medium	Serious	Local	7
Wildfire	Medium	Minor	Local	6
Earthquake	Very Low	Minor	Regional	5
Landslide	Low	Minor	Isolated	4
Major Urban Fire	Low	Minor	Isolated	4

Regional Vulnerability Assessment Utilizing HAZUS-MH

To get a clearer sense of the region’s vulnerabilities to certain natural hazards, OCPC utilized HAZUS-MH software. HAZUS is a nationally applicable standardized methodology that contains models for estimating potential losses from earthquakes, floods, and hurricanes. HAZUS uses Geographic Information Systems (GIS) technology to estimate physical, economic, and social impacts of disasters.⁵⁶

HAZUS is used for mitigation and recovery as well as preparedness and response. Government planners, GIS specialists, and emergency managers use HAZUS to determine losses and the most beneficial mitigation approaches to take to minimize them. HAZUS can be used in the assessment step in the mitigation planning process, which is the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. Being ready will aid in recovery after a natural disaster.⁵⁷

There are three levels of analysis at which HAZUS can be run, each level based on the effort and expertise employed by the user. For the purpose of this plan, OCPC utilized a Level 1 analysis, which uses national baseline data on items such as building types, utilities, transportation, etc. and is the quickest way to conduct a risk assessment. While running a Level 1 analysis HAZUS can generate a lot of information, but it has to be taken with caution, as it was run using default data-not community or regional specific data. For the purposes of this plan, a Level 1 analysis is effective because the plan is attempting to only generally indicate the extent of possible damages caused by a particular natural hazard.

Estimated Damages from Hurricanes

HAZUS was used to model potential damages to the region based on both a 100 year and 500 year hurricane wind event (.01% and .005% probabilities of striking the region in a given year respectively). The damages caused by these hypothetical hurricanes were modeled as if the storm track passed through the geographic center of the region-southern Plympton. While hurricanes

⁵⁶ Federal Emergency Management Agency (FEMA): Hazus: <http://www.fema.gov/hazus>

⁵⁷ *Ibid.*

are generally uncommon in the region, it was decided to run both a 100 year and 500 year hurricane wind event model to show the difference between the damage caused by a moderate hurricane versus a catastrophic hurricane (Table 112).

Table 112: Estimated Damages from Hurricanes

	100 Year	500 Year
Building Characteristics		
Estimated Total Number of Buildings	108,807	108,807
Estimated Total Building Replacement Value (millions of dollars)	\$27,821	\$27,821
Building Damages		
Number of Buildings Sustaining Slight Damage	15,139	37,855
Number of Buildings Sustaining Moderate Damage	2,558	16,285
Number of Buildings Sustaining Extensive Damage	147	2,983
Number of Buildings Completely Damaged	72	1,577
Population Needs		
Number of Households Displaced	555	4,996
Number of People Seeking Public Shelter	135	1,206
Debris		
Building Debris Generated (tons)	294,169	878,447
Tree Debris Generated (Tons)	244,456	635,715
Number of Truckloads to Clear Building Debris	1,989	9,709
Value of Damages (millions of dollars)		
Total Property Damage	\$482,516.90	\$2,527,496.81
Total Losses Due to Business Interruption	\$41,480.51	\$304,153.63

Estimated Damages from Earthquakes

The HAZUS earthquake model allows users to define an earthquake magnitude and model the damages caused by the earthquake. For this plan, the geographic center of the region-southern Plympton was used as the epicenter of the earthquake. Two different magnitude earthquakes were selected for this scenario, a 5.0 magnitude earthquake and a 7.0 magnitude earthquake (Table 113).

Table 113: Estimated Damages from Earthquakes

	5.0 Magnitude	7.0 Magnitude
Building Characteristics		
Estimated Total Number of Buildings	108,807	108,807
Estimated Total Building Replacement Value (millions of dollars)	\$27,821	\$27,821

	5.0 Magnitude	7.0 Magnitude
Building Damages		
Number of Buildings Sustaining Slight Damage	6,037	28,529
Number of Buildings Sustaining Moderate Damage	1,532	32,678
Number of Buildings Sustaining Extensive Damage	188	16,965
Number of Buildings Completely Damaged	17	12,445
Population Needs		
Number of Households Displaced	155	16,257
Number of People Seeking Public Shelter	77	10,948
Debris		
Building Debris Generated (tons)	50,000	4,030,000
Number of Truckloads to Clear Building Debris	2,000	161,000
Value of Damages (millions of dollars)		
Total Property Damage	\$10,527.18	\$105,873.53
Total Losses Due to Business Interruption	\$2,199.28	\$2,207.94

Estimated Damages from Flooding

OCPC did not use HAZUS to estimate flood damages in the region, due to technical difficulties that were experienced with the software. In lieu of using HAZUS, OCPC utilized a methodology developed by the Metropolitan Area Planning Council (MAPC) to give a rough approximation of flood damages.

The Old Colony region is approximately 344 square miles or 220,172.838 acres. Approximately 2,098.5869 acres of the 100 year floodplain in the region has been developed, which amounts to 0.953% of the land area in the region. The number of structures located in the developed floodplain area was estimated by applying the percentage of the total land area to the number of structures (108,807) in the region; the same number of structures used by HAZUS for the hurricane and earthquake calculations. HAZUS used a value of \$255,691 per structure for the building replacement value. This was used to calculate the total building replacement value in the developed floodplain area. The calculations were done for a low estimate of 10% building damages and a high estimate of 50% as suggested in the FEMA September 2002 publication, "State and Local Mitigation Planning How-to-Guides". The range of estimates for flood damages is \$26,517,193.00 to \$132,585,968.00.

Development Trends

The Old Colony region is still growing, as seen by the 3.7% increase in population from 321,515 in 2000 to 333,468 in 2010. This number is only projected to increase in the coming years with the regional population projected to be 353,000 in 2020 and 377,000 in 2035. While the growth will be spread about the region, it is more likely to occur in the eastern half of the region, where land is plentiful, such as in Plymouth.

To provide a sense of the development activity in the region since the completion of last mitigation plan in 2006, Table 114 details the numbers of residential building permits issued in each community from 2007 through 2011, along with the total construction costs associated with these permits. Overall the number of permits issued in the region annually and the associated construction costs has fallen sharply from 2007. The reasoning behind this decline is most likely the subprime mortgage crises and the ensuing economic downturn.

As can be seen on Table 114, the Town of Plymouth has issued the most building permits during the past five years, accounting for approximately 34.8% (730 of 2,092) of all building permits issued in the region from 2007 through 2011.

Table 114: Residential Building Permits & Constructions Costs 2007-2011^{*58}

Community	2007		2008		2009		2010		2011	
	# of Permits	Construction Costs	# of Permits	Construction Costs	# of Permits	Construction Costs	# of Permits	Construction Costs	# of Permits	Construction Costs
Abington	39	\$19,204,000	18	\$4,168,000	12	\$3,106,383	15	\$3,773,738	14	\$3,144,366
Avon	5	\$1,416,480	4	\$950,000	2	\$450,000	3	\$460,000	1	\$100,000
Bridgewater	46	\$7,513,319	30	\$4,929,846	23	\$3,775,566	26	\$4,389,741	20	\$3,362,677
Brockton	53	\$8,524,760	31	\$4,589,297	25	\$3,624,647	26	\$3,586,818	22	\$3,023,674
East Bridgewater	58	\$9,159,000	25	\$4,104,935	28	\$4,417,700	38	\$6,752,400	23	\$3,808,839
Easton	39	\$11,244,152	18	\$4,368,681	19	\$6,432,158	21	\$6,599,299	18	\$5,736,645
Halifax	12	\$1,995,000	5	\$544,000	6	\$818,000	8	\$1,205,465	7	\$1,286,000
Hanson	31	\$5,902,774	18	\$3,470,887	14	\$2,630,307	14	\$2,645,724	10	\$1,782,102
Kingston	16	\$3,753,700	24	\$5,895,610	29	\$5,067,396	18	\$3,353,103	20	\$4,314,343
Pembroke	69	\$11,666,600	23	\$4,758,970	22	\$5,001,813	21	\$5,055,725	15	\$3,373,241
Plymouth	177	\$37,697,605	142	\$19,881,086	125	\$24,741,087	137	\$34,980,571	149	\$26,841,406
Plympton	7	\$1,752,000	5	\$1,435,000	9	\$1,975,000	3	\$790,000	1	\$350,000
Stoughton	23	\$5,149,800	6	\$1,493,000	17	\$13,723,962	9	\$20,562,940	15	\$2,538,000
West Bridgewater	11	\$2,146,108	5	\$696,700	6	\$894,700	6	\$1,029,273	5	\$1,280,134
Whitman	48	\$6,131,948	31	\$3,957,555	23	\$2,936,679	26	\$3,319,609	22	\$2,808,925
Totals	634	\$133,257,246	385	\$65,243,567	360	\$79,595,398	371	\$98,504,406	342	\$63,750,352

**Note: Estimated with imputation*

In spite of the aforementioned subprime mortgage crises and the ensuing economic downturn, development has continued within the Old Colony region. Some of the more significant projects to occur in the region include:

- Lowe's: Bedford Street, Abington: 102,000 square feet
- Residences at Lakeshore: Pleasant Street, Bridgewater: 289 Units (Proposed)
- Waterford Village Expansion: Plymouth Street, Bridgewater: 507 Units (Proposed)
- Bernardi Honda & Bernardi Hyundai: Manley Street, Brockton: 78,000 square feet
- Market Basket: Westgate Drive, Brockton: 81,000 square feet
- Compass Medical Center: North Bedford Street, East Bridgewater: 70,000 square feet

⁵⁸ United States Census Bureau: Building Permits: <http://censtats.census.gov/cgi-bin/bldgprmt/bldgsel.pl>

- North Bedford Street Business Park: North Bedford Street, East Bridgewater: 715,000 square feet (Proposed)
- Ames Shovel Works Apartments: Main Street, Easton: 113 Units
- Highland Plaza: Robert Drive, Easton: 338,450 square feet
- AutoFair Honda of Plymouth: Long Pond Road, Plymouth: 33,000 square feet
- Sysco Boston, LLC: Spring Street, Plympton: 650,000 square feet
- Coppermill Park Apartments: Stagecoach Road, Stoughton: 154 Units
- Lodge at Stoughton: Technology Center Drive, Stoughton: 240 Units
- Shoppes at Page Point: Turnpike Street, Stoughton: 194,900 square feet
- Woodbridge Crossing: Central Street, Stoughton: 192 Units (Proposed)
- Market Basket: West Center Street, West Bridgewater: 25,500 square feet
- Bostonian Shoe Lofts: Marble Street, Whitman: 141 Units
- Whitman-Hanson Regional High School: Franklin Street, Whitman
- Village at Auburnville: Auburnville Way, Whitman: 92 Units

None of the above projects were built or redeveloped in a floodplain or other especially vulnerable area. This can be attributed to the fact that each community in the region has adopted some type of Floodplain District, as is noted in *Chapter 6: Existing Protection Measures*. These districts are designed to protect the health and safety of persons and property against the hazards of flooding and have been influential in limiting the amount and type of development in these vulnerable areas. Although the Old Colony region is located in the oldest developed part of the country, not very many structures are located in floodplains and essentially no new development occurs within floodplains thanks to these districts and other regulatory measures, such as FEMA Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS).

When reviewing critical facilities located within a 100 Year floodplain, only 163 of the 1,590 or approximately 10.25% of the critical facilities identified by local communities are located within a 100 Year floodplain. Of the 163 critical facilities located within a 100 Year floodplain, 77 or 47.2% of the facilities are dams and another 61 or 37.4% of the facilities are bridges, leaving just 25 other critical facilities located within a floodplain. Overall, the communities in the region have a strong practice of not constructing critical facilities within 100 Year floodplains.

CHAPTER 8: MITIGATION STRATEGY

Mitigation Goals

OCPC collected and analyzed natural hazard data throughout the past year. During that time, OCPC staff visited and spoke with a variety of local officials in each of the 15 communities. Personnel interviewed included but was not limited to: emergency managers, police officers, firefighters, planners, public works personnel, building inspectors and health agents. The Goals and Actions within this plan were developed as local vulnerabilities were identified and concerns were being raised by emergency responders and local officials. The following regional goal was agreed upon as this plan was being drafted.

Regional Goal: Reduce the loss of life, property, infrastructure, and environmental and cultural resources from natural disaster.

In support of the regional goal, there are five additional goals:

Goal: Investigate, design and implement structural projects that will reduce and minimize the risks and impacts from riverine and coastal flooding.

Goal: Investigate, design and implement projects that will reduce and minimize the risks and impacts from non-flooding hazards, such as wildfires, earthquakes, tornadoes, etc.

Goal: Improve pre-disaster planning, communication and coordination between federal, state, county, community, private and non-profit entities so that they can plan for and mitigate natural hazards in a clear and comprehensive manner.

Goal: Increase the awareness of the public and communities to the risks presented by the multiple natural hazards that affect the region as well as to the mitigation activities and grant opportunities available to minimize the impacts of these hazards.

Goal: Improve existing policies and programs to further reduce or eliminate the impacts of natural hazards.

Mitigation Actions

The next step in the creation of the region's mitigation strategy is to identify a series of mitigation actions that can reduce or avoid the impacts of natural hazards. The actions have been organized into the following categories, as recommended in the FEMA Local Multi-Hazard Mitigation Planning Guide (7/2008) and the Multi-Jurisdictional Mitigation Planning Guide (8/2006).

Prevention: Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation and stormwater management regulations.

Property Protection: Actions that involve the modification of existing buildings or infrastructure to protect them from a hazard or removal from a hazard area. Examples include acquisition,

elevation, relocation, structural retrofits, flood proofing, storm shutters and shatter-resistant glass.

Public Education & Awareness: Actions to inform and educate citizens, elected officials and property owners about potential risks from hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers and school-age and adult education programs.

Natural Resource Protection: Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management and wetland restoration and preservation.

Structural Projects: Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include stormwater controls (e.g. culverts), floodwalls, seawalls, retaining walls and safe rooms.

Emergency Services Protection: Actions that will protect emergency services before, during, and immediately after an occurrence. Examples of these actions include protection of warning system capability, protection of critical facilities and protection of emergency response infrastructure.

Mitigation Action Plan

The actions shown in Table 116 were identified in the 2006 Plan as well as from analyzing the needs and problems that were expressed in this plan update. The section will be divided into two parts, 1) Regional Mitigation Action Plan (Table 116), which identifies actions that can be carried out throughout the region and are not specific to any single community, and 2) Local Action Plans (Tables 117-131), which details actions specific to that community. Each of the actions are described in the following groups (with the exception of Plymouth, which added an objective to each action as well):

- Category of Action: There are six different groups of pre-disaster mitigation actions identified by FEMA for which a community may apply for hazard mitigation funding.
- Description of Mitigation Action: The description of each mitigation action measure to be taken to assist in the prevention of damage caused by natural hazards.
- Implementation Responsibility: The designation of implementation was done by OCPC based on a general knowledge of what municipalities and agencies are responsible for. It is likely that most mitigation actions will require several community departments and/or agencies work together.
- Timeframe/Priority: The designation of both the timeframe and priority of each mitigation action was done at the Multi-Hazard Community Planning Team Meetings (MHCPT) as well as at the individual community level. The designated timeframes were based on a combination of the priority of a measure, the complexity of measure, and how shovel-ready a measure was. Priorities are based on the potential benefits and projected costs of each action, as is seen in the Cost/Benefit description below. It should also be

noted that in the last iteration of the plan (2006 Old Colony Regional Multi-Hazard Pre-Disaster Mitigation Plan) mitigation actions were not prioritized.

- **Cost/Benefit Review:** The benefit/cost review was qualitative; that is, it did not include the level of detail required by FEMA for project grant eligibility under the HMGP and PDM grant program. This was done because some projects may not be implemented for up to 10 years, and the costs and benefits associated with them could change dramatically during that time. Each action was assessed was assigning subjective ratings (high, medium, and low) to its costs and benefits, as stated in Table 115 below:

Table 115 Cost/Benefit Matrix

Costs	
High	Existing funding levels are not adequate to cover the costs of the proposed project and implementation would require an increase in revenue through an alternative source, such as bonds, grants, fee increases, etc.
Medium	Action could be implemented with existing funding but would require a reapportionment of the budget or a budget amendment, or the cost of the action would have to be spread over multiple years.
Low	Action could be funded under the existing budget. The project is part of or can be part of an existing, ongoing program.
Benefits	
High	Action will have an immediate impact on the reduction of risk exposure to life and property.
Medium	Action will have a long-term impact on the reduction of risk exposure to life and property or will provide an immediate reduction in the risk exposure to property.
Low	Long-term benefits of the action are difficult to quantify in the short term.

- **Potential Funding Sources:** This column attempts to identify the most likely sources of funding for a specific measure. The information on potential funding sources in the table is preliminary and varies depending on a number of factors. These factors include whether or not a mitigation measure has been studied, evaluated or designed, or if it is still in the conceptual phase. Each grant program and agency has specific eligibility requirements that need to be taken into consideration. In most instances, the measures will require a number of different funding sources. Identification of a potential funding source in this table does not guarantee that a project will be eligible for, or selected for funding. Upon adoption of this plan, the participating communities should begin to explore the funding sources in more detail.
- **Status from 2006 Plan or New Action:** This column gives the status of a particular action. If an action was from the 2006 Plan, the status will indicate if the action has been completed, deleted, not started or ongoing. If an action is new to the plan, it will be indicated in this column. To give FEMA a comprehensive look at what mitigations actions were completed since 2006, OCPC asked each community for a list of mitigation actions that have been completed since that time. These actions are included in a bullet list at the bottom of each communities updated mitigation action plan.

It should be noted that the 2006 Old Colony Regional Multi-Hazard Pre-Disaster Mitigation Plan's regional mitigation action plan was also used as the mitigation action plan for each of the 15 communities in the form of standalone annex reports that accompanied the main regional report. During the development of this plan specific community based actions were developed by each community reflecting discussions and general consensus over a series meetings.

Table 116: Old Colony Regional Mitigation Action Plan

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006
Prevention-All Hazards	Provide technical assistance to local communities in the development, adoption and maintenance of local multi-jurisdictional hazard mitigation plans.	OCPC	5 Years/ High	Medium/ Medium	OCPC, FEMA HMA Program	New Action
Public Education & Awareness-All Hazards	Notify eligible applicants of available hazard mitigation project grant funding through the FMA, PDM, HMGP and SRL programs.	OCPC	Annually/ High	Low/ Low	OCPC	New Action
Emergency Services Protection- All Hazards	Conduct local disaster response drills.	Community Emergency Management Agencies (CEMA)	1-3 Years/ Medium	Low/ Low	CEMA Budget, Department of Homeland Security (DHS), Mass. Dept. of Public Health (DPH)	New Action
Public Education & Awareness- All Hazards	Conduct workshops to assist local businesses and cultural institutions to develop disaster mitigation plans for their facilities.	MEMA, CEMA, Private Businesses & Cultural Institutions	1-5 Years/ Medium	Low/ Low	Local Community, Private Businesses & Cultural Institutions	New Action
Emergency Services Protection- All Hazards	Develop and publicize local and regional evacuation routes.	MEMA, MassDOT, CEMA	1-3 Years/ Medium	Medium/ Medium	Local Community, MEMA, DHS, DPH	Multiple agencies have begun to undertake this project.

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Emergency Services Protection- All Hazards	Expand and formalize local agreements for use of shared mass care shelters in the event of a disaster.	CEMA, Red Cross, Regional Emergency Planning Committee (REPC)	1-5 Years/ Low	Low/ Low	Local Community	New Action
Emergency Services Protection- All Hazards	Install generators and/or back-up generators at the most critical of facilities, ex. Police, Fire, EOC, Mass Care Shelters, and Elderly Housing.	CEMA, Local Department of Public Works (DPW)	1-5 Years/ Medium	Medium/ Medium	Local Community, FEMA HMA Programs	New Action
Emergency Services Protection- All Hazards	Add additional airwave capacity for emergencies, if needed.	MEMA, CEMA	1-3 Years/ Medium	Low/ Medium	Local Community	New Action
Emergency Services Protection- All Hazards	Develop formal Mutual Aid Agreements for DPWs and Emergency Response Teams, if not done so already.	CEMA, DPW, REPC, Southeast Regional Advisory Council Homeland Security (SRACHS)	1-3 Years/ High	Low/ Low	Local Community, SRACHS	New Action
Emergency Services Protection- All Hazards	Develop a coordinated resource list of equipment to be shared among communities during an emergency.	CEMA, DPW, SRACHS	1-5 Years/ Medium	Low/ Low	Local Community	New Action
Public Education- All Hazards	Provide brochures/leaflets to landowners in hazard-prone areas that discuss hazard mitigation.	MEMA, CEMA	1-3 Years/ Low	Low/ Low	Local Community	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Emergency Services Protection- All Hazards	Educate local officials to help them develop plans to protect critical documents and materials.	MEMA, CEMA	1-5 Years/ Medium	Low/ Low	Local Community	New Action
Prevention- Flooding	Continue National Flood Insurance Program (NFIP) compliance by enforcing local floodplain ordinances.	Local Community Building Inspectors	Ongoing/ High	Medium/ Low	Local Community	New Action
Prevention- Flooding	Encourage local municipalities to consider joining the Community Rating System.	MEMA, CEMA, OCPC	1-5 Years/ Low	Low/ Low	OCPC, Local Community	New Action
Prevention- Flooding	Incorporate updated FEMA floodplain data and maps into existing and future planning efforts.	MEMA, Local Community Planning Departments	Ongoing/ High	Medium/ Low	Local Community	New Action
Property, Protection, Emergency Services Protection- Flooding	Floodproof or relocate municipally-owned critical facilities located within floodplains.	CEMA, DPW	Ongoing/ Medium	High/ High	Local Community, FEMA HMA Program	New Action
Property Protection- Flooding	Selectively elevate high-risk structures where/when appropriate.	CEMA, Property Owners	Ongoing/ Medium	High/ High	Local Community, FEMA HMA Program, Private Property Owner	Communities have not had the funding to pursue this further. Although private property owners have.
Property Protection- Flooding	Very selectively elevate key appliances in basements of homes that frequently flood where/when appropriate.	CEMA, Property Owners	Ongoing/ Medium	Medium/ Medium	FEMA HMA Programs, Private Property Owners	Communities have not had the funding to pursue this further. Although private property owners have.

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Structural Project-Flooding	Assist vulnerable businesses and cultural institutions to secure funding to retrofit their facilities against flood damage.	Chambers of Commerce, MEMA, CEMA	1-5 Years/ Medium	Medium/ Medium	Local Community, FEMA HMA Program	New Action
Property Protection-Flooding	Consider voluntary flood area acquisition programs where appropriate as well as provide incentives for land protection.	FEMA, MEMA, CEMA, Property Owners	1-10 Years/ Low	Medium/ High	Local Community, FEMA HMA Program, Private Property Owner	New Action
Prevention- Flooding	Improve enforcement of existing floodplain bylaws.	Local Community Building Inspectors	Ongoing/ Medium	High/ Low	Local Community	Some communities have enforced these fully, whereas others have not had the funding to fully enforce
Prevention- Flooding	Limit the expansion of infrastructure in hazard-prone areas.	Local Community	Ongoing/ Medium	Medium/ Low	Local Community	New Action
Prevention- Flooding	Encourage the use of Low Impact Development (LID) techniques.	Local Community	Ongoing/ Medium	Low/ Low	OCPC, Local Community	New Action
Prevention- Flooding	Develop bylaws that require the on-site containment of stormwater.	Local Community	1-10 Years/ Medium	Low/ Low	Local Community	Some communities have achieved this, while others have not due funding.
Prevention- Flooding	Study opportunities for selective enhancement of low-lying natural areas for flood storage/habitat/ open space along waterways.	Local Community	1-10 Years/ Low	Low/ Low	Local Community	Some communities have achieved this, while others have not due to a lack of funding.

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Structural Project- Flooding	Improve stormwater management systems that are located in hazard prone areas or that are inadequate.	MassDEP, Local Community	Ongoing/ Medium	High/ High	Local Community	New Action
Prevention- Flooding	Regularly maintain/clean system of catch basins.	Local Community, MassDOT	Ongoing/ High	Medium/ Low	Local Community, MassDOT	New Action
Prevention- Flooding	Regularly conduct street sweeping.	Local Community	Ongoing/ High	Medium/ Low	Local Community	New Action
Prevention, Structural Project- Flooding	Remove/modify obstacles to flow in confined spaces, such as bridges and culverts with inadequate clearance.	MassDOT, Local Community	1-3 Years/ High	High/ High	Local Community, MassDOT	Some communities have achieved this, while others have not due to a lack of funding.
Property Protection- Flooding	Encourage the flood-proofing or relocation of existing structures in floodplain zones.	Local Community, Property Owner	Ongoing/ Medium	High/ High	Local Community, Private Property Owner	New Action
Prevention- Flooding	Ensure that each dam has an updated Emergency Action Plan and Inundation Map.	DCR Office of Dam Safety, Local Community	1-10 Years/ High	Medium/ Medium	Local Community	Some communities have achieved this for each of their dams while others have not due to a lack of funding.
Prevention, Structural Project- Flooding	Inspect, maintain/upgrade older dams for present functions and stormwater management potential.	MEMA, DCR Office of Dam Safety, Local Community, Property Owner	1-3 Years/ High	High/ High	DCR, Local Community, Property Owner	Some communities have achieved this for each of their dams while others have not due to a lack of funding.

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006
Prevention- Flooding	Educate local Emergency Management Directors about dams and the risk level of the dams in their communities.	DCR Office of Dam Safety, Local Community	1-3 Years/ High	Low/ Low	DCR	New Action
Prevention/ Public Education- Flooding	Increase the working relationship between upstream and downstream dam owners.	DCR Office of Dam Safety, Local Community, Property Owner	1-10 Years/ Medium	Low/ Low	Local Community	New Action
Public Education- Flooding	Educate dam owners about their responsibilities, liabilities and alternatives they could explore.	DCR Office of Dam Safety, MEMA, Local Community, Property Owner	1-3 Years/ High	Low/ Low	Local Community	Some communities have achieved this for each of their dams while others have not due to a lack of funding.
Prevention-Hurricane	Work with utility providers to proactively trim trees around utility lines.	Local Community, Utility Provider	Ongoing/ High	Medium/ Low	Local Community, Utility Provider	Some communities are successfully working with utility companies on this matter while others are still attempting to develop more open lines of communication.
Prevention-Hurricane	Assure that mobile homes have adequate tie downs.	Local Community	Ongoing/ Medium	High/ Low	Local Community	Some communities have achieved this, while others have not due to a lack of funding.

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006
Prevention- Hurricane	Require and maintain effective lightning rods.	Local Community, Private Owner	1-5 Years/ Low	Low/ Low	Local Community, Private Property Owner	Some communities have achieved this, while others have not due to a lack of funding.
Prevention, Structural Projects-Winter Storm	Minimize snowdrifts with upwind snow fences.	Local Community, MassDOT	1-5 Years/ Low	Low/ Low	Local Community, MassDOT	Some communities have achieved this, while others have not due to a lack of funding.
Structural Project-Coastal Erosion	Selectively expand hard structures, such as seawalls and stone dikes.	CZM, Local Community	1-10 Years/ High	High/ High	Local Community	Some communities have achieved this for part of their coastline, but need additional funding to continue with this work.
Natural Resource Protection, Structural Project-Coastal Erosion	Replenish beaches and dunes-increase height of natural protective features.	U.S. Army Corps of Engineers, Local Community, MassDEP, CZM	1-10 Years/ Medium	High/ Medium	Local Community	Some communities have achieved this for part of their coastline, but need additional funding to continue with this work.
Natural Resources Protection, Structural Project-Coastal Erosion	Identify and implement beach nourishment and dune restoration needs.	MassDEP, CZM, Local Community	1-10 Years/ Low	Medium/ Medium	Local Community	Some communities have achieved this for part of their coastline, but need additional funding to continue with this work.
Prevention-Wildfire	Consider conducting controlled burns of flammable brush on public land at risk.	Local Community, State Forest Fire Warden	1-5 Years/ Medium	Medium/ Low	Local Community	Some communities are proactively doing this, while others have not due to lack of funding.

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006
Prevention-Wildfire	Require clearance of flammable underbrush near critical facilities.	Local Community, Private Owner	1-5 Years/ Low	Low/ Low	Local Community, Private Property Owner	Some communities are proactively doing this, while others have not due to a lack of funding.
Emergency Services Protection-Wildfire	Consider creating/ expanding fire breaks upwind of critical facilities via controlled burns and or tree trimming along roads where trees touch.	DCR, Local Community, State Forest Fire Warden	Ongoing	Medium/ Low	Local Community	Some communities are proactively doing this, while others have not due to a lack of funding.
Prevention-Wildfire	Mow or use herd animals to graze otherwise un-harvested grasslands once or twice per season to prevent grass from turning to brush and trees.	Local Community	1-10 Years/ Low	Low/ Low	Local Community	Communities have not embarked upon this action due to time constraints and funding issues.
Prevention-Wildfire	Implement and advocate Defensible Space Techniques (keeping roof gutters clear of flammable material, keeping cut well-watered grass around houses, removing nearby “ladder” growth potentially connecting ground fires to trees, use of fire-resistant building materials.)	Local Community, Private Owner	1-5 Years/ Medium	Medium/ Low	Local Community, Private Property Owner	Communities have advocated this through the distribution of literature that educates people on this important topic.
Prevention-Wildfire	Develop any needed fire ponds and enhance with dry hydrants.	Local Community	1-10 Years/ Low	Low/ Medium	Local Community	Communities have not had the funding to pursue this further.
Property Protection-Landslide	Relocate buildings and structures along bluffs.	Local Community, Private Owner	1-10 Years/ Low	High/ High	Local Community, Private Property Owner	Communities have not had the funding to pursue this further.

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006
Structural Project, Natural Resource Protection-Landslide	Stabilize slopes by implementing bank stabilization techniques.	CZM, Local Community	1-10 Years/ Medium	High/ Medium	Local Community	Communities have not had the funding to pursue this further.
Prevention, Structural Project- Earthquake	Earthquake-proof public buildings.	Local Community	1-10 Years/ Low	Medium/ High	Local Community	Communities have not had the funding to pursue this further.
Property Protection- Earthquake	Conduct public building seismic assessments.	Local Community	1-10 Years/ Low	Medium/ Medium	Local Community	New Action
Structural Project- Tsunami	Construct refuge towers in isolated areas.	MEMA, Local Community	Deleted	N/A	MEMA, Local Community	Deleted-Not feasible considering there has not been a recorded tsunami on the East Coast.
Prevention- Tsunami	Improve Atlantic Coast Warning Systems.	NOAA	Completed	N/A	NOAA	Completed-NOAA placed 6 DART tsunami warning buoys in the Atlantic Ocean
Structural Project- Tsunami	Maintain inland shelters in event of a tsunami.	MEMA, Local Community	Deleted	N/A	Local Community	Deleted-Shelters are already in place for other natural hazards; not feasible to have unique tsunami shelters

Table 117: Abington Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Emergency Services Protection-All Hazards	Upgrade vintage generators located at the Highway Department and Vehicle Maintenance building.	Highway Department	1-5 Years/ Medium	Medium/ Medium	General Fund, PDM Grant Program	New Action
Prevention, Structural Project- Flooding	Develop and implement a local flood mitigation dam management program, including inspecting, maintaining and upgrading the following dams for present functions and stormwater management potential: Atwoods Pond Dam, Cushing Pond Dam, Cleveland Pond, Island Grove Pond Dam and Hunt's Pond Dam.	Highway Department, Private Property Owners	1-5 Years/ Medium	Medium/ High	General Fund, Private Property Owners, DCR	Town has not had the funding to pursue this further.
Structural Project-Flooding	Enlarge the capacity of the undersized drainage culvert that crosses Central Street, just east of Route 58. The culvert is insufficient to handle flows during storm events and negatively effects nearby private properties.	Highway Department	1-5 Years/ Medium	Medium/ High	General Fund, Bond PDM Grant Program	New Action
Structural Project-Flooding	Work with the state to enlarge several culverts on Route 18 in need of replacement and/or upgrades.	Highway Department, MassDOT	1-5 Years/ Medium	Medium/ High	MassDOT, PDM Grant Program	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Structural Project-Flooding	Enlarge the capacity of an underground culvert on Wyman Road through to Summit Road that is often blocked with debris and subsequently floods nearby residential properties.	Highway Department	1-5 Years/ Medium	Medium/ High	General Fund, Bond, PDM Grant Program	New Action
Structural Project-Flooding	Enlarge the capacity of the culvert that drains a holding pond behind the Frolio Middle School, which is often insufficient to handle additional flows during storm events. The Highway Department installed an overflow culvert to alleviate the situation, but at times continues to overflow.	Highway Department	1-5 Years/ Medium	Medium/ High	General Fund, Bond, PDM Grant Program	New Action
Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention-Flooding	Conduct regular maintenance of retention and detention ponds in town, as many are overgrown with weeds and grass.	Highway Department	1-5 Years/ Medium	Low/ Low	Highway Department Operating Budget	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Public Education & Awareness- All Hazards	Improve community awareness during emergency events by having the ability to broadcast over the local cable access channel from the EOC. This is not currently possible as the cable access station is miles from the EOC. By installing the necessary equipment at the EOC, valuable information can be relayed to the residents in a fast, efficient manner.	Abington Emergency Management Agency	1-10 Years/ Medium	Low/ High	General Fund	New Action

Abington Mitigation Actions Completed Since 2006

- Removed and replaced several “blocked” drain lines in various locations throughout town, including Nash Memorial Drive, Jennings Drive, Spruce Street, West Street and Central Street.
- Cleared and cleaned pipe inverts in the following areas: Island Grove Pond, Central Street, Centre Avenue, North Avenue, Lincoln Street, Colonel Hunt Drive, Shaw Avenue and others.
- Conducted regular maintenance of storm drains utilizing a catch basin digger.
- Resurfaced various roadways throughout town.

Table 118: Avon Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Structural Project-Flooding	Extend the culvert from the headwaters of the West Trout Brook to the parking lot of the Avon Public Library to mitigate periodic flooding in the Library's parking lot.	Highway Department	1-5 Years/ High	Medium/ High	General Fund, PDM Grant Program	New Action
Prevention, Structural Project- Flooding	Develop and implement a local flood mitigation dam management program, including inspecting, maintaining and upgrading the following dams for present functions and stormwater management potential: Brockton Reservoir Dam and dams along the lakes and ponds of D.W. Field Park.	Highway Department, City of Brockton	1-5 Years/ Medium	Medium/ High	General Fund, City of Brockton, DCR	Town has not had the funding to pursue this further.
Prevention-Wildfire	Enhance fire roads into DeMarco Park by clearing vegetation making it easier for the Police & Fire Departments to access during fires.	Highway Department	1-3 Years/ Medium	Medium/ Low	Highway Department Operating Budget	New Action
Structural Project-Flooding	Upgrade the surface drainage infrastructure on Bodwell Street to alleviate flooding concerns.	Highway Department	1-5 Years/ Low	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Structural Project-Flooding	Upgrade the surface drainage infrastructure on Kiddie Drive to alleviate flooding concerns.	Highway Department, Private Business Owners	1-5 Years/ Low	Medium/ High	General Fund, Bond, Private Business Owners, PDM Grant Program	New Action
Structural Project-Flooding	Enhance drainage in the Brentwood Avenue subdivision to alleviate flooding concerns.	Highway Department	1-5 Years/ High	Medium/ High	General Fund, Bond	New Action
Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Natural Resource Protection- Flooding	Continue to clear brooks and streams throughout town of trash and vegetation to allow for the free flow of water and to mitigate the threat of flooding.	Highway Department	1-2 Years/ High	Medium/ Low	Highway Department Operating Budget	Town has done this for several years to alleviate the threat of flooding.
Structural Project-Flooding	Clean and maintain the stormwater detention pond at the intersection of Bodwell Street and Murphy Drive to alleviate the threat of flooding during periods of heavy rain.	Highway Department	1-5 Years/ Medium	Low/ Low	Highway Department Operating Budget	New Action
Prevention-Flooding	Create a drainage map for the entire town to identify areas in need of new or additional drainage infrastructure	Highway Department	1-3 Years/ High	Low/ Low	Highway Department Operating Budget	New Action

Avon Mitigation Actions Completed Since 2006

- Cleaned pipes and outlets on Route 24 during the Resurfacing and Related Work on Route 24 Project (MassDOT Project ID# 605238)
- Replaced the Ladge Street culvert over the Trout Brook with a new larger culvert after it collapsed due to heavy rains during the March 2010 floods.
- Improved drainage on the following roadways with the addition of culvert enlargements, larger pipes and additional catch basins:
 - East High Street
 - East Spring Street
 - Page Street
 - Pond Street
 - Brentwood Subdivision Avenue Subdivision (partially completed)
- Completed drainage improvements in the Nichols Avenue, Johnson Road, Howard Lane and Lawson Street neighborhood.
- Cleared brooks and streams of trash and vegetation throughout town to allow for the free flow of water and to mitigate flooding.

Table 119: Bridgewater Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention, Structural Project- Flooding	Develop and implement a local flood mitigation dam management program, including inspecting, maintaining and upgrading the following dams for present functions and stormwater management potential: Stanley Mill Dam, Paper Mill Village Dam and Carver Pond Dam.	Highway Department, Private Property Owners	1-5 Years/ Medium	Medium/ High	General Fund, Private Property Owners, DCR	Town has not had the funding to pursue this further.
Structural Project-Flooding	Enlarge the culvert at Water and Wood Street at South Brook to eliminate flooding.	Highway Department	1-5 Years/ High	Medium/ High	General Fund, Bond, PDM Grant Program	New Action
Structural Project-Flooding	Upgrade the drainage infrastructure around the Town Common to eliminate flooding concerns.	Highway Department, MassDOT	1-5 Years/ High	Low/ High	MassDOT	New Action
Property Protection-Flooding	Acquire properties in flood zones that flood on a regular basis.	Emergency Management Agency, Private Property Owners	1-5 Years/ Low	High/ High	General Fund, Bond, PDM Grant Program	New Action

Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention- All Hazards	Create a Local Emergency Planning Committee (LEPC) in Bridgewater.	Emergency Management Agency	1-3 Years/ High	Low/ Low	Emergency Management Agency Operating Budget	New Action
Prevention- All Hazards	Create a video to show businesses how to prepare for natural hazard events. The video will then be shown on the local cable access television station.	Emergency Management Agency	1-5 Years/ Medium	Low/ Low	Emergency Management Agency Operating Budget	New Action
Prevention-Flooding	Complete a town-wide Comprehensive Stormwater, Wastewater and Clean Water Plan.	Highway, Sewer & Water Departments	1-3 Years/ High	Low/ Medium	General Fund	New Action
Emergency Services Protection-All Hazards	Install a new generator at the Council on Aging.	Council on Aging	1-5 Years/ High	Medium/ Medium	Council on Aging, PDM Grant Program	New Action

Bridgewater Mitigation Actions Completed Since 2006

- Installed catch basins and built-up aprons to control drainage on Bedford Street (Routes 18/28) during the Resurfacing and Related Work on Route 18 & 28 Project from the Bridgewater to the Middleboro Rotary (MassDOT Project ID# 601104).
- Replaced the Bedford Street (Route 18) Bridge over the Taunton River with a reinforced concrete drain pipe and catch basins during the Bedford Street Bridge Replacement Project (MassDOT Project ID# 603385).
- Installed catch basins with curb inlets and reinforced concrete drain pipes at the intersection of Bedford Street (Routes 18/28) at Winter Street during the Signalization & Improvement Project (MassDOT Project ID# 603568).
- Replaced the Summer Street Bridge over the Taunton River during the Summer Street Bridge Replacement Project (MassDOT Project ID #604415).
- Installed a closed drainage system to convey stormwater from North Street during the Reconstruction of North Street, from Pleasant Street (Route 104) to Village Gate Drive Project (MassDOT Project #604958).
- Replaced the Bridge Street Bridge over the Town River after it partially collapsed during the March 2010 floods.

- Replaced the Hayward Street Bridge over the Town River after it partially collapsed during the March 2010 floods.
- Repaired the Northfield Drive culvert.
- Hired a structural engineer to conduct roof snow load assessments for all the public buildings and larger commercial buildings in town.

Table 120: Brockton Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention, Structural Project-Flooding	Conduct channel work to mitigate flooding along Lovett’s Brook from Stoughton line along/ through the Westgate Mall to Beaver Brook.	DPW, Engineering Dept.	1-5 Years/ Medium	Medium/ High	A variety of sources may include General Fund and HMGP Grant	New Action
Structural Project-Flooding	Raise the underground outlets into the Salisbury Plain River in the area of Kmart Plaza on Main Street and address resulting upstream drainage impacts to reduce severe flooding in the area.	DPW, Engineering Dept.	1-10 Years/ Medium	Medium/ Medium	A variety of sources may include General Fund and HMGP Grant	New Action
Structural Project-Flooding	Install a concrete floor in the Cold Spring Brook near St. Edith Stein Church on E. Main Street to minimize scouring and debris transport.	DPW, Engineering Dept.	1-10 Years/ Medium	Medium/ Medium	A variety of sources may include General Fund and PDM Grant	New Action
Natural Resource Protection- Flooding	Conduct channelization and significant slope stabilization on Malfardar Brook to limit additional damage to private property due to stream bed migration and prevent vegetation from falling into the brook causing flooding.	DPW, Engineering Dept., Private Property Owners	1-5 Years/ Medium	Medium/ Medium	A variety of sources may include General Fund, HMGP Grant, and Private Property Owners	New Action

Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention, Structural Project- Flooding	Develop and implement a local flood mitigation dam management program, including inspecting, maintaining and upgrading the following dams for present functions and stormwater management potential: Lower Porter Pond Dam, Upper Porter Pond Dam, Ellis Brett Pond Dam and Cross Pond Dam.	DPW, Engineering Dept., Private Property Owners	1-5 Years/ Medium	Medium/ High	A variety of sources may include General Fund and DCR	Ongoing- Completed Emergency Action Plans (EAP) for the Ellis Brett Pond Dam, Thirty Acre Pond Dam and Waldo Lake Pond Dam
Prevention-Flooding	Review findings and recommendations of past U.S. Army Corps of Engineers studies regarding the Salisbury Brook and Salisbury Plain River and identify which actions have been completed and which have not.	DPW, Engineering Dept.	1-5 Years/ Medium	Low/ Low	A variety of sources may include General Fund, DPW Budget and Engineering Budget	Ongoing-Town has not had the staff or funding to pursue this further.
Structural Project-Flooding	Obtain and install at least one additional Bandalong Litter Trap in the Salisbury Plain River to collect trash and debris and prevent migration down the river.	DPW	1-3 Years/ High	Medium/ Medium	A variety of sources may include General Fund and DPW Budget	New Action
Structural Project-Flooding	Install a structural liner in the old granite/fieldstone double barrel stone culvert at Pleasant Street (Route 27) at the Salisbury River to prevent its collapse.	DPW, Engineering Dept.	1-10 Years/ Low	Medium/ Medium	A variety of sources may include General Fund and HMGP Grant	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Structural Project- Flooding	Conduct channel work and slope stabilization along the retaining wall of the Salisbury Plain River, to prevent potential collapse due to lack of foundations and sufficient support.	DPW, Engineering Dept.	1-10 Years/ Low	Medium/ Medium	A variety of sources may include General Fund and HMGP Grant	New Action
Prevention, Structural Projects- Flooding	Complete a watershed study and implement drainage improvements in and around the area of Ames Street, East Main Street, Intervale Street, Spark Street and North Montello Street into Trout Brook down to Salisbury Brook.	DPW, Engineering Dept., Planning Dept.	1-10 Years/ Medium	High/ High	A variety of sources may include General Fund and DPW Budget	New Action

Brockton Mitigation Actions Completed Since 2006

- Installed catch basins, catch basins with curb inlets and drainage manholes and reinforced concrete drain pipes as part of the Reconstruction of West Chestnut Street from Pearl Street to Burke Drive (MassDOT Project ID# 601339).
- Installed catch basins with curb inlets, drainage manholes and reinforced concrete drain pipes as part of the Reconstruction of Winter Street from Howard Street to North Cary Street (MassDOT Project ID #601347).
- Replaced the Bartlett Street Bridge over the Salisbury Brook during the Bartlett Street Bridge Replacement Project (MassDOT Project ID #601393).
- Installed catch basins with curb inlets, drainage manholes and reinforced concrete drain pipes as part of the Signal & Intersection Improvements Project at Montello Street (Route 28) and Howard Street (Route 37) (MassDOT Project ID #602557).
- Installed catch basins, catch basins with curb inlets, gutter inlets and reinforced concrete drain pipes as part of the Signal & Intersection Improvements Project at Pleasant Street (Route 27) and Belair Street and Moraine Street (MassDOT Project ID #604595).
- Replaced the White Avenue Bridge over the Salisbury Brook during the White Avenue Bridge Replacement Project (MassDOT Project ID #604419).
- Installed catch basins, new drainage manholes and reinforced concrete drain pipes as part of the Reconstruction of Pleasant Street (Route 27) at West Street and Westgate Mall Drive (MassDOT Project ID# 604741).
- Completed Emergency Action Plans (EAP) for the following city-owned dams:

- Ellis Brett Pond Dam
- Thirty Acre Pond Dam
- Waldo Lake Dam
- Became the first community in New England to install a Bandalong Litter Trap. The Litter Trap is in the Salisbury Plain River and it captures and removes floating litter as well as mitigates against trash dams, which can impair the free flow of water in the river.
- In support the city's wastewater treatment plant, the city has completed over \$110 million in wastewater, sewer and clean water infrastructure improvements throughout the city.
- Spent \$1.6 million in upgrading the booster station.
- Made infrastructure improvements to the earthen Brockton Reservoir Dam in Avon, including replacing the wooden spillways with newer concrete spillways, as well as high and low level outlet control valves.

Table 121: East Bridgewater Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention, Structural Project- Flooding	Develop and implement a local flood mitigation dam management program, including inspecting, maintaining and upgrading the Forge Pond Dam to present function and stormwater management potential.	Department of Public Works	1-5 Years/ Medium	Medium/ High	General Fund, DCR	Town has not had the funding to pursue this further.
Structural Project- Flooding	Engineer a solution to mitigate flooding that occurs in the Willow Avenue area, including the ongoing process of upgrading the Forge Pond Dam.	Department of Public Works	1-5 Years/ High	Medium/ Medium	General Fund, Bond	New Action
Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Structural Project- All Hazards	Investigate the feasibility of constructing a new EOC within the Fire Department Headquarters.	East Bridgewater Emergency Management Agency	1-5 Years/ Low	Low/ Low	General Fund	New Action
Prevention- All Hazards	Create a list of all town-owned properties, noting any vulnerability and prioritizing the need to address said vulnerability.	East Bridgewater Emergency Management Agency	1-5 Years/ High	Low/ Low	Operating Budget	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention- All Hazards	Create a list of all properties in town deemed critical and prioritize mitigation measures of their vulnerability.	East Bridgewater Emergency Management Agency	1-5 Years/ High	Low/ Low	Operating Budget	New Action
Prevention- All Hazards	Utilize GIS to overlay and incorporate established hazard zones into town-wide emergency response planning.	East Bridgewater Emergency Management Agency	1-5 Years/ High	Low/ Low	Operating Budget	New Action
Prevention- All Hazards	Investigate the need for bylaw changes that will facilitate hazard mitigation.	East Bridgewater Emergency Management Agency, Planning Board	1-5 Years/ High	Low/ Low	Operating Budget	New Action
Prevention- All Hazards	Identify and highlight extremely vulnerable properties and develop a procedure to monitor those properties during severe weather events.	East Bridgewater Emergency Management Agency	1-5 Years/ High	Low/ Low	Operating Budget	New Action
Prevention- All Hazards	Further investigate mitigation options for all properties identified as extremely vulnerable.	Department of Public Works	1-5 Years/ High	Low/ Low	Operating Budget, General Fund	New Action

East Bridgewater Mitigation Actions Completed Since 2006

- Made repairs at the Forge Pond Dam, which is rated in “Poor” condition.
- Reduced streamside risks by removing selected structures from floodway and reconfiguring banks for storage and safe dry weather open space/habitat use.
- Adopted stormwater treatment and retention requirements for new developments.
- Replaced and elevated the Department of Public Works office building that was severely flooded as a result of heavy rains. The new elevated building is now not at risk from flooding.
- Placed snow fencing in snowdrift prone areas throughout town.

Table 122: Easton Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention, Structural Project- Flooding	Develop and implement a local flood mitigation dam management program, including inspecting, maintaining and upgrading the following dams for present functions and stormwater management potential: Ames Long Pond Dam, Shovelshop Pond Dam, Langwater Pond Dam, Morse Pond Dam, Old Pond Dam and New Pond Dam.	Department of Public Works, Private Property Owners	1-5 Years/ Medium	Medium/ High	General Fund, Private Property Owners, DCR	Town has not had the funding to pursue this further.
Structural Project-Flooding	Reduce the threat of flooding on Union Street at French’s Pond and Dorchester Brook.	Department of Public Works	1-5 Years/ High	Low/ Low	General Fund, Bond, PDM Grant Program	New Action
Structural Project-Flooding	Reduce the threat of flooding on Bay Road between Highland Street and Dean Street.	Department of Public Works	1-5 Years/ High	Low/ Low	General Fund, Bond, PDM Grant Program	New Action
Structural Project-Flooding	Reduce the threat of flooding on Depot Street (Route 123) between Black Brook Road and Center Street.	Department of Public Works	1-5 Years/ High	Low/ Low	General Fund, Bond, PDM Grant Program	New Action

Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention- All Hazards	Create and maintain a database of all responses due to natural disasters or storm events. This datum will be reviewed and analyzed periodically and recommendations will be developed for remediation.	Department of Public Works, Police and Fire Departments	1-5 Years/ High	Low/ Low	Department of Public Works, Police and Fire Departments Operating Budgets	New Action
Prevention- All Hazards	Compile and maintain a list of all private small and large scale wastewater treatment plants in town.	Health Department	1-5 Years/ High	Low/ Low	Health Department Operating Budget	New Action
Prevention- All Hazards	Compile and maintain a list as well as map all private drinking water wells in town.	Health Department	1-5 Years/ High	Low/ Low	Health Department Operating Budget	New Action

Easton Mitigation Actions Completed Since 2006

- Replaced the Central Street Bridge over the Queset Brook during the Central Street Bridge Replacement Project (MassDOT Project ID #602836).
- Installed catch basins, catch basins with curb inlets and drainage manholes and reinforced concrete drain pipes as part of the Reconstruction of the Intersection of Routes 106 & 123 (Five Corners) (MassDOT Project ID# 604658).
- Installed catch basins, catch basins with curb inlets, drainage manholes, gutter inlets, leaching basins and reinforced concrete drain pipes as part of the Reconstruction of Foundry Street (Route 123) from Route 106 to the Norton Town Line (MassDOT Project ID# 601332).
- Made improvements to the following dams in town:
 - Ames Long Pond Dam- Brought into compliance with Massachusetts Office of Dam Safety standards, as the dam is now rated in “Good” condition. Repairs included adding one foot of freeboard providing additional flood storage.
 - Langwater Pond Dam- Repairs made to the dam brought the dam into compliance with the Office of Dam Safety standards. Upon confirmation from the Office of Dam Safety, the dam will be rated in “Good” condition.
 - Shovelshop Pond Dam- Repairs made to the dam brought the dam into compliance with the Office of Dam Safety standards. Upon confirmation from the Office of Dam Safety, the dam will be rated in “Good” condition.

Table 123: Halifax Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention, Structural Project- Flooding	Develop and implement a local flood mitigation dam management program, including inspecting, maintaining and upgrading the following dams for present functions and stormwater management potential: Stump Brook Dam, Furnace Pond structures off Old Plymouth Street and Plymouth Pond control structure off Route 106.	Highway Department, Private Property Owners	1-5 Years/ Medium	Medium/ High	General Fund, Private Property Owners, DCR	Town has not had the funding to pursue this further.
Prevention, Structural Project- Flooding	Develop a working relationship with owners of the Plymouth Street Pond Dam in East Bridgewater in hopes of working towards a formal agreement to upgrade the structure to functioning condition, develop operating policies and reconcile any potential water supply issues and local downstream flooding issues.	Highway Department, Water Department, Private Property Owner, Town of East Bridgewater	1-5 Years/ Medium	Low/ Low	General Fund, PDM Grant Program, Private Property Owner, Town of East Bridgewater	A working group had formed but disbanded due to lack of funding to implement policies.
Structural Project- Flooding	Replace and enlarge culvert on South Street at Monponsett Brook to eliminate flooding.	Highway Department	1-3 Years/ High	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention- Flooding	Study Monponsett Pond water management issues and develop protocols for balancing key water supply needs, controlling flooding, and maintaining flows in the Stump Brook and the Jones River.	Highway Department, Water Department, City of Brockton	1-5 Years/ Medium	Low/ Low	General Fund, PDM Grant Program, City of Brockton	Discussions with the City of Brockton and other partners have been intermittent since 2006.
Structural Project-Flooding	Reconstruct Pratt Street so as to eliminate the threat of flooding and erosion which is damaging the road.	Highway Department	1-5 Years/ Medium	Medium/ Medium	General Fund, Bond	New Action
Structural Project-Flooding	Upgrade drainage infrastructure on Hemlock Lane near the Highway Department to eliminate flooding during periods of heavy rain.	Highway Department	1-3 Years/ High	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action
Structural Project-Flooding	Upgrade drainage infrastructure on Plymouth Street (Rt. 106) in front of Cumberland Farms Plaza to eliminate flooding during heavy rain.	Highway Department	1-3 Years/ High	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action
Structural Project-Flooding	Upgrade drainage infrastructure on Plymouth Street (Rt. 106) in front of Stop & Shop to eliminate flooding during periods of heavy rain.	Highway Department	1-3 Years/ High	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action

Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Structural Project-Flooding	Upgrade the stormwater drainage infrastructure system throughout the town.	Highway Department	1-5 Years/ Medium	Medium/ High	Highway Department Operating Budget, General Fund, Bond	New Action
Prevention, Natural Resource Protection, Structural Project-Flooding	Examine and if feasible, implement with other interested towns a local or regional flood-mitigation dam management program that will inspect, maintain, and upgrade dams for stormwater management potential.	Highway Department, Private Property Owners, DCR, MEMA	1-5 Years/ Medium	Medium/ High	General Funds, Local Towns, Private Property Owners	New Action
Prevention- Flooding	Adoption of a stormwater management bylaw.	Highway Department	1-3 Years/ High	Low/ Low	Highway Department Operating Budget	New Action

Halifax Mitigation Actions Completed Since 2006

- Replaced the riprap around the culvert on Plymouth Street (Route 106) across from the Police Station.

Table 124: Hanson Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Emergency Services Protection- All Hazards	Purchase a generator for Town Hall. This is needed as Town Hall houses the email communication infrastructure for the town as well as a number of vital records in the Town Clerk’s Office.	Town Admin. Office	1-5 Years/ Medium	Medium/ Medium	General Fund, PDM Grant Program	New Action
Property Protection- Flooding	Work with DCR to upgrade the current Wompatuck Pond Dam control structure from being managed manually to a more mechanized control structure, so that it can be regulated remotely in advance of heavy rain. Also create a Dam Management Plan for the Wompatuck Pond Dam.	Highway Department, Private Property Owner	1-5 Years/ Medium	Medium/ High	General Fund, Private Property Owners, DCR	Town has not had the funding to pursue this further.
Structural Project- Flooding	Replace and enlarge culvert on King Street to eliminate flooding.	Highway Department	1-10 Years/ Medium	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action
Structural Project- Flooding	Replace and enlarge culvert on Winter Street to eliminate flooding.	Highway Department	1-10 Years/ Medium	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action
Structural Project- Flooding	Upgrade drainage infrastructure along Route 58 to alleviate flooding during heavy rain.	Highway Department	1-10 Years/ Medium	Medium/ Medium	General Fund, Bond	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Structural Project-Flooding	Upgrade drainage infrastructure on Gorwin Drive to alleviate flooding during heavy rain.	Highway Department	1-10 Years/ Medium	Medium/ Medium	General Fund, Bond	New Action
Natural Resource Protection- Flooding	Dredge trenches located alongside roadways throughout town. These trenches buildup with sediment over time and flood the nearby road.	Highway Department	1-10 Years/ Medium	Medium/ Medium	General Fund	New Action

Hanson Mitigation Actions Completed Since 2006

- Installed drainage manholes, reinforced concrete drain pipes, and catch basins with curb inlets during the Reconstruction of Franklin Street (Route 27) (MassDOT Project ID# 600397).
- Replaced smaller drainage pipes with larger ones on Maquan Street across from Maquan Pond
- Purchased a new jet rodder for \$44,000 to flush drains throughout town. The new more powerful and efficient jet rodder replaces an aging 1961 rod that was used to flush drains.
- Completed a drainage project on Crescent Street to alleviate flooding issues.

Table 125: Kingston Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention, Structural Project- Flooding	Develop and implement a local flood mitigation dam management program, including inspecting, maintaining and upgrading the following dams for present functions and stormwater management potential: Silver Lake Dam, Elm Street Dam, Wapping Road Dam, Russell Pond Dam, Foundry Pond Dam and Sylvia Place Pond Dam.	Streets, Trees and Parks Department, Private Property Owners	1-5 Years/ Medium	Medium/ High	General Fund, Private Property Owners, DCR	Town has not had the funding to pursue this further.
Structural Project-Flooding	Enlarge the culvert on Main Street (Route 106) in front of St. Joseph’s Church to eliminate flooding.	Streets, Trees and Parks Department	1-3 Years/ High	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action
Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Emergency Services- All Hazards	Work with the towns of Halifax and Plympton to create a regional shelter at the Silver Lake Regional Middle/High School.	Emergency Management Agency, Towns of Halifax and Plympton	1-5 Years/ Medium	Medium/ Low	General Fund, Towns of Halifax and Plympton	New Action
Emergency Services- All Hazards	Install a backup generator for the Council on Aging, which is used as a cooling center.	Council on Aging	1-3 Years/ High	Medium/ Medium	General Fund, PDM Grant Program	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Emergency Services- All Hazards	Work with the owners of both mobile home parks in town- Conifer Green and Country Estates to obtain generators for their community buildings, which can be used as storm shelters.	Private Mobile Home Park Owners	1-5 Years/ Medium	Medium/ Medium	Private Mobile Home Park Owners, PDM Grant Program	New Action
Structural Project- Flooding	Dredge the Jones River as needed to remove the natural buildup of silt and sand that accumulates over time. This buildup can cause the river to flood properties adjacent to the river.	Streets, Trees and Parks Department	1-5 Years/ Medium	Medium/ Medium	General Fund	New Action

Kingston Mitigation Actions Completed Since 2006

- Replaced the Elm Street Bridge over the Jones River during the Elm Street Bridge Replacement Project (MassDOT Project ID #24090).
- Installed drainage manholes, reinforced concrete drain pipes, catch basins and catch basins with curb inlets, drop inlets, leaching basins and gutter inlets during the Reconstruction of Pembroke Street (Route 27) (MassDOT Project ID# 600413).
- Acquired property on Elder Avenue to mitigate flooding.
- Acquired the Halfway Preserve property off of Route 106 to mitigate flooding.
- Replaced the Brookdale Street culvert that washed away during the March 2010 floods.
- Purchased a Vactor sewer cleaning truck to clean catch basins as needed.
- Embarked on a program to reduce the amount of road salt being used when treating roadways in inclement weather.
- Implemented a Reverse 911 public safety communications system to notify residents via telephone of emergency situations in town.

Table 126: Pembroke Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention, Structural Project- Flooding	Develop and implement a local flood mitigation dam management program, including inspecting, maintaining and upgrading the following dams for present functions and stormwater management potential: Mill Pond/ Furnace Pond Dam and Lower Chandler Pond Dam.	Department of Public Works, Private Property Owners	1-5 Years/ Medium	Medium/ High	General Fund, Private Property Owners	Town has not had the funding to pursue this further.
Structural Project-Flooding	Install outfall control structure and drainage from the Hobomock Pond down Center Street (Route 36) to alleviate the flooding of homes and businesses and the flooding of Hobomock Street.	Department of Public Works	1-3 Years/ High	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action
Structural Project-Flooding	Enlarge the Birch Street culvert at the Duxbury town line to eliminate flooding issues.	Department of Public Works	1-3 Years/ High	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action
Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Structural Project-Flooding	Upgrade failing leach basins on Mill Pond Road	Department of Public Works	1-5 Years/ Medium	Medium/ Medium	General Fund	New Action

Pembroke Mitigation Actions Completed Since 2006

- Installed drainage manholes, catch basins and catch basins with curb inlets and gutter inlets with gutter mouths during the Corridor Improvements on Route 139 (Plain Street) Project.
- (MassDOT Project ID# 604915).
- Removed backup angle drive diesel fuel engine and replaced it with a Natural Gas backup generator and automatic transfer switch at Drinking Water Pumping Station #2.
- In the process of replacing backup angle drive natural gas engine and replacing it with a Natural Gas backup generator and automatic transfer switch at Drinking Water Pumping Station #3.
- Replaced failed leach basins and paved roadway at 14 Glenwood Road.
- Replaced failed box culvert with 24" RCP and tied it into existing headwalls at Monroe Street.
- Getting ready to start a \$250,000 drainage project to reroute stormwater runoff to alleviate flooding in the McKenzie Orchard subdivision as well as on Oldham Street.

Table 127: Plymouth Mitigation Action Plan

Category of Action & Hazard Addressed	Description of Objective	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Mitigation-All Hazards	Objective #1: Implement IT cyber protection, Disaster Mitigation Strategy (DMS) program that protects critical municipal facilities and services.	Action #1: Buildout alternate and auxiliary data center infrastructure to support the Town of Plymouth’s continuity planning for critical IT systems.	Information Technology Dept.	New Town Hall project is in design with funding available FY2016-17	High/ Medium	FY2016-17 General Fund	New Action
Mitigation-Flooding	Objective #2: The Town of Plymouth shall make every effort to reduce the number of repetitive loss properties within its boundaries.	Action #2: Seek funding through Plymouth’s Community Preservation Fund to acquire and demolish structures subject to repetitive flood losses. Plymouth will continue to partner with repetitive loss property owners to apply for funding through FEMA.	Planning and Development Dept.	FY2016-2018 CPC funding will be approved through Town Meeting to assist in the removal of (2) properties.	High/ High	FY2016-17 CPC Funding, General Fund	New Action

Category of Action & Hazard Addressed	Description of Objective	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Property Protection/ Emergency Services Protection- All Hazards	Objective #3: Protect municipal water systems and aquifers, in order to maximize their survivability and to safeguard them from damages caused by natural disasters.	Action #3: Develop DPWs planning to make improvements to the Water Street Wastewater Treatment Plant Pump Station, to include flood barrier protections.	Dept. of Public Works & Office of Emergency Management	2017-2018 IAW the DPW Facility Management Plan; the Water Barrier system plan has been reviewed with DPW.	High/ Medium	FY2018-19 General Fund; FEMA HMA	New Action
Property Protection/Mitigation- All Hazards	Objective #4: Conduct structural assessment for and develop and implement plans to retrofit and replace town-owned bridges and other critical storm drain and outfall infrastructure that are categorized as deficient and are necessary for response agencies to use during an emergency.	Action #4: Seek available MassDOT and/or Hazard Mitigation 406 or 404 funding to address identified infrastructure.	Dept. of Public Works & Office of Emergency Management	Project delayed due to lack of resources.	High/ High	DMEA and DPW will continue to seek hazard mitigation and infrastructure funding to complete.	New Action

Category of Action & Hazard Addressed	Description of Objective	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Natural Resource Protection-All Hazards	Objective #5: Develop and implement beach protections and nourishment projects currently under study with Coastal Zone Management.	Action #5: Stabilize seawall, dunes and coastal bluffs susceptible from erosion and sliding through netting and vegetation stabilization methods.	DMEA	Project is under study	High/ High	Project is under planning review, pending action on scope and costs. The Town does not have the completed budget for this project.	New Action
Preparedness/Mitigation-All Hazards	Objective #6: Consider designing and installing wind and/or water proofing components and site hardening for all proposed government owned critical facilities.	Action #6: Develop a policy for Plymouth's Building and Construction Committee requiring all municipal facilities vulnerable to wind or flood damage to include design measures to protect these facilities from such hazards.	Planning and Development Dept.	Project is under review.	High/ High	Seek local, state and federal funding to retrofit municipal facilities.	New Action

Category of Action & Hazard Addressed	Description of Objective	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Mitigation-Wildfire	Objective #7: Continue to develop the future planning and direction of the Wildland Urban Interface Task Force to effectively and practically deal with tree disease and die off.	Action #7: Conduct fuel break management practices, to include prescribed burns and harvesting.	Fire Department	Project delayed due to lack of state/local resources. Potential Hazard Mitigation 404 Funding Project.	High/ Medium	General Fund, DCR, HMA	New Action
Natural Resource Protection-All Hazards	Objective #8: Develop public outreach and awareness program about water resource protections within our agricultural and aquaculture community.	Action #8: Work with Plymouth's Right to Farm Committee and Harbor Committee to educate farmers and coastal associations on impacts of farming practices on wetland resources and areas prone to flooding. Work to minimize pollution and flooding risks associated with irrigation and drainage swale maintenance, water storage and discharge.	Planning and Development Dept.	2016-2018 IAW the Town of Plymouth's Open Space Management Plan initiative timelines.	Medium/ Low	Town Operating Budget	New Action

Plymouth Mitigation Actions Completed Since 2006

- Installed gutter inlets, catch basins, catch basins with curb inlets, reinforced concrete pipes and leaching basins at the Intersection of Route 3A, Manomet Point Road and Strand Avenue (MassDOT Project ID# 603468).
- Installed catch basins, reinforced concrete drain pipes during the Resurfacing and Related Work Project on Route 3 (MassDOT Project ID #604223).
- Plymouth Department of Public Works (DPW) completed the Billington Sea 319 Stormwater Project. This project made improvement to existing stormwater outfalls, improving capacities and treatment of sediments, nutrients, and bacteria's which discharge directly to coastal sea beds.
- Plymouth DPW completed the Samoset Street 319 Stormwater Project. This project construction focused on improvements to drainage, stormwater treatment and water quality in Plymouth Harbor.
- Water management and modeling software was procured and installed to improve simulations that assess hydraulic and aquifer performance, determine firefighting capabilities and facilitate environmental impacts and design.
- The Town of Plymouth received an award from the Commonwealth's Coastal Zone Management office to complete and improve the recreational boating pump-out facility within the Town of Plymouth.
- Plymouth DPW completed over 95 drainage projects which involved the reconstruction of swales and conventional drainage systems, and the design and installation of stormwater mitigation areas and culverts.
- Plymouth DPW conducted over 3,600 Catch Basin Maintenance and Repair Operations to improve stormwater capacity and limit localized problem flooding areas.
- Plymouth's Environmental Management Division obtained 11 grant awards for the design and execution of the Eel River Headwaters Mitigation Project.
- Plymouth DPW completed extensive road side and aerial brush clearing and large scale brush and tree removal hazards.
- Plymouth Fire Department completed over 1,000 Fire Prevention Inspections, coordinated annual S.A.F.E. fire prevention training programs and coordinated 2 major prescribed wildland fire hazard mitigation burns with the Commonwealth and Federal partner agencies.
- Plymouth DPW completed phase 1 inspection of 12 municipally owned dams and initiated dam removal projects with private/public owners.
- Plymouth DPW and Planning Departments completed extensive GIS improvements to map stormwater drainage systems, coastal erosion and flooding areas affecting Plymouth Bay and the Buzzards Bay Watershed Areas.
- Plymouth Office of Emergency Management conducted 2 federally required Radiological Emergency Preparedness exercises and completed review and maintenance of the Town of Plymouth Comprehensive Emergency Management Plan.
- Plymouth Office of Emergency Management coordinated 2 Federal Disaster declaration mitigation and recovery projects for the Town of Plymouth.
- Plymouth Town Meeting and the Plymouth Planning Board adopted new FEMA Flood Insurance Rate Maps (FIRMs) and zoning.
- Plymouth Conservation Commission adopted more stringent local regulations regarding setbacks to bluffs, ponds and wetlands.
- Wildlands Trust has done work to restore the Ellisville Marsh's tidal flows.

Table 128: Plympton Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention- Flooding	Implement a dam management program that includes the inspection, maintenance and necessary upgrades for all dams in town.	Highway Department, Private Property Owners	1-3 Years/ High	Medium/ High	General Fund, Private Property Owners	Town has not had the funding to pursue this further.
Structural Project-Flooding	Replace and enlarge the culvert on Lake Street to eliminate flooding.	Highway Department	1-3 Years/ High	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action
Structural Project-Flooding	Upgrade drainage infrastructure on Prospect Road between Tobey Lane and Marie Elaine Drive to eliminate flooding.	Highway Department	1-5 Years/ Medium	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action
Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/C ost	Potential Funding Sources	Status from 2006 Plan
Prevention- Wildfire	Provide information and educational materials to residents about Defensible Space techniques and the dangers of wildfires.	Fire Department	1-3 Years/ High	Low/ Low	Fire Department Operating Budget	New Action
Prevention- Flooding	Adopt a stormwater management bylaw.	Highway Department	1-5 Years/ Low	Low/ Low	General Fund	New Action
Structural Project-Flooding	Work with the owner of the Dennetts Pond Dam and DCR to upgrade or remove the dam.	Highway Department, Private Property Owner	1-3 Years/ High	Medium/ High	General Fund, Private Property Owner	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Property Protection-Flooding	Develop a program to lower the elevation of the Winnetuxet Road Pond Dam before a storm so that the intersection of Elm Street, West Street and Winnetuxet Road does not flood.	Highway Department	1-3 Years/ High	Medium/Low	General Fund	New Action
Prevention, Natural Resource Protection, Structural Project-Flooding	Examine and if feasible, implement with other interested towns a local or regional flood-mitigation dam management program that will inspect, maintain, and upgrade dams for stormwater management potential.	Highway Department, Private Property Owners, DCR, MEMA	1-5 Years/ Medium	Medium/ High	General Funds, Local Towns, Private Property Owners	New Action

Plympton Mitigation Actions Completed Since 2006

- Installed catch basins and catch basins with curb inlets, gutter inlets with gutter mouths and gutter inlets during the Reconstruction of Main Street and Palmer Road (Route 58) (MassDOT Project ID# 602337).
- Completed Phase 1 of the Dam Management Plan for the Winnetuxet Road Pond Dam.
- Removed and cleared debris from culverts throughout town.
- Worked with NSTAR to proactively trim trees around utility lines throughout town.
- Advocated and publicized the benefits of Defensible Space Techniques.

Table 129: Stoughton Mitigation Action Plan

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention- Flooding	Develop and implement a local flood mitigation dam management program, including inspecting, maintaining and upgrading the following dams for present functions and stormwater management potential: Pinewood Lake Dam, Town Pond Dam, and Wood Pond Dam.	Department of Public Works, Private Property Owners	1-3 Years/ High	Medium/ High	General Fund, Bond, Private Property Owners, DCR	Town has not had the funding to pursue this further.
Structural Project-Flooding	Enlarge the culvert on West Street at Ames Long Pond between Highland Street and Lake Drive to eliminate flooding.	Department of Public Works	1-5 Years/ Medium	Medium/ Medium	General Fund, Bond, PDM Grant Program	New Action
Structural Project-Flooding	Enlarge the culvert at the driveway of 1821 Washington Street to eliminate flooding concerns (This driveway provides access to two houses off of Washington Street).	Department of Public Works, Private Property Owner	1-5 Years/ Medium	Medium/ Medium	General Fund, Department of Public Works Operating Budget, Private Property Owner	New Action
Emergency Services Protection- Flooding	Enlarge the storm drain behind the Police Station to eliminate flooding concerns.	Department of Public Works	1-5 Years/ Medium	Low/ Low	General Fund, Department of Public Works Operating Budget	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention- All Hazards	Develop a plan to protect critical documents and materials-store digitally or hard copies of public records in a hazard-free offsite location to protect important or irreplaceable documents.	Town Clerk	1-3 Years/ High	Medium/ Medium	General Fund	New Action
Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention- All Hazards	Locate and map the location of all vulnerable populations (elderly, disabled, etc.) in town.	Stoughton Emergency Management Agency	1-3 Years/ High	Low/ Low	General Fund	New Action
Public Education & Awareness- All Hazards	Develop and distribute educational materials for the public to generate awareness of hazards, mitigation steps, and disaster responses.	Stoughton Emergency Management Agency	1-10 Years/ Low	Low/ Low	General Fund	New Action
Public Education & Awareness- All Hazards	Work with the necessary state and federal agencies to develop and sign an evacuation route for the town in the event of a major natural hazard.	Stoughton Emergency Management Agency, MEMA, MassDOT,	1-5 Years/ Medium	Medium/ Medium	MEMA	Multiple agencies have met and begun to under-take this project.
Public Education & Awareness- All Hazards	Work with businesses and non-profit organizations in town to develop emergency action plans that can be utilized in the event of a natural hazard.	Stoughton Emergency Management Agency	1-5 Years/ Medium	Low/ Low	General Fund	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Public Education & Awareness- All Hazards	Install signs that direct people what to do in case of an emergency in all public buildings and facilities.	Stoughton Emergency Management Agency	1-10 Years/ Low	Low/ Low	General Fund	New Action
Emergency Services Protection- All Hazards	Assist residents on life support systems to obtain generators.	Stoughton Emergency Management Agency, Private Owners	1-5 Years/ Medium	Medium/ Medium	General Fund, Private Owner	New Action
Prevention- Flooding	Inspect, repair and maintain town-owned detention basins for the purpose of increasing their capacity.	Department of Public Works	1-10 Years/ Low	Medium/ Low	General Fund	New Action
Structural Project-Flooding	Inspect and repair stormwater outfalls throughout town as needed.	Department of Public Works	1-10 Years/ Low	Low/ Medium	General Fund	New Action
Prevention- Flooding	Perform tests (smoke detection, etc.) to detect illicit sewer discharge in the drainage system.	Department of Public Works	1-10 Years/ Low	Low/ Low	General Fund	New Action
Prevention- Flooding	Evaluate critical facilities that either have flooding issues or are in a flood zone and conduct studies to develop potential solutions.	Department of Public Works, Engineering Department	1-5 Years/ Medium	Medium/ Medium	General Fund	New Action
Structural Project-Flooding	Evaluate and upgrade older sewer lines and pump stations throughout town.	Department of Public Works, Engineering Department	1-10 Years/ Low	Low/ Low	General Fund	New Action

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention- Flooding	Evaluate the entire stormwater system in town.	Department of Public Works, Engineering Department	1-10 Years/ Low	Low/ Low	General Fund	New Action
Structural Project-Flooding	Upgrade the dam at Pratt's Court (Town Pond).	Department of Public Works	1-5 Years/ Medium	Medium/ High	General Fund, Bond	New Action
Structural Project-Flooding	Construct improvements to Red Wing Brook to reduce the threat of flooding.	Department of Public Works	1-5 Years/ Medium	Medium/ Medium	General Fund	New Action
Structural Project-Flooding	Reconstruct the sewer where the road has settled near the intersection of Turnpike Street and Pleasant Street.	Department of Public Works	1-5 Years/ Medium	Low/ Medium	General Fund, Bond	New Action
Structural Project-Flooding	Upgrade numerous catch basins as needed throughout town.	Department of Public Works	1-5 Years/ Medium	Medium/ Low	General Fund	New Action

Stoughton Mitigation Actions Completed Since 2006

- Replaced a culvert on Bay Road in 2010
- Installed Beehive drainage grates on Grove Street at Lincoln Street in 2010
- Replaced a culvert on Lake Drive in 2011
- Installed Beehive drainage grates at the Pratt Court Treatment Plant in 2011
- Replaced a culvert on Pratt Court at in 2012
- Installed catch basins on Sharon Street
- Installed Beehive drainage grates on Walker Road

Table 130: Mitigation Action Plan-West Bridgewater

Mitigation Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Emergency Services Protection- All Hazards	Upgrade the generator at the Highway/Forestry/ Vehicle Maintenance Departments. The current unit is more than 40 years old.	Highway/Vehicle Maintenance Department	1-3 Years/ High	Medium/ Medium	General Fund, PDM Grant Program	New Action
Emergency Services Protection- All Hazards	Install a generator at the Public Library. Having a generator on site will ensure that the library has power in the case of a disaster. The library preserves a number of historical artifacts and documents.	Library	1-3 Years/ High	Medium/ Medium	General Fund, PDM Grant Program	New Action
Structural Project-Flooding	Work with private property owner to upgrade and improve the West Meadow Dam. The condition of the dam is quickly deteriorating and contributing to deficiencies in the area. The dam, which poses a safety threat, is due for major improvements, coordinated by the Mass. Div. of Fisheries & Wildlife. If left untouched, the dam could fail and cause massive flood damage.	Highway/Vehicle Maintenance Department, Private Property Owner	1-3 Years/ High	Medium/ High	Mass. Div. of Fisheries & Wildlife, Private Property Owner	There have been no upgrades or improvements to the dam since 2006.

Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Emergency Services Protection- All Hazards	Install a generator at the Norman Avenue Water Pumping Station. This is the only infrastructure belonging to the Water Dept. without a generator.	Water Department	1-3 Years/ High	Medium/ Medium	General Fund	New Action

West Bridgewater Mitigation Actions Completed Since 2006

- Replaced the South Street Bridge over the Town River during the South Street Bridge Replacement Project (MassDOT Project ID #130200).
- Installed catch basins, new drainage manholes and reinforced concrete drain pipes as part of the Reconstruction of Manley Street from West Center Street (Route 106) to the Brockton City Line. (MassDOT Project ID# 601854).
- Replaced the Scotland Street Bridge over the Town River during the Scotland Street Bridge Replacement Project (MassDOT Project ID #603515).
- Installed catch basins during the Park & Ride Upgrade Project (MassDOT Project ID# 604814).
- Cleaned existing pipes and outlets on Route 24 during the Resurfacing and Related Work on Route 24 Project (MassDOT Project ID# 605558).
- Updated FEMA Flood Maps were adopted by the town.
- Made repairs were made to both the Maple Street culvert and the Manley Street culvert.
- Installed new generators at Town Hall and Council on Aging.

Table 131: Mitigation Action Plan-Whitman

Mitigation Activities						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Emergency Services Protection- All Hazards	Upgrade generators at critical facilities throughout town, especially the generators at the DPW and the Middle School.	Department of Public Works, School Department	1-3 Years/ High	Medium/ Medium	General Fund, PDM Grant Program	New Action
Structural Project-Flooding	Work with DCR to upgrade the Hobart Pond Dam.	Department of Public Works	1-5 Years/ High	Medium/ High	General Fund	Town has not had the funding to pursue this further.
Structural Project-Flooding	Enhance the stormwater drainage infrastructure on Cherry Street, Thayer Street and Raynor Avenue to eliminate concerns of flooding.	Department of Public Works	1-5 Years/ Medium	Medium/ Medium	General Fund, Bond	New Action
Natural Resource Protection, Structural Project- Flooding	Upgrade the granite retaining wall along the Shumatuscasant River culvert under the intersection of Franklin Street (Route 27) and South Avenue. Part of the wall has collapsed and is currently obstructing the river's flow, which could cause flooding.	Department of Public Works	1-3 Years/ High	Medium/ Medium	Town, PDM Grant Program	New Action

Preparedness, Response & Maintenance Actions						
Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Property Protection-Flooding	Construct a new Department of Public Works facility that is away from rivers and floodplains.	Department of Public Works	1-10 Years/ Medium	Medium/ High	Bond	New Action
Structural Project- All Hazards	Move the Whitman Emergency Management Office from the Fire Department and create a new stand-alone Emergency Management Office at the former Town Armory.	Emergency Management Agency	1-10 Years/ Medium	Low/ High	Bond	New Action
Public Education & Awareness-All Hazards	Provide information to residents via social media (Twitter & Facebook) about non-emergency, but important public matters, such as when a road is closed due to flooding or brush fire, when fire hydrant flushing is taking place, etc.	Fire Department, Police Department, Department of Public Works	1-5 Years/ Low	Low/ Low	Fire, Police & Public Works Operating Budget	New Action
Public Education & Awareness-All Hazards	Update evacuation routes throughout town, working cooperatively with local Police, Fire and DPW as well as with the appropriate state officials.	Fire Department, Police Department, Department of Public Works, MEMA, MassDOT	1-3 Years/ Medium	Medium/ Medium	Fire, Police, & Public Works Operating Budgets, MEMA, MassDOT	Multiple agencies have met and begun to under-take this project.

Category of Action & Hazard Addressed	Description of Action	Responsible Party	Timeframe/ Priority	Benefit/ Cost	Potential Funding Sources	Status from 2006 Plan
Prevention- All Hazards	Update the town's GIS system to reflect current land use changes. Also input building data into the system. This assists emergency personnel in knowing the layout of each building, which is helpful during emergency situations.	Department of Public Works, Assessor's Office	1-5 Years/ Medium	Medium/ Medium	General Fund	New Action

Whitman Mitigation Actions Completed Since 2006

- Rebuilt existing drainage structures during the Cold Planing and Resurfacing of Bedford Street (Route 18) Project (MassDOT Project ID# 604160).
- Replaced the crumbling headwall of the Harding's Pond Dam with a new poured concrete headwall.
- Cleared trees and brush away from the river and stream banks throughout town every winter to allow for the free flow of water.
- Used a sewer jet to clean drains of sediment and roots in various neighborhoods throughout Whitman as needed.
- Dredged the following rivers and streams of sediment to reduce the risk of flooding:
- Unnamed stream at Route 18 and the Stop & Shop Driveway
- Unnamed stream at Route 58 between Simmons Avenue & Indian Trail
- Unnamed stream at Route 14 and Homeland Drive

CHAPTER 9: PLAN ADOPTION & MAINTENANCE

Adoption of the Plan

According to 44 CFR §201.6(d) mitigation plans must be submitted to the State Hazard Mitigation Officer (SHMO) for initial review and coordination. The SHMO then forwards the plan to the FEMA Regional Office for formal review and approval.⁵⁹ It should be noted that the final draft is submitted to the SHMO and FEMA prior to seeking the formal adoption of the plan by the communities or the Old Colony Planning Council (OCPC) Board of Delegates. FEMA reviewers document their evaluation of the plan using the Local Mitigation Plan Review Crosswalk.

Mitigation plans are approved when they receive a “Satisfactory” for all requirements under 44 CFR §201.6. Once a final plan is submitted, the FEMA Regional Office will complete the review within 45 days from the day it is received when possible. In the event the plan is not approved, the FEMA Regional Office will provide comments on the areas that need improvement. FEMA will complete the review of the re-submittal of the plan within 45 days of its receipt.⁶⁰

Once FEMA determines that the plan is “approvable pending adoption” (i.e., the plan meets all requirements except for the formal adoption and submittal), the participating local communities and the OCPC Board of Delegates can begin the formal plan adoption process.⁶¹ A FEMA recommended Adoption Resolution that can be used by the communities to formally adopt the plan can be found in this chapter.

Monitoring, Evaluating and Updating the Plan

For the Old Colony Region Natural Hazard Mitigation Plan to be successful, it is critical that the plan be monitored, evaluated and updated on a regular basis. It is therefore necessary to include procedures for maintaining, evaluating and updating the plan. Together, OCPC, the participating communities and members of the MHCPT will monitor the plan’s implementation and coordinate the required updates. It is expected that members of the MHCPT will remain the same during each stage (monitoring, evaluation and update) of the next 5-year planning cycle.

OCPC will be responsible for:

- Working with local partners during the fourth year after the initial plan adoption to begin to prepare for an update of the plan (as resources allow) which will be required by the end of the fifth year to maintain approved plan status with FEMA. The update will focus on successes and failures of the current plan through a series of meetings, discussions and reports from the local communities. Any new information relating to new or changing hazard conditions or improved vulnerability assessments will be added. The latest guidance from MEMA and FEMA will be utilized to ensure that the process meets all state and federal requirements. OCPC will once again invite stakeholders and members of the public, including neighboring communities, to participate and provide input into the

⁵⁹ Federal Emergency Management Agency. (2011). *Local Mitigation Plan Review Guide*. Washington, D.C.

⁶⁰ *Ibid.*

⁶¹ *Ibid.*

plan revision. Outreach to groups not included in the current phase will be asked to participate in the next phase, including businesses, academia and non-profits. OCPC will post a copy of the final plan on its website allowing the public to submit feedback.

- Hosting an annual hazard mitigation meeting for members of the Multi-Hazard Community Planning Team, local emergency managers, town planners, public works officials, city/town engineers and Chief Administrative and Elected Officials from each community in the region to discuss the status of hazard mitigation in the region and each community's progress in implementing the plan. These meetings will be open to the public and advertised in local media as well as on the OCPC website.
- Distributing hazard mitigation related material to its member communities, including notices of meetings, workshops and grant opportunities. This will be done utilizing a variety of methods, including posting materials on OCPCs website and social media outlets, such as Facebook and Twitter. Materials will also be mailed and emailed to the MHCPT members and emergency managers in each community.
- Evaluating and updating the plan in the wake of a substantial hazard event or federally declared disaster. Part of the evaluation and update of the plan would include a meeting of the MHCPT, so that members could discuss and share their experiences and determine what, if any, mitigation strategies or actions need to be incorporated into an amended plan.
- Working with local REPCs and LEPCs, the Southeast Region Homeland Security Council, and MEMA to update critical facilities, threats, vulnerabilities, and resources throughout the region.
- Updating the plan to reflect federal or state hazard mitigation planning regulation changes (as funding permits).
- Assisting communities in applying for hazard mitigation grants.

Communities will be responsible for:

- Attending MEMA grant program briefings and technical assistance meetings (if needed) and applying for hazard mitigation grants to address vulnerabilities in their community.
- Reviewing the plan on a regular basis and noting changes that need to be to the plan in the aftermath of a natural hazard.
- Holding regularly scheduled Local Emergency Planning Committee (LEPC) meetings to discuss new and existing projects and initiatives that relate to mitigation planning and emergency management.
- Informing the public of imminent weather hazards and advising what precautions to take to stay safe.
- Keeping records of local notable weather-related incidents.
- Tracking the progress of all planned, ongoing and completed mitigation projects.

Incorporation into Existing Planning Mechanisms

OCPC and the communities participating in the development of this plan will work to ensure that this plan's goals and strategies are incorporated into a variety of community based plans and OCPC based plans that are updated from time to time: Table 132 has a list of these plans and their schedule of updates. (Please note that each of the 15 participating community's actual schedule of updates varies from community to community.)

Table 132: Incorporation into Existing Planning Mechanisms

Plan Name	Schedule of Updates:
Community Based Plans	
Master Plans	Updates are not mandated by any agency or entity, but according to Massachusetts General Law Chapter 41; Section 81D “plans may be added to or changed from time to time, by a majority vote of such planning board and shall be made public record.”
Open Space & Recreation Plans	Updates to have an approved plan are required every five years per the Massachusetts Executive Office of Energy and Environmental Affairs.
Comprehensive Emergency Management Plans	Updates are not mandated by any agency or entity, but should comply with the Commonwealth of Massachusetts Comprehensive Emergency Management Plan.
Capital Improvement Plans	Updates are recommended annually per the Massachusetts Department of Revenue.
Stormwater Plans	Updates are not mandated by any agency or entity, but should comply with the U.S. Environmental Protection Agency’s National Pollutant Discharge Elimination System Permit Program.
OCPC Based Plans	
OCPC Policy Plan	Updates are recommended every five years per the OCPC Board of Delegates and Alternates (Next Update Scheduled for 2015)
OCPC Regional Transportation Plan	Updates are required every four years per the U.S. Department of Transportation (Next Update Scheduled for 2015)
OCPC Comprehensive Economic Development Strategy	Updates are required annually per the U.S. Department of Commerce (Next Update Scheduled for 2015)

The plans noted in Table 132 address many of the mitigation actions found in this plan, which are intended to reduce the region’s vulnerability to natural hazards. Examples of actions include the replacement of culverts, the adoption of stormwater management bylaws, proper management of dams, and replacement of generators at critical facilities among a host of others. The responsibility of implementing the strategies and actions contained within this plan into other plans ultimately falls to the individual community. OCPC is ready, able and willing to assist communities in the implementation of these actions when possible.

Continued Public Involvement

The Draft Old Colony Region Natural Hazard Mitigation Plan was made available for a 75 day public review and comment period from September 24, 2012 through December 7, 2012. This public review and comment period afforded not only communities participating in the plan to comment on the final draft, but also afforded neighboring communities and interested agencies and organizations an opportunity to comment on the plan. Notice of the comment period was advertised in two local newspapers-the Brockton Enterprise and the Patriot Ledger. The circulation area of these two newspapers not only covers the communities participating in the

plan, but also all neighboring communities. The Brockton Enterprise is considered a newspaper of record for Brockton and many nearby towns in northern Bristol and Plymouth counties, and southern Norfolk County, whereas the Patriot Ledger covers Abington, Braintree, Canton, Carver, Cohasset, Duxbury, Halifax, Hanover, Hanson, Hingham, Holbrook, Hull, Kingston, Marshfield, Milton, Norwell, Pembroke, Plymouth, Quincy, Randolph, Rockland, Scituate, Sharon, Stoughton, Weymouth and Whitman. In addition, the plan was also posted on the OCPC website as well as the OCPC Facebook and Twitter accounts. The draft was also distributed to the Old Colony Multiple Hazard Community Planning Team and to all those who were involved in the development of the plan, as well as to OCPC Board of Delegates. Notice of the public review period and a copy of the draft plan were also sent to a list of potentially interested organizations listed in Appendix 3. Comments received were evaluated and incorporated into the final plan as appropriate. On XX, the OCPC Board of Delegates voted to adopt the Old Colony Region Natural Hazard Mitigation Plan. The final plan will be on OCPC's website and comments will always be accepted.

On an annual basis OCPC will convene a meeting of the Old Colony Multiple Hazard Community Planning Team to discuss hazard mitigation planning activities and actions that have occurred during the prior year. Findings from these annual meetings will be incorporated into the next plan update. These annual meetings will assess the effectiveness of the plan by discussing what mitigation actions have occurred and if there have been any issues with the plan not addressing specific problem areas.

Adoption Resolution

(Community Name) _____

(Governing Body) _____

(Address) _____

Adoption Resolution

WHEREAS, *(insert name of jurisdiction)*, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,

WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, *(insert the name of jurisdiction)* is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, *(insert the name of the governing body)* has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by *(insert the name of the governing body)* that *(insert the name of jurisdiction)* adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this _____ day of _____, 201__ at the meeting of the *(insert the name of the governing body)*.

Insert appropriate signature lines and dates

(Mayor, Chair of Board of Selectmen, President of Town Council, etc...)

Adoption by Communities

The participating communities formally adopted the plan on the following dates. The formal adoption resolution from each community follows.

Table 133: Plan Adoption Date by Community

Community	Date Adopted
Abington	September 14, 2015
Avon	September 3, 2015
Bridgewater	October 6, 2015
Brockton	February 16, 2016
East Bridgewater	September 14, 2015
Easton	October 5, 2015
Halifax	September 8, 2015
Hanson	September 1, 2015
Kingston	August 25, 2015
Pembroke	December 14, 2015
Plymouth	September 8, 2015
Plympton	October 19, 2015
Stoughton	October 6, 2015
West Bridgewater	January 20, 2016
Whitman	September 15, 2015

INSERT LOCAL ADOPTIONS

Adoption Resolution

TOWN OF KINGSTON

BOARD of SELECTMEN/EMERGENCY MANAGEMENT AGENCY

26 EVERGEEN STREET

Adoption Resolution:

WHEREAS, the Town of Kingston, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and

WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Town of Kingston is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, the Town of Kingston and the Emergency Management Agency has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by the Town of Kingston and the Kingston Emergency Management Agency adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdictions Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 25th day of August, 2015 at the meeting of the Kingston Board of Selectmen.



Chair of the Board of Selectmen



Vice Chair of the Board of Selectmen



Member, Board of Selectmen



Member, Board of Selectmen

Member, Board of Selectmen



Director, Kingston Emergency Management Agency

Adoption Resolution

WHEREAS, The Town of Hanson, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,

WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and


WHEREAS, The Town of Hanson is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

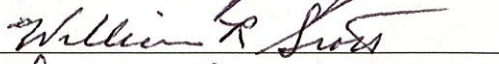
WHEREAS, The Board of Selectmen has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

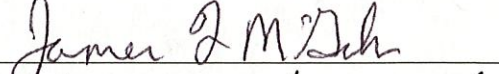
NOW, THEREFORE, BE IT RESOLVED by The Board of Selectmen that The Town of Hanson adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.


ADOPTED this first day of September, 2015 at the meeting of the Board of Selectmen.


Hanson Board of Selectmen











BOARD OF SELECTMEN
Francis A. Hegarty, Chairman
Steven P. Rose, Clerk
Robert F. Brady, Jr., Associate

Town of Avon Massachusetts

Town Offices
Buckley Center 02322
(508) 588-0414
FAX (508) 559-0209

Francis T. Crimmins, Jr.
TOWN ADMINISTRATOR



Adoption Resolution

(Community Name) Town of Avon

(Governing Body) Board of Selectmen

(Address) 65 East Main Street, Avon, MA 02322

Adoption Resolution

WHEREAS, the Town of Avon, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,


WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Town of Avon is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, the Board of Selectmen has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by the Board of Selectmen that the Town of Avon adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 3rd day of September, 2015 at the meeting of the Board of Selectmen.



Francis A. Hegarty, Chairman, Board of Selectmen

9/3/15

Date

Adoption Resolution

Town of Halifax

Halifax Board of Selectmen

499 Plymouth Street, Halifax, MA 02338

Adoption Resolution

WHEREAS, *the Town of Halifax*, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,

WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

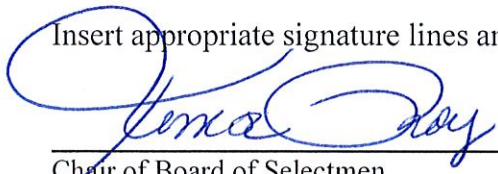
WHEREAS, *the Town of Halifax* is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, *the Halifax Board of Selectmen* has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by *the Halifax Board of Selectmen* that *the Town of Halifax* adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 8th day of September, 2015 at the meeting of *the Halifax Board of Selectmen*.

Insert appropriate signature lines and dates



Chair of Board of Selectmen

September 8th, 2015

Date



TOWN OF PLYMOUTH

11 Lincoln Street
Plymouth, Massachusetts 02360

FAX: (508) 830-4140

Board of Selectmen
Town Manager
(508) 747-1620 ext. 100

Human Resources
(508) 747-1620 ext. 101

Adoption Resolution

WHEREAS, the Town of Plymouth, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,

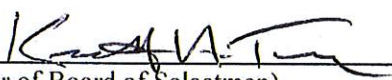
WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Town of Plymouth is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, the Board of Selectmen has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by the Board of Selection that the Town of Plymouth adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this the eighth day of September, 2015 at the meeting of the Board of Selectmen.



(Chair of Board of Selectmen)



Adoption Resolution

Abington

Board of Selectmen

500 Gliniewicz Way, Abington, MA

Adoption Resolution

WHEREAS, The Town of Abington, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,


WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, The Town of Abington is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, The Board of Selectmen has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by The Board of Selectmen that The Town of Abington adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 14th day of September, 2015 at the meeting of the Board of Selectmen.


Michael W. Franey, Chairman, Board of Selectmen



Adoption Resolution

Town of East Bridgewater

**Board of Selectmen
175 Central Street
East Bridgewater, MA 02333**

Adoption Resolution

WHEREAS, **East Bridgewater**, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,

WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, **East Bridgewater** is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, **East Bridgewater** has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by the **Board of Selectmen** that **East Bridgewater** adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 14th day of SEPT., 2015 at the meeting of the Board of Selectmen.



David Sheedy
Chair of Board of Selectmen

ADOPTION RESOLUTION

Town of Whitman
Board of Selectmen
54 South Avenue
Whitman, MA 02382

Adoption Resolution

WHEREAS, the Town of Whitman, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,

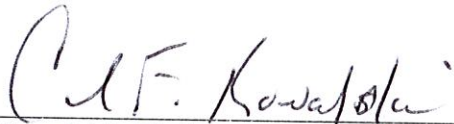
WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Town of Whitman is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, the Board of Selectmen has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by the Board of Selectmen that the Town of Whitman adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 15th day of September, 2015, at a meeting of the Board of Selectmen.



Dr. Carl F. Kowalski, Chairman, Board of Selectmen



Office of the Board of Selectmen

136 Elm Street

North Easton, Massachusetts 02356

WHEREAS, The Town of Easton, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,

WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, The Town of Easton is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, the Town of Easton has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by Board of Selectmen that the Town of Easton adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

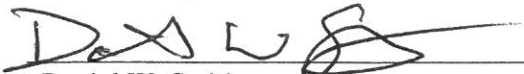
GIVEN, under our hand and seal of the Town of Easton this 5th day of October, in the year Two Thousand and Fifteen.



Daniel J. Murphy



Dottie A. Fulginiti



Daniel W. Smith



Carol F. Nestler



Kevin G. McIntyre



Bridgewater Town Council

In Town Council, Tuesday, October 6, 2015

Council Resolution: R-2015-005

Introduced By: Town Manager (at the request of the Fire Chief)
 Date Introduced: September 22, 2015
 First Reading: September 22, 2015
 Second Reading: October 6, 2015
 Amendments Adopted: None
 Date Adopted: October 6, 2015
 Effective Date: October 6, 2015

Resolution #R-2015-005

ADOPTION OF OLD COLONY HAZARD MITIGATION PLAN

WHEREAS, the Town of Bridgewater, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,

WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Town of Bridgewater is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, the Town of Bridgewater Town Council has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by Town Council that the Town of Bridgewater adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

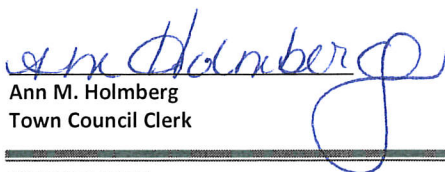
ADOPTED this 6th day of October, 2015 at the meeting of the Town Council.

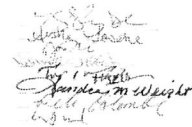
Committee Referrals and Dispositions:

Referral(s)	Disposition(s)
• No Committee Referrals	

In accordance with the applicable provisions of the Town of Bridgewater Home Rule Charter and Town Council Rules and Procedures, the Town Council assembled voted, at their meeting on Tuesday, October 5, 2015, to approve the aforementioned Resolution by a voice vote (7-0).

A TRUE COPY ATTEST:


 Ann M. Holmberg
 Town Council Clerk


 [Signature]

VOICE VOTE



Town of Stoughton

Board of Selectmen

Adoption Resolution

WHEREAS, the Town of Stoughton, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and

WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F. R. 2016; and

WHEREAS, the Town of Stoughton is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, Board of Selectmen has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by the Board of Selectmen that the Town of Stoughton adopts the Old Colony Region Natural Hazard mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the plan.

ADOPTED this 6th day of October, 2015 at the meeting of the Board of Selectmen.



Joseph M. Mokrisky; Chairman



Thomas J. Recupero

David J. Sousa; Vice Chair



Robert J. O'Regan



Robert M. Cohn

Adoption Resolution

(Community Name) _____ TOWN OF PLYMPTON _____

(Governing Body) _____ BOARD OF SELECTMEN _____

(Address) 5 PALMER RD PLYMPTON, MA 02367

Adoption Resolution

WHEREAS, *TOWN OF PLYMPTON*, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,

WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, *TOWN OF PLYMPTON* is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, *BOARD OF SELECTMEN* has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by *BOARD OF SELECTMEN* that *TOWN OF PLYMPTON* adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 19TH day of October, 2015 at the meeting of the *BOARD OF SELECTMEN*.

Insert appropriate signature lines and dates



(Mayor, Chair of Board of Selectmen, President of Town Council, etc...)



**TOWN OF PEMBROKE
BOARD OF SELECTMEN**

100 Center Street, Pembroke, MA 02359
781-293-3844 Fax: 781-293-4650

Adoption Resolution

WHEREAS, The Town of Pembroke, with the assistance of the Old Colony Planning Council, has gathered information and prepared the Old Colony Regional Hazard Mitigation Plan; and,

WHEREAS, The Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

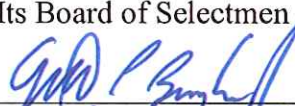
WHEREAS, The Town of Pembroke is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and,


WHEREAS, The Town of Pembroke has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

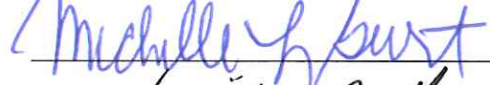
NOW, THEREFORE, BE IT RESOLVED by the Board of Selectmen that The Town of Pembroke adopts the Old Colony Regional Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the plan.


ADOPTED this fourteenth (14th) day of December, 2015 at the meeting of the Town of Pembroke's Board of Selectmen.


TOWN OF PEMBROKE,
By Its Board of Selectmen











Adoption Resolution

Town of West Bridgewater

**Board of Selectmen
65 N. Main Street
West Bridgewater, MA 02379**

Adoption Resolution

WHEREAS, The Town of West Bridgewater, with the assistance from the Old Colony Planning Council, has gathered information and prepared the Old Colony Region Natural Hazard Mitigation Plan; and,

WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, The Town of West Bridgewater is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, The Town of West Bridgewater has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by the Board of Selectmen that The Town of West Bridgewater adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 20th day of Jan, 2016 at the meeting of the Town of West Bridgewater Board of Selectmen.

Insert appropriate signature lines and dates

Nancy Maloney
Chairperson, Town of West Bridgewater Board of Selectmen


WHEREAS, the Old Colony Region Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the City is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, Brockton Emergency Management Agency and the City of Brockton has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

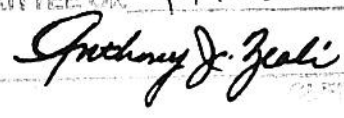
ORDERED:

That the City hereby adopts the Old Colony Region Natural Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.


Councillor Robert F. Sullivan





January 25, 2016
READ AND REFERRED TO STANDING
COMMITTEE ON finance


In City Council February 16, 2016

Adopted by a roll call vote taken by "yeas" and "nays"; eleven members present and all voting in the affirmative


City Clerk

Feb. 19 2016
Bill A. M.

CHAPTER 10: LIST OF REFERENCES

In addition to the plans and reports listed below, much of the information for this plan came from meetings with municipal department heads and staff.

- Old Colony Planning Council. Regional Multi-Hazard Pre-Disaster Mitigation Plan. June 2005.
- Massachusetts Emergency Management Agency (MEMA) & Department of Conservation & Recreation (DCR). Commonwealth of Massachusetts State Hazard Mitigation Plan. July 2013.
- Federal Emergency Management Agency (FEMA). Multi Hazard Identification and Assessment. January 1997.
- Federal Emergency Management Agency (FEMA). NFIP Community Rating System Coordinator's Manual. January 2007.
- Federal Emergency Management Agency (FEMA). Local Multi-Hazard Mitigation Planning Guidance. July 2008.
- Federal Emergency Management Agency (FEMA). Answers to Questions About the NFIP. March 2011.
- Federal Emergency Management Agency (FEMA). Local Mitigation Plan Review Guide. October 2011.
- Berkshire Regional Planning Commission. Berkshire County Hazard Mitigation Plan. February 2012.
- Northern Middlesex Council of Governments. Draft Hazard Mitigation Plan for the Northern Middlesex Region. May 2012.
- Franklin Regional Council of Governments & Town of Erving Natural Hazards Mitigation Planning Committee. Town of Erving Local Natural Hazards Mitigation Plan. March 2011.
- Metropolitan Area Planning Council. Draft Town of Randolph Hazard Mitigation Plan Update. June 2011.
- Town of Plymouth. Flood Management Plan. 2009.
- Community General Bylaws and Zoning Bylaws

APPENDIX 1: PUBLIC MEETING PRESENTATIONS & MATERIALS



Old Colony Planning Council

Multiple Hazard Community Planning Team

Old Colony Planning Council, 70 School Street, Brockton, MA 02301
Phone 508.583.1833 ~ Fax 508.559.8768 ~ Email: info@ocpcrpa.org

Monday – April 25, 2011

10:00- 11:30 A.M.

At Old Colony Planning Council

70 School Street

Brockton, MA 02301

AGENDA

- 1. Call to Order and Introductions**
- 2. Introduction to the Pre-Disaster Mitigation Plan**
 - *Ms. Sarah White*
Massachusetts Emergency Management Agency (MEMA)
- 3. Presentation of Regional Natural Hazard Maps**
- 4. The Data Gathering Process**
- 5. Other Business**
- 6. Adjournment**

Multiple Hazard Community Planning Team Meeting Minutes Meeting #1-April 25, 2011

The meeting began at 10:05 a.m.

Executive Director, Pat Ciaramella opened the meeting by talking about how the 2005 Pre-Disaster Mitigation (PDM) Plan will be expiring at the end of the summer and how grants have recently been received to update the PDM Plan for each community in the region. This will enable communities to continue to apply for FEMA funding and grant opportunities. After briefly going over some the highlights of the 2005 PDM Plan, Pat Ciaramella then introduced the staff of the Old Colony Planning Council.

Eric Arbeene went over what is to be expected with the new PDM Plan update. The update will not be as in-depth as the 2005 PDM Plan and the goals throughout the document for the region as well as each individual community will be adjusted accordingly. The goal is for the Multi-Community Hazard Planning Team to meet approximately three times as a group throughout the process, and hold a series of meetings with the towns individually and to have the plan done by December, 2011.

Sarah White began by going over a brief description of what mitigation is. Simply put, mitigation is eliminating risk that you know about. There are two types of mitigation: Immediate and Long Term. Immediate mitigation, for example, would have to do with fixing flooding in a building. With long term mitigation you would sit down and plan for the future. Sarah White also stated how FEMA is excited to get more people involved in the planning process. For example, she noted that communities should discuss potential hazards with large businesses/colleges to come up with mitigation ideas and plans to include in the PDM Plan.

Pat Ciaramella asked Sarah White what happens to money left over from previous plans. Sarah White said that MEMA receives more money than they actually spend and end up giving some of it back to FEMA.

Pat Ciaramella then spoke about the sea wall issues in Plymouth and Kingston. These towns are having issues with the walls breaking down and falling into disrepair. He stated that this could be an opportunity for them to address them in the PDM Plan and to possibly apply for funding to have them repaired.

Eric Arbeene stated that he would email the action goals from the 2005 Plan to members representing their respective community.

Chris Cutter from Abington asked how the Comprehensive Emergency Plan differs from the PDM Plan. Sarah White explained that the CEP is a response framework to all emergencies/hazards. The CEP is not from a land use perspective as is the PDM Plan.

Sarah White stated that even though some ideas may not be funded through a MEMA or FEMA grant, it does not mean that a community should preclude from putting that idea in the PDM Plan.

To conclude, Pat Ciaramella stated that the previous PDM plan is available and can be mailed out to each community.

The meeting concluded at 10:35 a.m.



Old Colony Planning Council

Multiple Hazard Community Planning Team

Old Colony Planning Council, 70 School Street, Brockton, MA 02301
Phone 508.583.1833 ~ Fax 508.559.8768 ~ Email: earbeene@ocpcrpa.org

Tuesday – November 15, 2011
10:00- 11:00 A.M.
At Old Colony Planning Council
70 School Street
Brockton, MA 02301

AGENDA

- 1. Call to Order and Introductions**
- 2. Review of Plan Status/Timeline**
- 3. Review and Update of Critical Facilities**
- 4. Review of Frequently Flooded Areas**
- 5. Review of 2005 Plan's Regional and Individual Community Mitigation Action Items**
- 6. Discussion of Regional and Individual Community Mitigation Action Plans** (Please review the enclosed Regional Mitigation Action Plan and be prepared to discuss at the meeting)
- 7. Review/Update of Hazard Vulnerability in the Region**
- 8. Other Business**
- 9. Adjournment**

Please contact Community Planner Eric Arbeene at 508-583-1833 Ext. 209 or at earbeene@ocpcrpa.org to confirm your attendance at this meeting

Multiple Hazard Community Planning Team Meeting Minutes Meeting #2-November 15, 2011

The meeting began at 10:10 a.m.

Executive Director, Pat Ciaramella opened the meeting by welcoming the attendees to the second Multiple Hazard Community Planning Team Meeting. He stated that the Pre-Disaster Mitigation Plan update is progressing nicely and that each community's participation is essential in creating a good plan.

Eric Arbeene then gave an update of the plan's status and timeline. He stated that OCPC staff has completed a large amount of background work on the plan, including updating information and reformatting the plan to comply with current FEMA specifications. He stated that OCPC is currently in a phase where they are continuing to reach out with communities to meet and obtain community specific information, such as updating their lists of critical facilities, highlighting frequently flooded areas and developing specific hazard mitigation action items for each community. He stated that OCPC is looking to complete a first draft of the plan by the end of the year for communities to review.

Eric Arbeene stated that OCPC are looking to obtain updated lists of critical facilities from each community as soon as possible. He stated that he mailed out lists of critical facility to each of the planning team members asking them to update, change, edit and confirm the lists for each town. He stated that OCPC is looking to obtain this information as soon as possible because it still needs to be mapped into GIS.

Eric Arbeene stated that OCPC is also looking to obtain a list of frequently flooded areas from each community to include in the plan. Inclusion of the areas would only enhance the quality of the plan and may put some context to these areas in relation to the location of critical facilities in each community. He stated that he mailed out list templates to each of the planning team members asking them to create a list of these locations within each community. He stated that OCPC is looking to obtain this information as soon as possible because it still needs to be mapped into GIS.

Eric Arbeene then reviewed the list of Regional Mitigation Actions from the 2005 Plan. He asked team members to go back to their community to see if any of these actions were implemented or pursued since that time. Chief Spurr of Avon described a few drainage projects that Avon has completed since the last plan and asked if that was relevant. Eric Arbeene stated that the types of projects Chief Spurr described are indeed relevant because the projects reduced or eliminated the threat of flooding in certain areas of town.

Eric Arbeene also presented a draft of an updated list of Regional Action Items to be included in the 2012 Plan update. He again asked team members to review and comment on these actions. Scott Mitchell of Bridgewater asked why evacuation routes were not prominently featured in the 2005 Plan or in the list of updated regional action items. Eric Arbeene stated that evacuation route planning would be relevant to an emergency management plan, not so much in a Pre-

Disaster Mitigation Plan and stressed that the goal of this plan is not how to respond to an emergency, but how to mitigate the risks before a natural hazard strikes and causes an emergency situation.

Scott Mitchell stated the one of the biggest threats to communities right now is the loss of electricity during a storm and wanted to know how the plan looks to address this threat. Eric Arbeene stated that one of the regional mitigation action items is to work with utility companies to trim trees and tree branches near power lines to prevent the loss of electricity. Communities can also educate citizens to this danger and encourage them to be proactive and trim trees near power lines on their own property as well.

Eric Arbeene stated that in addition to reviewing the Regional Mitigation Action Plan, communities are responsible for developing a list of mitigation actions specific to their community. He stressed that even though some ideas may not be funded through a MEMA or FEMA grant, it does not mean that a community should preclude from putting that idea into the Plan. Eric Arbeene stated that he is happy to meet with communities at any time to discuss their mitigation action ideas. Pat Ciaramella stressed that for a community to receive grant funding for a project, that project must be included in the plan.

It was stated that communities would be responsible for locating DEP Tier II sites in their community so they can be added to their lists of critical facilities.

The meeting concluded at 10:55 a.m.

Old Colony Planning Council
Multiple Hazard Community Planning
Team Meeting #2

November 15, 2011

Tuesday – November 15, 2011
10:00- 11:00 A.M.
At Old Colony Planning Council
70 School Street
Brockton, MA 02301

AGENDA

1. Call to Order and Introductions
2. Review of Plan Status/Timeline
3. Review and Update of Critical Facilities
4. Review of Frequently Flooded Areas
5. Review of 2005 Plan's Regional and Individual Community Mitigation Action Items
6. Discussion of Regional and Individual Community Mitigation Action Plans (Please review the enclosed Regional Mitigation Action Plan and be prepared to discuss at the meeting)
7. Review/Update of Hazard Vulnerability in the Region
8. Other Business
9. Adjournment

Review of Plan Status

- The Old Colony Multi Hazard Mitigation Plan is progressing quite nicely since the last time we have met.
- OCPC staff has done a large amount of background work on updating information and re-formatting the plan to comply with current FEMA specifications.
- OCPC is currently in the phase where it is reaching out to each of the communities for community specific information, including updating lists of critical facilities, highlighting frequently flooded areas and developing specific hazard mitigation actions for their community.
- OCPC is looking to complete a draft plan by the end of the year.

Review & Update of Critical Facilities

- OCPC is currently reaching out to each of the communities in the region to update its list of critical facilities located within their community.
- Updated lists were sent out to each the communities, asking for the list to be verified, updated and changed as each community saw fit.
- Critical facilities can be defined as
- OCPC is looking to obtain this information as soon as possible.

Review of Frequently Flooded Areas

- OCPC is currently reaching out to each of the communities in the region to create a list of frequently flooded areas located within their community.
- List templates were sent out to each the communities, asking that any area in town that frequently floods be placed on the list.
- OCPC is looking to obtain this information as soon as possible.

Review of 2005 Regional Mitigation Action Plan

Flood Related Actions

- Very selectively elevate high-risk structures
- Elevate key appliances in basements, e.g., furnaces, hot water heaters, freezers, etc.
- Develop and implement local flood mitigation dam management program(s)
- Inspect, maintain/upgrade older dams for present functions and storm water management potential
- Identify ownership issues and define responsibilities and coordination mechanisms
- Development of the community organization, commitment, communications and overall management plans needed to manage selected major dams for flood attenuation
- Remove/modify obstacles to flow in confined streams, e.g., bridges with inadequate clearance
- Maintain clear spillways and operable board or sluices to allow purposeful dam operation
- Directly reduce streamside risks, e.g., by removing selected structures from floodway and reconfiguring banks for flood storage and safe dry weather open space/habitat use
- Study opportunities for selective enhancement of low-lying natural areas for flood storage/habitat/open space use along streams
- Adoption of storm water treatment and retention provisions (maximizing recharge and allowing no increase in runoff) where missing in the Local Subdivision Rules and Regulations
- Enforce flood hazard zoning

SLOSH Related Actions

- Replenish beaches and dunes, increase height of natural protective features
- Selectively expand hard structures, such as seawalls and stone dikes
- Elevate buildings in SLOSH areas
- Use sand to enlarge any dunes to protect houses from storm surges
- Identify / Implement beach nourishment and dune restoration needs and opportunities

Wind Related Actions

- Upgrade boat moorings and lines, ensure adequate spacing for free movement
- Install supplementary all-weather heating; wood, oil, propane burning stoves
- Strengthen local regulations for communications towers
- Strengthen / enforce tie-down requirements for light structures, particularly for mobile homes predating present requirements
- Adopt Board of Health provisions allowing Building Inspector to confirm safety of older (Pre-1976) units
- Consider new state statute or town non-zoning bylaw covering older units
- Require and maintain effective lightning rods

Winter Storm Related Actions

- Minimize drifts with upwind snow fences
- When snow fences are infeasible, expand use of convex ice mounds to deflect potential drifts back away from roads or other sensitive areas
- Trim heavy branches on upper portions of isolated tall pines near houses to lessen potential damage in a windfall

Wildfire Related Actions

- Continue controlled burns of flammable brush in public and private forests
- Continue creating/expanding fire breaks upwind of critical facilities and other development, particularly via controlled burns along roads and power lines; expand effort to key out-of-Forest locations
- Practice defensible space techniques, e.g., keepings roof gutters clear of inflammable debris; keeping cut well-watered grass around houses, removing nearby "ladder" growth potentially connecting ground fires to trees, using fire resistant building materials
- Mow otherwise un-harvested grasslands once or twice a season to prevent grass turning to brush and trees
- Develop any needed fire ponds/enhance them with dry hydrants
- Require clearance of burnable underbrush near critical facilities
- Adopt protective provisions potentially modeled after the Town of Plymouth's recommended "Defensible Space Principles" and the Forest Service guidance noted above in all affected communities
- Inform home owners, residents, and agencies/firms of Defensible Space principals

Major Urban Fire Related Actions

- Improve access to and through isolated neighborhoods by connecting dead end roads to ease winter time access by Fire Dept.
- Maintaining evacuation plans in case of fires, tornados or other hazards at schools, colleges and nursing homes, etc.

Landslide Related Actions

- Relocate buildings along bluffs
- Stabilize slopes, review and implement any feasible "soft" bank stabilization techniques to strengthen receding banks

Earthquake Related Actions

- Earthquake proof structures

Discussion of Updated Regional Mitigation Action Plan

Category of Action	Description of Action	Implementation Responsibility	Timeframe/Priority	Potential Resources/Funding
Prevention	Continue National Flood Insurance Program (NFIP) compliance by enforcing local flood plain ordinances.	Federal Emergency Management Agency (FEMA), Massachusetts Emergency Management Agency (MEMA), Municipalities	Ongoing/Medium	Municipalities
Prevention	Encourage local municipalities to consider joining the Community Rating System (CRS)	FEMA, MEMA, Municipalities	1-5 Years/Low	Municipalities
Prevention	Incorporate updated FEMA floodplain data and maps into existing and future planning efforts	MEMA, Municipalities	Ongoing/Medium	FEMA
Prevention, Emergency Services Protection	Flood proof or relocate municipally-owned critical facilities located within floodplains	Municipalities	Ongoing/Medium	FEMA, Municipalities
Prevention, Property Protection	Very selectively elevate high-risk structures where/when appropriate	Municipalities, Property Owners	Ongoing/Medium	FEMA, Municipalities, Property Owners
Prevention, Property Protection	Very selectively elevate key appliances in basements of homes that frequently flood where/when appropriate	Municipalities, Property Owners	Ongoing/Medium	FEMA, Municipalities, Property Owners
Structural Projects	Assist vulnerable businesses and cultural institutions to secure funding to retrofit their facilities against flood damage.	Chambers of Commerce, MEMA, Municipalities, OCPC	1-5 Years/Medium	FEMA
Property Protection	Consider voluntary flood acquisition programs where appropriate	FEMA, MEMA, Municipalities, Property Owner	1-10 Years/Low	FEMA, Property Owners
Prevention	Improve enforcement of existing floodplain bylaws	Municipalities	Ongoing/Medium	Municipalities

Category of Action	Description of Action	Implementation Responsibility	Timeframe/Priority	Potential Resources/Funding
Prevention	Limit the expansion of infrastructure in hazard-prone areas	Municipalities	Ongoing/Medium	Municipalities
Prevention	Encourage the use of Low Impact Development (LID) techniques	Municipalities	Ongoing/Medium	Massachusetts Department of Environmental Protection (MassDEP)
Prevention	Develop bylaws that require the on-site containment of storm water	Municipalities	1-10 Years/Medium	Municipalities
Structural Projects	Improve storm water management systems that are located in hazard prone areas or that are inadequate	MassDEP, Municipalities	Ongoing/Medium	MassDEP, Environmental Protection Agency (EPA)
Prevention	Regularly maintain/clean system of catch basins	Municipalities, MassDOT	Ongoing/High	Municipalities, MassDOT
Prevention	Regularly conduct street sweeping	Municipalities	Ongoing/High	Municipalities
Prevention, Structural Projects	Remove/modify obstacles to flow in confined spaces, such as bridges and culverts with inadequate clearance	MassDOT, Municipalities	Immediately/High	FEMA, MassDOT, Municipalities
Property Protection	Encourage the flood-proofing or relocation of existing structures in floodplain zones	Municipalities, Property Owners	Ongoing/Medium	Municipalities, Property Owners
Prevention	Ensure that each dam has an updated Emergency Action Plan and Inundation Map	DCR-Office of Dam Safety, Municipalities, OCPC	1-10 Years/High	MEMA
Prevention, Structural Projects	Inspect, maintain/upgrade older dams for present functions and storm water management potential	FEMA, Massachusetts Department of Conservation & Recreation (DCR)- Office of Dam Safety, Municipalities	Immediately/High	DCR, Municipalities

Category of Action	Description of Action	Implementation Responsibility	Timeframe/Priority	Potential Resources/Funding
Emergency Services Protection, Prevention	Educate local Emergency Management Directors about dams in their municipalities	DCR-Office of Dam Safety, Municipalities	Immediately/High	DCR
Prevention/Public Education	Increase the working relationship between upstream and downstream dam owners	DCR-Office of Dam Safety, Municipalities	1-10 Years/Medium	N/A
Public Education	Educate dam owners about their responsibilities and liabilities	(DCR)- Office of Dam Safety, FEMA, Municipalities	Immediately/ High	DCR, Federal Energy Regulatory Commission (FERC)
Emergency Services Protection	Conduct local disaster response drills	Municipalities, Regional Emergency Planning Committees (REPCs)	1-3 Years/Medium	Department of Homeland Security, (DHS), Mass. Dept. of Public Health (DPH)
Public Education	Provide workshops to help local businesses and cultural institutions to develop disaster mitigation plans for their facilities	Chambers of Commerce, MEMA	1-5 Years/Medium	FEMA
Emergency Services Protection	Develop and publicize local and regional evacuation routes	MEMA, Municipalities, REPCs, Utility Providers	1-3 Years/Medium	DHS, DPH
Emergency Services Protection	Expand and formalize local agreements for use of shared mass care shelters in the event of a disaster	MEMA, Municipalities, Red Cross, REPCs	1-5 Years/Low	Municipalities
Emergency Services Protection	Install generators and/or back-up generators at the most critical of facilities, ex. Police, Fire, EOC, Mass Care Shelters, Elderly Housing	Municipalities	1-5 Years/Medium	Municipalities

Category of Action	Description of Action	Implementation Responsibility	Timeframe/Priority	Potential Resources/Funding
Emergency Services Protection	Develop formal Mutual Aid Agreements for DPWs, Emergency Response Teams, if not done so already	MEMA, Municipalities, REPCs, Southeast Regional Advisory Council Homeland Security (SRACHS)	1-2 Years/High	Homeland Security
Emergency Services Protection	Develop a coordinated resource list of equipment that can be shared among communities during an emergency.	Municipalities, SCHRACHS	1-5 Years/Medium	Municipalities
Emergency Services Protection	Add additional airwave capacity for emergencies	MEMA, Municipalities, REPCs, SRACHS	1-3 Years/ Medium	Homeland Security
Public Education	Provide brochures/leaflets to landowners in hazard-prone areas that discuss hazard mitigation	MEMA, Municipalities	1-3 Years/Low	MEMA, Municipalities
Emergency Services Protection	Educate local officials to help them develop plans to protect critical documents and materials	Municipalities	1-5 Years/Medium	Municipalities
Prevention, Public Education	Periodically update the Old Colony Hazard Mitigation Plan	OCPC, MEMA	5 Years/Medium	FEMA, MEMA
Prevention	Assure that mobile homes have adequate tie downs	Municipalities	Ongoing/Medium	Municipalities
Prevention	Enforce the state building code	Municipalities	Ongoing/High	Municipalities
Prevention, Structural Projects	Minimize snowdrifts with upwind snow fences	Municipalities, MassDOT	1-5 Years/Low	Municipalities, MassDOT
Prevention	Require and maintain effective lightning rods	Municipalities/Private Owners	1-5 Years/Low	Municipalities/Private Owners
Prevention	Consider conducting controlled burns of flammable brush on public land at risk	Municipalities/State Forest Fire Warden	1-5 Years/Medium	Municipalities

Category of Action	Description of Action	Implementation Responsibility	Timeframe/Priority	Potential Resources/Funding
Emergency Services Protection	Consider creating/expanding fire breaks upwind of critical facilities via controlled burns and or tree trimming along roads where tree touch overhead	DCR, Municipalities, State Forest Fire Warden	Ongoing	DCR, Municipalities
Prevention	Implement and advocate Defensible Space Techniques (keeping roof gutters clear of flammable material, keeping cut well-watered grass around houses, removing nearby "ladder" growth potentially connecting ground fires to trees, use of fire-resistant building materials	Municipalities/Private Owners	1-5 Years/Medium	Municipalities/Private Owners
Prevention	Develop any needed fire ponds and enhance with dry hydrants	Municipalities	1-10 Years/Low	Municipalities
Prevention	Work with utility providers to proactively trim trees around utility lines	Municipalities, Utility Providers	Ongoing/High	Municipalities, Utility Providers
Prevention, Structural Projects	Replenish beaches and dunes-increase height of natural protective features	Army Corps of Engineers Municipalities, MassDEP, Office of Coastal Zone Management (CZM)	1-10 Years/Medium	CZM, MassDEP, Municipalities
Prevention, Structural Projects	Nourish beaches with upstream deposits of sand	MassDEP, CZM, Municipalities	1-10 Years/Low	Municipalities
Prevention, Structural Projects	Earthquake Proof Structures	Municipalities	1-10 Years/Low	Municipalities
Property Protection	Conduct public building seismic assessments	Municipalities	1-10 Years/Low	Municipalities

Review of Hazard Vulnerability in the Old Colony Region

Hazard Vulnerability in the Old Colony Region

Frequency Categorization

Very low: events that occur less frequently than once in 100 years (Less than 1% per year)
Low: events that occur from once in 50 years to once in 100 years (1% to 2% per year)
Medium: events that occur from once in 5 years to once in 50 years (2% to 20% per year)
High: events that occur more frequently than once in 5 years (Greater than 20% per year)

Severity Categorization

Minor: Limited and scattered property damage; limited damage to public infrastructure and essential services not interrupted; limited injuries or fatalities.
Serious: Scattered major property damage; some minor infrastructure damage; essential services are briefly interrupted; some injuries and/or fatalities.
Extensive: Widespread major property damage; major public infrastructure damage (up to several days for repairs); essential services are interrupted from several hours to several days; many injuries and/or fatalities.
Catastrophic: Property and public infrastructure destroyed; essential services stopped; numerous injuries and fatalities.

Area of Impact

Isolated: a single whole or partial community impacted
Local: One community to several communities impacted
Regional: many communities to a county impacted
Widespread: multiple counties impacted

Hazards Affecting the Old Colony Region

Natural Hazard	Frequency	Severity	Area of Impact	Hazard Ranking
Flooding	High	Extensive	Regional	10
Winter Storms	High	Serious	Widespread	10
Hurricanes & Tropical Storms	Medium	Extensive	Widespread	10
Coastal Erosion & Shoreline Change	High	Serious	Local	8
Extreme Temperatures	Medium	Minor	Widespread	8
Tsunami	Very Low	Extensive	Widespread	8
Tornadoes	Medium	Serious	Local	7
Wildfire	Medium	Minor	Local	6
Earthquake	Very Low	Minor	Regional	5
Landslide	Low	Minor	Isolated	4
Major Urban Fire	Low	Minor	Isolated	4



Old Colony Planning Council

Regional Hazard Mitigation Plan Meeting

*Old Colony Planning Council, 70 School Street, Brockton, MA 02301
Phone 508.583.1833 ~ Fax 508.559.8768 ~ Email: earbeene@ocpcrpa.org*

Monday – September 24, 2012

9:30- 11:00 A.M.

At Old Colony Planning Council

70 School Street

Brockton, MA 02301

AGENDA

- 1. Call to Order and Introductions**
- 2. Review of Plan Status/Timeline**
- 3. Review and Release of the Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan for Comment**
- 4. Review of FEMA Hazard Mitigation Grant Program & Question and Answer Session on Project Eligibility**
 - *Scott MacLeod, MEMA Mitigation & Disaster Recovery Division Manager*
 - *Dan Nietzsche, MEMA Hazard Mitigation Grants Coordinator*
 - *Alex Gill, MEMA Hazard Mitigation Grants Coordinator*
- 5. Other Business**
- 6. Adjournment**

Your attendance is important for the continued development of this plan!

Please contact Community Planner Eric Arbeene at 508.583.1833 Ext. 213 or at earbeene@ocpcrpa.org to confirm your attendance at this meeting.

Coffee and light refreshments will be served.

Multiple Hazard Community Planning Team Meeting Minutes
Meeting #3-September 24, 2012

The meeting began at 9:35 a.m.

Executive Director, Pat Ciaramella opened the meeting by welcoming the attendees to the third Multiple Hazard Community Planning Team Meeting. He stated that the Pre-Disaster Mitigation Plan update is continuing to progress nicely and each community's contribution has been essential in creating a good plan.

Eric Arbeene then gave an update of the plan's status and timeline and noted that the draft plan was now complete and would be available for a 75 day public review and comment period, ending on December 7, 2012. A copy of the draft plan on CD format was given to each of the attendees to review and comment on. (Communities that were not present at the meeting would be mailed a copy of the CD and the followed up with via a phone call from OCPC staff.) The draft plan would also be posted on the Old Colony Planning Council website as well as mailed to approximately a dozen other agencies and organizations with an interest in hazard mitigation planning. Eric Arbeene encouraged comments and questions from the communities and the public and noted that OCPC staff would incorporate comments, edits and suggestions into the report where appropriate.

Eric Arbeene then briefly reviewed the contents of each of the 10 chapters in the plan and described how each chapter was developed using a PowerPoint presentation.

Scott MacLeod, Dan Nietsche and Alex Gill of MEMA then gave a presentation and overview of the hazard mitigation assistance grant program using a PowerPoint presentation. The presentation contained background information on the different types of grants, eligibility requirements as well as examples of previous success stories. MEMA staff then fielded a variety of questions from the audience as it related to grant eligible mitigation projects and how the grant funding process works.

The meeting concluded at 10:45 a.m.

NOTICE OF PUBLIC COMMENT/REVIEW FOR THE DRAFT OLD COLONY MULTI-JURISDICTION NATURAL HAZARD MITIGATION PLAN

The Old Colony Planning Council (OCPC) is making the DRAFT Old Colony Multi-Jurisdiction Natural Hazard Mitigation Plan available for public review and comment. The Plan's mission is to identify risks and ways to minimize damage caused by natural disasters. This comprehensive resource document will serve many purposes such as enhancing public awareness, creating a decision tool for management, promoting compliance with State and Federal program requirements, enhancing local policies for hazard mitigation capability, and providing inter-jurisdictional coordination. Copies of the plan are available for review at the OCPC Offices (8:30 a.m. to 4:00 p.m.) at <http://www.ocpcrpa.org>, and/or upon request. This notice will initiate a Public Review Period. Written comments will be accepted until 4:00 p.m. on December 7, 2012. Please contact Eric Arbeene at 508-583-1833 Extension 213 for further information. Written comments should be sent to:
Old Colony Planning Council
70 School Street
Brockton, MA 02301
Attention: Eric Arbeene

12832696 10/12/12

Notice of Public Comment/Review
appeared in the Friday, October 12, 2012
edition of the Brockton Enterprise Newspaper

MULTI-JURISDICTION NATURAL HAZARD MITIGATION PLAN

**LEGAL NOTICE
NOTICE OF PUBLIC COMMENT/REVIEW FOR THE DRAFT OLD COLONY MULTI-JURISDICTION NATURAL HAZARD MITIGATION PLAN**

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Written comments should be sent to:

Old Colony
Planning Council
70 School Street
Brockton, MA 02301

Attention: Eric Arbeene

AD#12832669
PL 10/12/12

Notice of Public Comment/Review
appeared in the Friday, October 12, 2012
edition of the Patriot Ledger Newspaper

Old Colony Planning Council
Multiple Hazard Community Planning
Team Meeting #3

September 24, 2012

Meeting Agenda

- Call to Order & Introductions
- Review of Plan Status/Timeline
- Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan
- Review of FEMA Hazard Mitigation Grant Program & Question and Answer Session on Project Eligibility from MEMA Staff
- Other Business
- Adjournment

Review of Plan Status

- OCPC applied for and received a grant from MEMA to update the 2006 Old Colony Hazard Mitigation Plan.
- The 2006 Plan was valid for 5 years and expired in 2011.
- To update this plan OCPC has been working with each of the member communities to update the plan over the past two years.
- Today OCPC is releasing a new draft plan for public review and will accept comments until December 7, 2012.

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 1: Introduction & Overview

- Includes general background information about the plan, identifies the communities participating in the plan and how the communities were involved in the development of the plan.

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 2: Planning Process

- Describes the role of OCPC in the development of the plan as well as gives an overview of the planning process, which included the development of the Multi-Hazard Community Planning Team, a number of public and community meetings.

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 3: Regional Profile

- A regional profile of the region was completed, which included a variety of population, housing, land use, and employment data.

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 4: Natural Hazard Identification

- The plan covers the following natural hazards:
 - Flood Related Hazards
 - Wind Related Hazards: Hurricanes, Tropical Storms & Tornadoes
 - Winter Related Hazards
 - Coastal Related Hazards
 - Fire Related Hazards-Wildfires, Major Urban Fires
 - Geologic Hazards-Earthquakes, Landslides & Tsunamis
 - Extreme Temperatures

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 4: Natural Hazard Identification

- For each of these hazards the following information is included in the plan:
 - Description and background on each hazard
 - The locations of each hazard
 - History and extent of previous hazards
 - Probability of future occurrences for each hazard

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 5: Community Hazard Risk Assessments

- A community hazard risk assessment was conducted for each community. These assessments consists of:
 - A brief community profile
 - A list of critical facilities and their relation to a variety of hazards
 - A list of floodprone areas
 - A list of repetitive flood loss properties
 - A list of bridges and dams
 - A hazard risk assessment for each individual community

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 6: Existing Protection Measures

- This chapter shows the actions each community has taken to protect themselves against the threat of natural hazards.
- These actions include programs, plans, regulations and efforts taken in each community to mitigate the effects of natural hazards.

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 7: Regional Vulnerability/Risk Assessment

- This chapter discusses the vulnerability of the region to natural hazards by identifying:
 - FEMA Disaster Declarations in the Region
 - Vulnerable areas, potential health and safety risks and potential damage to property for each hazard

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 8: Mitigation Strategy

- This chapter reviews the mitigation strategy for both the region as well as for the individual communities.
- Included is a list of mitigation goals, measures and actions the communities have identified and would like to complete as well as a list of projects/actions that the communities have completed since the completion of the last plan in 2006.

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 8: Mitigation Strategy

- These actions are divided into one of six categories:
 - Prevention
 - Property Protection
 - Public Education & Awareness
 - Natural Resource Protection
 - Structural Projects
 - Emergency Service Protection

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 9: Plan Adoption & Maintenance





- This chapter gives an overview of the plan adoption and maintenance process, including the monitoring, evaluating and updating of the plan as well as how the plan can be incorporated into existing planning mechanisms such as CEMP Plans, Master Plans, etc.

Review & Release of Draft Old Colony Multi-Jurisdictional Hazard Mitigation Plan

Chapter 10: List of References



- This chapter includes a list of plans, reports and guidance documents that OCPC used in the development of this plan.

HAZARD MITIGATION ASSISTANCE GRANTS

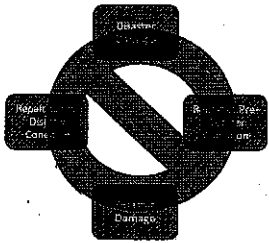


Intent of HMA Grant Programs



- Opportunity to protect individuals & property, and infrastructure from natural hazards while also reducing reliance on Federal disaster funds.
- HMA programs provide pre-disaster mitigation grant funds on an annual basis. Post-disaster HMGP too...
- Statutory origins of programs differ, but share common goal of reducing loss of life and property damage due to natural hazards...
- When in doubt – reference the FEMA program guidance;
- Don't get hung-up on different programs, focus on developing a good scope, budget & schedule...



Mitigation breaks the cycle...



Natural Hazard Mitigation results in long-term, cost-effective, and environmentally sound reduction of hazard vulnerability...



Is it long-term hazard mitigation?

- With implementation of the project, is there an increased level of protection from hazards?
 - Has the risk from the hazard been reduced?
- Build better, stronger, smarter – don't simply restore to pre-disaster condition;
- Avoid the 3-R's...Repair, Reconstruct & Rehabilitate;
- Different from "preparedness" – e.g. sandbagging (temporary/response).
- Does the solution (proposed project) address the source of problem (too much water – too fast) and not just a symptom (erosion)?



FEMA-Funded Mitigation Grant Programs

- **Hazard Mitigation Grant Program (HMGP)**
 - Only available after a major/Presidential disaster declaration event;
 - Generally available statewide in MA (not nationally competitive)
 - All-hazard mitigation *planning* and *projects* (flood, seismic, wind, etc.);
 - Word Document Application – available on MEMA website
- **Pre-Disaster Mitigation (PDM)**
 - Nationally competitive, annual program;
 - All-hazard mitigation *planning* and *projects* (flood, seismic, wind, etc.);
 - Online Application – eGrants
- **Flood Mitigation Assistance (FMA)**
 - Projects that reduce or eliminate damage to structures insured under the *National Flood Insurance Program (NFIP)*;
 - Online Application – eGrants
- **Severe Repetitive Loss (SRL)**
 - Only FEMA-identified Severe Rep Loss structures are eligible to be mitigated (+/- 175 individual properties in Massachusetts);
 - Homeowners and businesses are notified directly by FEMA if they are an "SRL" property;
 - Online Application – eGrants

Recent Mitigation Highlights...

- Haverhill – Bank Stabilization
- Greenfield – Property Acquisition
- Becket – Slope Stabilization
- Scituate/Quincy – Elevations & Retrofits
- Melrose – Ell Pond Drainage Improvements
- Harwich – Wind Retrofit
- Other mitigation ideas...

Haverhill – Merrimack River Bank Stabilization to Protect Sewer Infrastructure

- Significant erosion from May '06 flood event
- Potential impact to 54" sewer interceptor in Riverside Ave. – major loss of function possible
- Near vertical slopes – unstable and complicated riverine situation – rare species habitat
- \$386,000 HMGP Grant Award
- Project completed Summer 2011

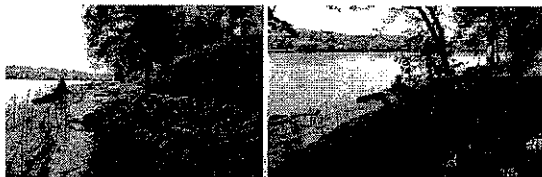


Haverhill – Merrimack River Bank Stabilization to Protect Sewer Infrastructure

- Significant coordination w/ permitting agencies for creative 'hard' & 'soft' solutions...
 - Improvements to ~500' of bank
 - Stone toe, re-grade for shallower bank, erosion control blankets w/ plantings, aquatic plantings & anchored tree stumps
- Project highlighted at Sept. 2011 DEP/Assoc. of MA Wetland Scientists workshop as a 'best practice' ...



Haverhill – Merrimack River Bank Stabilization to Protect Sewer Infrastructure

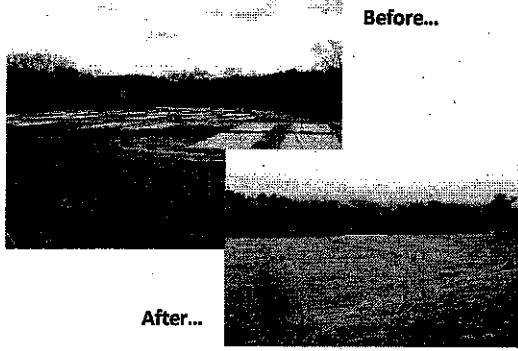


Greenfield – Property Acquisition

- October 2005 flood disaster;
- 14.8 acre parcel w/ 37 Mobile Homes; ~100 residents displaced;
- Convert to open space in perpetuity; connect w/ existing bike trail;
- Funding/Grant:
 - \$1.15M Total Cost
 - \$855,850 FEMA FMA Grant
 - Creative non-federal match (Urban Self-Help Grant)



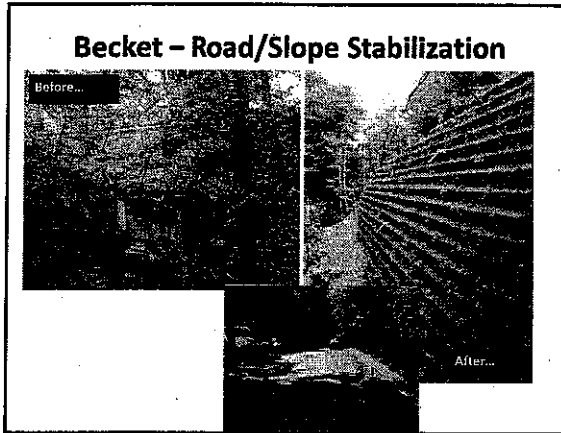
Greenfield – Property Acquisition

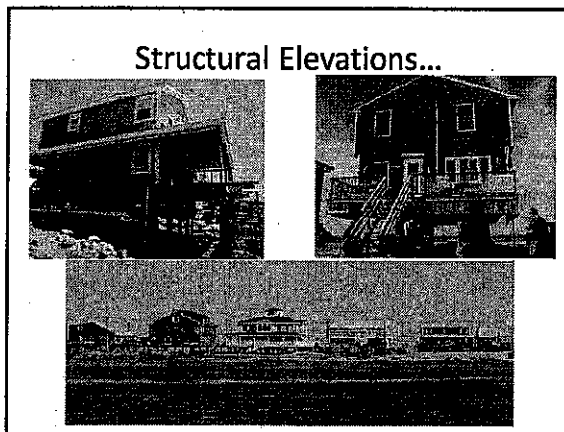


Becket – Brooker Hill Road/Slope Stabilization

- Emergency access route (road closed = major detours);
- Recurrent erosion issues;
- 'Wild & Scenic River' designation – NPS involved;
- Bio-engineered solution;
- FEMA '05 PDM Grant award: \$248,464 Total Cost
 - \$186,348 FEMA Grant
 - \$62,116 local share
- Completed Fall 2008



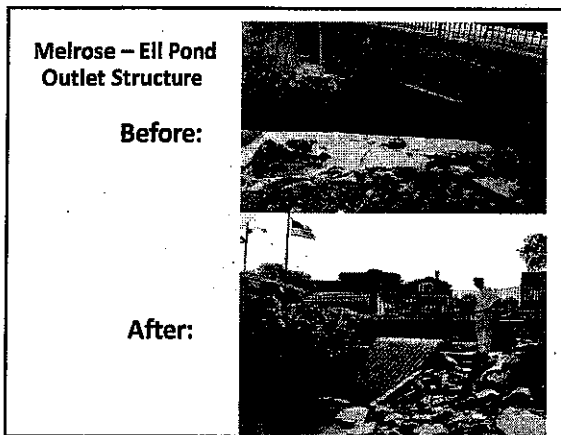


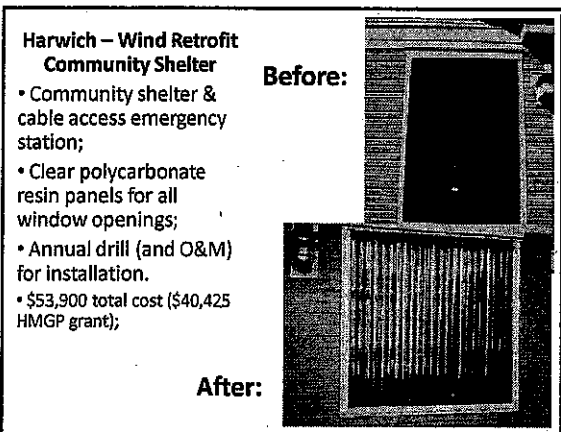


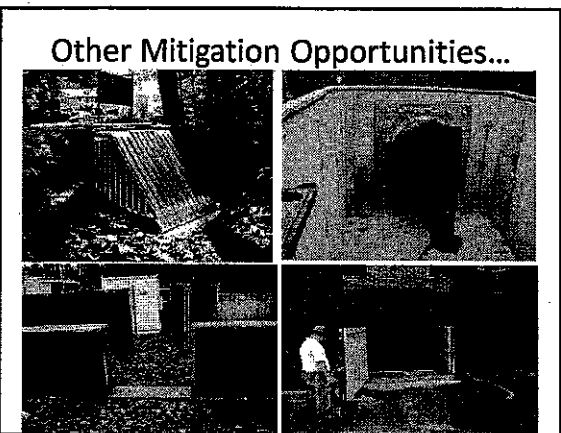
Melrose – Ell Pond Drainage

- Significant flood impacts to major roads, High School, Towers Apt., DPW Yard;
- Culvert Upgrades, Upsize Drainage Pipe & Outlet Control Structure;
- '05 PDM Grant Award:
 - \$2.3M Total Cost
 - \$1.75M FEMA Award
 - \$582,000 Local Share

Melrose, MA
Project Location







Future HM Grant Opportunities

- Significant uncertainty regarding FEMA's non-disaster mitigation grant programs (PDM, FMA, SRL);
- Post-disaster HMGP funds available from TS Irene & Oct. '11 Snow events:
 - Application deadline December 3, 2012.
- Combined approx. \$13M post-disaster HMGP available for TS Irene & Oct Snowstorm
- Stay tuned for additional details...!

Grant Briefings DR-4051

- September 25, 9:00-4:00 at West Boylston DCR Office.
- September 27, 9:00-4:00 at Town of Plymouth Emergency Operations Center.



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Hazard Mitigation Program Resources

Hazard Mitigation Grant Programs:

PDM Info: <http://www.fema.gov/government/grant/pdm/index.shtm>

FMA Info: <http://www.fema.gov/government/grant/fma/index.shtm>

SRL Info: <http://www.fema.gov/government/grant/srl/index.shtm>

RFC Info: <http://www.fema.gov/government/grant/rfc/index.shtm>

Unified HMA Guidance: <http://www.fema.gov/library/viewRecord.do?id=4225>

Grant Applicant Resources: <http://www.fema.gov/grant-applicant-resources>

e-Grants:

E-Grants website: <https://portal.fema.gov/famsVuWeb/home>

e-Grants Course website: <http://training.fema.gov/EMIWeb/IS/is30.asp>

E-Grants Helpdesk: (866)476-0544 mtegrants@dhs.gov

To obtain e-grants access contact:

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Phone: 508-820-1436

e-mail: Shirletta.Leung@state.ma.us

Scott MacLeod, MEMA Mitigation & Disaster Recover
Division Manager

Phone: 508-820-1445

e-mail: Scott.Macleod@state.ma.us

Other Resources:

Benefit-Cost Analysis Software Download and related Toolkit: <http://www.fema.gov/benefit-cost-analysis#1>

Benefit-Cost Analysis Helpline: 1-855-540-6744 bchelpline@dhs.gov

Engineering Helpline: 1-855-540-6744 enghelpline@dhs.gov

Env./Historic Helpline: 1-855-540-6744 ehhelpline@dhs.gov

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Hazard Mitigation Program Resources

Hazard Mitigation Resources in *Coastal Environments*:

Coastal Zone Management – StormSmart Coasts: <http://www.mass.gov/czm/stormsmart/index.htm>

Massachusetts River & Stream Crossing Standards:

http://www.nae.usace.army.mil/reg/Stream/MA_RiverStreamCrossingStandards.pdf

Procedures for Developing Scopes of Work for a Draining/Stormwater Management Project:

<http://www.fema.gov/library/viewRecord.do?id=1846>

Procedures for Developing Scopes of Work for the Elevation of Floodprone Structures:

<http://www.fema.gov/library/viewRecord.do?id=1844>

Procedures for Developing Scopes of Work for Wind Retrofit Projects:

<http://www.fema.gov/library/viewRecord.do?id=1876>

Procedures for Developing Scopes of Work for Protective Measures Retrofit Projects for Utility, Water, and Sanitary Systems and Infrastructure:

<http://www.fema.gov/library/viewRecord.do?id=1881>

Property Acquisition Handbook for Local Communities:

<http://www.fema.gov/application-development-and-process/property-acquisition-buyouts>

Engineering Case Studies by Project Type

FEMA has developed sample engineering case studies to provide the types of information and data needed to ensure completeness of the sections of project applications affecting engineering feasibility for several common mitigation measures. The Engineering Case Studies below are available from the FEMA Information Resources Library:

- Minor Structural Flood Control Projects (<http://www.fema.gov/library/viewRecord.do?id=1863>)
- Elevation (<http://www.fema.gov/library/viewRecord.do?id=1862>)
- Acquisition (<http://www.fema.gov/library/viewRecord.do?id=1861>)
- Wind Shutters (<http://www.fema.gov/library/viewRecord.do?id=1864>)
- Non-Structural Seismic Retrofit (<http://www.fema.gov/library/viewRecord.do?id=1865>)
- Structural Seismic Retrofit (<http://www.fema.gov/library/viewRecord.do?id=1866>)

Multi-Hazard Mitigation Planning Resources:

FEMA's Hazard Mitigation Planning "How-to Guides" Website:

<http://www.fema.gov/plan/mitplanning/resources.shtm>

Mitigation Planning, Laws, Regulations & Guidance:

<http://www.fema.gov/plan/mitplanning/guidance.shtm>

FEMA's Multi-Hazard Mitigation Planning Website:

<http://www.fema.gov/plan/mitplanning/index.shtm>

FEMA's Local Mitigation Plan Review Guide:

<http://www.fema.gov/library/viewRecord.do?id=4859>



THE COMMONWEALTH OF MASSACHUSETTS

MASSACHUSETTS EMERGENCY MANAGEMENT AGENCY
400 WORCESTER RD., FRAMINGHAM, MA 01702-5399 508-820-2000 FAX 508-820-1404

DEPARTMENT OF CONSERVATION & RECREATION
251 CAUSEWAY STREET, SUITE 600-700, BOSTON, MA 02114-2104 617-626-1250 FAX 617-626-1449



Kurt N. Schwartz
DIRECTOR

Deval L. Patrick
GOVERNOR

Edward M. Lambert, Jr.
COMMISSIONER

August 2012

To Potential Hazard Mitigation Grant Applicants:

The Massachusetts Emergency Management Agency (MEMA) and Department of Conservation and Recreation (DCR) are pleased to announce the availability of Federal Emergency Management Agency (FEMA) **Hazard Mitigation Grant Program (HMGP)** funding. This post-disaster mitigation grant funding is available as a result of the federal disaster declarations for the October 29-30, 2011 Snow Storm event. The grant application period is now officially "open". This HMGP funding is available to all communities in the Commonwealth that meet the sub-applicant and project eligibility requirements.

Why should this information be important to you? The federally-funded hazard mitigation grant program provide significant opportunities to reduce, minimize or eliminate potential damages to public and private non-profit infrastructure from natural hazard events. Funding for hazard mitigation plans and projects can reduce overall risks to the population and structures, while also reducing the reliance on taxpayer-funded federal disaster assistance for disaster recovery.

- *Who's eligible to apply?* State & local governments, tribal organizations and certain private non-profits.
- *What type of work is eligible?* Storm-water, drainage and culvert improvements, property acquisition, slope stabilization, infrastructure protection, seismic and wind retrofits, structure elevations, etc.
- *What is the grant cost share?* Funding reimbursement is typically 75% federal share, 25% non-federal match of eligible project costs (in most cases); 'in-kind' services are allowable as part of the non-federal match.
- To be eligible for FEMA HMGP hazard mitigation project grants, applicants must have a locally-adopted and FEMA-approved Local Natural Multi-Hazard Mitigation Plan (in accordance with 44 Code of Federal Regulations Part 201) at the time of official FEMA grant award.
- Formal grant briefings & technical assistance opportunities are available prior to application deadline.
- The State-established deadline for complete, full HMGP grant applications is: **Monday December 3, 2012 by 3:00 PM**

FEMA's hazard mitigation grant programs are not intended as a source of funding for repair, replacement or deferred maintenance activities, but are designed to assist sub-applicants to develop long-term, cost-effective improvements that will reduce or eliminate risk/damage to people and property from the effects of natural hazards. Projects that address operation, deferred or future maintenance, repairs or replacement (without a change in the level of protection provided) of existing structures, facilities, or infrastructure (e.g., dredging, debris removal, replacement of obsolete utility systems, bridges and facility repair/rehabilitation) are not eligible mitigation grant activities.

The Massachusetts Emergency Management Agency (MEMA) and Department of Conservation and Recreation (DCR) co-administer these grant programs on behalf of FEMA in the Commonwealth and encourage you to consider applying for grant funding to mitigate natural hazards that may impact your jurisdiction. For your information, this grant notice has been sent to the local chief elected and/or administrative official, conservation commission, building official, planning official, public works director and emergency manager in your community. Communities are encouraged to coordinate local project applications with other local officials.

To assist potential sub-applicants considering applying for FEMA HMGP mitigation funding, MEMA/DCR will be hosting a series of future grant program briefing(s) and technical assistance meetings. The grant program briefings will provide an overview of the HMGP program, available funding and relevant application process/deadlines. Interested sub-applicants are strongly encouraged to attend one of these briefings as details regarding the grant program will be described and discussed in detail. Technical assistance meetings will be a chance for you to meet one on one with representative from MEMA/DCR to discuss any questions you may have about your community's application. Details regarding the grant program briefings or technical assistance meetings are located below and will also be published on the 'Disaster Recovery & Mitigation' section of the MEMA website (www.mass.gov/mema) in the near future.

Interested applicants are encouraged to coordinate with MEMA/DCR early in the application development process to ensure that proposed mitigation projects are FEMA-eligible activities. Communities can submit multiple grant applications but each project must demonstrate cost-effective hazard mitigation benefits independent of other applications (no phased projects).

MEMA is the conduit for all applications and FEMA funding, and is required to review and rank all the individual local sub-applications that are ultimately submitted to FEMA for funding consideration. To allow sufficient time for this review and evaluation process the **State has established a deadline for complete, full grant applications of Monday December 3, 2012 by 3:00 PM.**

Some grant program requirements to be aware of (please attend the grant briefing and refer to the HMA Program Guidance for more specific sub-applicant and project eligibility requirements):

- **Multi-Hazard Mitigation Plan Requirement:** To be eligible for HMGP project grants, applicants must have a locally adopted and FEMA-approved Local Natural Multi-Hazard Mitigation Plan (in accordance with 44 Code of Federal Regulations Part 201) at the time of FEMA grant award;
- **Non-Federal Cost Share Requirement:** Sub-applicants must commit to the non-federal share of the proposed application cost; for HMGP this is 25% (or more) of the total estimated project cost.
- All proposed project applications must include a formal Benefit-Cost Analysis (using FEMA-approved methodology/software) to document the project's cost-effectiveness. Planning and HMGP '5% Initiative' applications do not have a BCA requirement.
- Community participation in the **National Flood Insurance Program (NFIP)**, may also be a requirement for sub-applicant and project eligibility (see Part III, Section D.7 of the FEMA Guidance for additional details).

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Dan Nietsche,
Hazard Mitigation Grants Coordinator
MA Emergency Management Agency
400 Worcester Road
Framingham, MA 01702
(508) 820-2016
Dan.Nietsche@state.ma.us

Hazard Mitigation Grant Program (HMGP) Briefing Schedule

Please do not contact these facilities directly with questions about the briefings.

Grant Program Briefing & Overview
Thursday September 13, 2012 (10:00am ~ 12:00)
Tewksbury Public Library – Meeting Room
300 Chandler Street
Tewksbury, MA 01876

Grant Program Briefing & Overview
Tuesday September 18, 2012 (9:30am ~ 11:30am)
Massachusetts Emergency Management Agency
Operations Room
400 Worcester Road
Framingham, MA 01701

Grant Program Briefing & Overview
Friday September 21, 2012 (9:30am ~ 11:30am)
Berkshire Regional Planning Agency
1 Fenn Street, Suite 201
Pittsfield, MA 01201

Grant Program Briefing & Overview
Tuesday September 25, 2012 (9:30am ~ 11:30am)
Department of Conservation and Recreation
Division of Water Supply Protection
180 Beaman Street
West Boylston, MA 01583

Grant Program Briefing & Overview
Thursday September 27, 2012 (9:30am ~ 11:30am)
Plymouth Emergency Operations Center
Co-located with the Fire Station
2209 State Road (Route 3A)
Plymouth, MA 02360

Please do not contact these facilities directly with questions about the briefings. Please RSVP your attendance to:

Kathryn Fatherley, MEMA Hazard Mitigation Contract Specialist
(508) 820-1425, or via email at: Kathryn.Fatherley@state.ma.us

RSVP's are required so that we can notify participants in the event that the briefing logistics (date/time/location) must be changed or postponed due to weather or other events.

Note: Please monitor the Disaster Recovery & Mitigation section of the MEMA website (www.mass.gov/mema) for additional training opportunities and updated and/or revised mitigation grant related information.

**Technical Assistance Meetings for
Hazard Mitigation Grant Program (HMGP)**

Technical Assistance Meeting(s)
Thursday September 13, 2012 (1:30pm ~ 3:30pm)
Tewksbury Public Library – Meeting Room
300 Chandler Street
Tewksbury, MA 01876

Technical Assistance Meeting(s)
Tuesday September 18, 2012 (1:00pm ~ 3:00pm)
Massachusetts Emergency Management Agency
Operations Room
400 Worcester Road
Framingham, MA 01701

Technical Assistance Meeting(s)
Friday September 21, 2012 (1:00pm ~ 3:00pm)
Berkshire Regional Planning Agency
1 Fenn Street, Suite 201
Pittsfield, MA 01201

Technical Assistance Meeting(s)
Tuesday September 25, 2012 (1:00pm ~ 3:00pm)
Department of Conservation and Recreation
Division of Water Supply Protection
180 Beaman Street
West Boylston, MA 01583

Technical Assistance Meeting(s)
Thursday September 27, 2012 (1:00pm ~ 3:00pm)
Plymouth Emergency Operations Center
Co-located with the Fire Station
2209 State Road (Route 3A)
Plymouth, MA 02360

These technical assistance meetings are targeted to those who have previously attended a formal mitigation grant program briefing. These technical assistance meetings are available to sub-applicants considering submission of a FEMA Hazard Mitigation Grant Program application. These individual 1-hour meetings are an opportunity to meet with members of the State Hazard Mitigation Team (MEMA & DCR staff) to:

- ✓ Discuss proposed project applications (including eligibility of proposed activities);
- ✓ Answer specific questions regarding grant application procedures and/or requirements;
- ✓ Discuss which FEMA mitigation grant program(s) may be most appropriate based on the type of activity/project proposed;
- ✓ Benefit-Cost Analysis (BCA), environmental/historic or other technical issues associated with project proposals; and,
- ✓ Other questions or issues sub-applicants may have regarding FEMA-funded mitigation grant programs.

These technical assistance meetings do not prohibit or prevent interested sub-applicants from contacting members of the State Hazard Mitigation Team to discuss questions or issues related to their proposed project activity. One (1) hour blocks of time (1:00-2:00pm, 2:00-3:00pm, 3:00-4:00pm) for each of the dates above will be available for prospective sub-applicants.

Please direct your requested date/time/location to:

Kathryn Fatherley, MEMA Hazard Mitigation Contract Specialist
(508) 820-1425, or via email at: Kathryn.Fatherley@state.ma.us

Interested sub-applicants are required to pre-register so that we can contact you in the event that the meeting logistics (date/time/location) must be changed. We will do our best to accommodate as many sub-applicants as possible but the 1-hour meetings will be booked on a first come – first serve basis.

Technical Assistance Meetings for Hazard Mitigation Grant Program (HMGP)

Technical Assistance Meeting(s)

Monday October 22, 2012 (9:00 am ~ 3:00 pm)

MEMA Region II Office

Operations Room

12-I Read Administration Road

Bridgewater, MA 02324

POC is Kathryn Fatherley (508)820-1425

Technical Assistance Meeting(s)

Monday October 29, 2012 (9:00 am ~ 3:00 pm)

MEMA Region III/IV Office

Training Room

1002 Suffield Street

Agawam, MA 01001

POC is Kathryn Fatherley (508)820-1425

Technical Assistance Meeting(s)

Friday November 2, 2012 (9:00am ~ 3:00pm)

DCR Flood Hazard Mgt. Program

8th Floor Water Supply Protection Conf. Room

251 Causeway Street, 8th Floor

Boston, MA 02114

POC is Kathryn Fatherley (508)820-1425

These technical assistance meetings are targeted to those who have previously attended a formal mitigation grant program briefing. These technical assistance meetings are available to sub-applicants considering submission of a FEMA Hazard Mitigation Grant Program application. These individual 1-hour meetings are an opportunity to meet with members of the State Hazard Mitigation Team (MEMA & DCR staff) to:

- ✓ Discuss proposed project proposal (including eligibility of proposed activities);
- ✓ Answer specific questions regarding grant application procedures and/or requirements;
- ✓ Discuss which FEMA mitigation grant program(s) may be most appropriate based on the type of activity/project proposed;
- ✓ Benefit-Cost Analysis (BCA), environmental/historic or other technical issues associated with project proposals; and,
- ✓ Other questions or issues sub-applicants may have regarding FEMA-funded mitigation grant programs.

These technical assistance meetings do not prohibit or prevent interested sub-applicants from contacting members of the State Hazard Mitigation Team to discuss questions or issues related to their proposed project activity. One (1) hour blocks of time (9:00-10:00am, 10:00-11:00am, 11:00-Noon & 1:00-2:00pm, 2:00-3:00pm, 3:00-4:00pm) for each of the dates above will be available for prospective sub-applicants.

Please direct your requested date/time/location to:

Kathryn Fatherley, MEMA Hazard Mitigation Contract Specialist
(508) 820-1425, or via email at: Kathryn.Fatherley@state.ma.us

Interested sub-applicants are required to pre-register so that we can contact you in the event that the meeting logistics (date/time/location) must be changed. We will do our best to accommodate as many sub-applicants as possible but the 1-hour meetings will be booked on a first come – first serve basis.

Note: Please monitor the Disaster Recovery & Mitigation section of the MEMA website (www.mass.gov/mema) for additional training opportunities and updated and/or revised grant related information.

Old Colony Planning Council

Robert G. Moran, Jr.
President

70 School Street
Brockton, MA 02301-4097



Pasquale Ciaramella
Executive Director

Telephone: (508) 583-1833
Fax: (508) 559-8768
Email: info@ocpcrpa.org
Website: www.ocpcrpa.org

To: All Interested Parties

From: Pat Ciaramella, Executive Director

Date: April 4, 2012

Re: Old Colony Multi-Jurisdictional Natural Hazard Mitigation Plan Public Meetings

The Old Colony Planning Council is in the process of preparing the Old Colony Multi-Jurisdictional Natural Hazard Mitigation Plan and invites you to attend one of two public meetings:

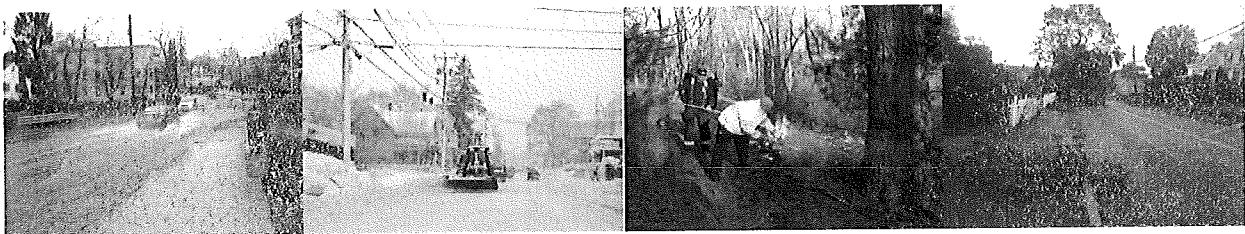
• **Monday, April 30, 2012: Brockton Public Library-Main Branch Multi-Purpose Room from 6:00 PM to 7:00 PM. The Main Branch is located at 304 Main Street in Brockton.**

• **Wednesday, May 9, 2012: Plymouth Public Library-Main Branch Otto Fehlow Room from 7:00 PM to 8:00 PM. The Main Branch is located at 132 South Street in Plymouth.**

(The meeting agendas are the same. Please attend whichever is most convenient for you)

This is an opportunity for public input and comments on the development of the update of the Old Colony Multi-Jurisdictional Natural Hazard Mitigation Plan. The plan will address natural disasters likely to affect the communities within the Old Colony region by discussing the planning process, analyzing the hazards most threatening to the region and defining general mitigation goals. The Plan, which is to be submitted to State and Federal Emergency Management authorities, will ensure compliance with state and federal hazard mitigation guidelines and maintain community eligibility for future hazard mitigation grant opportunities.

Should you have any questions about these meetings or the Old Colony Multi-Jurisdictional Natural Hazard Mitigation Plan, please contact Community Planner Eric Arbeene at (508) 583-1833 Ext. 209 or at earbeene@ocpcrpa.org



Please share your opinions on hazard mitigation planning in the Old Colony Region by taking the Hazard Mitigation Plan Survey at http://www.ocpcrpa.org/hmp_survey.html

**OLD COLONY MULTI-JURISDICTIONAL NATURAL HAZARD MITIGATION PLAN
PUBLIC MEETING AGENDA**

**Monday, April 30, 2012 at 6:00 PM
Brockton Public Library Main Branch**

**Wednesday, May 9, 2012 at 7:00 PM
Plymouth Public Library Main Branch**

- Welcome and Introductions
- Hazard Mitigation Plan Presentation
 - Overview of Hazard Mitigation Planning
 - Discussion of the Planning Process
 - Assessing the Risks
 - Development of Mitigation Strategy
 - Plan Implementation & Maintenance
- Hazard Mitigation Grant Program Overview
- Input from Attendees
- Discussion & Questions
- Adjournment

Please attend whichever meeting is most convenient for you.

Please share your opinions on hazard mitigation planning in the Old Colony Region by taking the Hazard Mitigation Plan Survey at http://www.ocpcrpa.org/hmp_survey.html

Old Colony Multi-Jurisdictional Hazard Mitigation Plan Public Meeting

PlymouthPublic Library

132 South Street, Plymouth, MA 02360

Attendance Sheet

DATE: May 9, 2012 - 7:00 PM

Name (Please Print)	Town/Agency	Email/Phone Number	May we contact you about future meetings and plan reviews?
Mary MacNeil	Plymouth	MarybethMacNeil@aol.com	
Andrew Vidal	OCPC	Avidal@ocpcpa.org	✓
Greg Guimond	Bridgewater	gguimond@bridgewaterMA.org	✓

Old Colony Planning Council

Multi-Jurisdictional Hazard Mitigation Plan Update

Public Meetings

Brockton Public Library April 30, 2012

&

Plymouth Public Library May 9, 2012

Objectives for this Meeting

- **Provide an overview of the process and progress to date.**

- **Solicit input from the public on:**
 - **Hazards**
 - **Vulnerabilities**
 - **Mitigation Strategies**

What is the Old Colony Planning Council?

- **The Old Colony Planning Council is a governmental entity that was established under state statute in 1967 as a comprehensive regional agency to address a multitude of issues that cross over local boundaries, such as air and water pollution, transportation deficiencies, economic distress and as well as hazard mitigation planning.**
- **The 15 communities in the Old Colony Region include: Abington, Avon, Bridgewater, Brockton, East Bridgewater, Easton, Halifax, Hanson, Kingston, Pembroke, Plymouth, Plympton, Stoughton, West Bridgewater and Whitman**

What is Hazard Mitigation?

- **Mitigation is defined by FEMA “as any sustained action taken to reduce or eliminate long-term risk to people and their property from a hazard event.”**
- **The goal of mitigation is to reduce the loss of life and property.**
- **Mitigation enables individuals and communities to recover more rapidly from disasters.**
- **Mitigation can reduce the massive costs of disasters to individuals and all levels of government.**

What is a Hazard Mitigation Plan?

- A Hazard Mitigation Plan is the foundation of a community's long-term strategy to reduce disaster losses by breaking the cycle of disaster damage, reconstruction and repeated damage. In particular, these plans:
 - Identify Hazards
 - Assess Vulnerabilities
 - Develop & Prioritize Mitigation Strategies

The Old Colony Plan and Update

- OCPC and its member communities developed their original plan in 2005/2006 and it was approved by MEMA, FEMA and member communities in 2006.
- By regulation all plans must be formally updated, approved by FEMA and adopted by all communities every 5 years.
- OCPC applied for a grant to update the plan in 2010 but did not receive approval until 2011.
- The OCPC plan expired in August 2011 and it is currently being updated.

Why prepare a Hazard Mitigation Plan?

- To reduce losses resulting from natural hazards.
- To become eligible to apply for hazard mitigation grants. Local governments are required to have an approved plan to be considered eligible.
- A multi-jurisdictional plan allows for each municipality to benefit with minimal effort and financial impact.

Plan Schedule

Topic	Timeframe
Kickoff Meeting/Formation of Steering Committee	Spring 2011
Updating Background/Demographic Information	Summer-Fall 2011
Meeting with Communities to Update Information and Public Participation	Winter 2011-Spring 2012
Draft Completed and sent out for review	Spring 2012
Review and make edits to the Plan	Summer 2012
Send to FEMA/MEMA for Conditional Approval	Summer 2012

Plan Update Process Steps

- 1. Organize Resources**
- 2. Re-Assess the Risk**
- 3. Review and Update the Mitigation Plan**
- 4. Develop Procedures for Plan Implementation, Monitoring and Update**
- 5. MEMA/FEMA Approval**
- 6. Adopt the Plan**

Throughout this Process, we will be engaging numerous stakeholders, including federal, state and local officials, civic groups and the general public.

What does the OCPC Plan look like?

- Chapter 1-Introduction & Overview**
- Chapter 2-Planning Process**
- Chapter 3-Regional Profile**
- Chapter 4-Natural Hazard Identification**
- Chapter 5-Community Profile Risk Assessments**
- Chapter 6-Mitigation Goals & Strategies**
- Chapter 7-Plan Adoption & Maintenance**

Municipal Planning Partnership

- All municipalities have been encouraged to participate (and continue to be covered by the Multi-Jurisdictional Plan), and all have indicated their interest.
- FEMA has greatly expanded their scrutiny of participation. Municipalities are required to actively participate in the process to be covered by the plan.
- Municipalities are responsible for:
 - Providing data and information in a timely manner
 - Assisting with development of their particular section of the plan
 - Reviewing and providing feedback on the Draft and Final Plan
 - Facilitating the adoption resolution process
 - Implementing the Plan

OCPC Plan Steering Committee

Representative

Chris Cutter, Deputy Police Chief
 Robert Spurr, Fire Chief
 John Mitchell, Dep. Emergency Manager
 Morton Schleffer, Emergency Manager
 Don Gazerro, Fire Dept.
 David A. Repeta, Fire Dept.
 Kevin Partridge, Fire Chief
 William Carrico, II, Fire Chief
 Jerome Thompson, Fire Chief
 Robert Heath, Fire Chief
 Michael Hill, Co Emergency Manager
 Richard Wall, Co Emergency Manager
 Aaron Wallace, Emergency Manager
 Warren Borsari, Fire Chief
 Patrick Dillon, Police Chief
 Mark Dolloff, Fire Chief
 Leonard Hunt, Fire Chief
 Timothy Grenno, Fire Chief

Community

Abington
 Avon
 Bridgewater
 Brockton
 Brockton
 East Bridgewater
 Easton
 Halifax
 Hanson
 Kingston
 Pembroke
 Pembroke
 Plymouth
 Plympton
 Plympton
 Stoughton
 West Bridgewater
 Whitman

Assessing the Risk- Hazards in the Old Colony Region

The following hazards will be profiled in the plan:

- Coastal Erosion & Shoreline Change
- Earthquakes
- Extreme Temperatures
- Flooding
- Hurricanes & Tropical Storms
- Landslides
- Major Urban Fires
- Tornados
- Tsunamis
- Wildfires
- Winter Storms

Assessing the Risk- FEMA Declared Disaster Since 2001

Date	Disaster Number	Incident Description	OCPC Counties Affected
9/3/2011	FEMA-DR-4028	Tropical Storm Irene	Bristol, Norfolk & Plymouth
3/7/2011	FEMA-DR-1959	Severe Winter Strom & Snowstorm	Norfolk
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4/21/2004	FEMA-DR-1512	Flooding	Norfolk
4/10/2001	FEMA-DR-1364	Severe Storms & Flooding	Bristol, Norfolk & Plymouth

Assessing the Risk- Hazard Profiling

- **Each of the hazards profiled include the following information:**
 - **Description of each hazard**
 - **Locations of each hazard**
 - **Description and listing of previous occurrences**
 - **Probability of future hazard events**

Hazards in the Old Colony Region March 2010 Floods-Brockton



**Hazards in the Old Colony Region
March 2010 Floods-Brockton**



**Hazards in the Old Colony Region
Tropical Storm Irene 2011 -Brockton**



**Hazards in the Old Colony Region
Winter Storms 2011-Brockton**



**Hazards in the Old Colony Region
Winter Storms-Plymouth**



**Hazards in the Old Colony Region
Coastal Erosion-Plymouth**



**Hazards in the Old Colony Region
Coastal Erosion-Plymouth**



Hazards in the Old Colony Region Wildfire-Stoughton



Hazards in the Old Colony Region Wildfires-Plymouth



Hazards in the Old Colony Region Major Urban Fire-Worcester



Other Potential Hazards 2011 Tornado-Springfield



Assessing the Risk- Hazards in the Old Colony Region

**Are there any other hazards
that should be considered
in the Plan?**

Assessing the Risk- Community Profile Risk Assessments

- **Each community will have a risk assessment which includes the following information:**
 - **Background Information, such as history, population, land statistics and notable commercial and open space areas**
 - **List of Critical Facilities, including the following categories: security, government, services, bridges and dams, water, energy, telecommunications and Tier II sites**
 - **List of Floodprone Areas**
 - **Flooding Vulnerability Assessment**
 - **Natural Hazard Risk Assessment**

Mitigation Strategy Regional Goals

The regional goal of the Old Colony Planning Council Multi-Jurisdictional Hazard Mitigation Plan Update is to reduce the loss of life, property, infrastructure and environmental and cultural resources from natural disasters.

In support of this regional goal there are five additional goals:

1. Investigate, design and implement structural projects that will reduce and minimize the risks and impacts from riverine and coastal flooding.
2. Investigate, design and implement projects that will reduce and minimize the risks and impacts from non-flooding hazards, such as wildfires, earthquakes, tornadoes, etc.

Mitigation Strategy Regional Goals

3. Improve pre-disaster planning, communication and coordination between federal, state, regional county, municipal, private and non-profit entities to be able to plan for and mitigate natural hazards in a clear and comprehensive manner.
4. Increase the awareness of the public and communities to the risks presented by the variety of natural hazards that affect the region and mitigation activities and grant opportunities available to them to combat mitigate the impacts of these hazards.
5. Improve existing policies, programs to reduce or eliminate the impacts of natural hazards.

Mitigating the Hazards- Mitigation Action Plan

- The Old Colony Multi-Jurisdictional Hazard Mitigation Plan Update will feature short and long-term mitigation action items which are the primary mechanism through which the mitigation plan is implemented.
- The plan will consist of individual community mitigation action plans as well regional mitigation action plan.
- Action items are detailed recommendations for activities that communities and citizens can engage in to reduce risk. The list includes both hazard specific actions (e.g., strategies for floods, wildfires, landslides, etc.) as well as multi-hazard actions (i.e., cuts across all specified hazards).

Types of Mitigation Actions

- **Prevention:** Measures such as planning and zoning, open space preservation, land development regulations, building codes, stormwater management.
- **Property Protection:** Measures such as acquisition, relocation, storm shutters, rebuilding, barriers, floodproofing, insurance and structural retrofits for high winds.
- **Public Education & Awareness:** Measures such as outreach projects, real estate disclosure, hazard information centers, technical assistance.
- **Natural Resource Protection:** Measures such as erosion and sediment control, stream corridor protection, vegetative management and wetlands preservation.
- **Emergency Services:** Measures such as hazard threat recognition, hazard warning systems, emergency response, protection of critical facilities, and health and safety maintenance.
- **Structural Projects:** Measures such as levees, seawalls, bulkheads, retaining walls, channel modifications, storm sewers, and retrofitted buildings and elevated roadways.

Update of Local Mitigation Action Plans

- OCPC has been meeting with town officials to review their current mitigation action plan and update it to reflect any changes since the last plan was adopted in 2006.
- If an action wasn't completed; explain why not.
- This strategy review process is **NOT** meant to blame or punish. The answer can reveal things that need to be addressed to allow mitigation to progress (new initiatives), for example:
 - **Obstacle:** We do not have the technical resources to prepare a grant application.
 - **Possible Action:** Develop a county-level support team trained in application development.

Update of Local Mitigation Action Plans

- Mitigation actions need to be realistic, achievable and action-oriented.
- Include both regional actions, as well as jurisdiction-specific.
- Address both public and private property.
- For each proposed mitigation strategy, the following will be identified:
 - Category of Action
 - Description of Mitigation Action
 - Implementation Responsibility
 - Timeframe/Priority
 - Potential Funding Sources

Mitigation Action Example

General Action: Replace the Lake Street culvert

Detailed Action: The town will address the replacement of the Lake Street culvert by replacing it with a larger culvert. During past heavy rain events the capacity of the culvert has proved to be inadequate and has resulted in water flowing onto the roadway, endangering motorists and passersby.

Old Colony Regional Mitigation Action Plan

Prevention

- Continue National Flood Insurance Program (NFIP) compliance by enforcing local floodplain ordinances
- Encourage local communities to join the Community Rating System (CRS)
- Incorporate updated FEMA floodplain data and maps into existing and future planning efforts
- Improve the enforcement of existing floodplain bylaws
- Limit the expansion of infrastructure in hazard-prone areas
- Encourage the use of Low Impact Development (LID) techniques
- Develop bylaws that require the onsite containment of stormwater

Old Colony Regional Mitigation Action Plan

Prevention

- Regularly maintain/clean catch basins
- Regularly conduct street sweeping
- Remove/modify obstacles to flow in confined spaces, such as bridges and culverts with inadequate clearance
- Ensure that each dam has an updated Emergency Action Plan and Inundation Map
- Update the Old Colony Hazard Mitigation Plan every 5 years
- Continue to strictly enforce the State Building Code
- Consider conducting controlled burns of flammable brush on public lands at risk
- Implement and advocate Defensible Space Techniques
- Conduct public building seismic assessments

Old Colony Regional Mitigation Action Plan

Property Protection

- Floodproof or relocate municipally-owned critical facilities located within floodplains
- Very selectively elevate high-risk structures when appropriate
- Very selectively work with homeowners to elevate key appliances in basements of homes that frequently flood where/when appropriate
- Assist vulnerable businesses and cultural institutions to secure funding to retrofit their facilities against flood damage.
- Consider voluntary flood acquisition programs where appropriate

Old Colony Regional Mitigation Action Plan

Property Protection

- Encourage the floodproofing or relocation of existing structures in floodplain zones
- Assure that mobile homes have adequate tie-downs
- Require and maintain effective lightening rods
- Work with utility providers to proactively trim trees around utility lines
- Earthquake proof structures

Old Colony Regional Mitigation Action Plan

Public Education & Awareness

- Educate local Emergency Management Directors about dams in their community
- Increase the working relationship between upstream and downstream dam owners
- Educate private dam owners about their responsibilities and liabilities
- Conduct workshops to help local businesses and cultural institutions to develop disaster mitigation plans
- Provide leaflets/brochures to homeowners and businesses in hazard-prone areas that discuss hazard mitigation

Old Colony Regional Mitigation Action Plan

Natural Resources Protection

- Replenish beaches and dunes-increase height of natural protective features
- Nourish beaches with upstream deposits of sand

Old Colony Regional Mitigation Action Plan

Emergency Services Protection

- Conduct local disaster response drills on a regular basis
- Develop and publicize local and regional evacuation routes
- Expand and formalize local agreements for use of shared mass care shelters in the event of a natural disaster
- Install generators and/or backup generators at the most critical of facilities-Police, Fire, EOC, Shelters, Schools
- Develop formal mutual aid agreements for DPWs and Emergency Response Teams, if not already done so
- Develop a coordinated resource list of equipment that can be shared among communities during an emergency
- Add additional airwave capacity for emergency situations

Old Colony Regional Mitigation Action Plan

Emergency Services Protection

- Educate local officials to help them develop plans to protect critical documents and materials
- Consider creating/expanding fire breaks upwind of critical facilities via controlled burns and or tree trimming along roads where trees touch overhead

Old Colony Regional Mitigation Action Plan

Structural Projects

- Improve stormwater management systems that are located in hazard prone areas or that are inadequate
- Inspect, maintain/upgrade older dams for present functions and stormwater management potential
- Minimize snowdrifts with upwind snow fences
- Develop any needed fire ponds and enhance with dry hydrants
- Build/replace seawalls along the coast as needed

Old Colony Regional Mitigation Action Plan

**Do you have thoughts on these or
any other additional actions?**

Plan Implementation

- **Mitigation action plans are the “blueprint” for progressively reducing a community’s natural hazard risk.**
- **The plan include two types of initiatives/projects- those that your community can “self-fund”, and those that will require outside (e.g. grant) funding.**
- **Mitigation grant opportunities open regularly:**
 - **The annual HMA grant window opens in June of each year.**
 - **HMGP funding comes in the wake of Presidentially Declared Disasters.**
- **OCPC will alert communities of grant opportunities as they arise, including all guidance provided by MEMA and FEMA.**

Conclusion

- **OCPC is committed to working on the development of the plan with each community to address and identify potential mitigation projects.**
- **Mitigation is the cornerstone of emergency management and planning. It is an essential proactive approach to prevent the impact of disasters on lives, property and community.**
- **The benefit of a collaborative effort between federal, state and local partners will provide for a safer environment.**

General Issues, Questions or Concerns?

Are there any General Issues, Questions or Concerns?

**Please contact:
Eric Arbeene
Community Planner
508-583-1833 Ext. 209
earbeene@ocpcrpa.org**

Thank you very much for your time!!

Old Colony Planning Council Agenda

Agenda for Meeting No. 487
March 28, 2012

Old Colony Planning Council
70 School Street, Brockton, MA 02301

The listings of matters are those reasonably anticipated by the Chair, which may be discussed at the meeting. Not all items listed may in fact be discussed and other items not listed may be brought up for discussion to the extent permitted by law.

1. **Call to Order, 7:30 PM**
2. **Roll Call of Members**
3. **Minutes February 29, 2012 Meeting**
4. **Financial Report for February 2012**
5. **Staff Report**
6. **Regional Clearinghouse Reviews**

Mr. Robert G. Moran, Jr., President
Mr. Fred Gilmetti, Secretary
Mr. Fred Gilmetti, Secretary
Mr. Lee Hartmann, Treasurer
Mr. Pat Ciaramella, Executive Director

Industrial Revenue Bonds

None

Environmental Notifications

i. Easton - EEA #14266 –Queset Commons (FEIR) - The proposed project is a Chapter 40R smart growth, mixed use development located west of the Belmont Street (Route 123) & Washington Street (Route 138) intersection and north of Morse's Pond in Easton. The development activity will be located within the Queset Smart Growth Overlay District and will consist of a total of 9 new buildings: one 4 story condominium building (60 units); one 4 story assisted living apartment building (83 units); two 4 story mixed-use residential and retail/commercial buildings (137 apartment rental units & 60,000 square feet of retail/commercial space); a 16,000 square foot conference center; a 15,000 square foot food market, two office buildings (25,000 square feet); and a 100,000 gallon per day wastewater treatment plant building. The proposed project is expected to generate approximately 9,200 average daily trips; establish 767 parking spaces (251 underground or covered and 516 surface spaces); and draw approximately 93,000 gallons of water per day. Approximate project cost is \$70 million dollars. Information only, no Council action required.

7. Old Business

- A. Update on the Upper Taunton River Regional Wastewater Evaluation Project. Bruce Hughes, Economic Development/Community Planner.

- B. Report and update on the 2012 District Local Technical Assistance (DLTA) Program/Contract. Pat Ciaramella, Executive Director

8. New Business

- A. Appointment of a Nominating Committee for OCPC Officers for 2012-2013. Robert G. Moran, Jr., OCPC President
- B. Report and update on the Pre-Disaster Mitigation (PDM) Plan. Eric Arbeene, Community Planner.
- C. Report and update on CapeNet. Pat Ciaramella, Executive Director.
- D. Report on the Annual Citizen Planner Training Collaborative (CPTC) Conference/ workshop. Bruce Hughes, Economic Development/Community Planner.
- E. Report and update on Casinos, Pat Ciaramella, Executive Director.
- F. Report and update on the Building Improvements. Pat Ciaramella, Executive Director.

9. Community Concerns

10. Other Business

11. Visitors Comments/Questions

12. Adjournment

OLD COLONY PLANNING COUNCIL

Robert G. Moran, Jr.
President
70 School Street
Brockton, MA 02301-4097



Pasquale Ciaramella
Executive Director
Telephone: (508) 583-1833
Fax: (508) 559-8768
Email: info@ocpcrpa.org

PLEASE POST

NOTICE OF MEETING

You are respectfully requested to publicly post this notice and agenda of a meeting of the Old Colony Planning Council in accordance with the Law Regulating Meetings of Governmental Bodies, Chapter 397 of the Acts of 1976, Section 23 B. Said notice should be posted in the Clerk's Office or on the principal official bulletin board of the municipality.

MEETING OF THE OLD COLONY PLANNING COUNCIL

DATE: March 28, 2012
TIME: 7:30 PM
PLACE: **Old Colony Planning Council**
70 School Street
Brockton, MA 02301-4097

Respectfully submitted,

Robert G. Moran, Jr., President

OLD COLONY JOINT TRANSPORTATION COMMITTEE

*Advising the Old Colony Metropolitan Planning Organization (MPO)
and the Old Colony Planning Council (OCPC)*

C/o Old Colony Planning Council, 70 School Street, Brockton, MA 02301

Phone: 508-583-1833 / Fax: 508-559-8768 / Web: www.ocpcrpa.org



Thursday, April 12, 2012
12:00 to 1:30 P.M.
At Old Colony Planning Council
70 School Street, Brockton, MA 02301

AGENDA

1. Call to Order and Introductions
2. Minutes of March 8, 2012 Meeting
3. Communications
4. Reports
 - A. Brockton Area Regional Transit Authority (BAT)
 - B. South Coast Rail Project
5. Old Business
 - A. FFY 2012-2015 Transportation Improvement Program (TIP) Implementation
 - B. Proposed MBTA Fare Increases and Service Changes
6. New Business
 - A. Old Colony Multi-Jurisdictional Hazard Mitigation Plan Update
 - B. FFY 2013-2016 Old Colony Transportation Improvement Program (TIP) Development
 - C. FFY 2013 Old Colony Unified Planning Work Program (UPWP) Development
 - D. *Give Your Old Bike...a New Life!* Initiative
7. Other Business and Public Comment
 - A. Community Local Technical Assistance Studies
 - B. Staff Reviews on ENFs, EIRs and NPCs
 - C. Regional Concerns and Local Community Transportation Issues
8. Adjournment

The Old Colony MPO fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. The Old Colony MPO operates without regard to race, color, national origin, English Proficiency, ancestry, creed, income, gender, age, and/ or disability. Any person who believes him/herself or any specific class of persons, to be subjected to discrimination prohibited by Title VI may by him/herself or by representative file a written complaint with the Old Colony MPO. Complaints are to be filed no later than 180 days from the date of the alleged discrimination. Please contact Pat Ciaramella at 508-583-1833 for more information.

Old Colony Economic Development District

Comprehensive Economic Development Strategy Committee Meeting

Old Colony Planning Council, 70 School Street, Brockton, MA 02301

Phone 508.583.1833 ~ Fax 508.559.8768 ~Email: info@ocpc.org



This meeting is open to the public

Date: September 17, 2012
Time: 1:30 P.M. ~ Monday
Location: Old Colony Planning Council
70 School Street
Brockton MA 02301

AGENDA

1. Call to Order
2. Minutes of the June 4, 2012 Meeting
3. MassDevelopment Bond Review
4. Update on Economic Development in Brockton: Mary Waldron, Brockton 21st Century Corp, Bruce Hughes, Old Colony Planning Council.
5. Update on Hazard Mitigation in the OCPC Region, Eric Arbeene, Old Colony Planning Council
6. Old Business
7. New Business

Upcoming Events

1. MEDC Transportation and Economic Development Event Sept 21
2. Dedication of Rocky Marciano statue Sept 23
3. Cheer Pack ribbon cutting Sept 25
4. Chapter 40B Past, Present and Future Sept 28
5. Metro South Chamber Legislative Reception Oct 3
6. Plymouth County Development Council Luncheon Oct 12
7. CPTC course at OCPC Next Chapter in 40B Oct 17
8. CPTC Course at OCPC Roles and Responsibilities Planning Boards and ZBAs Part 1, Oct 31
9. NEDA Annual Conference Oct. 28-30
8. Adjournment

Old Colony Planning Council

Multi-Jurisdictional Hazard Mitigation Plan Update

Public Meetings

- Old Colony Planning Council Delegates: March 28, 2012
- Old Colony Joint Transportation Committee (JTC): April 12, 2012
- Old Colony Comprehensive Economic Development Strategy (CEDS) Committee: September 17, 2012

Objectives for this Meeting

- Provide an overview of the process and progress to date
- Solicit input from the public on:
 - Hazards
 - Vulnerability
 - Mitigation Strategies

What is Hazard Mitigation?

- **Mitigation is defined by FEMA “as any sustained action taken to reduce or eliminate long-term risk to people and their property from a hazard event.”**
- **The goal of mitigation is to reduce the loss of life and property.**
- **Mitigation enables individuals and communities to recover more rapidly from disasters.**
- **Mitigation can reduce the massive costs of disasters to individuals and all levels of government.**

What is a Hazard Mitigation Plan?

- **Mitigation plans form the foundation of a community’s long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction and repeated damage. In particular, these plans:**
 - **Identify Hazards**
 - **Assess Vulnerabilities**
 - **Develop & Prioritize Mitigation Strategies**

Why prepare a Hazard Mitigation Plan?

- To reduce losses resulting from natural hazards.
- To become eligible to apply for hazard mitigation grants. Local governments are required to have an approved plan to be considered eligible.
- A multi-jurisdictional plan allows for each municipality to benefit with minimal effort and financial impact.

Plan Schedule

Topic	Timeframe
Kickoff Meeting/Formation of Steering Committee	Spring 2011
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Meeting with Communities to Update Information and Public Participation	Winter 2011-Spring 2012
Draft Completed and sent out for review	Spring 2012
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- All municipalities have been encouraged to participate (and continue to be covered by the Multi-Jurisdictional Plan), and all have indicated their interest.
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Hazards in the Old Colony Region Major Urban Fire-Worcester



Other Potential Hazards 2011 Tornado-Springfield



Assessing the Risk- Hazards in the Old Colony Region

**Are there any other hazards
that should be considered?**

**(Possible examples include Drought,
Sinkholes, Hail Storm, Ice Storm, etc.)**

Assessing the Risk- Community Profile Risk Assessments

- **Each community will have a risk assessment which includes the following information:**
 - **Background Information, such as history, population, land statistics and notable commercial and open space areas**
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Old Colony Regional Mitigation Action Plan

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- Nourish beaches with upstream deposits of sand

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- **Conduct local disaster response drills on a regular basis**
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- **Expand and formalize local agreements for use of shared mass care shelters in the event of a natural disaster**
- **Install generators and/or backup generators at the most critical of facilities-Police, Fire, EOC, Shelters, Schools**
- **Develop formal mutual aid agreements for DPWs and Emergency Response Teams, if not already done so**
- **Develop a coordinated resource list of equipment that can be shared among communities during an emergency**
- **Add additional airwave capacity for emergency situations**

Old Colony Regional Mitigation Action Plan

Emergency Services Protection

- **Educate local officials to help them develop plans to protect critical documents and materials**
- **Consider creating/expanding fire breaks upwind of critical facilities via controlled burns and or tree trimming along roads where trees touch overhead**

Old Colony Regional Mitigation Action Plan

Structural Projects

- **Improve stormwater management systems that are located in hazard prone areas or that are inadequate**
- **Inspect, maintain/upgrade older dams for present functions and stormwater management potential**
- **Minimize snowdrifts with upwind snow fences**
- **Develop any needed fire ponds and enhance with dry hydrants**
- **Build/replace seawalls along the coast as needed**

Old Colony Regional Mitigation Action Plan

**Do you have thoughts on these or
any other additional strategies?**

Plan Implementation

- Your mitigation strategy section provides a “blueprint” to follow for progressively reducing your community’s natural hazard risk.
- It will include two types of initiatives/projects- those that your community can “self-fund”, and those that will require outside (e.g. grant) funding.
- Mitigation grant opportunities open regularly:
 - The annual HMA grant window opens in June of each year.
 - HMGP funding comes in the wake of Declared Disasters in the State.
- OCPC will alert communities of grant opportunities as they arise, including all guidance provided by MEMA and FEMA.

Conclusion

- OCPC is committed to working on the development of the plan with each community to address and identify potential mitigation projects.
- Mitigation is the cornerstone of emergency management and planning. It is an essential proactive approach to prevent the impact of disasters on lives, property and community.
- The benefit of a collaborative effort between federal, state and local partners will provide for a safer environment.

General Issues, Questions and Concerns?

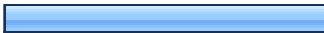






Are there any General Issues, Questions and Concerns?

**Please contact:
Eric Arbeene,
OCPC Community Planner
508-583-1833 Ext. 209
earbeene@ocpcrpa.org**

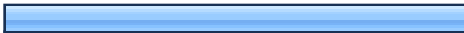







Thank you very much for your time!!

APPENDIX 2: SURVEY QUESTIONS & RESPONSES

1. Which municipality do you live or work in the Old Colony Region?

		Response Percent	Response Count
Abington		0.0%	0
Avon		0.0%	0
Bridgewater		0.0%	0
Brockton		48.1%	13
East Bridgewater		0.0%	0
Easton		3.7%	1
Halifax		7.4%	2
Hanson		3.7%	1
Kingston		3.7%	1
Pembroke		0.0%	0
Plymouth		0.0%	0
Plympton		0.0%	0
Stoughton		33.3%	9
West Bridgewater		0.0%	0
Whitman		11.1%	3
answered question			27
skipped question			0






2. Which of the following natural hazard events have you experienced within the Old Colony Region?

		Response Percent	Response Count
Flooding		69.2%	18
Hurricanes & Tropical Storms		76.9%	20
Winter Storms		92.3%	24
Coastal Erosion & Shoreline Change		15.4%	4
Tornadoes		7.7%	2
Extreme Temperatures (Hot & Cold)		61.5%	16
Wildfires		7.7%	2
Major Urban Fires		7.7%	2
Landslides		0.0%	0
Earthquakes		0.0%	0
Tsunamis		0.0%	0
		answered question	26
		skipped question	1







3. How concerned are you about the following natural hazards within the Old Colony Region?

	Not Concerned	Somewhat Concerned	Concerned	Very Concerned	Extremely Concerned	Response Count
Flooding	11.1% (3)	18.5% (5)	29.6% (8)	25.9% (7)	14.8% (4)	27
Hurricanes & Tropical Storms	3.7% (1)	18.5% (5)	40.7% (11)	22.2% (6)	14.8% (4)	27
Winter Storms	3.7% (1)	11.1% (3)	18.5% (5)	48.1% (13)	18.5% (5)	27
Coastal Erosion & Shoreline Change	55.6% (15)	18.5% (5)	11.1% (3)	7.4% (2)	7.4% (2)	27
Tornadoes	41.7% (10)	33.3% (8)	16.7% (4)	0.0% (0)	8.3% (2)	24
Extreme Temperatures (Hot & Cold)	11.5% (3)	38.5% (10)	38.5% (10)	3.8% (1)	7.7% (2)	26
Wildfires	46.2% (12)	26.9% (7)	19.2% (5)	3.8% (1)	3.8% (1)	26
Major Urban Fires	36.0% (9)	24.0% (6)	24.0% (6)	12.0% (3)	4.0% (1)	25
Landslides	87.5% (21)	8.3% (2)	4.2% (1)	0.0% (0)	0.0% (0)	24
Earthquakes	43.5% (10)	43.5% (10)	8.7% (2)	0.0% (0)	4.3% (1)	23
Tsunamis	83.3% (20)	12.5% (3)	4.2% (1)	0.0% (0)	0.0% (0)	24
					answered question	27
					skipped question	0






4. How prepared is your household for a natural hazard event?

		Response Percent	Response Count
Not at all prepared		25.9%	7
Somewhat prepared		48.1%	13
Adequately prepared		18.5%	5
Well prepared		7.4%	2
Very well prepared		3.7%	1
answered question			27
skipped question			0

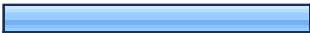









5. Which of the following have provided you with useful information to help you prepare for natural hazards?

		Response Percent	Response Count
Police/Fire Departments		36.0%	9
Newspapers		32.0%	8
TV News		60.0%	15
Radio News		36.0%	9
Local, State or Federal Government Websites		48.0%	12
Internet		40.0%	10
Other (please specify)			5
answered question			25
skipped question			2




6. What are the most important things local governments can do to help communities be more prepared for a disaster?

		Response Percent	Response Count
Disseminate effective emergency notifications and communication		88.9%	24
Conduct training to educate residents and business owners on how to reduce future damages		59.3%	16
Conduct community outreach regarding emergency preparedness		55.6%	15
Being aware of special needs and vulnerable populations		74.1%	20
Create a plan that utilizes volunteers to help in a disaster		55.6%	15
	Other (please specify)		2
		answered question	27
		skipped question	0




7. Which of the following steps has your household taken to prepare for a natural hazard event?

		Response Percent	Response Count
Received First Aid/CPR training		46.2%	12
Prepared a disaster supply kit		19.2%	5
Stored food and water		38.5%	10
Stored flashlights, radios and batteries		76.9%	20
Maintained working smoke alarms on each level of my house		84.6%	22
Created a fire escape plan		23.1%	6
Identified the location of the nearest storm shelter		15.4%	4
Identified utility shutoffs		57.7%	15
Strengthened openings (doors, windows, garage doors to reduce risks from high winds)		23.1%	6
Purchased a generator as an additional source of power		23.1%	6
	Other (please specify)		1
answered question			26
skipped question			1


8. Is your property located in a FEMA designated flood plain?

		Response Percent	Response Count
Yes		11.5%	3
No		57.7%	15
Not sure		30.8%	8
answered question			26
skipped question			1

9. Do you have flood insurance?

		Response Percent	Response Count
Yes		19.2%	5
No		69.2%	18
Not sure		11.5%	3
answered question			26
skipped question			1





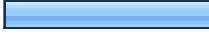


10. Have you ever had problems securing homeowners or renters insurance due to risks from natural hazards?

		Response Percent	Response Count
Yes		0.0%	0
No		96.0%	24

If yes, what hazard caused the difficulty? 1

answered question			25
skipped question			2

11. If available, which of the following incentives would encourage you to make hazard mitigation improvements on your home?

		Response Percent	Response Count
I would make improvements without an incentive		23.1%	6
Financial incentives would not motivate me		0.0%	0
Mortgage discount (for portion of retrofit cost)		42.3%	11
Insurance premium discount		61.5%	16
Property tax break/incentive (for portion of retrofit cost)		46.2%	12
Building permit fee waiver/reduction		30.8%	8
Low interest rate loan		53.8%	14
Grant funding (will require a cost share)		42.3%	11
	Other (please specify)		1
answered question			26
skipped question			1

12. How much money would you be willing to spend on your current home to retrofit it from the impacts of potential future natural disasters? Examples of retrofitting are: Elevating a flood-prone home; elevating utilities in flood-prone basements; retrofitting your roof, siding or windows to withstand high winds; removing threatening trees or branches.

		Response Percent	Response Count
\$0		0.0%	0
Less than \$100		4.0%	1
\$100 to \$499		12.0%	3
\$500 to \$999		12.0%	3
\$1,000 to \$2,499		24.0%	6
\$2,500 to \$4,999		16.0%	4
\$5,000 or Above		32.0%	8
answered question			25
skipped question			2

13. How many days are you prepared for if you were unable to leave your home and assistance is unavailable to you?

		Response Percent	Response Count
Less than 1 Day/Less than 24 Hours		7.7%	2
1 Day / 24 Hours		19.2%	5
2 Days/ 48 Hours		11.5%	3
3 Days/ 72 Hours		26.9%	7
4 Days or Longer		34.6%	9
answered question			26
skipped question			1


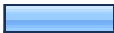




14. How prepared are you to get along without electricity and/or natural gas for one to five days?

		Response Percent	Response Count
Not at all prepared		23.1%	6
Somewhat prepared		50.0%	13
Very prepared		26.9%	7
		answered question	26
		skipped question	1






15. What types of projects do you believe that local, state or federal government agencies should be doing in order to reduce the damage and disruptions caused by natural hazards in the Old Colony Region?

	High	Medium	Low	Response Count
Retrofit and strengthen critical facilities such as police/fire departments, schools and hospitals	45.8% (11)	33.3% (8)	20.8% (5)	24
Retrofit infrastructure such as elevating roadways and improving drainage systems	40.0% (10)	44.0% (11)	16.0% (4)	25
Work on improving the damage resistance of utilities (electricity, communications, etc.)	88.0% (22)	12.0% (3)	0.0% (0)	25
Replacing inadequate or vulnerable bridges and culverts	62.5% (15)	33.3% (8)	4.2% (1)	24
Acquire vulnerable properties and maintain as open space	26.1% (6)	17.4% (4)	56.5% (13)	23
Inform property owners of ways that they can mitigate damage to their property	37.5% (9)	37.5% (9)	25.0% (6)	24
Provide better information about hazard risks and high-hazard areas	66.7% (16)	25.0% (6)	8.3% (2)	24
Assist vulnerable property owners with securing funding to mitigate damage to their properties	33.3% (7)	47.6% (10)	19.0% (4)	21
			answered question	25
			skipped question	2

16. Please indicate your age range.

		Response Percent	Response Count
Under 18		0.0%	0
18 to 24		4.0%	1
25 to 34		16.0%	4
35 to 49		32.0%	8
50 to 65		36.0%	9
66 to 75		4.0%	1
Over 75		8.0%	2
answered question			25
skipped question			2

17. How long have you lived or work in the Old Colony Region?

		Response Percent	Response Count
Less than 1 year		0.0%	0
1-5 years		20.0%	5
6-10 years		8.0%	2
11-15 years		12.0%	3
15 to 20 years		12.0%	3
Over 20 years		48.0%	12
answered question			25
skipped question			2

18. Are there any other issues regarding the reduction of risk and loss associated with natural hazards in the community that are important to you?

**Response
Count**

9

answered question

9

skipped question

18

19. If you would you like to be notified of future opportunities to participate in hazard mitigation planning please provide your name, address and email address in the space provided below.

**Response
Count**

5

answered question

5

skipped question

22

Q5. Which of the following have provided you with useful information to help you prepare for natural hazards?

1	Scanner	Jan 14, 2013 12:58 PM
2	Community 911 reverse call	Aug 21, 2012 6:07 AM
3	lifetime of experience	Jul 22, 2012 8:38 AM
4	common sense/ experience	May 22, 2012 11:49 AM
5	Twitter	Mar 27, 2012 11:40 AM

Q6. What are the most important things local governments can do to help communities be more prepared for a disaster?

1	Inform residents of where to go,what the town can and CAN NOT provide	May 3, 2012 12:09 PM
2	Exploit any flood control potencial of existing dams and maximize local flood storage/recharge.	Mar 28, 2012 9:32 AM

Q7. Which of the following steps has your household taken to prepare for a natural hazard event?

1	have wood burning stove and plenty of wood and matches so can be warm and cook	Mar 28, 2012 9:32 AM
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Q10. Have you ever had problems securing homeowners or renters insurance due to risks from natural hazards?

1	I am too highHouse is too high for flooding but still in wind hazard area with same coverage	Mar 28, 2012 9:32 AM
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Q11. If available, which of the following incentives would encourage you to make hazard mitigation improvements on your home?

1	Am having overhanging branches cut for damage prevention.\$1500 deductible was ,more than last work cost.	Mar 28, 2012 9:32 AM
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Q18. Are there any other issues regarding the reduction of risk and loss associated with natural hazards in the community that are important to you?

1	Lack of fire protection during storms; overgrowth of forests; debris in rivers	Jan 14, 2013 12:58 PM
2	Stoughton needs to have a disaster coordinator (one voice) that can provide accurate information to residents about services available to help residents and the current extent of the disaster. It needs to be available on the internet and an information hotline, staffed or automated. During the hurricane last year, depending on if you contacted the police, fire or DPW you would get different information. Pre-planning for a disaster is only the first step, residents need to know how to mitigate their losses.	Jul 22, 2012 10:50 AM
3	Improving communications from the town and NATIONAL GRID about power restoration after a storm. After TS Irene last year we had no power for a week and no truthful information was available. Very frustrating situation. We have a generator so luckier than many. Any phone calls to NG were answered with "we don't know" or outright lies - and the town's website is devoid of any useful information and basically a joke. The NG grid website does not work properly on a smartphone.	Jul 22, 2012 8:38 AM
4	Clearing trees and tree limbs from major power lines and to include residential and commercial areas	Jul 22, 2012 7:38 AM
5	no	Jul 21, 2012 2:27 PM
6	Alternative transportation networks are important. Hospitals are more important to retrofit than police depts.--these facilities should be separated. Communications more important than electricity. Drainage upgrades important--elevating roads, questionable. Agriculture important--more of it needed in this area to sustain the population.	May 22, 2012 11:49 AM
7	Having each town, especially the small ones like Halifax, have the town employees educate residents on car routes to exit town, what safe shelter exists in town, what services the town provides, a list of things we should do to prepare and maintain...if you save alot of food just for an emergency ...at some point it does go bad...so how do you make it not complicated an have emergency food?	May 3, 2012 12:09 PM
8	No	Mar 28, 2012 12:36 PM
9	Forst fire protection;not here but in Plymouth	Mar 28, 2012 9:32 AM

Q19. If you would you like to be notified of future opportunities to participate in hazard mitigation planning please provide your name, address and email address in the space provided below.

1	Ken McColl 623 Central St Stoughton, MA 02072 k.mccoll@comcast.net	Jul 29, 2012 10:44 PM
2	Tony Parmeggiani, 30 Pierce st, Stoughton, MA 02072 T4X4NO2@COMCAST.NET	Jul 22, 2012 7:38 AM
3	Patti Casserly 1784 Turnpike St Stoughton MA 02072 patti.casserly@ymail.com	Jul 21, 2012 2:27 PM
4	Brian Bellinger, 11 Upton Street, Halifax, MA 02338 bigbri9@hotmail.com	May 3, 2012 12:09 PM
5	James R.Watson 291 Rockland St..Hingham 02043 jJwatson@OCPCRPA,org	Mar 28, 2012 9:32 AM

APPENDIX 3: ORGANIZATIONS REQUESTED TO REVIEW DRAFT PLAN

Old Colony Planning Council

Robert G. Moran, Jr.
President

70 School Street
Brockton, MA 02301-4097



Pasquale Ciaramella
Executive Director

Telephone: (508) 583-1833
Fax: (508) 559-8768
Email: information@ocpcrpa.org
Website: www.ocpcrpa.org

September 27, 2012

Mr. Dick Shafer
President
Taunton River Watershed Alliance, Inc.
P.O. Box 1116
1298 Cohannet Street
Taunton, MA 02780

Mr. Shafer:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that the Taunton River Watershed Alliance please review and submit any comments that they may have by the comment period deadline of Friday December 7, 2012.

Please share the Plan with whomever you think may be interested in reviewing and commenting on the Plan. If you have any questions, please feel free to contact Community Planner Eric Arbeene at 508-583-1833 Ext. 213 or at earbeene@ocpcrpa.org. The plan and associated materials are also posted on our website at <http://www.ocpcrpa.org/hmp.html>

Thank you,

A handwritten signature in blue ink that reads "Pat Ciaramella". The signature is fluid and cursive, written over the printed name.

Pat Ciaramella
Executive Director
Old Colony Planning Council
70 School Street
Brockton, MA 02301
P: 508-583-1833
F: 508-559-8768

Old Colony Planning Council



Robert G. Moran, Jr.
President

70 School Street
Brockton, MA 02301-4097

Pasquale Ciaramella
Executive Director

Telephone: (508) 583-1833
Fax: (508) 559-8768
Email: information@ocpcrpa.org
Website: www.ocpcrpa.org

September 27, 2012

Mr. David Rose
President
Jones River Watershed Association
P.O. Box 73
55 Landing Road
Kingston, MA 02364

Mr. Rose:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that the Jones River Watershed Association please review and submit any comments that they may have by the comment period deadline of Friday, December 7, 2012.

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Thank you,

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Pat Ciaramella
Executive Director
Old Colony Planning Council
70 School Street
Brockton, MA 02301
P: 508-583-1833
F: 508-559-8768

Old Colony Planning Council

Robert G. Moran, Jr.
President

70 School Street
Brockton, MA 02301-4097



Pasquale Ciaramella
Executive Director

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Email: information@ocpcrpa.org

Website: www.ocpcrpa.org

September 27, 2012

Mr. Jason Burtner
CZM South Shore Regional Coordinator
c/o Stellwagen Bank National Marine Sanctuary
175 Edward Foster Road
Scituate, MA 02066

Mr. Burtner:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that the Massachusetts Office of Coastal Zone Management please review and submit any comments that they may have by the comment period deadline of Friday December 7, 2012.

Please share the Plan with whomever you think may be interested in reviewing and commenting on the Plan. If you have any questions, please feel free to contact Community Planner Eric Arbeene at 508-583-1833 Ext. 213 or at earbeene@ocpcrpa.org. The plan and associated materials are also posted on our website at <http://www.ocpcrpa.org/hmp.html>

Thank you,

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Pat Ciaramella
Executive Director
Old Colony Planning Council
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Brockton, MA 02301
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F: 508-559-8768

Old Colony Planning Council



Robert G. Moran, Jr.
President

70 School Street
Brockton, MA 02301-4097

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Website: www.ocpcrpa.org

September 27, 2012

Mr. Christopher Cooney
President & CEO
Metro South Chamber of Commerce
60 School Street
Brockton, MA 02301

Mr. Cooney:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that the Metro South Chamber of Commerce please review and submit any comments that they may have by the comment period deadline of Friday December 7, 2012.

Please share the Plan with whomever you think may be interested in reviewing and commenting on the Plan. If you have any questions, please feel free to contact Community Planner Eric Arbeene at 508-583-1833 Ext. 213 or at earbeene@ocpcrpa.org. The plan and associated materials are also posted on our website at <http://www.ocpcrpa.org/hmp.html>

Thank you,

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Old Colony Planning Council



Robert G. Moran, Jr.
President

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Website: www.ocpcrpa.org

September 27, 2012

Mr. Denis Hanks
Executive Director
Plymouth Area Chamber of Commerce
134 Court Street
Plymouth, MA 02360

Mr. Hanks:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that the Plymouth Area Chamber of Commerce please review and submit any comments that they may have by the comment period deadline of Friday December 7, 2012.

Please share the Plan with whomever you think may be interested in reviewing and commenting on the Plan. If you have any questions, please feel free to contact Community Planner Eric Arbeene at 508-583-1833 Ext. 213 or at earbeene@ocpcrpa.org. The plan and associated materials are also posted on our website at <http://www.ocpcrpa.org/hmp.html>

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Pat Ciaramella
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Old Colony Planning Council



Robert G. Moran, Jr.
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Fax: (508) 559-8768

Email: information@ocpcrpa.org

Website: www.ocpcrpa.org

October 1, 2012

Mr. Peter Forman
President & CEO
South Shore Chamber of Commerce
36 Miller Stile Road, Box 690625
Quincy, MA 02269

Mr. Forman:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that the South Shore Chamber of Commerce please review and submit any comments that they may have by the comment period deadline of Friday December 7, 2012.

Please share the Plan with whomever you think may be interested in reviewing and commenting on the Plan. If you have any questions, please feel free to contact Community Planner Eric Arbeene at 508-583-1833 Ext. 213 or at earbeene@ocpcrpa.org. The plan and associated materials are also posted on our website at <http://www.ocpcrpa.org/hmp.html>

Thank you,

A handwritten signature in blue ink that reads "Pat Ciaramella". The signature is written in a cursive style and is positioned above the printed name and title.

Pat Ciaramella
Executive Director

Old Colony Planning Council



Robert G. Moran, Jr.
President

70 School Street
Brockton, MA 02301-4097

Pasquale Ciaramella
Executive Director

Telephone: (508) 583-1833
Fax: (508) 559-8768
Email: information@ocpcrpa.org
Website: www.ocpcrpa.org

October 1, 2012

Mr. Frederick Clark
Executive Vice President and Vice President for External Affairs
Bridgewater State University
131 Summer Street, Room 211
Bridgewater, MA 02325

Name:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that Bridgewater State University please review and submit any comments that they may have by the comment period deadline of Friday December 7, 2012.

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Thank you,

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Pat Ciaramella
Executive Director

Old Colony Planning Council

Robert G. Moran, Jr.
President

70 School Street
Brockton, MA 02301-4097



Pasquale Ciaramella
Executive Director

Telephone: (508) 583-1833

Fax: (508) 559-8768

Email: information@ocpcrpa.org

Website: www.ocpcrpa.org

October 1, 2012

Mr. Phillip Sheppard, Esq.
Executive Director of External Relations & Special Assistant to the President
Massasoit Community College
1 Massasoit Boulevard
Brockton, MA 02302

Mr. Sheppard:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that Massasoit Community College please review and submit any comments that they may have by the comment period deadline of Friday December 7, 2012.

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Thank you,

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Pat Ciaramella
Executive Director

Old Colony Planning Council



Robert G. Moran, Jr.
President

70 School Street
Brockton, MA 02301-4097

Pasquale Ciaramella
Executive Director

Telephone: (508) 583-1833

Fax: (508) 559-8768

Email: information@ocpcrpa.org

Website: www.ocpcrpa.org

October 1, 2012

Mr. Francis X. Dillon
Vice President of Advancement
Stonehill College
Merkert 215
Easton, MA 02357

Mr. Dillon:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that Stonehill College please review and submit any comments that they may have by the comment period deadline of Friday December 7, 2012.

Please share the Plan with whomever you think may be interested in reviewing and commenting on the Plan. If you have any questions, please feel free to contact Community Planner Eric Arbeene at 508-583-1833 Ext. 213 or at earbeene@ocpcrpa.org. The plan and associated materials are also posted on our website at <http://www.ocpcrpa.org/hmp.html>

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Pat Ciaramella
Executive Director

Old Colony Planning Council



Robert G. Moran, Jr.
President

70 School Street
Brockton, MA 02301-4097

Pasquale Ciaramella
Executive Director

Telephone: (508) 583-1833
Fax: (508) 559-8768
Email: information@ocpcrpa.org
Website: www.ocpcrpa.org

September 27, 2012

Mr. Stephen D. Coan
State Fire Marshal
Massachusetts Department of Fire Services
P.O. Box 1025
1 State Road
Stow, MA 01775

Mr. Coan:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that the Massachusetts Department of Fire Services please review and submit any comments that they may have by the comment period deadline of Friday December 7, 2012.

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Thank you,

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Pat Ciaramella
Executive Director
Old Colony Planning Council
70 School Street
Brockton, MA 02301
P: 508-583-1833
F: 508-559-8768

Old Colony Planning Council

Robert G. Moran, Jr.
President

70 School Street
Brockton, MA 02301-4097



Pasquale Ciaramella
Executive Director

Telephone: (508) 583-1833

Fax: (508) 559-8768

Email: information@ocpcrpa.org

Website: www.ocpcrpa.org

October 1, 2012

Colonel Timothy P. Alben
Superintendent
Massachusetts State Police
470 Worcester Road
Framingham, MA 01702

Colonel Alben:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that the Massachusetts State Police please review and submit any comments that they may have by the comment period deadline of Friday December 7, 2012.

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Pat Ciaramella
Executive Director

Old Colony Planning Council



Robert G. Moran, Jr.
President

70 School Street
Brockton, MA 02301-4097

Pasquale Ciaramella
Executive Director

Telephone: (508) 583-1833
Fax: (508) 559-8768
Email: information@ocpcrpa.org
Website: www.ocpcrpa.org

October 1, 2012

Ms. Mary-Joe Perry
District Highway Director
MassDOT District 5
1000 County Street
Taunton, MA 02780

Ms. Perry:

On Monday, September 24, 2012 at the Old Colony Multiple Hazard Community Planning Team (MHCPT) Meeting, the Old Colony Planning Council (OCPC) released the Draft Old Colony Planning Council Multi-Jurisdiction Natural Hazard Mitigation Plan for public review and comment. Please find enclosed a CD containing a copy of the Draft Plan that we are kindly asking that the Massachusetts Department of Transportation please review and submit any comments that they may have by the comment period deadline of Friday December 7, 2012.

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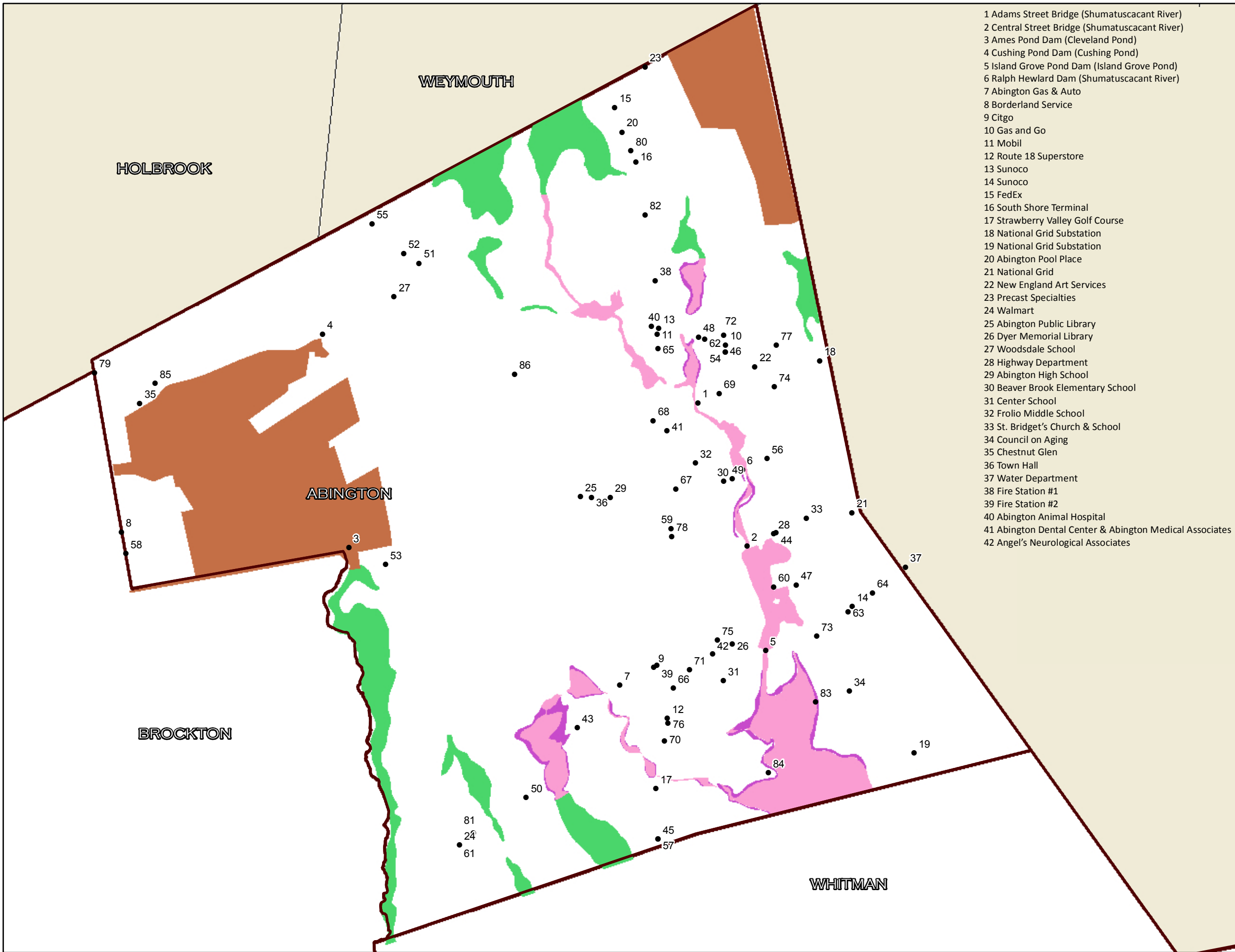
Thank you,

A handwritten signature in blue ink that reads "Pat Ciaramella". The signature is written in a cursive, flowing style.

Pat Ciaramella
Executive Director

APPENDIX 4: COMMUNITY MAPS

FLOOD ZONES AND SLOSH - ABINGTON



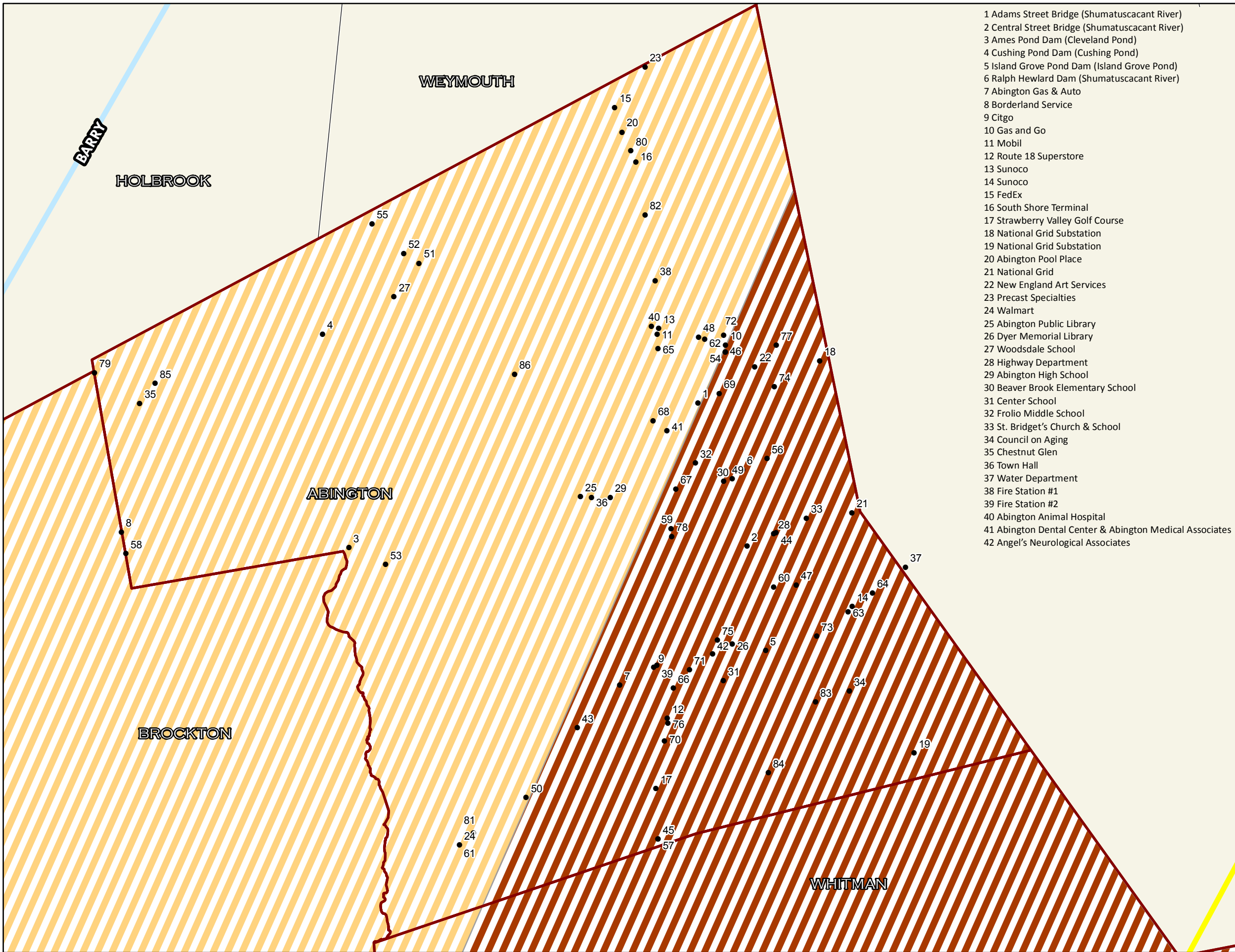
- 1 Adams Street Bridge (Shumatuscacant River)
- 2 Central Street Bridge (Shumatuscacant River)
- 3 Ames Pond Dam (Cleveland Pond)
- 4 Cushing Pond Dam (Cushing Pond)
- 5 Island Grove Pond Dam (Island Grove Pond)
- 6 Ralph Hewlard Dam (Shumatuscacant River)
- 7 Abington Gas & Auto
- 8 Borderland Service
- 9 Citgo
- 10 Gas and Go
- 11 Mobil
- 12 Route 18 Superstore
- 13 Sunoco
- 14 Sunoco
- 15 FedEx
- 16 South Shore Terminal
- 17 Strawberry Valley Golf Course
- 18 National Grid Substation
- 19 National Grid Substation
- 20 Abington Pool Place
- 21 National Grid
- 22 New England Art Services
- 23 Precast Specialties
- 24 Walmart
- 25 Abington Public Library
- 26 Dyer Memorial Library
- 27 Woodsdale School
- 28 Highway Department
- 29 Abington High School
- 30 Beaver Brook Elementary School
- 31 Center School
- 32 Frolio Middle School
- 33 St. Bridget's Church & School
- 34 Council on Aging
- 35 Chestnut Glen
- 36 Town Hall
- 37 Water Department
- 38 Fire Station #1
- 39 Fire Station #2
- 40 Abington Animal Hospital
- 41 Abington Dental Center & Abington Medical Associates
- 42 Angel's Neurological Associates

- 43 Signature Healthcare Nursing
- 44 Police Station
- 45 A Child's Dream Preschool & Daycare, Inc.
- 46 Christian Children's Center
- 47 Eager Beaver Day Camp
- 48 Lasting Impressions
- 49 Lasting Impressions
- 50 Lasting Impressions School Age Program
- 51 Little Stars Academy
- 52 Pre-School Playmates
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- 54 First Baptist Church of Abington
- 55 Hillside Cemetery
- 56 Island Grove Pond
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- 58 Lively Stones Christian Center
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- 60 Mount Vernon Cemetery
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- 62 South Shore Community Church
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- 64 Target Department Store
- 65 Trucchi's Supermarket
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- 68 Abington Housing Authority-Vinson Blanchard Garden
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- 71 USPS Abington Center Office
- 72 USPS North Abington Office
- 73 MBTA Abington Station
- 74 MBTA Maintenance Facility
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- 84 Abington Water Department & Filtration Plant
- 85 Chestnut Street Water Storage Tank
- 86 Lincoln Street Water Storage Tank

FLOOD ZONES

- A
- AE
- ANI
- X500
- CRITICAL FACILITIES
- OCPC REGION

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - ABINGTON



- 1 Adams Street Bridge (Shumatuscacant River)
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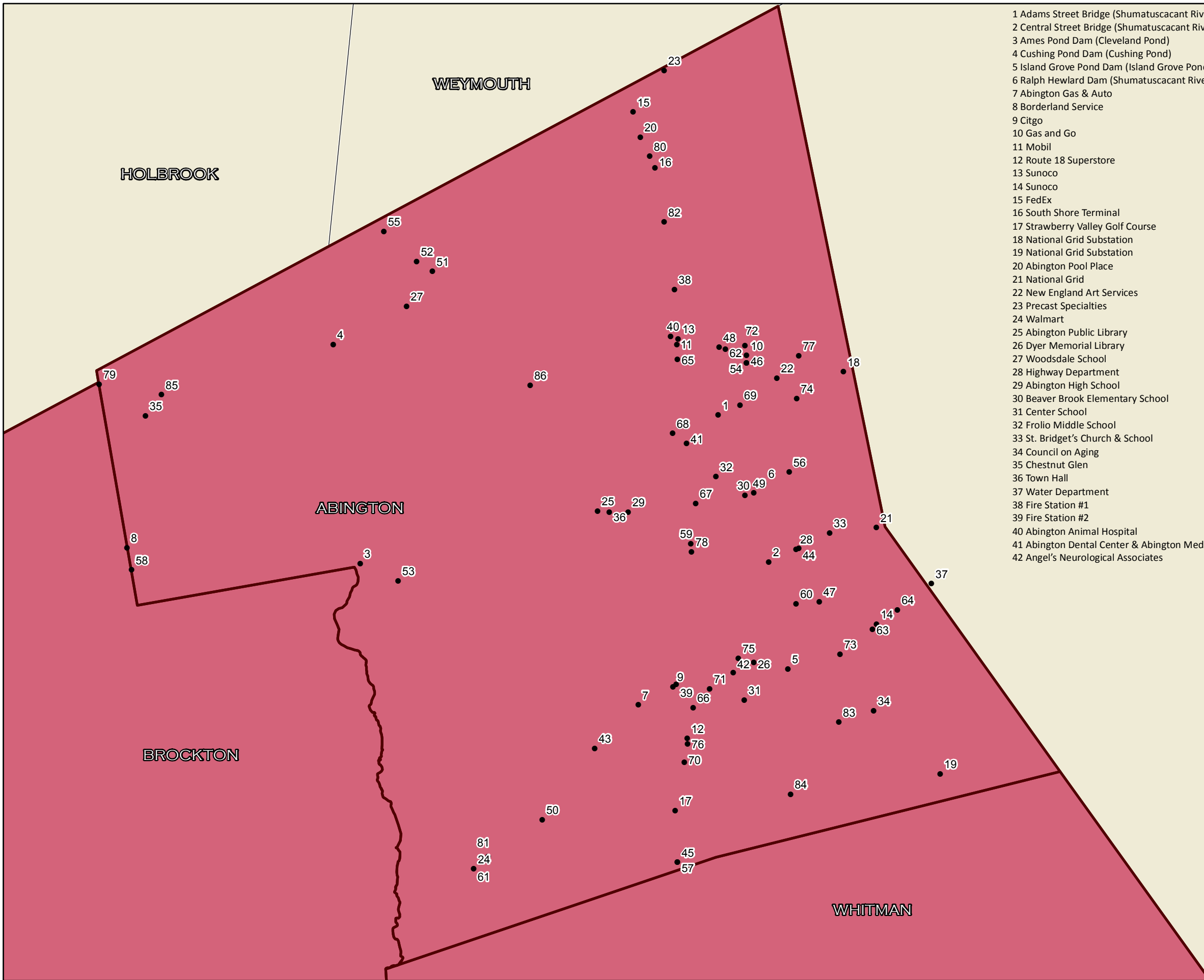
HURRICANE TRACKS

- CATEGORY 3
- CATEGORY 2
- CATEGORY 1
- TROPICAL DEPRESSION
- ▼ TORNADOES

100-YEAR WIND EVENT

- 110 MPH
- 120 MPH
- CRITICAL FACILITIES
- OCPC REGION


AVERAGE ANNUAL SNOWFALL - ABINGTON



- 1 Adams Street Bridge (Shumatuscacant River)
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AVERAGE ANNUAL SNOWFALL

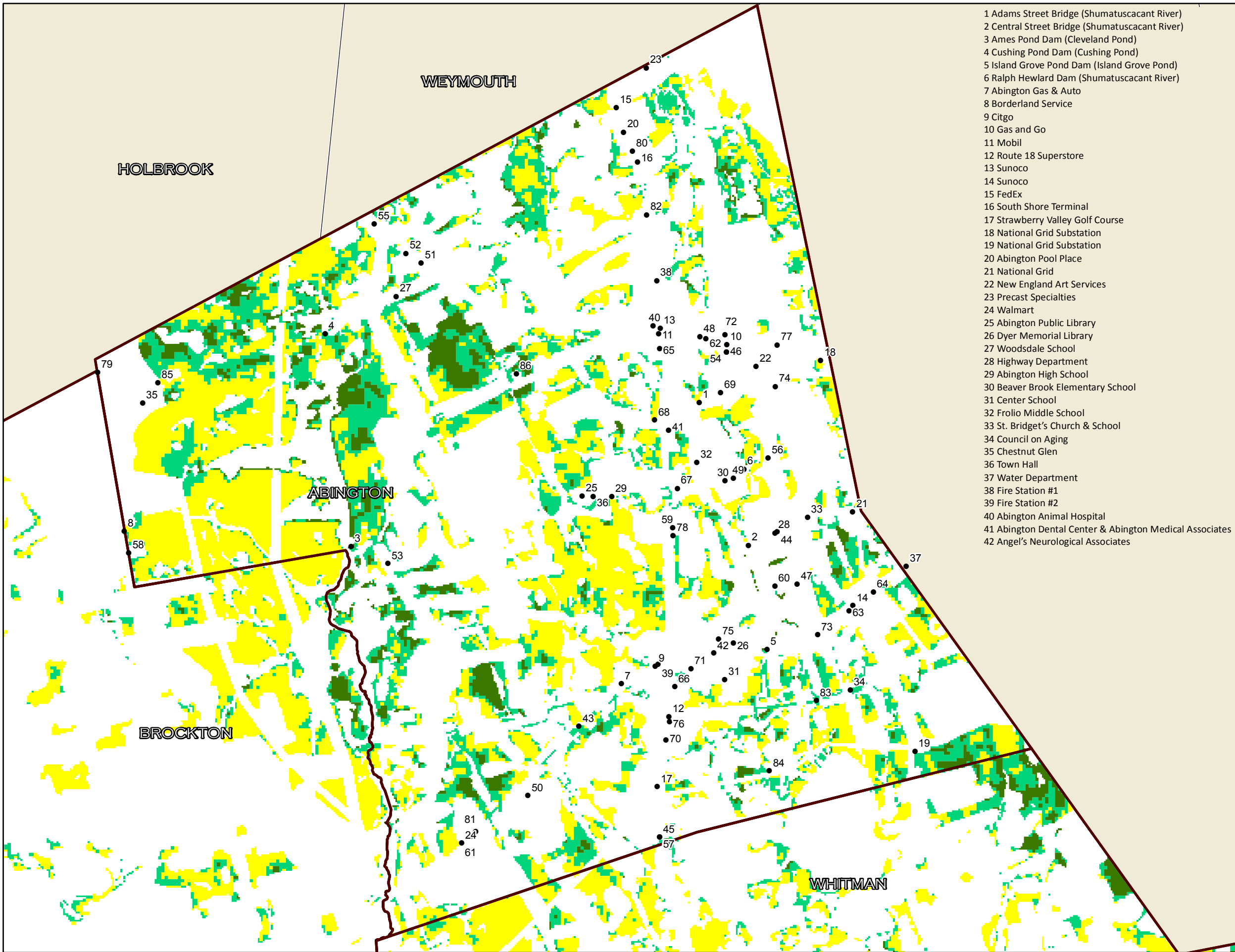
- 24-36 INCHES
- 36-48 INCHES
- 48-72 INCHES
- CRITICAL FACILITIES
- OCPC REGION



OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF ABINGTON

SEPTEMBER 2012

WILDFIRE SUSCEPTIBILITY - ABINGTON



- 1 Adams Street Bridge (Shumatuscacant River)
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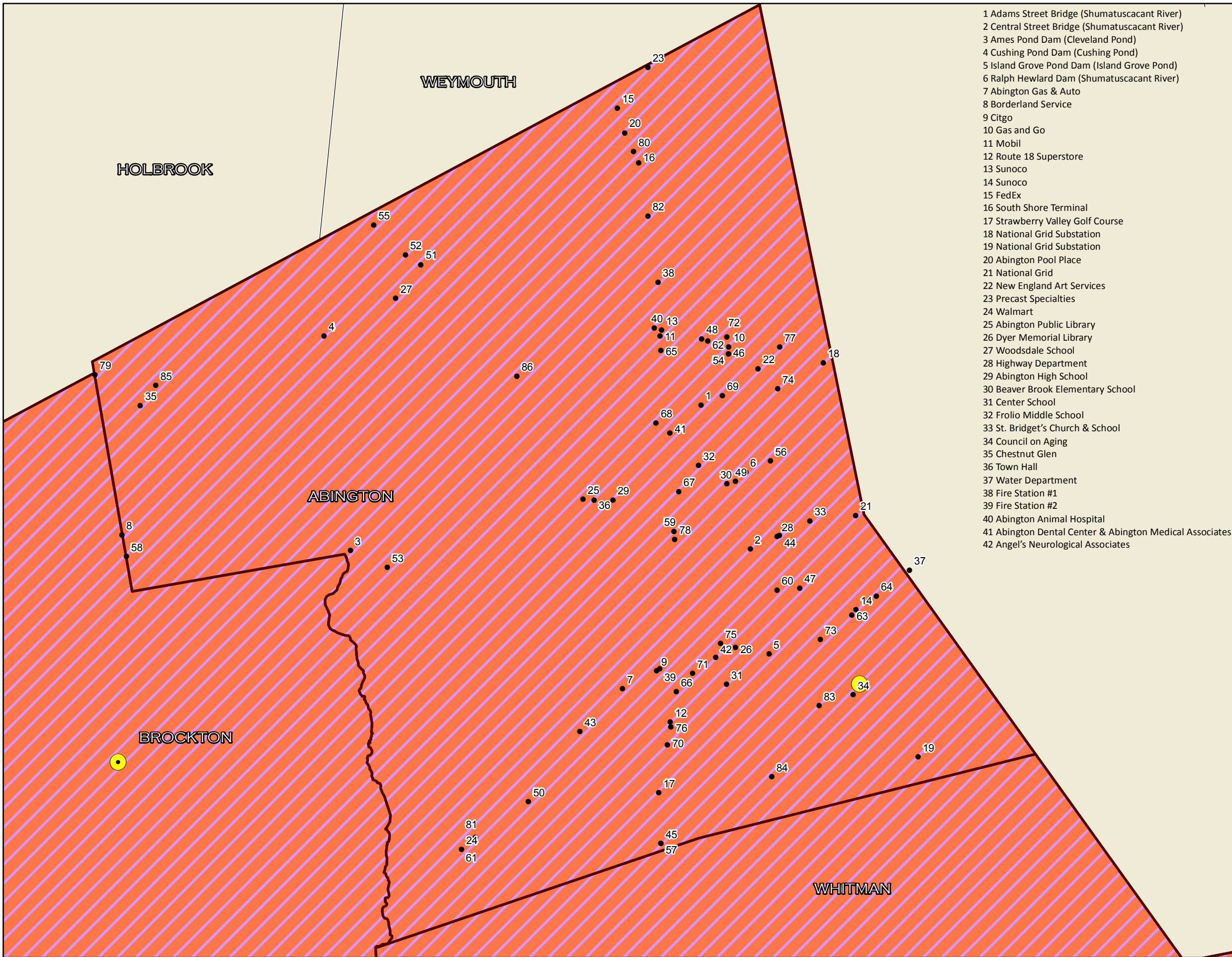
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- 86 Lincoln Street Water Storage Tank

- DECIDUOUS FOREST
- CONIFEROUS UPLAND FOREST
- MIXED DECIDUOUS & CONIFEROUS
- PITCH PINE & SCRUB OAK
- CRITICAL FACILITIES
- OCPC REGION



OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
BROCKTON, MA 02301
DATA SOURCES: MEMA, OCPC, MASSGIS,
TOWN OF ABINGTON
SEPTEMBER 2012

EARTHQUAKE & LANDSLIDE - ABINGTON

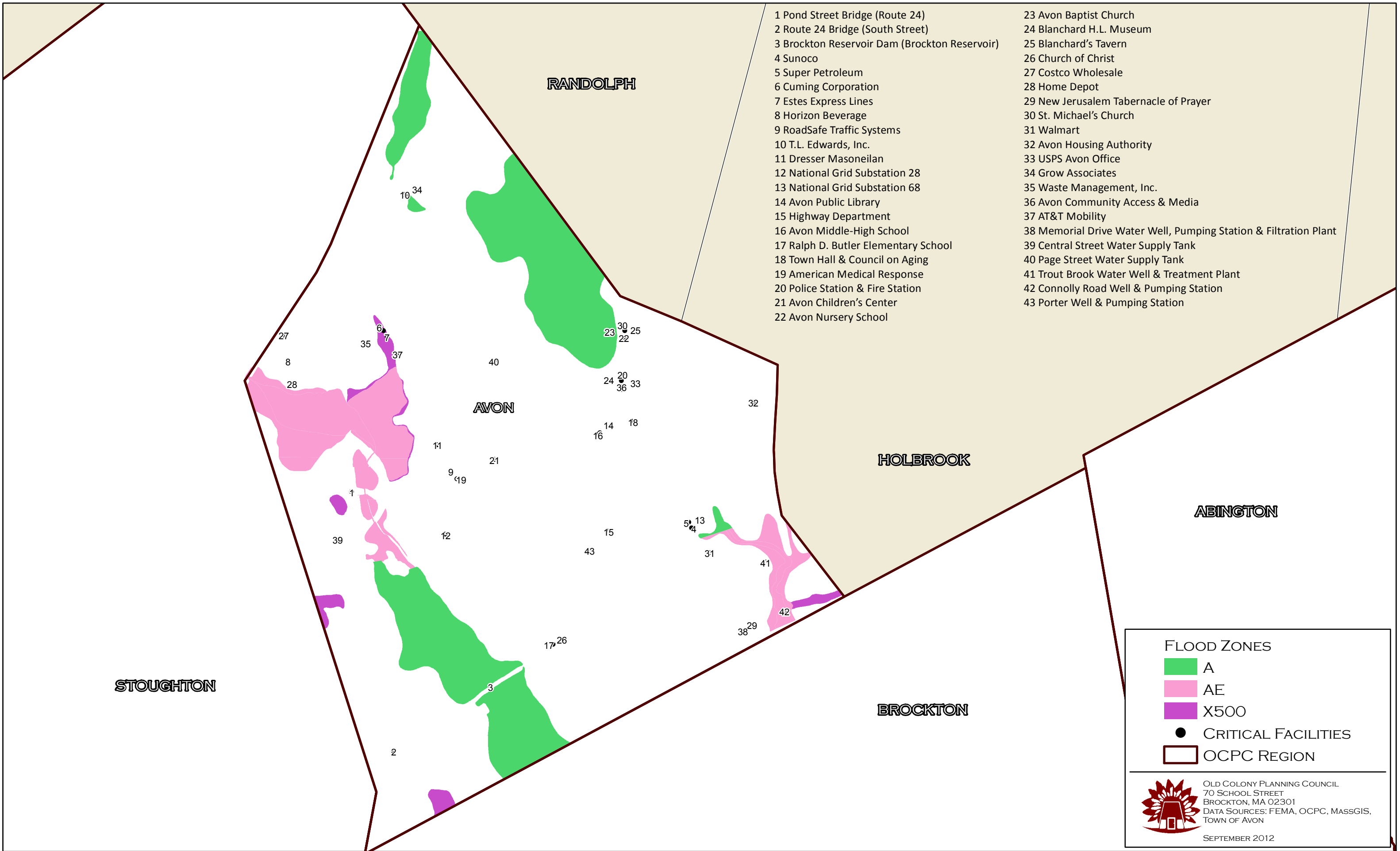


- | | |
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| | 84 Chestnut Street Water Storage Tank |
| | 85 Lincoln Street Water Storage Tank |

- EARTHQUAKES
- LANDSLIDE INCIDENCE AND SUSCEPTIBILITY
 - / / LOW INCIDENCE
 - / / MODERATE SUSCEPTIBILITY / LOW INCIDENCE
- PEAK GROUND ACCELERATION
 - ZONE 3
 - ZONE 4
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF ABINGTON
 SEPTEMBER 2012

FLOOD ZONES AND SLOSH - AVON



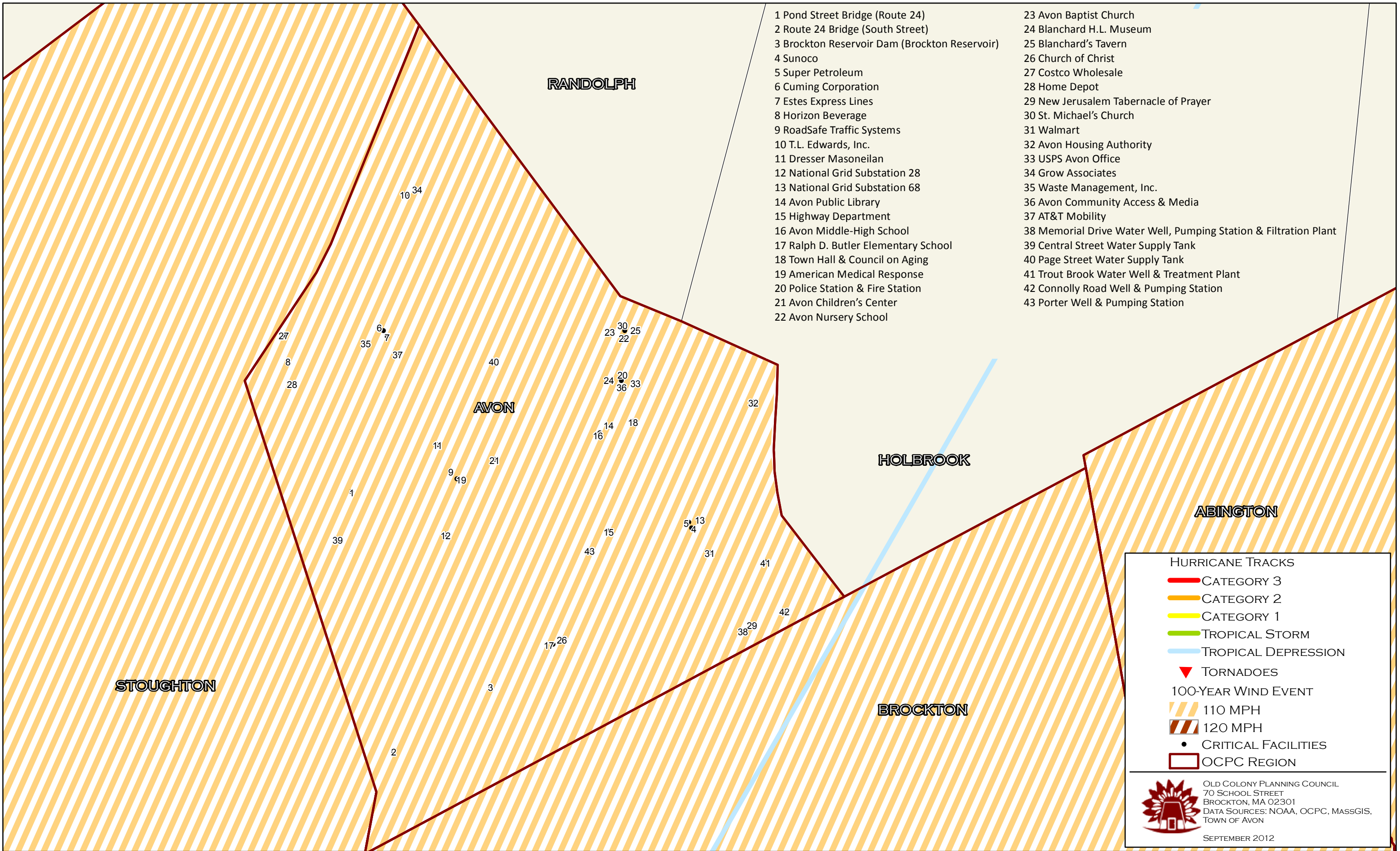
- 1 Pond Street Bridge (Route 24)
- 2 Route 24 Bridge (South Street)
- 3 Brockton Reservoir Dam (Brockton Reservoir)
- 4 Sunoco
- 5 Super Petroleum
- 6 Cuming Corporation
- 7 Estes Express Lines
- 8 Horizon Beverage
- 9 RoadSafe Traffic Systems
- 10 T.L. Edwards, Inc.
- 11 Dresser Masoneilan
- 12 National Grid Substation 28
- 13 National Grid Substation 68
- 14 Avon Public Library
- 15 Highway Department
- 16 Avon Middle-High School
- 17 Ralph D. Butler Elementary School
- 18 Town Hall & Council on Aging
- 19 American Medical Response
- 20 Police Station & Fire Station
- 21 Avon Children's Center
- 22 Avon Nursery School

- 23 Avon Baptist Church
- 24 Blanchard H.L. Museum
- 25 Blanchard's Tavern
- 26 Church of Christ
- 27 Costco Wholesale
- 28 Home Depot
- 29 New Jerusalem Tabernacle of Prayer
- 30 St. Michael's Church
- 31 Walmart
- 32 Avon Housing Authority
- 33 USPS Avon Office
- 34 Grow Associates
- 35 Waste Management, Inc.
- 36 Avon Community Access & Media
- 37 AT&T Mobility
- 38 Memorial Drive Water Well, Pumping Station & Filtration Plant
- 39 Central Street Water Supply Tank
- 40 Page Street Water Supply Tank
- 41 Trout Brook Water Well & Treatment Plant
- 42 Connolly Road Well & Pumping Station
- 43 Porter Well & Pumping Station

FLOOD ZONES

- A
- AE
- X500
- CRITICAL FACILITIES
- OCPC REGION

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - AVON



- 1 Pond Street Bridge (Route 24)
- 2 Route 24 Bridge (South Street)
- 3 Brockton Reservoir Dam (Brockton Reservoir)
- 4 Sunoco
- 5 Super Petroleum
- 6 Cuming Corporation
- 7 Estes Express Lines
- 8 Horizon Beverage
- 9 RoadSafe Traffic Systems
- 10 T.L. Edwards, Inc.
- 11 Dresser Masoneilan
- 12 National Grid Substation 28
- 13 National Grid Substation 68
- 14 Avon Public Library
- 15 Highway Department
- 16 Avon Middle-High School
- 17 Ralph D. Butler Elementary School
- 18 Town Hall & Council on Aging
- 19 American Medical Response
- 20 Police Station & Fire Station
- 21 Avon Children's Center
- 22 Avon Nursery School

- 23 Avon Baptist Church
- 24 Blanchard H.L. Museum
- 25 Blanchard's Tavern
- 26 Church of Christ
- 27 Costco Wholesale
- 28 Home Depot
- 29 New Jerusalem Tabernacle of Prayer
- 30 St. Michael's Church
- 31 Walmart
- 32 Avon Housing Authority
- 33 USPS Avon Office
- 34 Grow Associates
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HURRICANE TRACKS

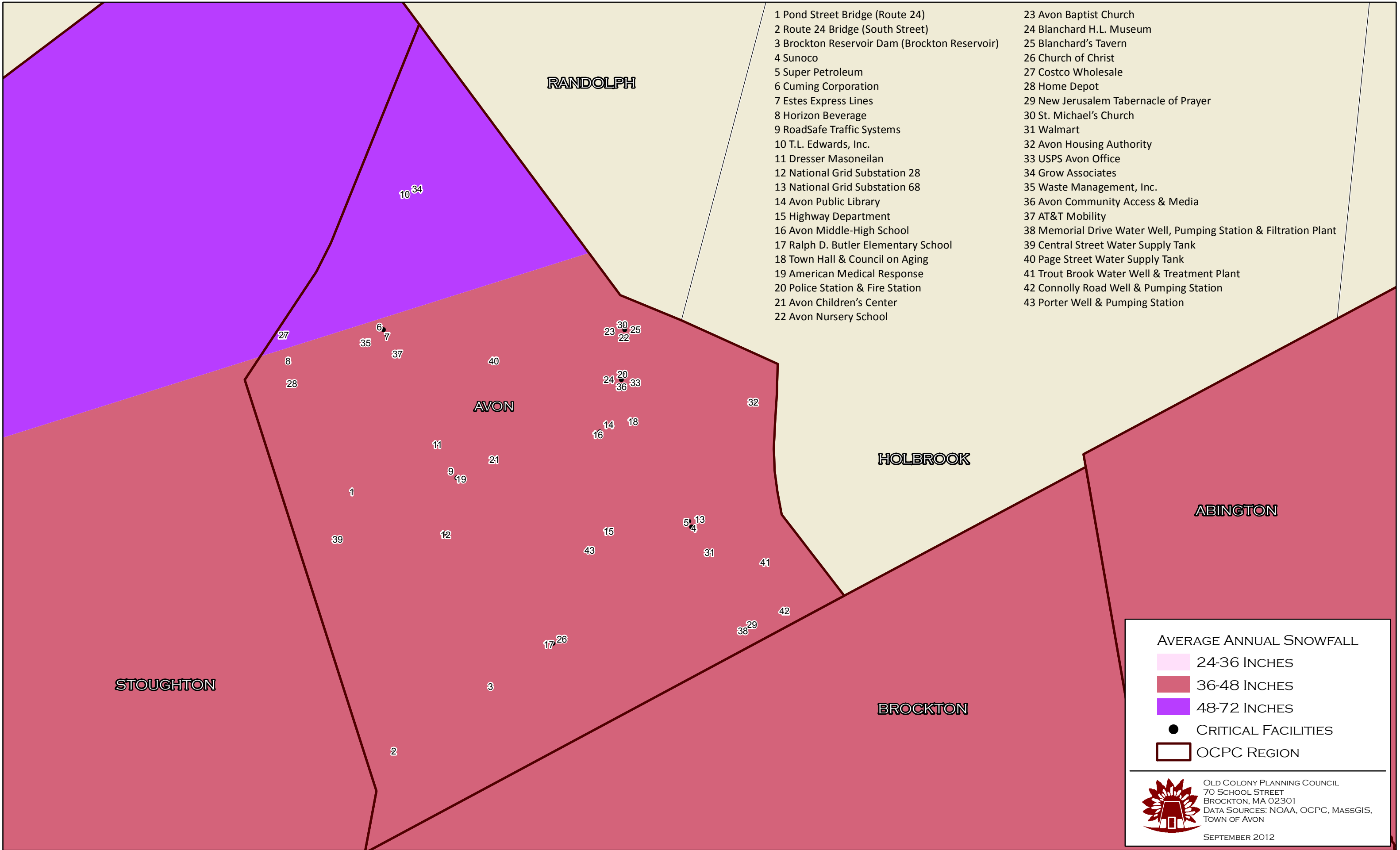
- CATEGORY 3
- CATEGORY 2
- CATEGORY 1
- TROPICAL STORM
- TROPICAL DEPRESSION
- ▼ TORNADOES

100-YEAR WIND EVENT

- 110 MPH
- 120 MPH

- CRITICAL FACILITIES
- OCPC REGION

AVERAGE ANNUAL SNOWFALL - AVON



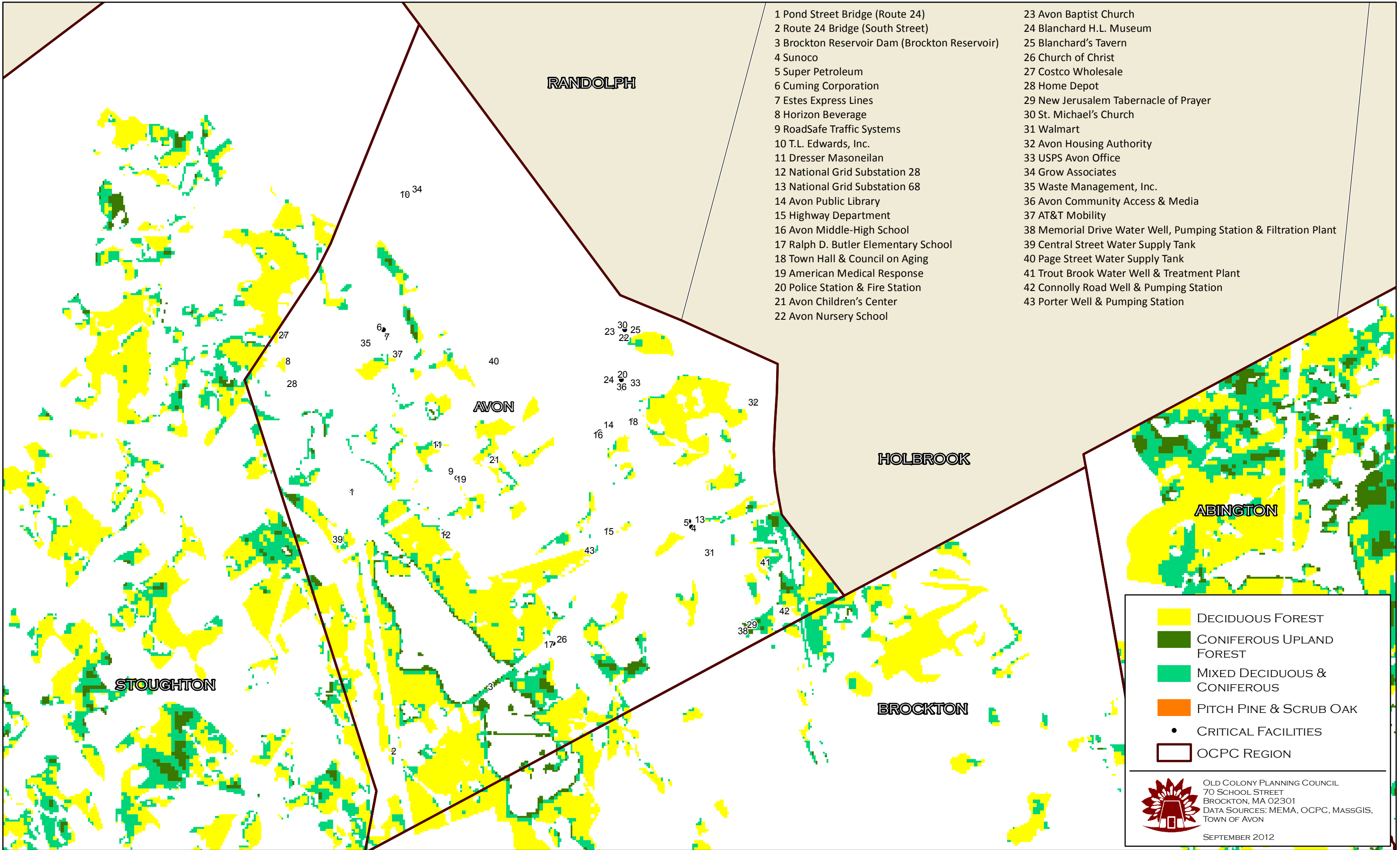
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AVERAGE ANNUAL SNOWFALL

- 24-36 INCHES
- 36-48 INCHES
- 48-72 INCHES
- CRITICAL FACILITIES
- OCPC REGION

WILDFIRE SUSCEPTIBILITY - AVON

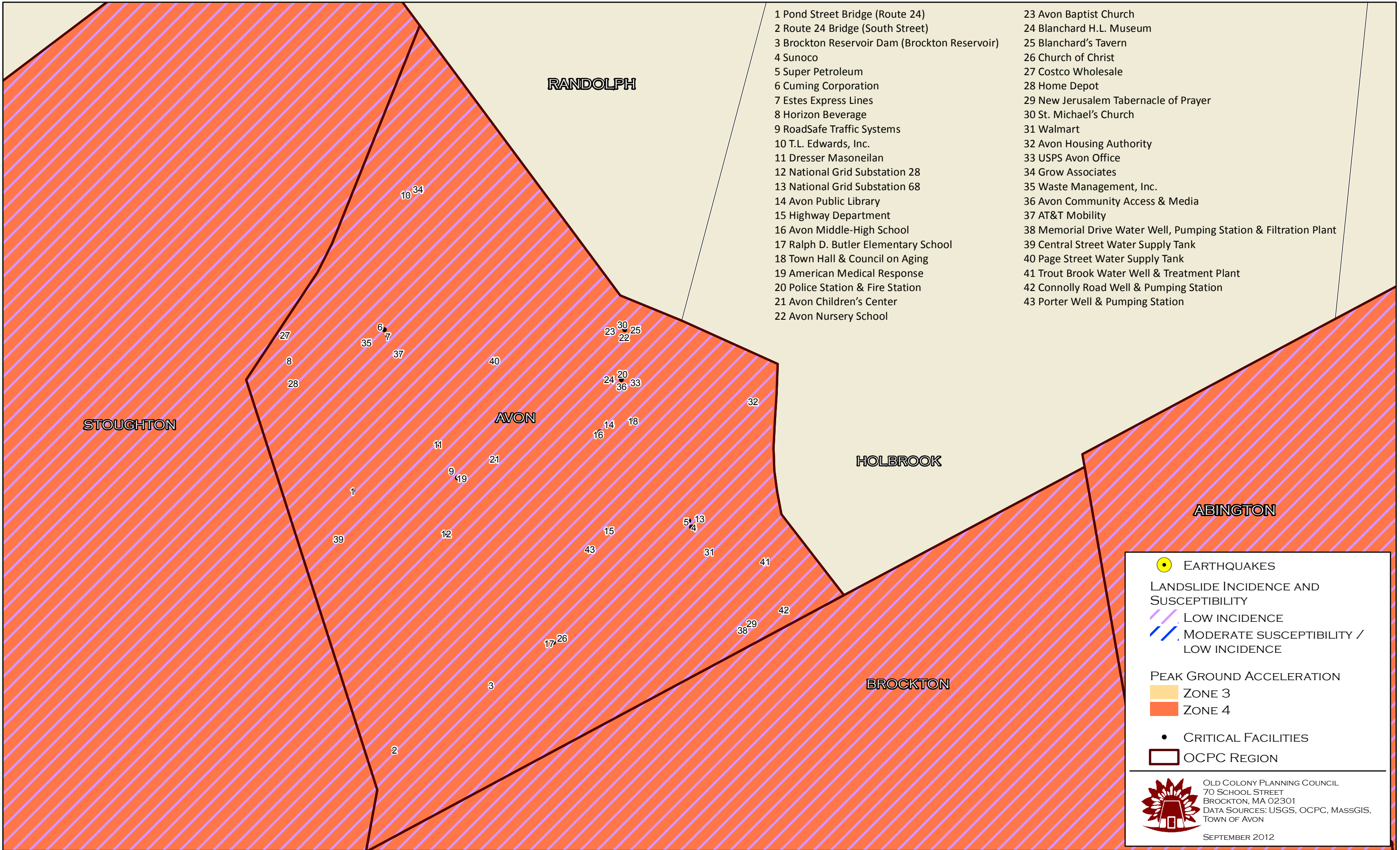


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- DECIDUOUS FOREST
- CONIFEROUS UPLAND FOREST
- MIXED DECIDUOUS & CONIFEROUS
- PITCH PINE & SCRUB OAK
- CRITICAL FACILITIES
- OCPC REGION

EARTHQUAKE & LANDSLIDE - AVON



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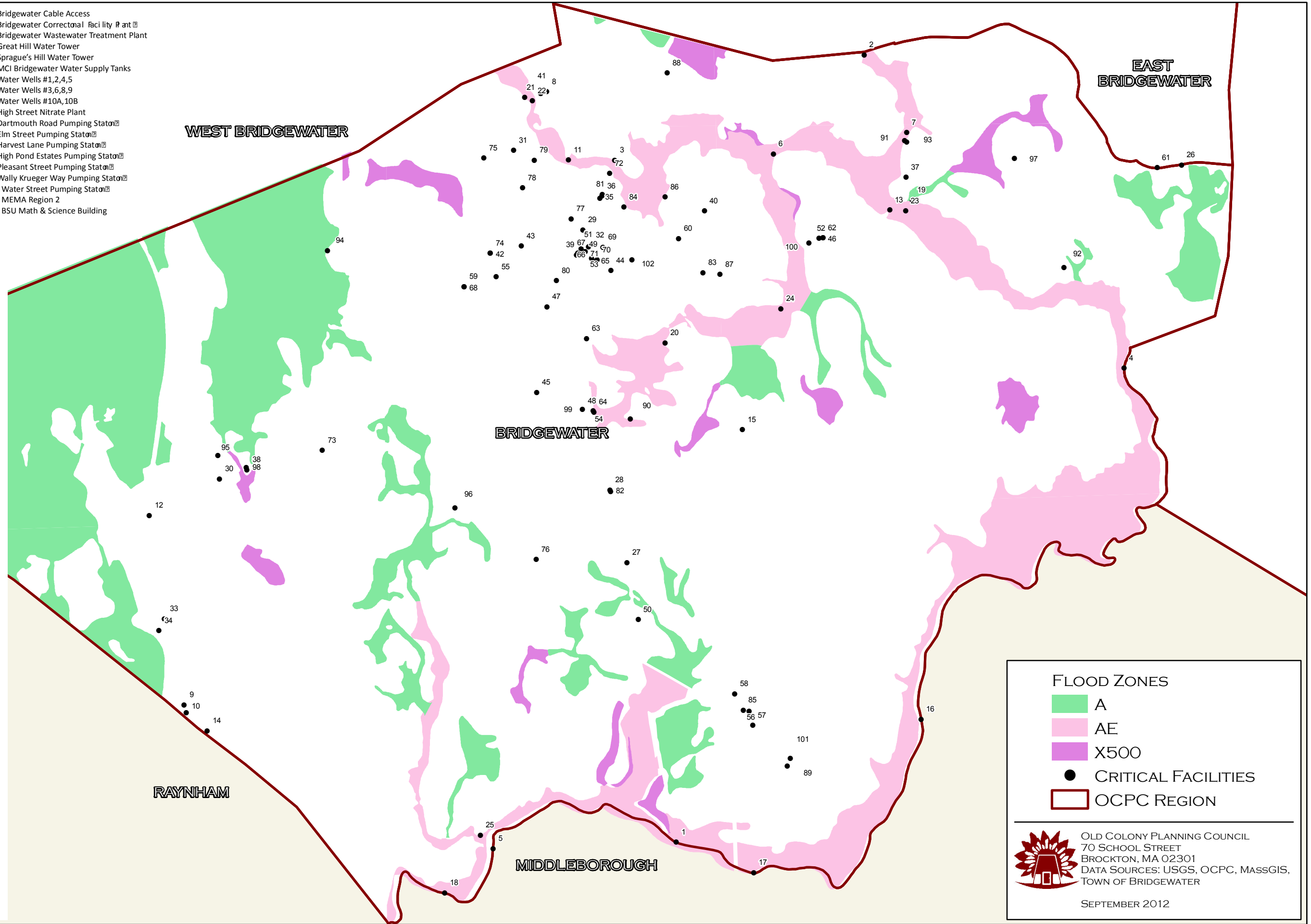
EARTHQUAKES
 LANDSLIDE INCIDENCE AND SUSCEPTIBILITY
 LOW INCIDENCE
 MODERATE SUSCEPTIBILITY / LOW INCIDENCE
 PEAK GROUND ACCELERATION
 ZONE 3
 ZONE 4
 CRITICAL FACILITIES
 OCPC REGION

FLOOD ZONES AND SLOSH - BRIDGEWATER



- 1 Bedford Street Bridge (Taunton River)
- 2 Bridge Street Bridge (Mati d R ver)
- 3 Broad Street Bridge (Town River)
- 4 Cherry Street Bridge (Taunton River)
- 5 Green Street Bridge (Taunton River)
- 6 Hayward Street Bridge (Town River)
- 7 High Street Bridge (Mati d R ver)
- 8 High Street Bridge (MBTA & CSX Railroad)
- 9 Interstate 495 NB Bridge (Route 24 SB)
- 10 Interstate 495 SB Bridge (Route 24 SB)
- 11 Oak Street Bridge (Town River)
- 12 Pleasant Street Bridge (Route 24)
- 13 Plymouth Street Bridge (Taunton River)
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- 15 Summer Street Bridge (MBTA & CSX Railroad)
- 16 Summer Street Bridge (Taunton River)
- 17 Titout Street Bridge (Taunton River)
- 18 Vernon Street Bridge (Taunton River)
- 19 Blood Pond Dam (Blood Pond)
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- 21 High Street-Jenkins Pond Channel Dam (Town River)
- 22 Jenkins Pond Dam
- 23 Mill Street Dam (Town River Pond)
- 24 South Brook Dam (South Brook)
- 25 South Street Pond Dam (South Street Pond)
- 26 Dyno New England
- 27 A&A Gas
- 28 BP
- 29 Cumberland Farms
- 30 Irving
- 31 Joe's Gas
- 32 Lucky Star Gas
- 33 Mobil
- 34 Mobil
- 35 Prime Energy
- 36 Rapid Refill
- 37 Mill Street Electric Power Substation
- 38 Montaup Electric Power Station
- 39 Bridgewater Public Library
- 40 Tinsley Center
- 41 Highway Department
- 42 Bridgewater-Raynham Regional High School
- 43 Bridgewater Middle School
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- 45 Mitchell Elementary School
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- 55 Police Station
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- 68 Faith Chapel Assemblies of God
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- 73 Scotland Congregational Church
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- 77 Trinity Episcopal Church
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- 81 USPS Bridgewater Office
- 82 USPS Elmwood Office
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- 84 Bridgewater Cable Access
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- 86 Bridgewater Wastewater Treatment Plant
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- 88 Sprague's Hill Water Tower
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- 100 Water Street Pumping Station
- 101 MEMA Region 2
- 102 BSU Math & Science Building



FLOOD ZONES

- A
- AE
- X500
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF BRIDGEWATER

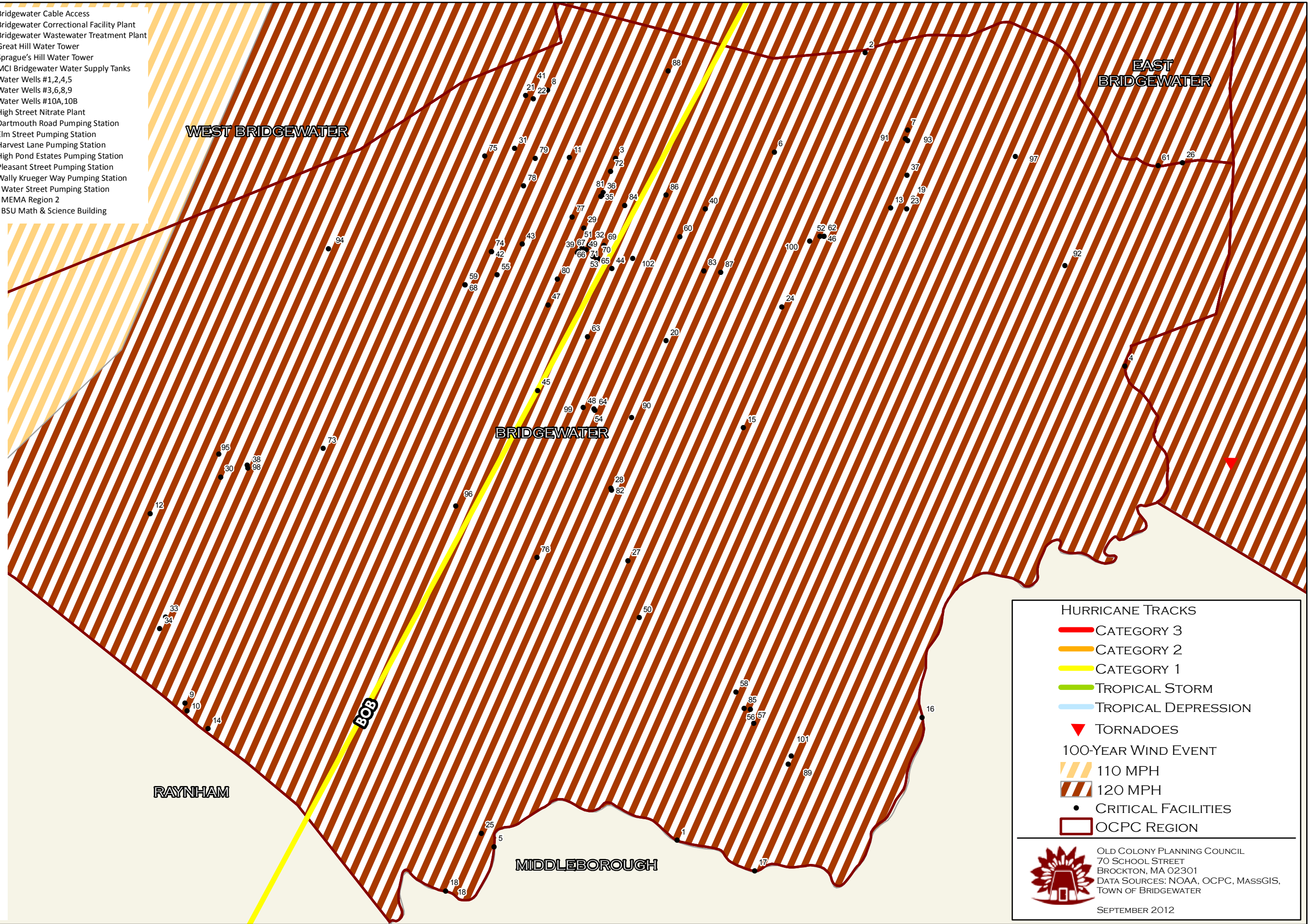
SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - BRIDGEWATER



- 1 Bedford Street Bridge (Taunton River)
- 2 Bridge Street Bridge (Matfield River)
- 3 Broad Street Bridge (Town River)
- 4 Cherry Street Bridge (Taunton River)
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HURRICANE TRACKS

- CATEGORY 3
- CATEGORY 2
- CATEGORY 1
- TROPICAL STORM
- TROPICAL DEPRESSION
- ▲ TORNADOES

100-YEAR WIND EVENT

- 110 MPH
- 120 MPH

CRITICAL FACILITIES

- CRITICAL FACILITIES

OCPC REGION

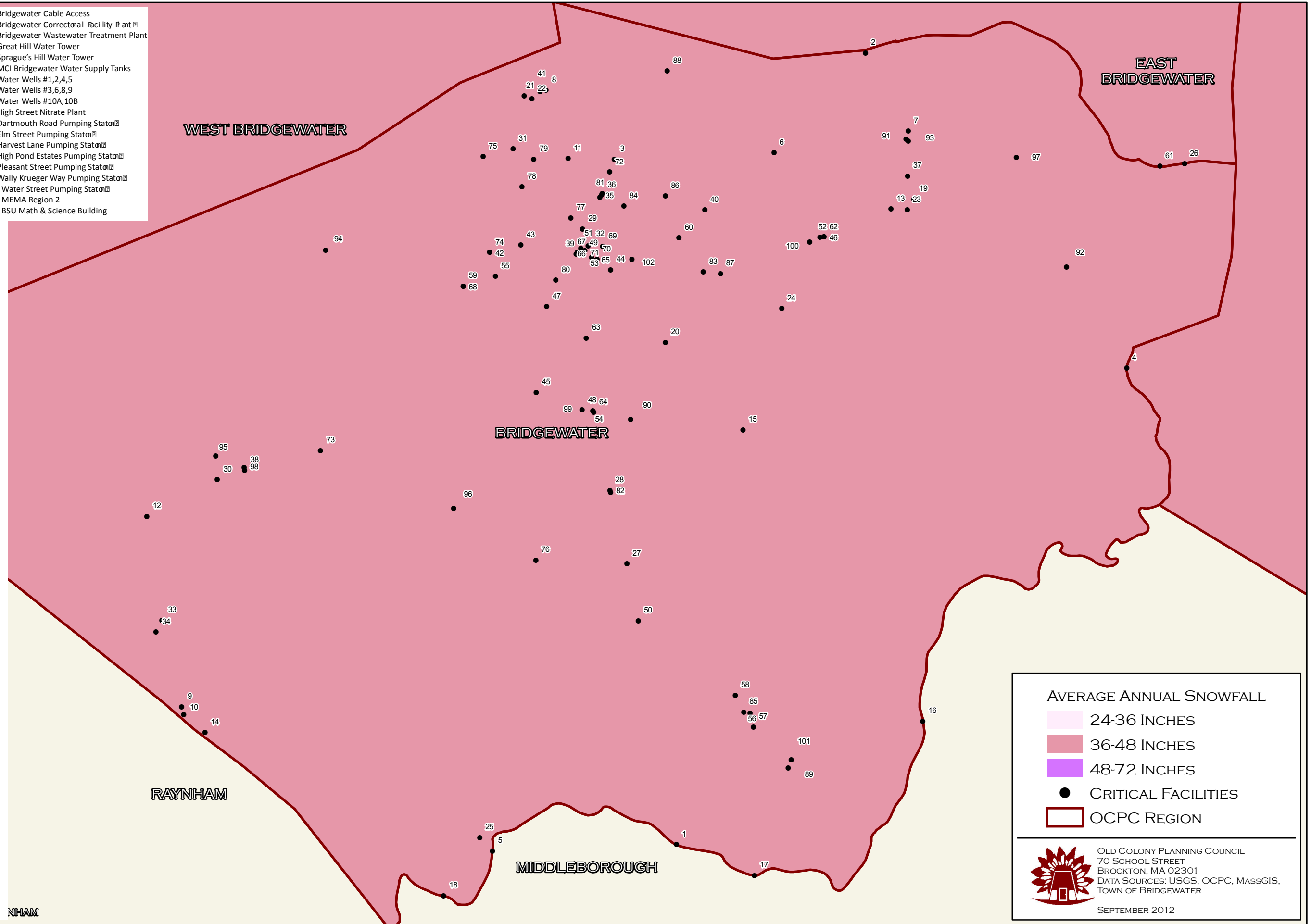
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AVERAGE ANNUAL SNOWFALL - BRIDGEWATER




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AVERAGE ANNUAL SNOWFALL

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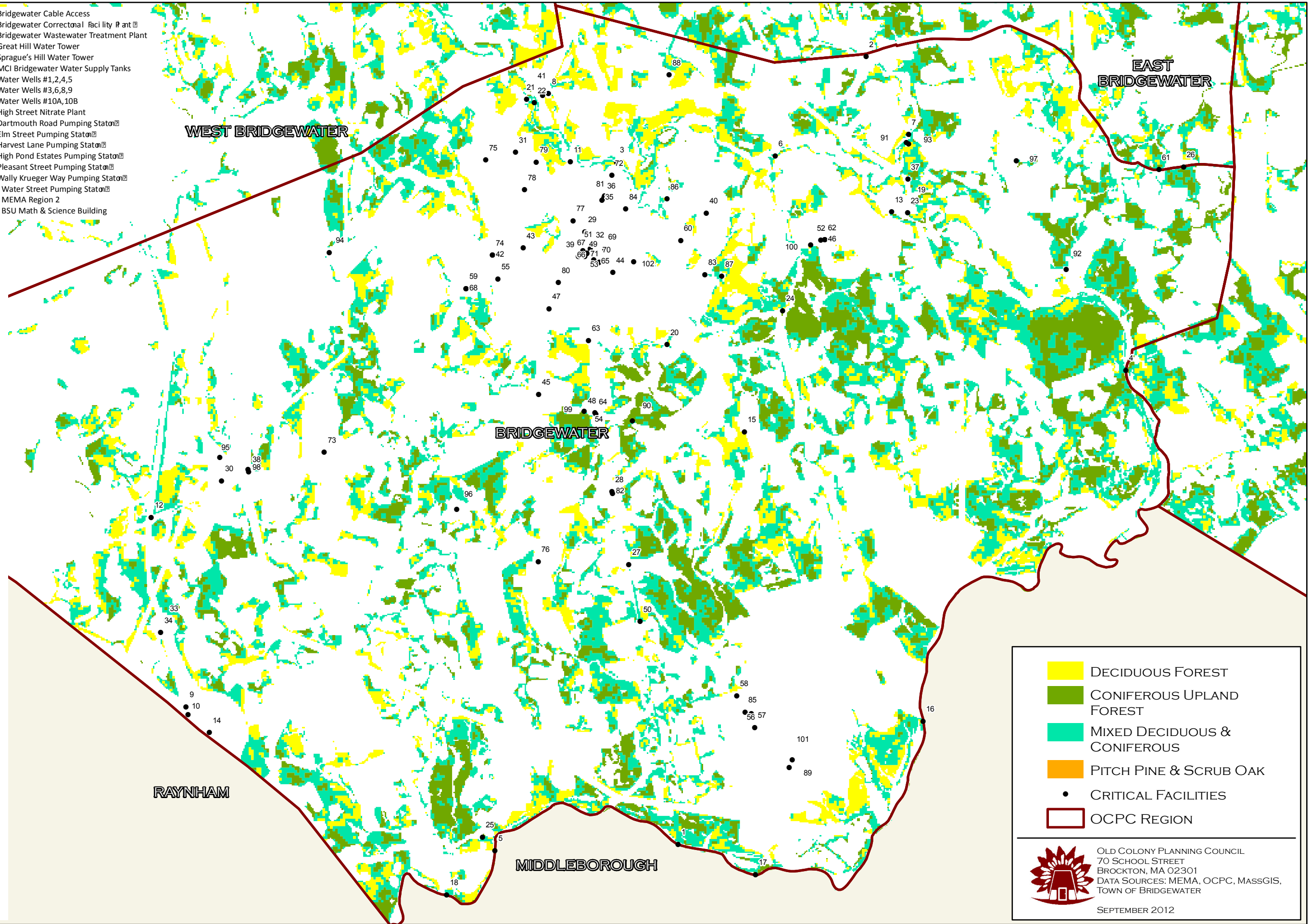


OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF BRIDGEWATER
 SEPTEMBER 2012

WILDFIRE SUSCEPTIBILITY - BRIDGEWATER



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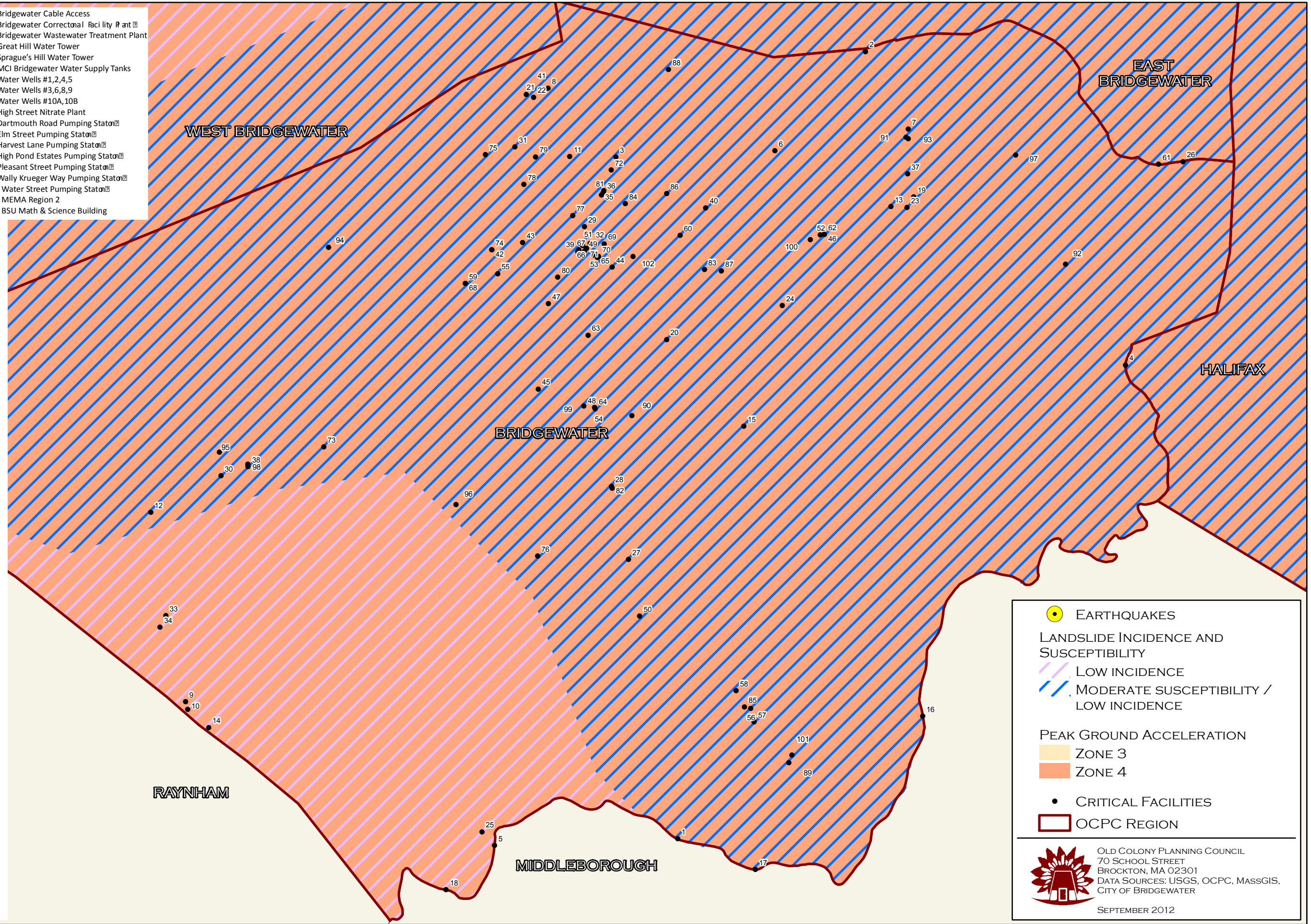
OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
BROCKTON, MA 02301
DATA SOURCES: MEMA, OCPC, MASSGIS,
TOWN OF BRIDGEWATER

SEPTEMBER 2012

EARTHQUAKE & LANDSLIDE - BRIDGEWATER



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- 88 Sprague's Hill Water Tower
- 89 MCI Bridgewater Water Supply Tanks
- 90 Water Wells #1,2,4,5
- 91 Water Wells #3,6,8,9
- 92 Water Wells #10A,10B
- 93 High Street Nitrate Plant
- 94 Dartmouth Road Pumping Station
- 95 Elm Street Pumping Station
- 96 Harvest Lane Pumping Station
- 97 High Pond Estates Pumping Station
- 98 Pleasant Street Pumping Station
- 99 Wally Krueger Way Pumping Station
- 100 Water Street Pumping Station
- 101 MEMA Region 2
- 102 BSU Math & Science Building



- EARTHQUAKES
- LANDSLIDE INCIDENCE AND SUSCEPTIBILITY
 - LOW INCIDENCE
 - MODERATE SUSCEPTIBILITY / LOW INCIDENCE
- PEAK GROUND ACCELERATION
 - ZONE 3
 - ZONE 4
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 CITY OF BRIDGEWATER
 SEPTEMBER 2012

FLOOD ZONES AND SLOSH - BROCKTON



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STOUGHTON

BROCKTON

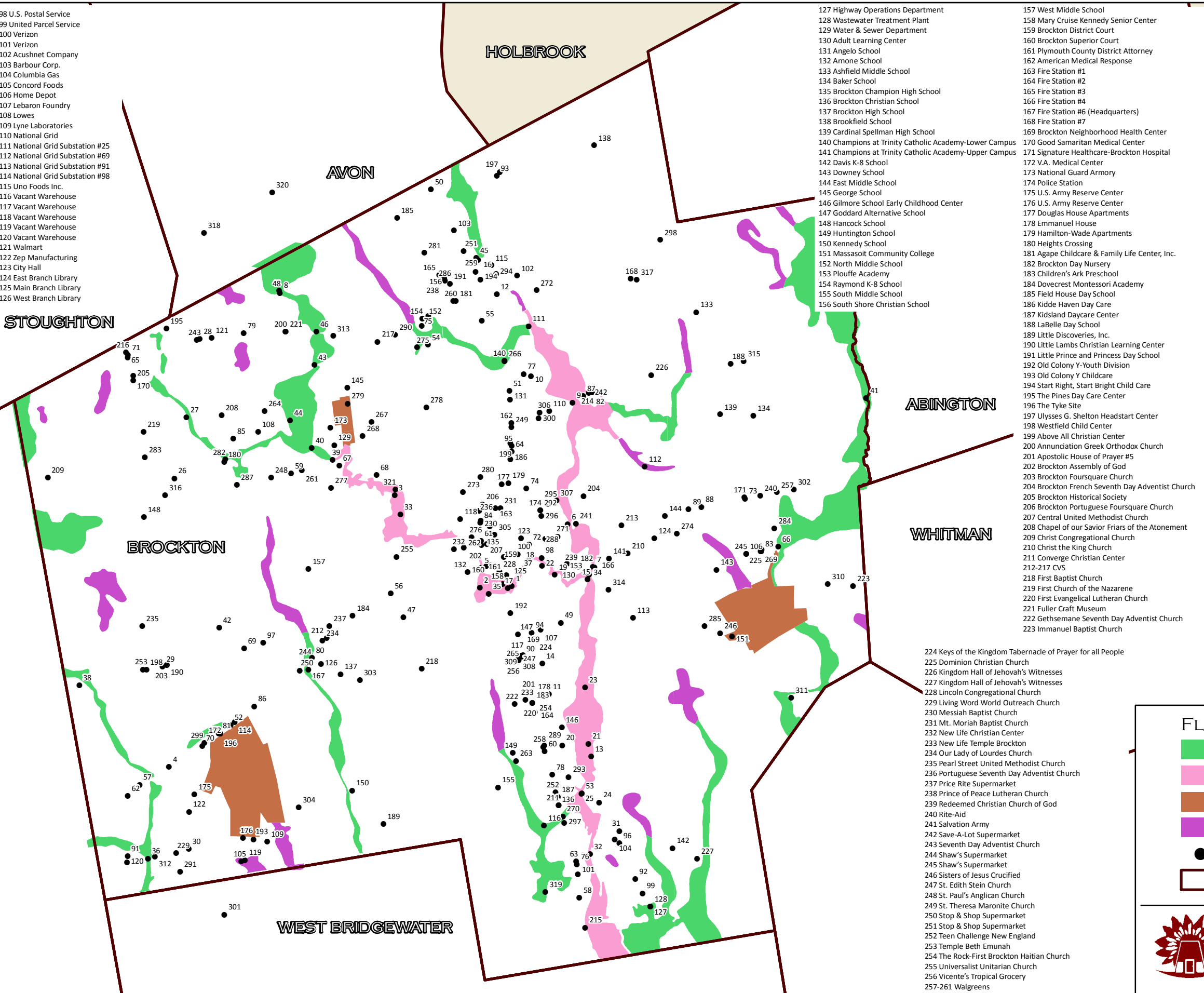
WEST BRIDGEWATER

HOLBROOK

AVON

ABINGTON

WHITMAN




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FLOOD ZONES

- A
- AE
- ANI
- X500
- CRITICAL FACILITIES
- OCPC REGION

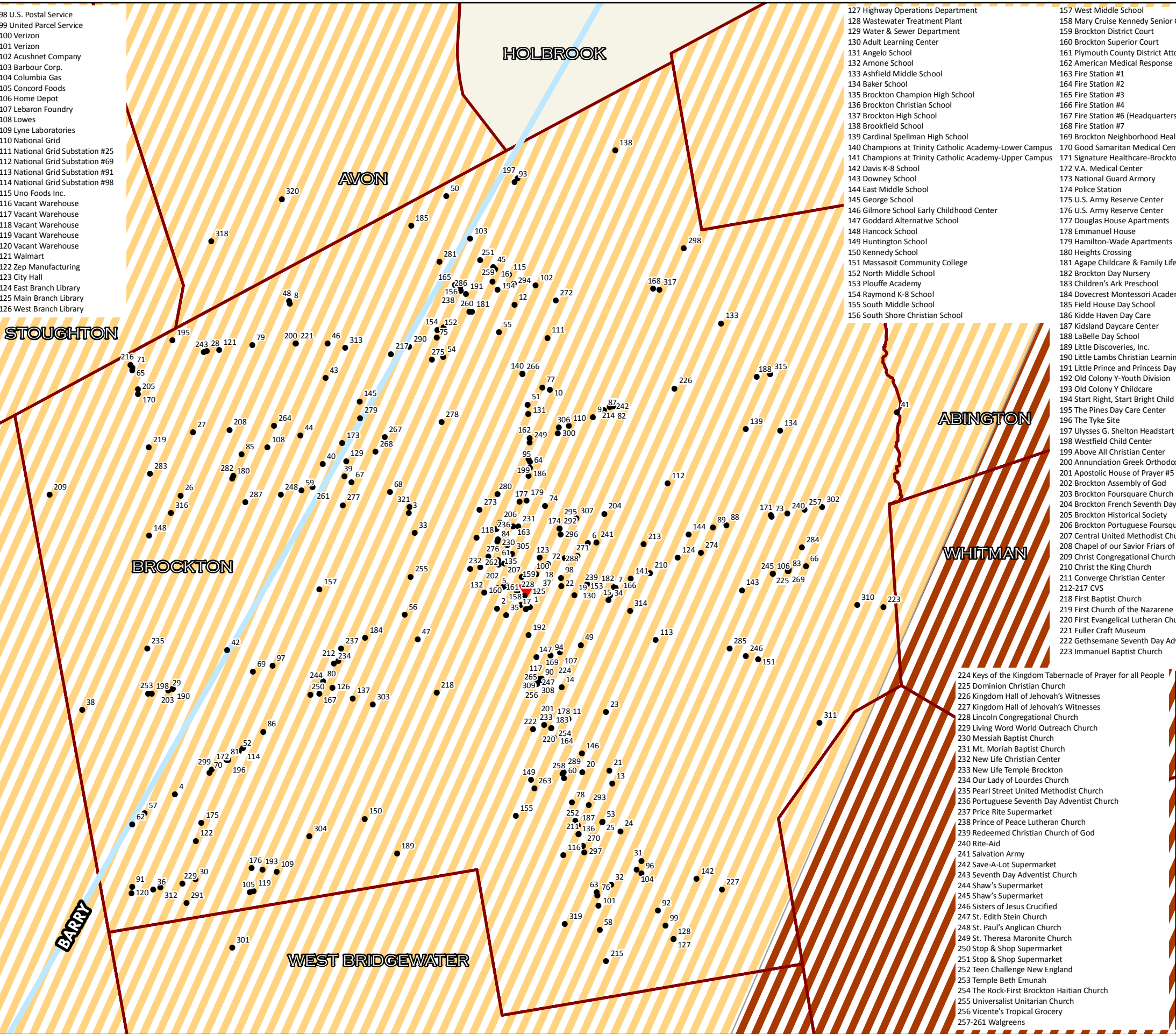


OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: FEMA, OCPC, MASSGIS,
 CITY OF BROCKTON
 SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - BROCKTON



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- 224 Keys of the Kingdom Tabernacle of Prayer for all People
- 225 Dominion Christian Church
- 226 Kingdom Hall of Jehovah's Witnesses
- 227 Kingdom Hall of Jehovah's Witnesses
- 228 Lincoln Congregational Church
- 229 Living Word World Outreach Church
- 230 Messiah Baptist Church
- 231 Mt. Moriah Baptist Church
- 232 New Life Christian Center
- 233 New Life Temple Brockton
- 234 Our Lady of Lourdes Church
- 235 Pearl Street United Methodist Church
- 236 Portuguese Seventh Day Adventist Church
- 237 Price Rite Supermarket
- 238 Prince of Peace Lutheran Church
- 239 Redeemed Christian Church of God
- 240 Rite-Aid
- 241 Salvation Army
- 242 Save-A-Lot Supermarket
- 243 Seventh Day Adventist Church
- 244 Shaw's Supermarket
- 245 Shaw's Supermarket
- 246 Sisters of Jesus Crucified
- 247 St. Edith Stein Church
- 248 St. Paul's Anglican Church
- 249 St. Theresa Maronite Church
- 250 Stop & Shop Supermarket
- 251 Stop & Shop Supermarket
- 252 Teen Challenge New England
- 253 Temple Beth Emunah
- 254 The Rock-First Brockton Haitian Church
- 255 Universalist Unitarian Church
- 256 Vicente's Tropical Grocery
- 257-261 Walgreens
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HURRICANE TRACKS

- CATEGORY 3
- CATEGORY 2
- CATEGORY 1
- TROPICAL STORM
- TROPICAL DEPRESSION
- ▼ TORNADOES

100-YEAR WIND EVENT

- 110 MPH
- 120 MPH
- CRITICAL FACILITIES
- OCPC REGION



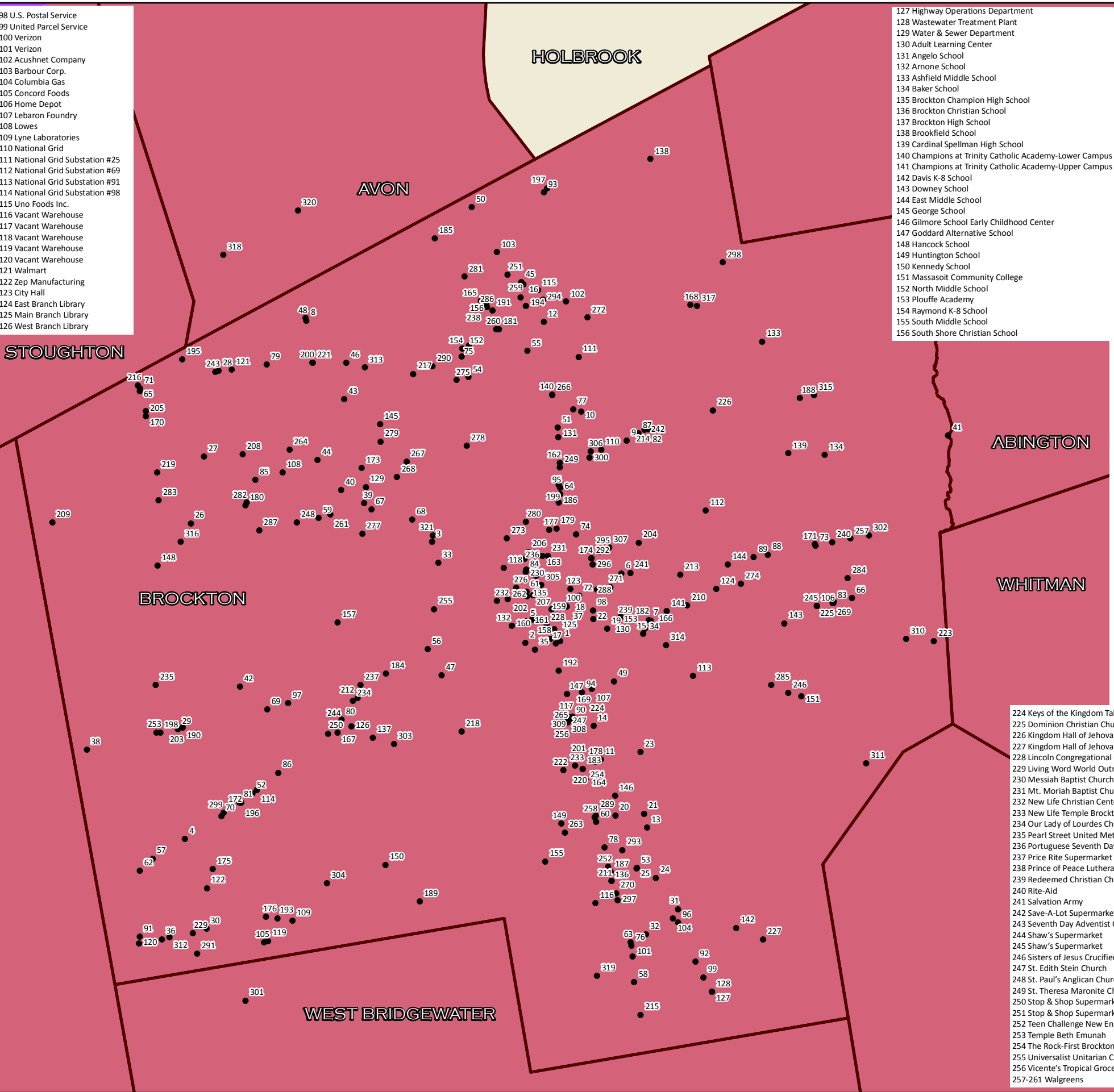
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70 SCHOOL STREET
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DATA SOURCES: NOAA, OCPC, MASSGIS,
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SEPTEMBER 2012

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- 321 Silver Lake Water Treatment Plant
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- 323 Monponsett Pond Diversion Structure (Halifax, MA)
- 324 Brockton Gatehouse Reservoir (Avon, MA)

AVERAGE ANNUAL SNOWFALL

- 24-36 INCHES
- 36-48 INCHES
- 48-72 INCHES
- CRITICAL FACILITIES
- OCPC REGION



OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 CITY OF BROCKTON
 SEPTEMBER 2012

WILDFIRE SUSCEPTIBILITY - BROCKTON



- 1 Allen Street Bridge (Salisbury Brook)
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- 44 Thirty Acre Pond Dam (Thirty Acre Pond)
- 45 Trout Pond Dam (Trout Pond)
- 46 Upper Porter Pond Dam (Upper Porter Pond)
- 47 VFW Pond Dam (VFW Pond)
- 48 Waldo Lake Dam (Waldo Lake)
- 49 Brockton Brightfields
- 50 AMS Gas
- 51 Awon's Auto Repair
- 52 Best Gas
- 53 Campello-Keith Gas
- 54 Champion Fuel
- 55 City Gas
- 56 CKML Gas
- 57 Cumberland Farms
- 58 Cumberland Farms
- 59 Cumberland Farms
- 60 Gas Depot
- 61 George's Service Station
- 62 Hess
- 63 Hess
- 64 Hess
- 65 Hess
- 66 Irving Gas/SpeeDee Oil Change
- 67 Irving
- 68 Prestige Gas
- 69 Mike's Gas
- 70 Mobil
- 71 Mobil
- 72 Montello Express Gas
- 73 Planet Petroleum
- 74 Prestige Gas
- 75 Prestige Gas
- 76 Prime Energy
- 77 Prime Energy
- 78 Saab Energy
- 79 Saab Energy
- 80 Shell
- 81 Shell
- 82 Shell
- 83 Star Gas
- 84 Stop-n-Gas
- 85 Sunny's Auto
- 86 Sunoco
- 87 Sunoco
- 88 Tedeschi Gas
- 89 Trojan Gas
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- 91 Colonial Boco Trucking
- 92 First Student, Inc.
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- 95 Salvation Army
- 96 Spectra Energy
- 97 Thorny Lea Golf Club

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- 105 Concord Foods
- 106 Home Depot
- 107 Lebaron Foundry
- 108 Lowes
- 109 Lyne Laboratories
- 110 National Grid
- 111 National Grid Substation #25
- 112 National Grid Substation #69
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- 114 National Grid Substation #98
- 115 Uno Foods Inc.
- 116 Vacant Warehouse
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- 119 Vacant Warehouse
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- 121 Walmart
- 122 Zep Manufacturing
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- 125 Main Branch Library
- 126 West Branch Library

STOUGHTON

BROCKTON

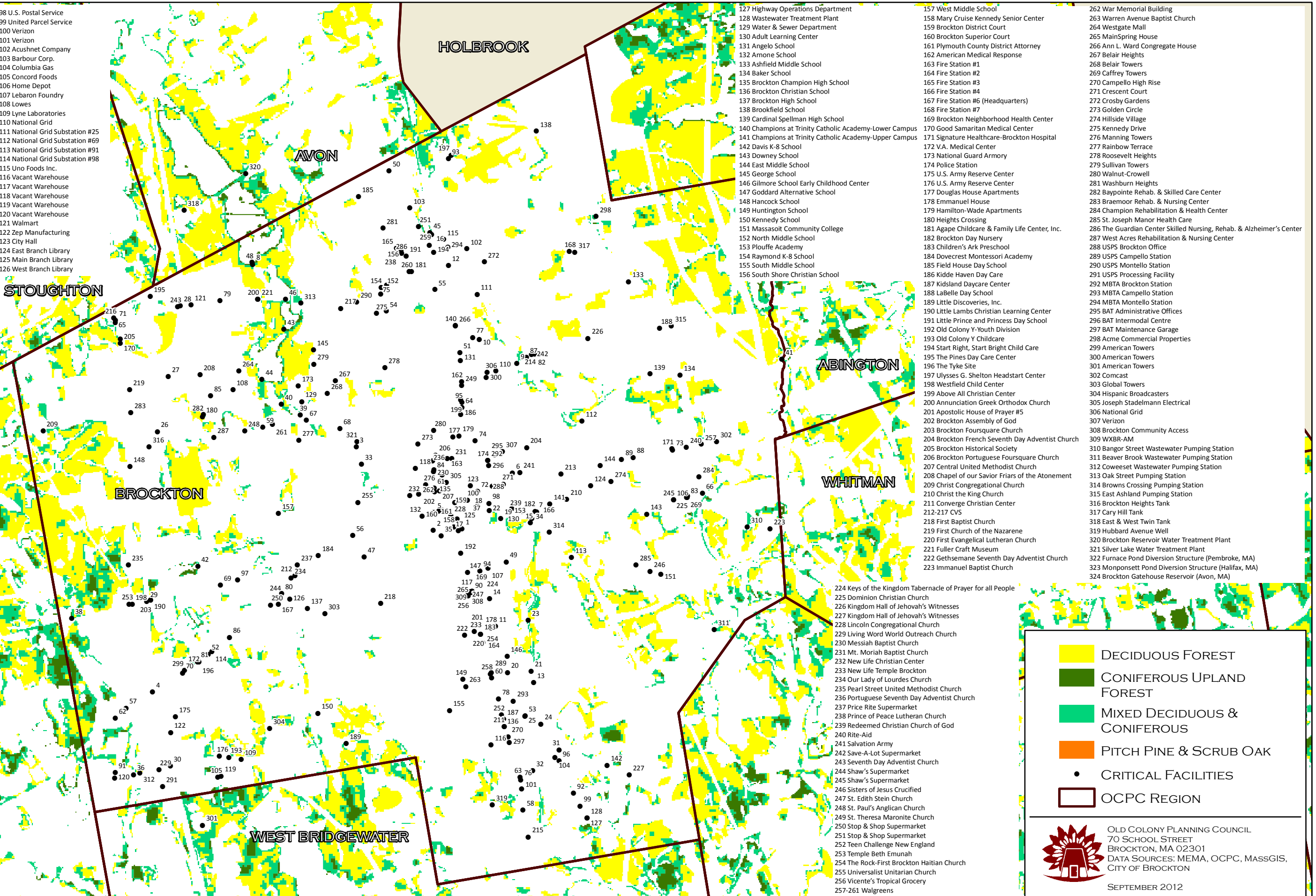
WEST BRIDGEWATER

HOLBROOK

AVON

ABINGTON

WHITMAN




- 127 Highway Operations Department
- 128 Wastewater Treatment Plant
- 129 Water & Sewer Department
- 130 Adult Learning Center
- 131 Angelo School
- 132 Arnone School
- 133 Ashfield Middle School
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- DECIDUOUS FOREST
- CONIFEROUS UPLAND FOREST
- MIXED DECIDUOUS & CONIFEROUS
- PITCH PINE & SCRUB OAK
- CRITICAL FACILITIES
- OCPC REGION



OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: MEMA, OCPC, MASSGIS,
 CITY OF BROCKTON
 SEPTEMBER 2012

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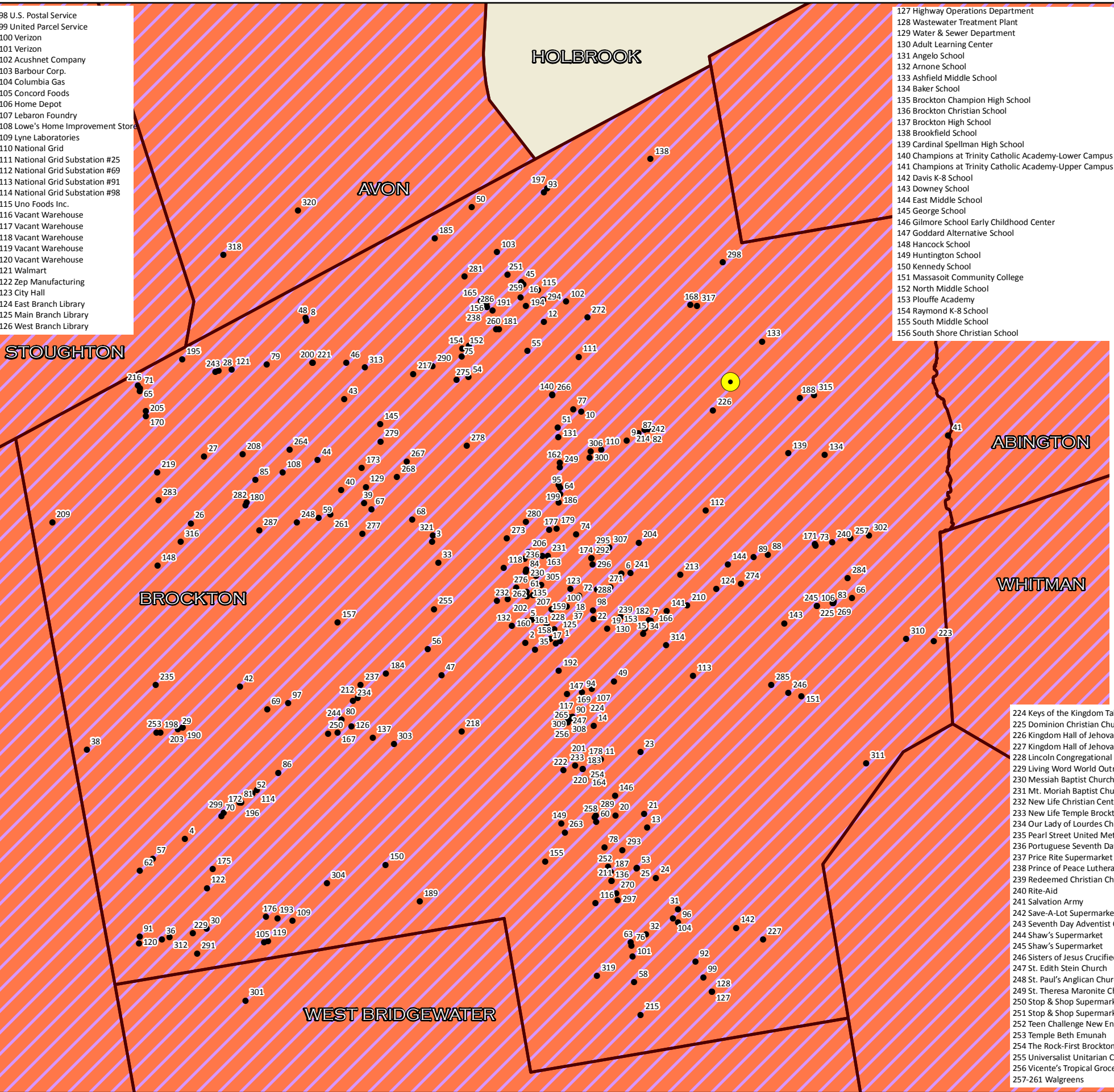
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- 223 Immanuel Baptist Church

- 224 Keys of the Kingdom Tabernacle of Prayer for all People
- 225 Dominion Christian Church
- 226 Kingdom Hall of Jehovah's Witnesses
- 227 Kingdom Hall of Jehovah's Witnesses
- 228 Lincoln Congregational Church
- 229 Living Word World Outreach Church
- 230 Messiah Baptist Church
- 231 Mt. Moriah Baptist Church
- 232 New Life Christian Center
- 233 New Life Temple Brockton
- 234 Our Lady of Lourdes Church
- 235 Pearl Street United Methodist Church
- 236 Portuguese Seventh Day Adventist Church
- 237 Price Rite Supermarket
- 238 Prince of Peace Lutheran Church
- 239 Redeemed Christian Church of God
- 240 Rite-Aid
- 241 Salvation Army
- 242 Save-A-Lot Supermarket
- 243 Seventh Day Adventist Church
- 244 Shaw's Supermarket
- 245 Shaw's Supermarket
- 246 Sisters of Jesus Crucified
- 247 St. Edith Stein Church
- 248 St. Paul's Anglican Church
- 249 St. Theresa Maronite Church
- 250 Stop & Shop Supermarket
- 251 Stop & Shop Supermarket
- 252 Teen Challenge New England
- 253 Temple Beth Emunah
- 254 The Rock-First Brockton Haitian Church
- 255 Universalist Unitarian Church
- 256 Vicente's Tropical Grocery
- 257-261 Walgreens

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EARTHQUAKES

LANDSLIDE INCIDENCE AND SUSCEPTIBILITY

LOW INCIDENCE

MODERATE SUSCEPTIBILITY / LOW INCIDENCE

PEAK GROUND ACCELERATION

ZONE 3

ZONE 4

CRITICAL FACILITIES

OCPC REGION

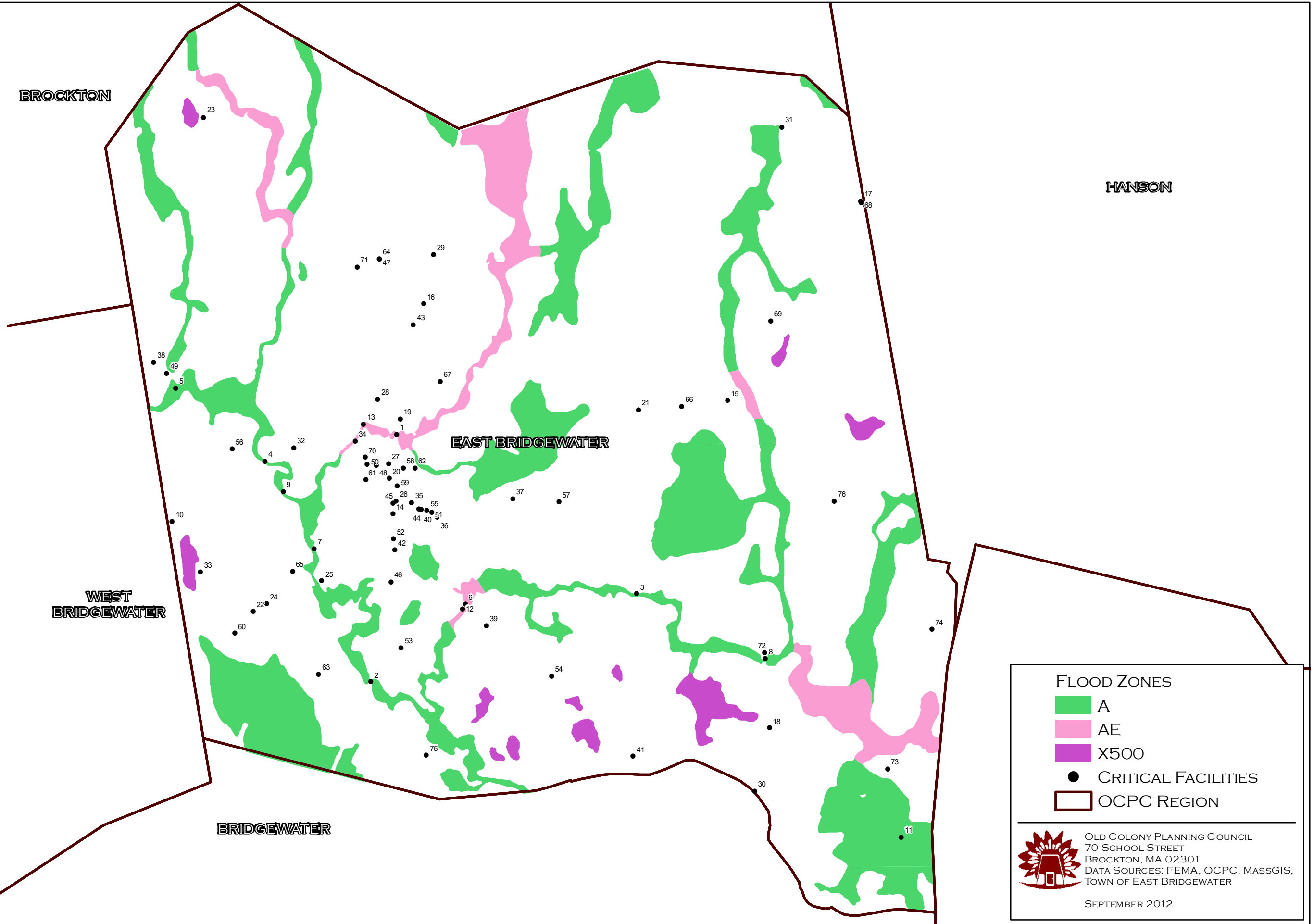
OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 CITY OF BROCKTON

SEPTEMBER 2012

FLOOD ZONES AND SLOSH - EAST BRIDGEWATER




- 1 Bedford Street Bridge (Forge Pond)
- 2 Bedford Street Bridge (Matfield River)
- 3 Bridge Street Bridge (Satucket River)
- 4 North Central Street Bridge (Matfield River)
- 5 Pleasant Street Bridge (Salisbury Plain River)
- 6 Plymouth Street Bridge (Satucket River)
- 7 Spring Street Bridge (Matfield River)
- 8 Washington Street Bridge (Satucket River)
- 9 West Union Street Bridge (Matfield River)
- 10 West Union Street Bridge (MBTA-Railroad)
- 11 Brockton Edison Dam
- 12 Cotton Gin Pond Dam (Cotton Gin Pond)
- 13 Forge Pond Dam (Forge Pond)
- 14 Cumberland Farms
- 15 Cumberland Farms
- 16 Hi-Lo Gas
- 17 Irving
- 18 Mobil
- 19 Mutual Gas
- 20 Prime Energy
- 21 Alvin Hollis
- 22 Forni Bros.
- 23 Gas Recovery Systems
- 24 Mueller Corporation
- 25 National Grid Substation
- 26 Verizon
- 27 East Bridgewater Public Library
- 28 Commercial Club
- 29 Harte-Hanks Direct Marketing
- 30 Heather's Place
- 31 Ridder Country Club
- 32 T.J. Smith's Victorian House
- 33 Verizon Warehouse
- 34 Department of Public Works
- 35 Central Elementary School
- 36 East Bridgewater High School
- 37 Gordon W. Mitchell Middle School
- 38 Metro South Academy
- 39 Council on Aging
- 40 Town Hall
- 41 Transfer Station
- 42 Fire Station
- 43 Compass Medical
- 44 Police Station
- 45 Busy Bee Preschool
- 46 Busy Bee Preschool Babies
- 47 Our Magical Beginnings
- 48 Abundant Faith Family Church
- 49 Community Covenant Church
- 50 East Bridgewater United Methodist Church
- 51 Grace Bible Church
- 52 Hoyts Cinemas
- 53 Jehovah's Witness Bridgewater Congregation
- 54 Old Colony YMCA
- 55 St. John Catholic Church
- 56 Union Congregational Church
- 57 East Bridgewater Housing Authority
- 58 East Bridgewater Housing Authority
- 59 Kindred Transitional Care & Rehabilitation- Sachem
- 60 Westview Nursing Home
- 61 USPS East Bridgewater Office
- 62 Group Home
- 63 Group Home
- 64 American Tower, Inc.
- 65 J & F Realty Trust
- 66 Mobilite Investments
- 67 Harmony Crossing
- 68 Irving
- 69 White Pines Village
- 70 Water Department Garage
- 71 Water Supply Tank
- 72 Water Supply Well
- 73 Water Supply Well
- 74 Water Supply Well
- 75 Treatment Plant & Well Site
- 76 Treatment Plant & Well Site



FLOOD ZONES

- A
- AE
- X500
- CRITICAL FACILITIES
- OCPC REGION



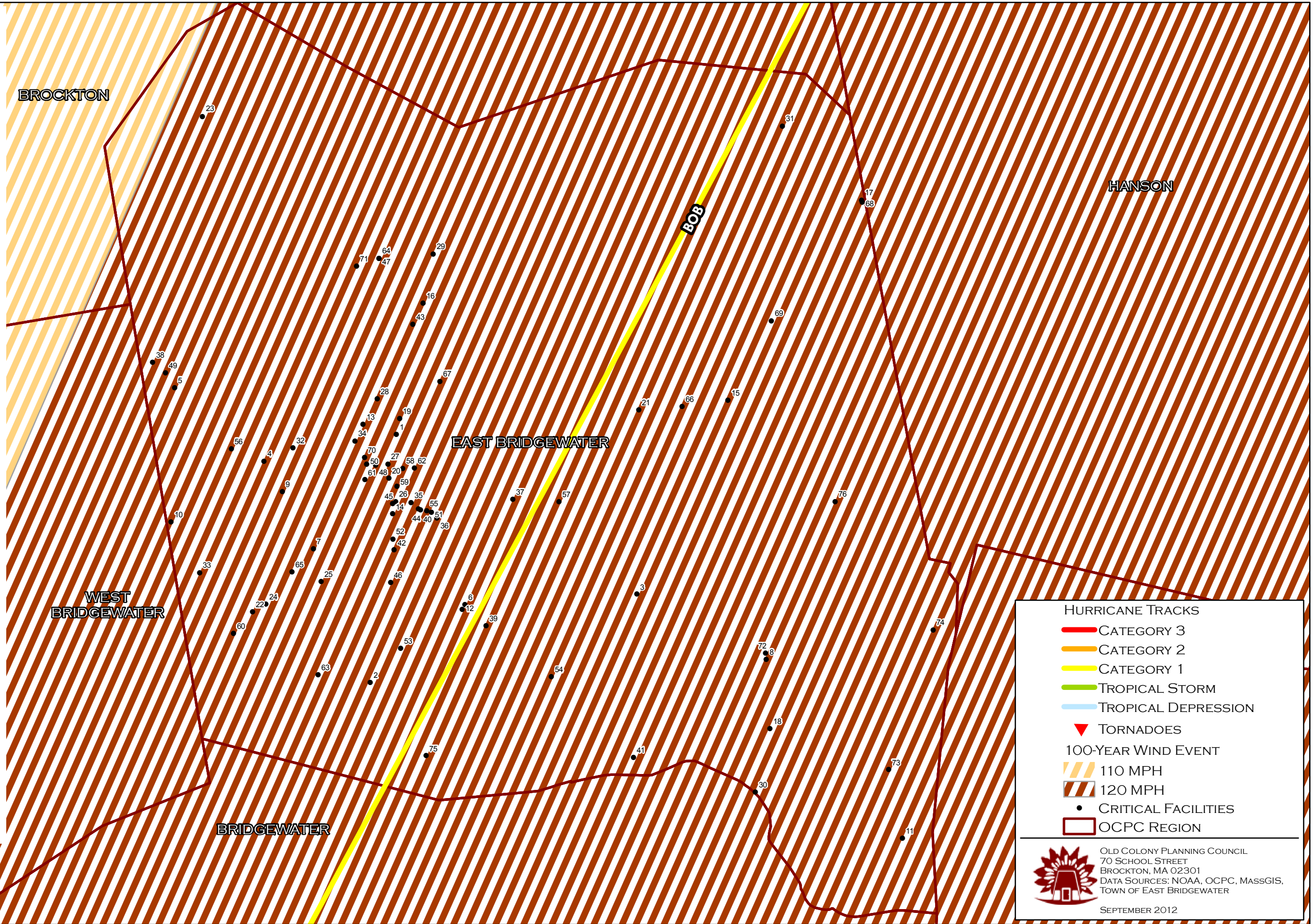
OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: FEMA, OCPC, MASSGIS,
 TOWN OF EAST BRIDGEWATER

SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - EAST BRIDGEWATER



- 1 Bedford Street Bridge (Forge Pond)
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- 75 Treatment Plant & Well Site
- 76 Treatment Plant & Well Site



HURRICANE TRACKS

- CATEGORY 3
- CATEGORY 2
- CATEGORY 1
- TROPICAL STORM
- TROPICAL DEPRESSION
- ▼ TORNADOES

100-YEAR WIND EVENT

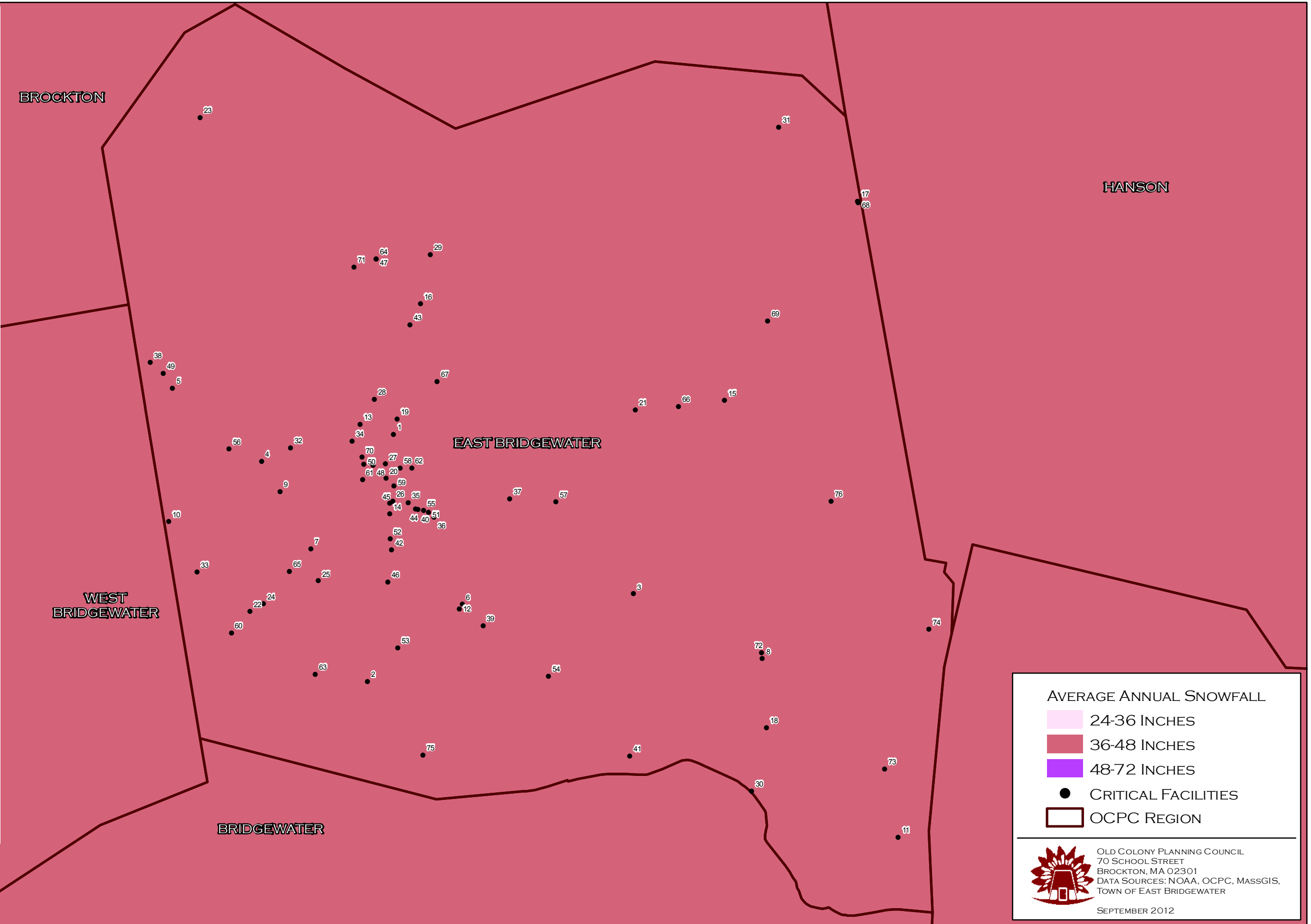
- ▨ 110 MPH
- ▨ 120 MPH
- CRITICAL FACILITIES
- ▭ OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF EAST BRIDGEWATER
 SEPTEMBER 2012

AVERAGE ANNUAL SNOWFALL - EAST BRIDGEWATER



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AVERAGE ANNUAL SNOWFALL

- 24-36 INCHES
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- 48-72 INCHES
- CRITICAL FACILITIES
- OCPC REGION

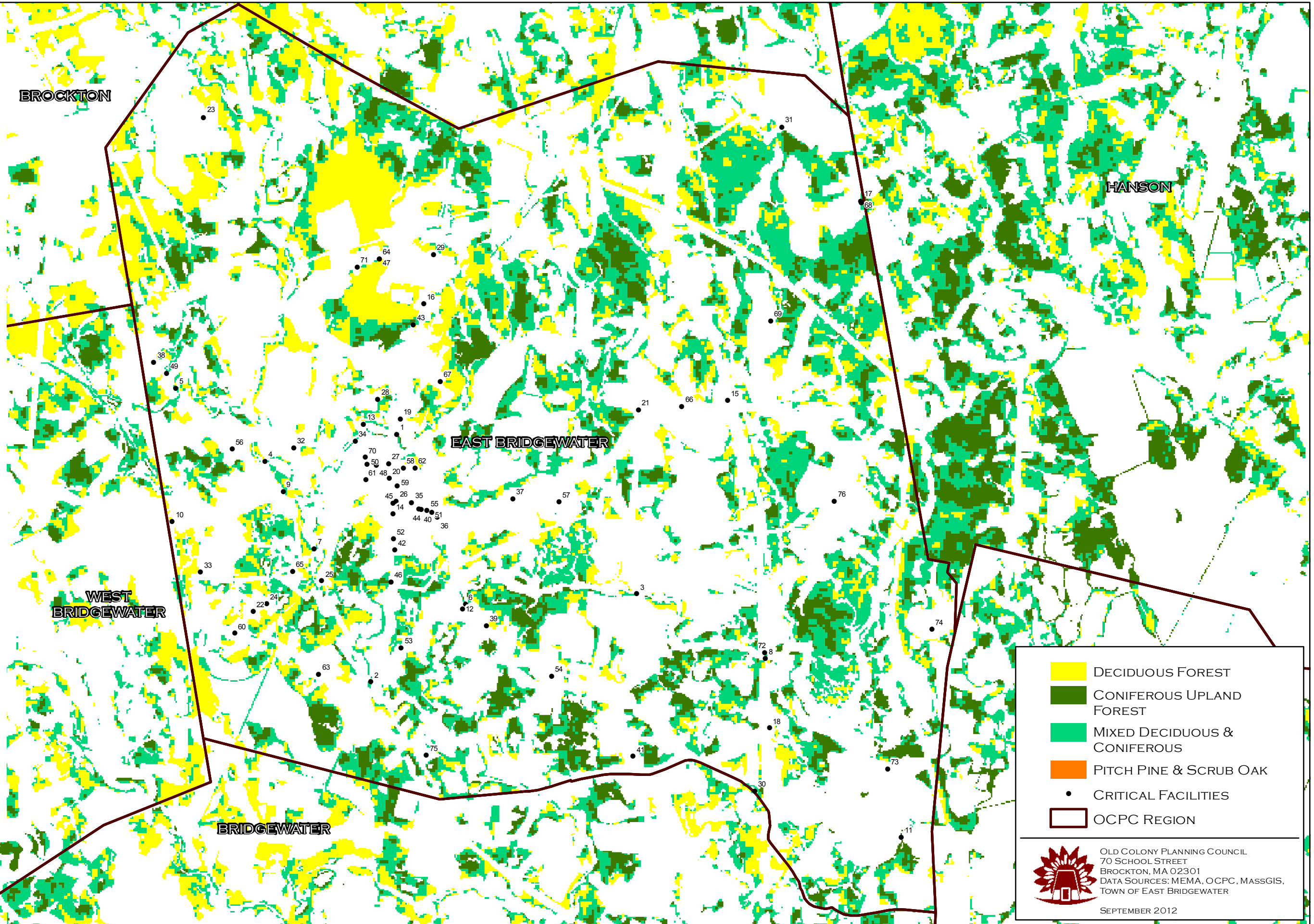
OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF EAST BRIDGEWATER

SEPTEMBER 2012

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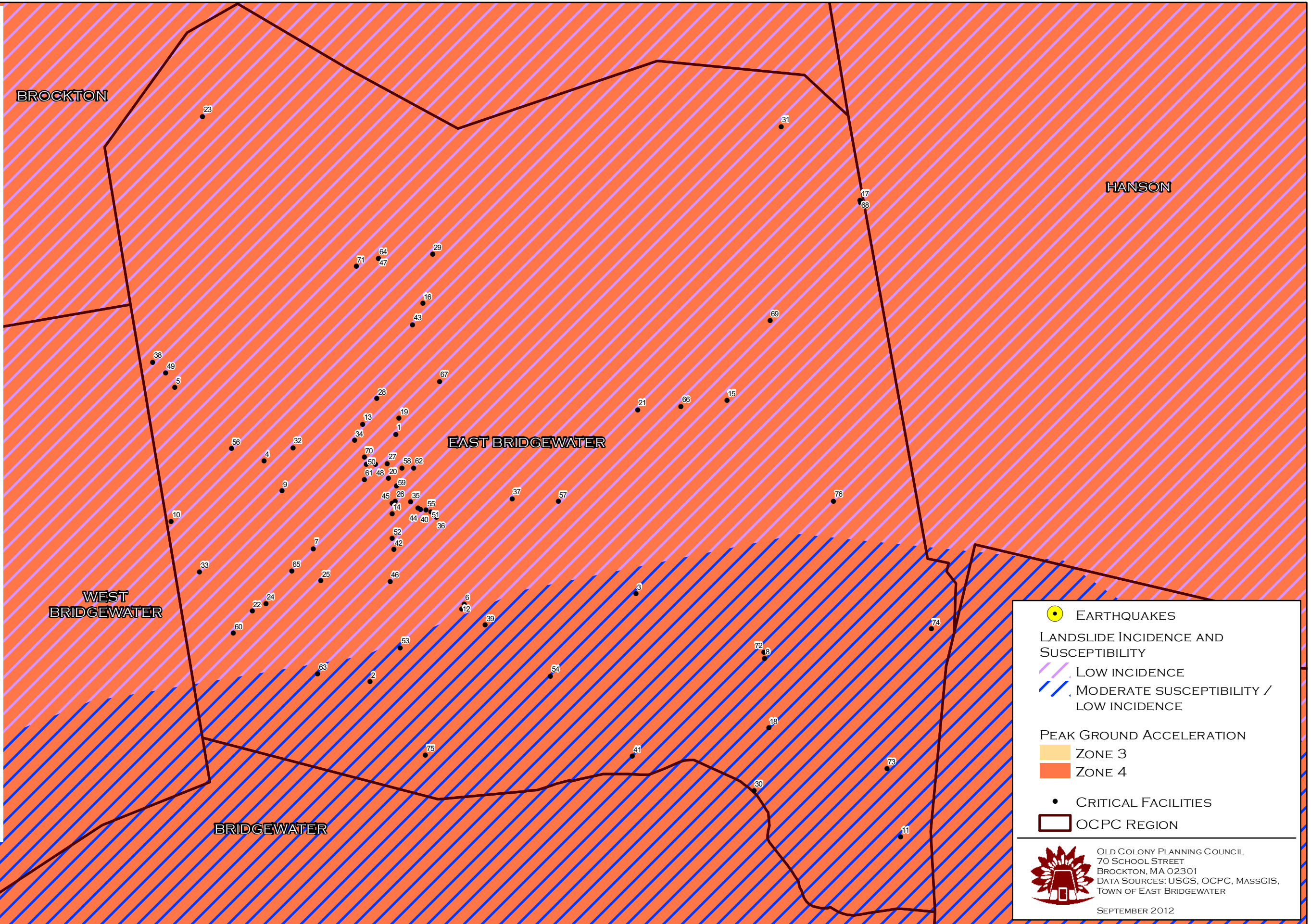


- DECIDUOUS FOREST
- CONIFEROUS UPLAND FOREST
- MIXED DECIDUOUS & CONIFEROUS
- PITCH PINE & SCRUB OAK
- CRITICAL FACILITIES
- OCPC REGION

EARTHQUAKE & LANDSLIDE - EAST BRIDGEWATER



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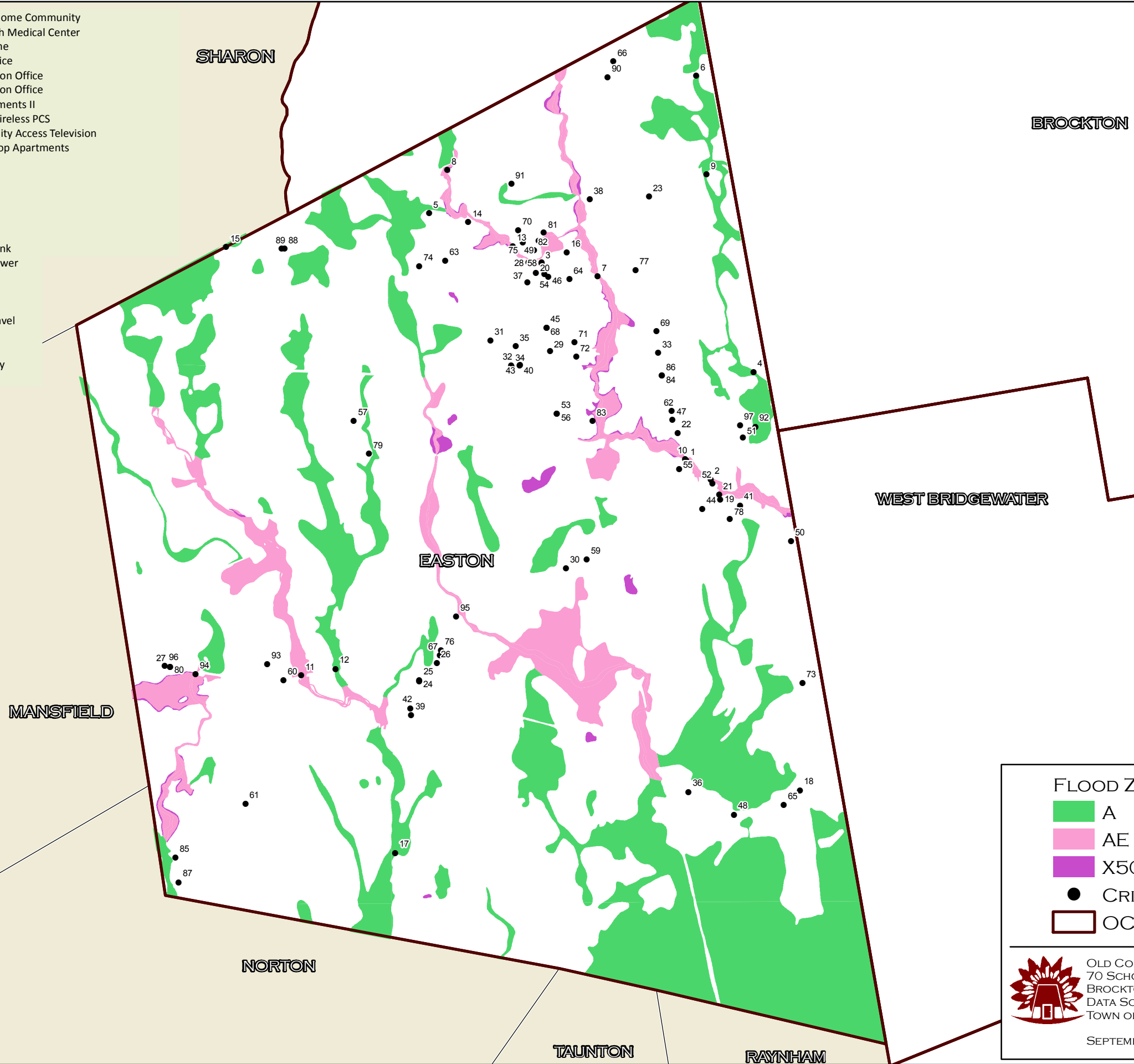


- EARTHQUAKES
- LANDSLIDE INCIDENCE AND SUSCEPTIBILITY
 - LOW INCIDENCE
 - MODERATE SUSCEPTIBILITY / LOW INCIDENCE
- PEAK GROUND ACCELERATION
 - ZONE 3
 - ZONE 4
- CRITICAL FACILITIES
- OCPC REGION

FLOOD AND SLOSH - EASTON



- 1 Central Street Bridge (Queset Brook)
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- 19 BP
- 20 Citgo
- 21 Citgo
- 22 Conco
- 23 Easton Gas
- 24 Five Corners Petroleum
- 25 Mobil
- 26 Sunoco
- 27 Columbia Gas
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- 91 Verizon
- 92 Pharmasol
- 93 Target
- 94 Boro Sand & Gravel
- 95 National Grid
- 96 Columbia Gas
- 97 Resin Technology



FLOOD ZONES

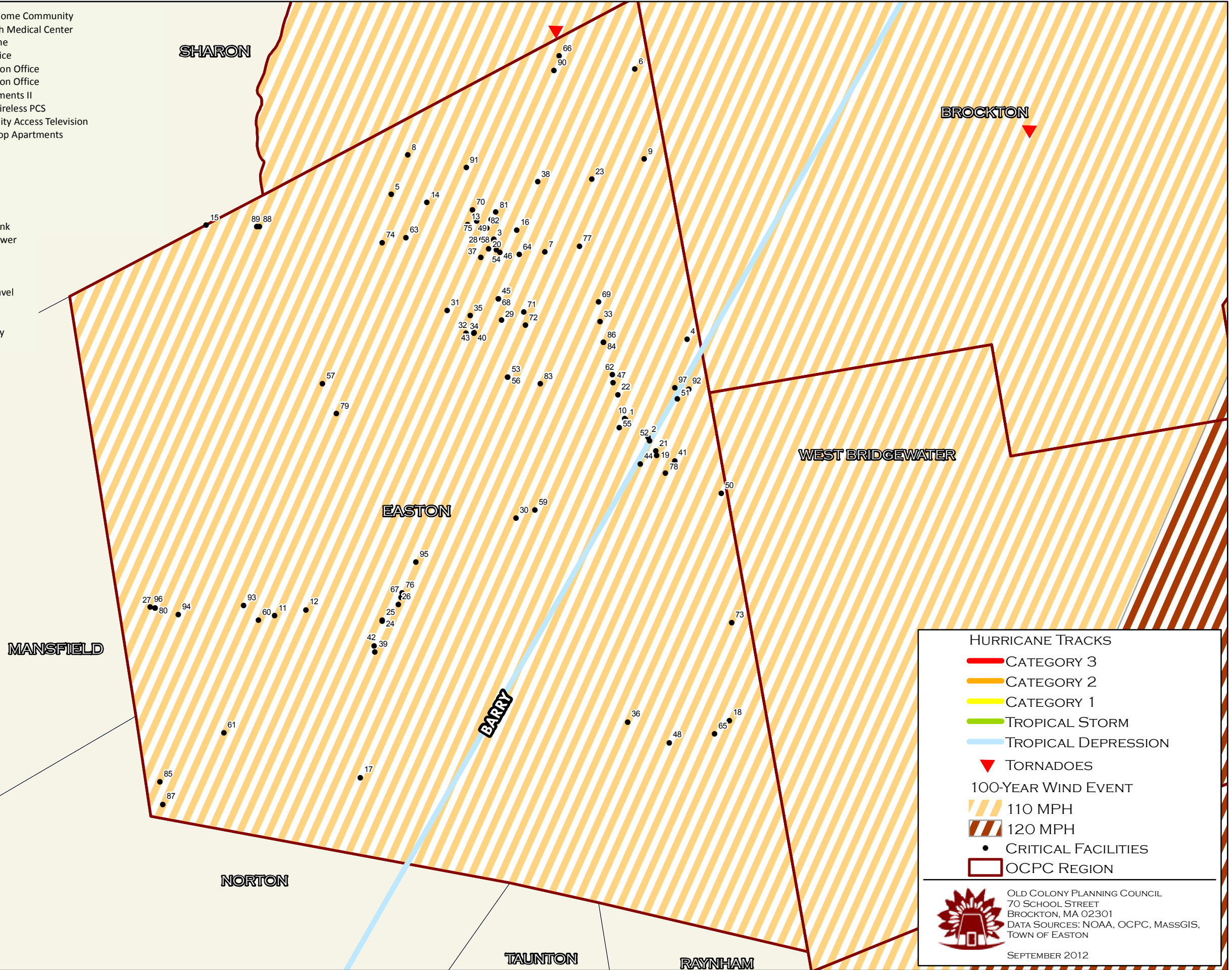
- A
- AE
- X500
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: FEMA, OCPC, MASSGIS,
 TOWN OF EASTON
 SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - EASTON



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HURRICANE TRACKS

- CATEGORY 3
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- ▼ TORNADOES

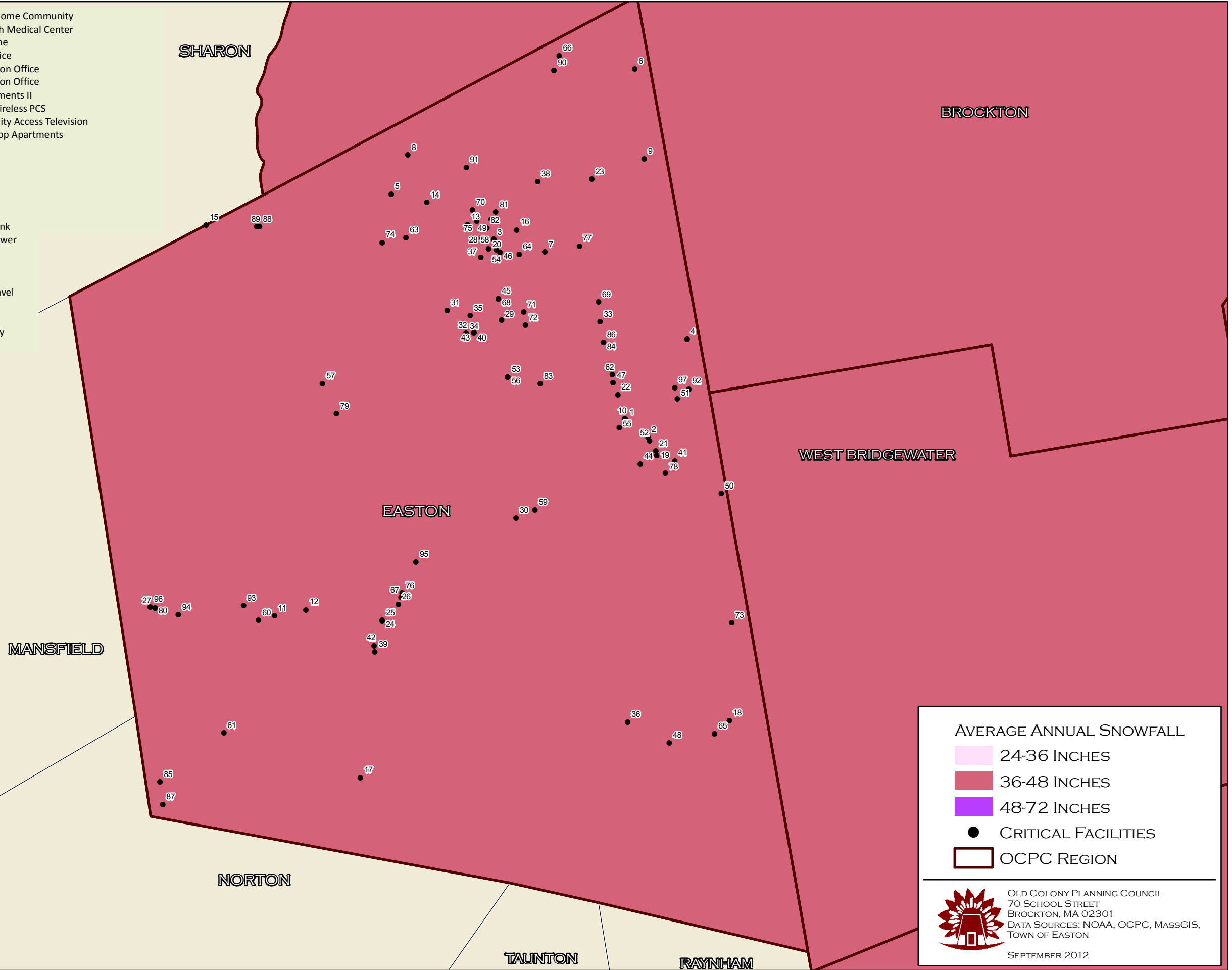
100-YEAR WIND EVENT

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- 120 MPH
- CRITICAL FACILITIES
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OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
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 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF EASTON

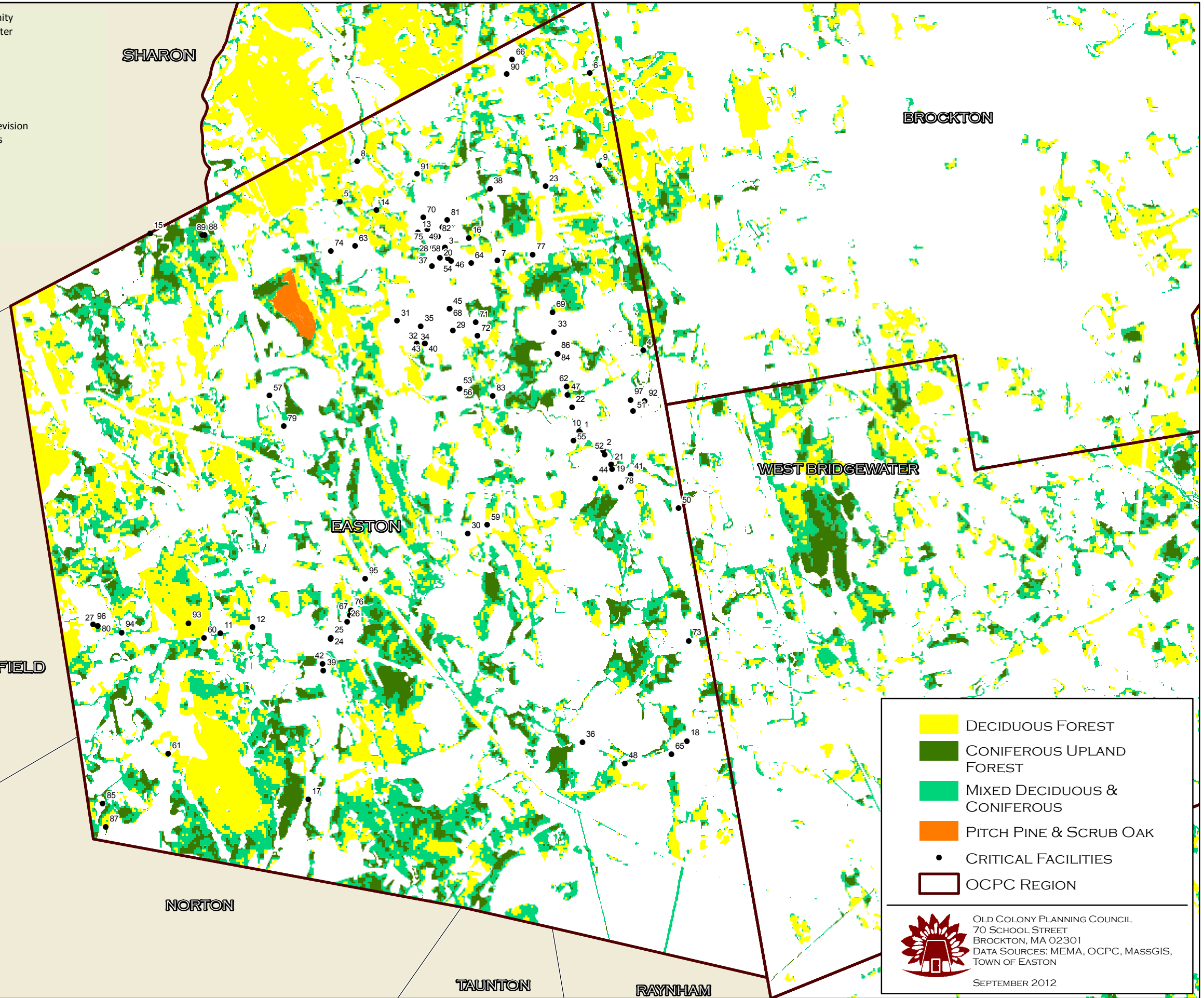
SEPTEMBER 2012

WILDFIRE SUSCEPTIBILITY - EASTON




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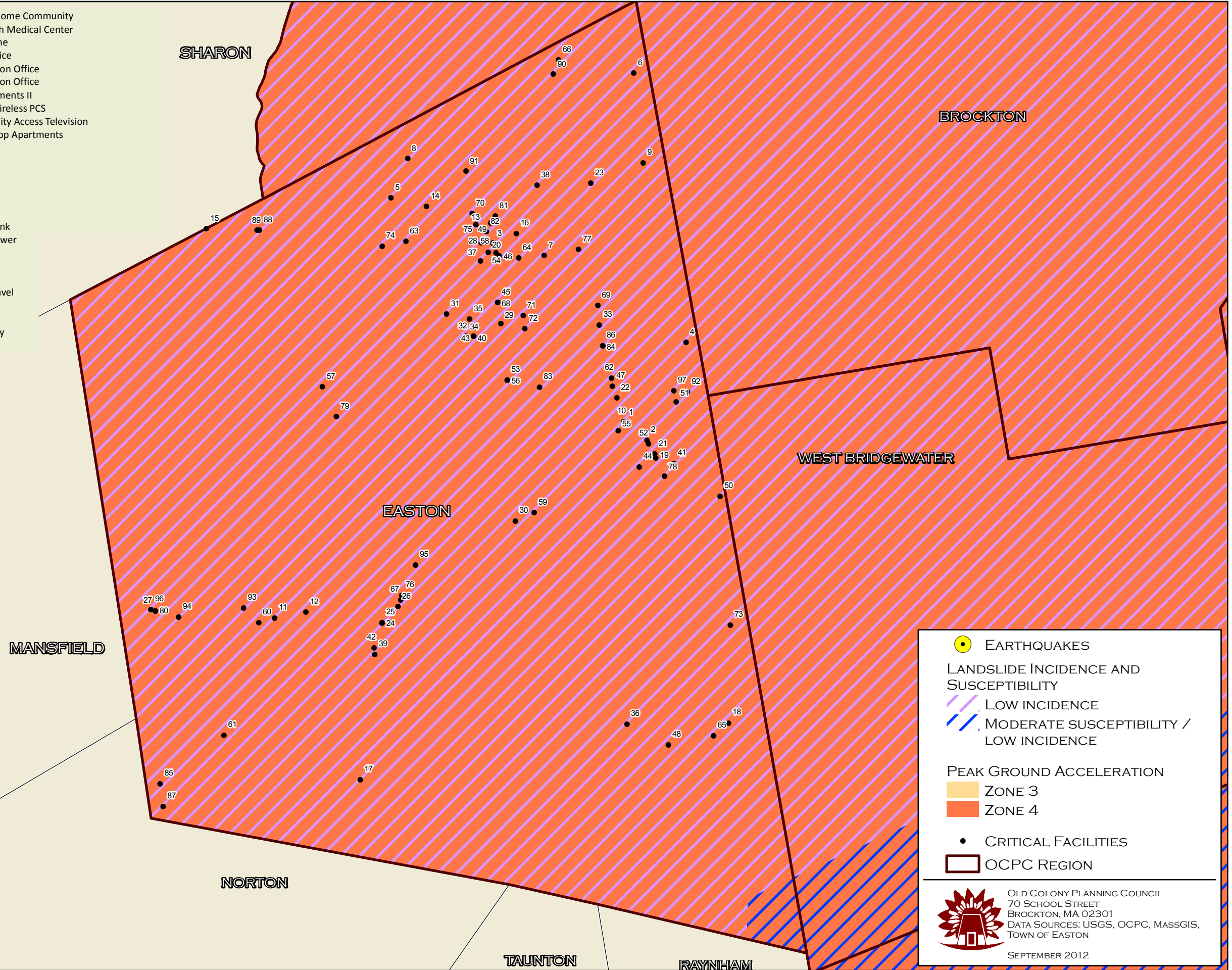


OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: MEMA, OCPC, MASSGIS,
 TOWN OF EASTON
 SEPTEMBER 2012

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- 4 Ames Pond Dam (Ames Pond)
- 5 Flyaway Pond Dam (Flyaway Pond)
- 6 French Pond Dam (French Pond)
- 7 Langwater Pond Dam (Langwater Pond)
- 8 Long Pond Dam (Long Pond)
- 9 Monte Pond Dam (Monte Pond)
- 10 Morse Pond Dam (Morse Pond)
- 11 New Pond Dam (New Pond)
- 12 Old Cabot Pond Dam (Old Cabot Pond)
- 13 Parker Pond Dam (Parker Pond)
- 14 Picker Pond Dam (Picker Pond)
- 15 Pud's Pond Dam (Pud's Pond)
- 16 Shovelshop Pond Dam (Hoeshop Pond)
- 17 Ward Pond Dam (Ward Pond)
- 18 7-Eleven
- 19 BP
- 20 Citgo
- 21 Citgo
- 22 Conco
- 23 Easton Gas
- 24 Five Corners Petroleum
- 25 Mobil
- 26 Sunoco
- 27 Columbia Gas
- 28 Ames Free Library of Easton
- 29 Department of Public Works
- 30 Easton Center School
- 31 Easton Middle School
- 32 F.L. Olmstead/H.H. Richardson School
- 33 Moreau Hall Elementary School
- 34 Oliver Ames High School
- 35 Parkview School
- 36 Southeastern Regional Voc. Tech. High School
- 37 Council on Aging
- 38 Town Hall
- 39 Water Department
- 40 Fire Station 1
- 41 Fire Station 2
- 42 Fire Station 3
- 43 Police Station
- 44 Creative World Children's Learning Center
- 45 Easton Country Day School
- 46 Easton Learning Adventures Preschool
- 47 KinderCare Learning Center #1377
- 48 Maplewood Enrichment Center
- 49 Old Colony YMCA
- 50 Shining Wonders Preschool
- 51 Stonehill College Child Care Center
- 52 The Learning Experience
- 53 Tiny Tots Nursery School
- 54 Children's Museum in Easton
- 55 Christian & Missionary Alliance
- 56 Covenant Congregational Church
- 57 Easton Baptist Church
- 58 Easton Historical Society
- 59 Evangelical Congregational Church of Easton
- 60 Free Evangelical Fellowship
- 61 Good Shepherd Presbyterian Church
- 62 Holy Cross Family Ministries
- 63 Holy Trinity Lutheran Church
- 64 Immaculate Conception Parish
- 65 New Hope Christian Chapel
- 66 Roche Bros. Supermarket
- 67 Shaw's Supermarket
- 68 St. Mark's Episcopal Church of North Easton
- 69 Stonehill College
- 70 Unity Unitarian Universalist Church of Easton
- 71 Easton Housing Authority
- 72 Easton Housing Authority
- 73 Easton Mobile Home Community
- 74 Southeast Health Medical Center
- 75 Village Rest Home
- 76 USPS Easton Office
- 77 USPS North Easton Office
- 78 USPS South Easton Office
- 79 Mobilite Investments II
- 80 New Cingular Wireless PCS
- 81 Easton Community Access Television
- 82 Ames Shovel Shop Apartments
- 83 Water Pump #1
- 84 Water Pump #2
- 85 Water Pump #3
- 86 Water Pump #4
- 87 Water Pump #5
- 88 Water Pump #6
- 89 Water Supply Tank
- 90 Water Supply Tower
- 91 Verizon
- 92 Pharmasol
- 93 Target
- 94 Boro Sand & Gravel
- 95 National Grid
- 96 Columbia Gas
- 97 Resin Technology



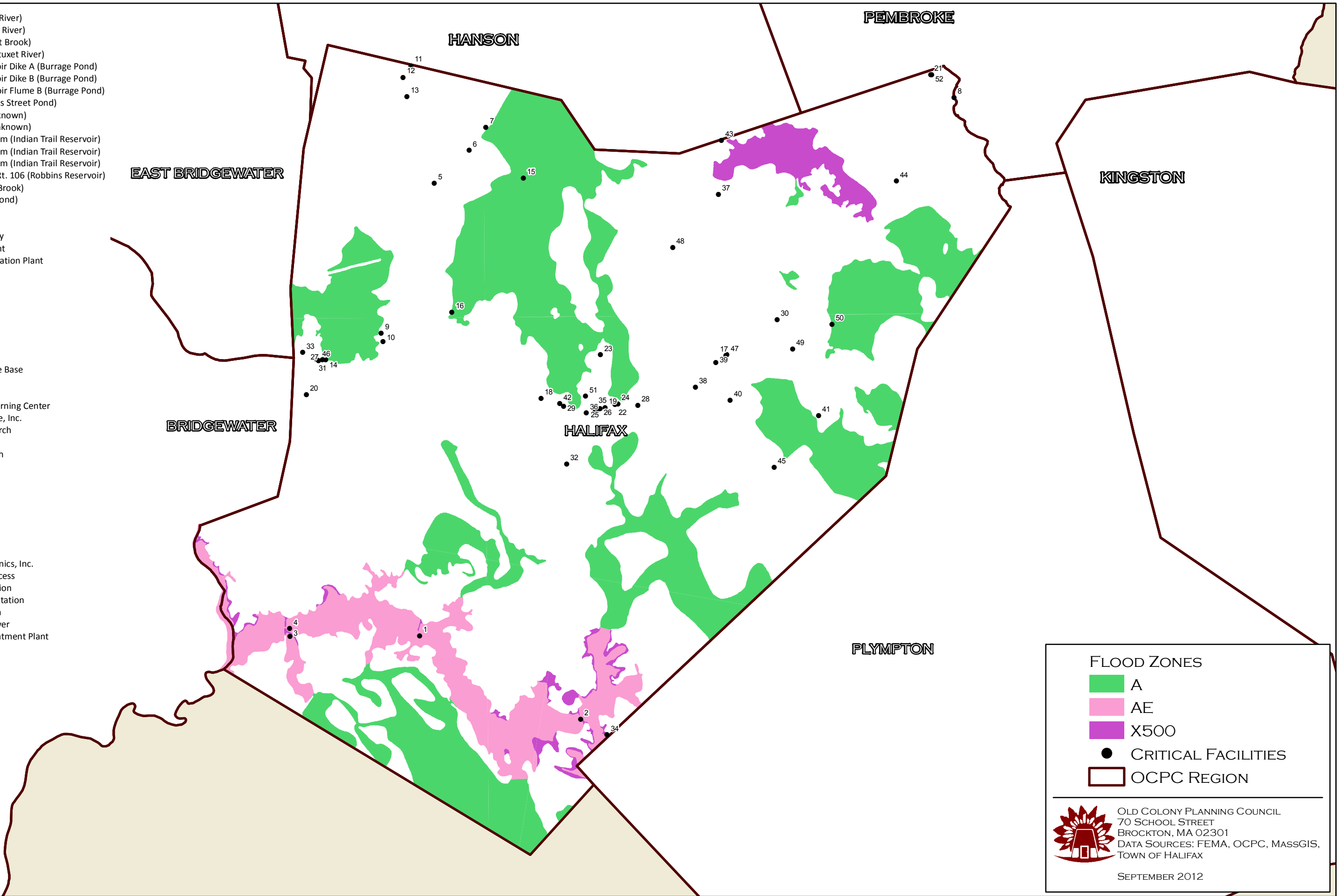
- EARTHQUAKES
- LANDSLIDE INCIDENCE AND SUSCEPTIBILITY
 - LOW INCIDENCE
 - MODERATE SUSCEPTIBILITY / LOW INCIDENCE
- PEAK GROUND ACCELERATION
 - ZONE 3
 - ZONE 4
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF EASTON
 SEPTEMBER 2012

FLOOD ZONES AND SLOSH - HALIFAX



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- 18 Mobil
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- 39 Walmart
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- 44 MBTA Halifax Station
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- 46 Industrial Comm. & Electronics, Inc.
- 47 Halifax-Plympton Public Access
- 48 Ligan Street Pumping Station
- 49 Plymouth Street Pumping Station
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- 51 Plymouth Street Water Tower
- 52 City of Brockton Water Treatment Plant



FLOOD ZONES

- A
- AE
- X500
- CRITICAL FACILITIES
- OCPC REGION



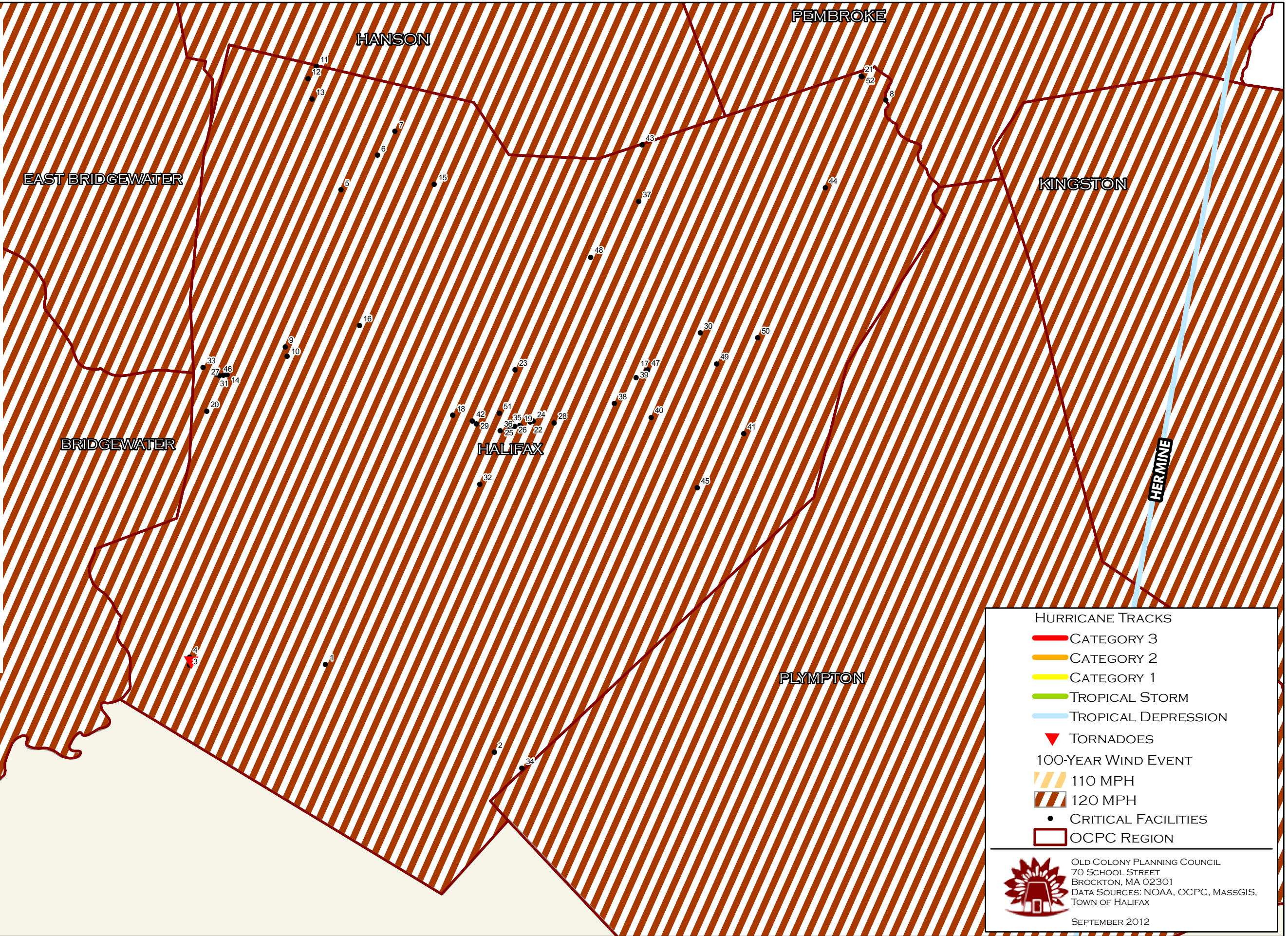
OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
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 DATA SOURCES: FEMA, OCPC, MASSGIS,
 TOWN OF HALIFAX

SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - HALIFAX



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HURRICANE TRACKS

- CATEGORY 3
- CATEGORY 2
- CATEGORY 1
- TROPICAL STORM
- TROPICAL DEPRESSION
- ▼ TORNADOES

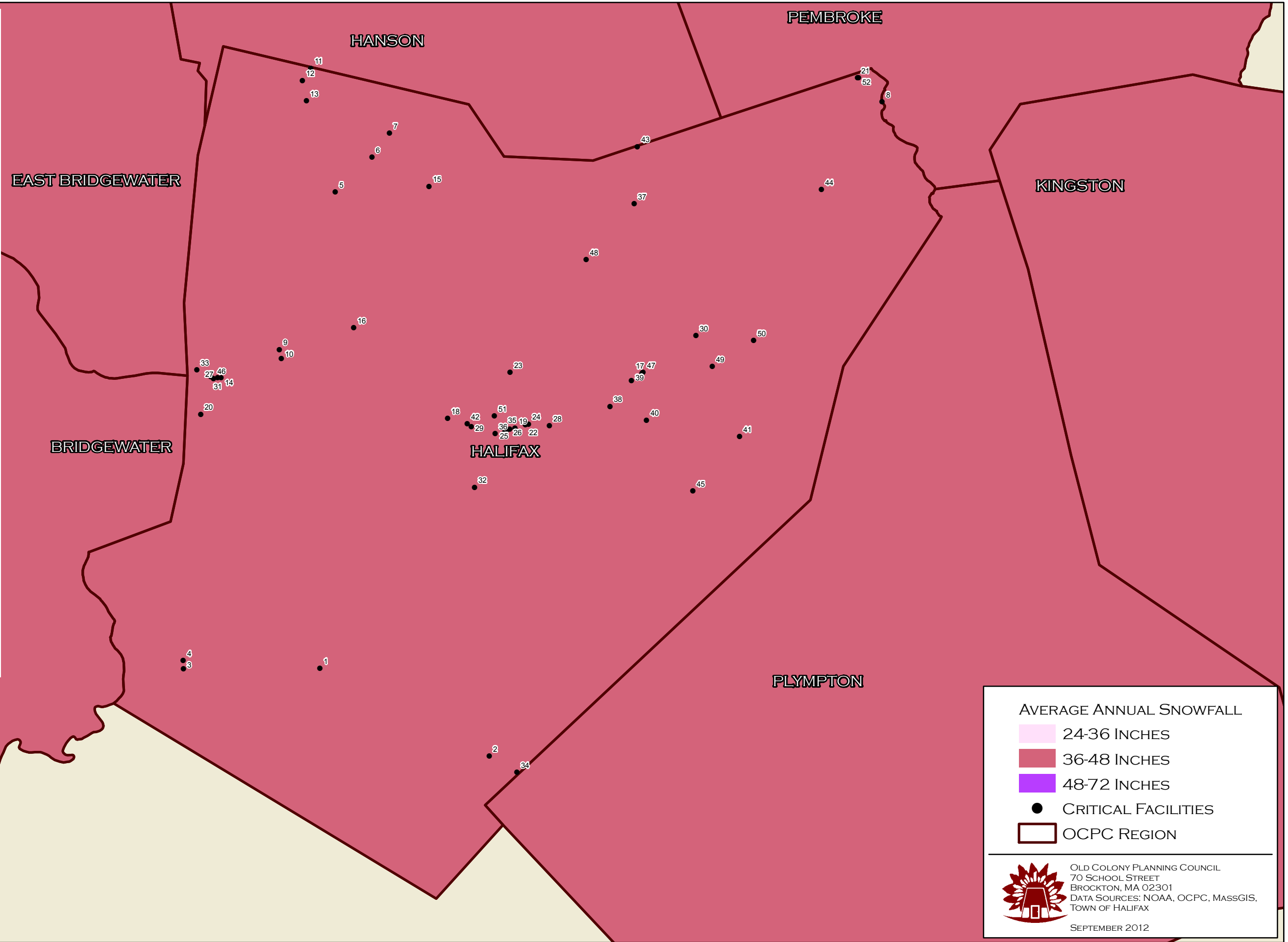
100-YEAR WIND EVENT

- 110 MPH
- 120 MPH
- CRITICAL FACILITIES
- OCPC REGION

AVERAGE ANNUAL SNOWFALL - HALIFAX



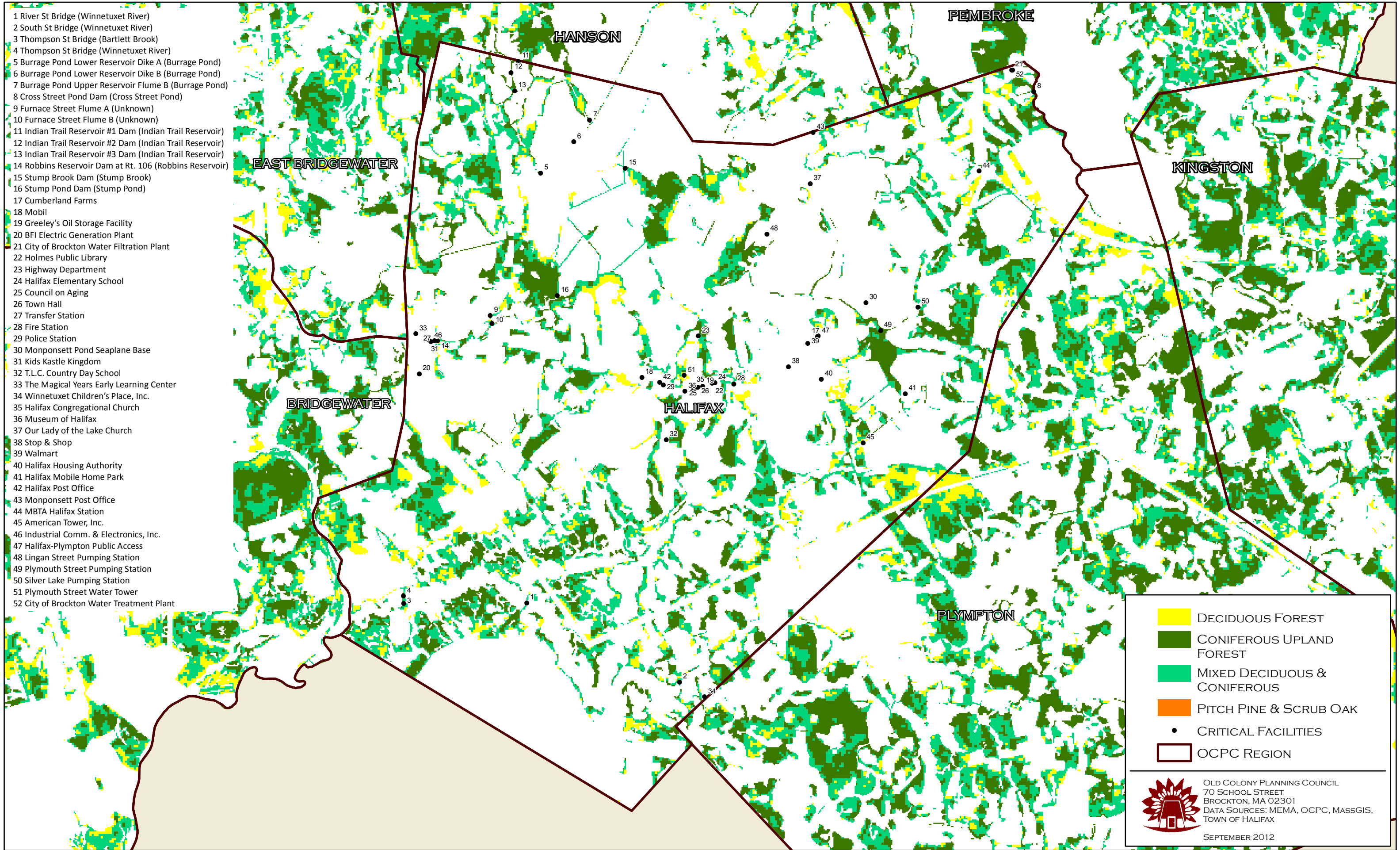
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AVERAGE ANNUAL SNOWFALL

- 24-36 INCHES
- 36-48 INCHES
- 48-72 INCHES
- CRITICAL FACILITIES
- OCPC REGION

WILDFIRE SUSCEPTIBILITY - HALIFAX



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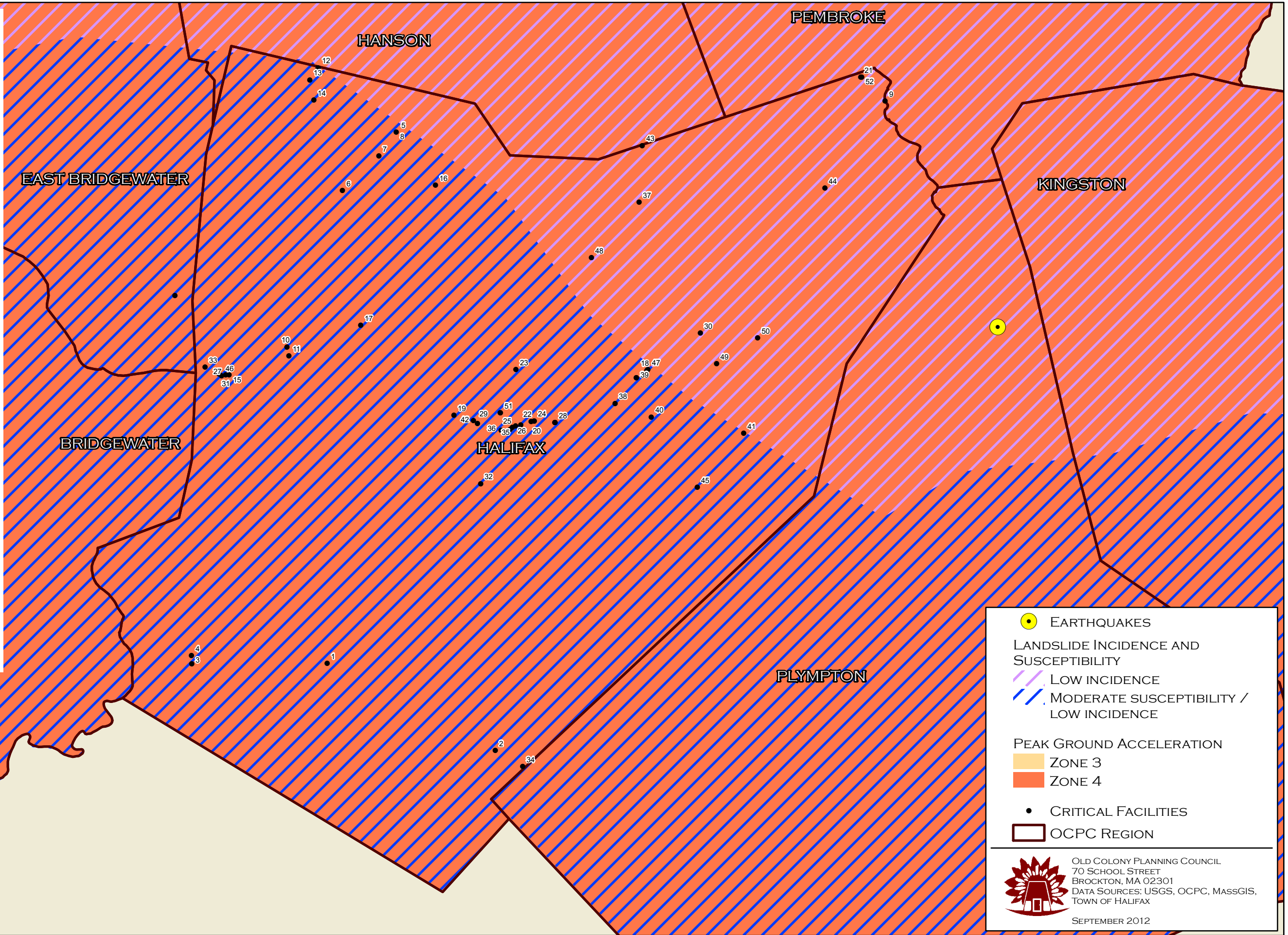
- DECIDUOUS FOREST
- CONIFEROUS UPLAND FOREST
- MIXED DECIDUOUS & CONIFEROUS
- PITCH PINE & SCRUB OAK
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: MEMA, OCPC, MASSGIS,
 TOWN OF HALIFAX
 SEPTEMBER 2012

EARTHQUAKE & LANDSLIDE - HALIFAX



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EARTHQUAKES

LANDSLIDE INCIDENCE AND SUSCEPTIBILITY

- LOW INCIDENCE
- MODERATE SUSCEPTIBILITY / LOW INCIDENCE

PEAK GROUND ACCELERATION

- ZONE 3
- ZONE 4

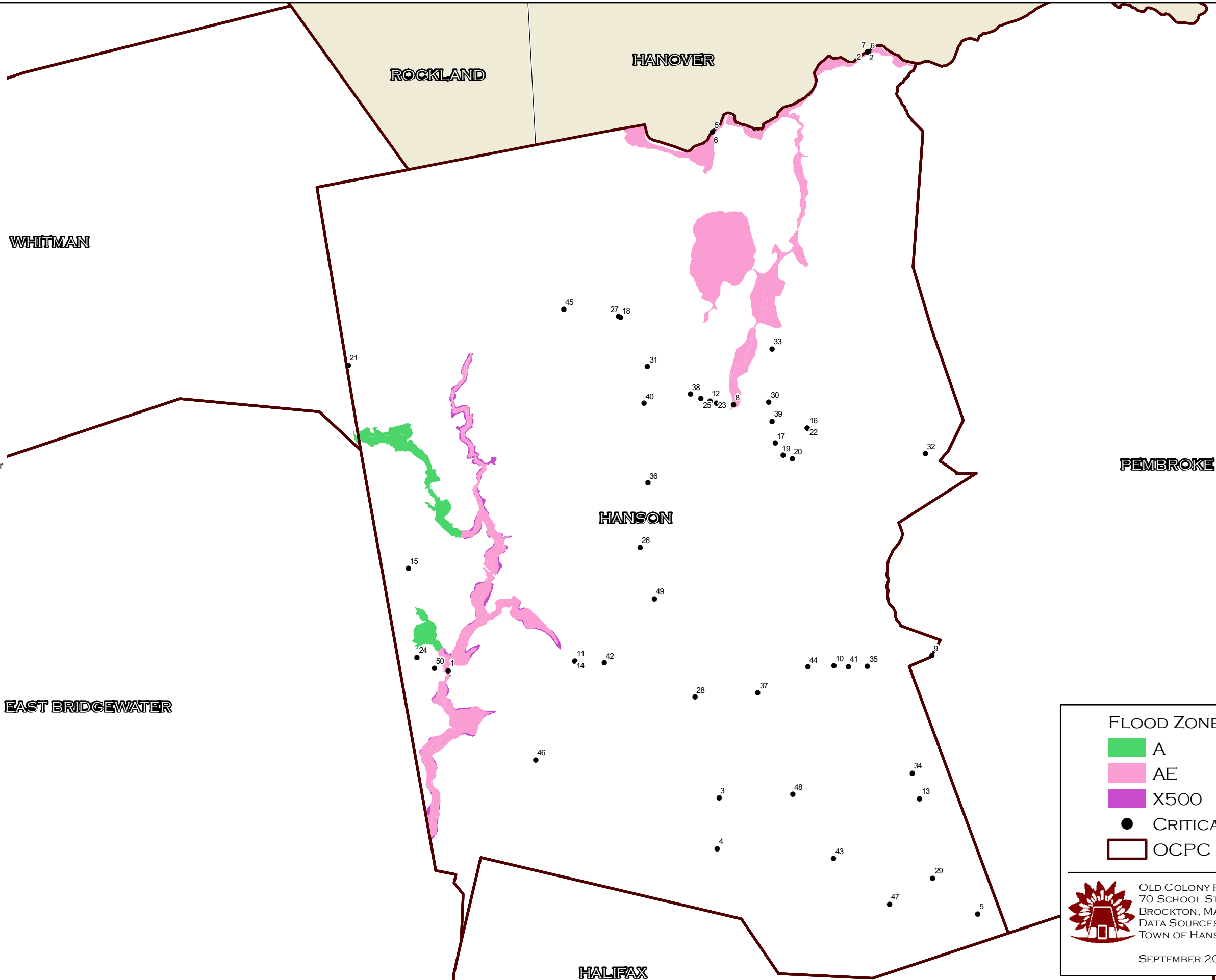
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF HALIFAX
 SEPTEMBER 2012

FLOOD AND SLOSH - HANSON




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- 39 St. Joseph the Worker Church
- 40 Hanson Housing Authority
- 41 USPS Hanson Office
- 42 MBTA Hanson Station
- 43 Cardinal Cushing Centers
- 44 Cardinal Cushing Centers
- 45 South Shore Housing
- 46 Southeastern Residential Service
- 47 Vinfen
- 48 SBA Towers II LLC
- 49 Water Supply Tank
- 50 Crystal Springs Well Field



FLOOD ZONES

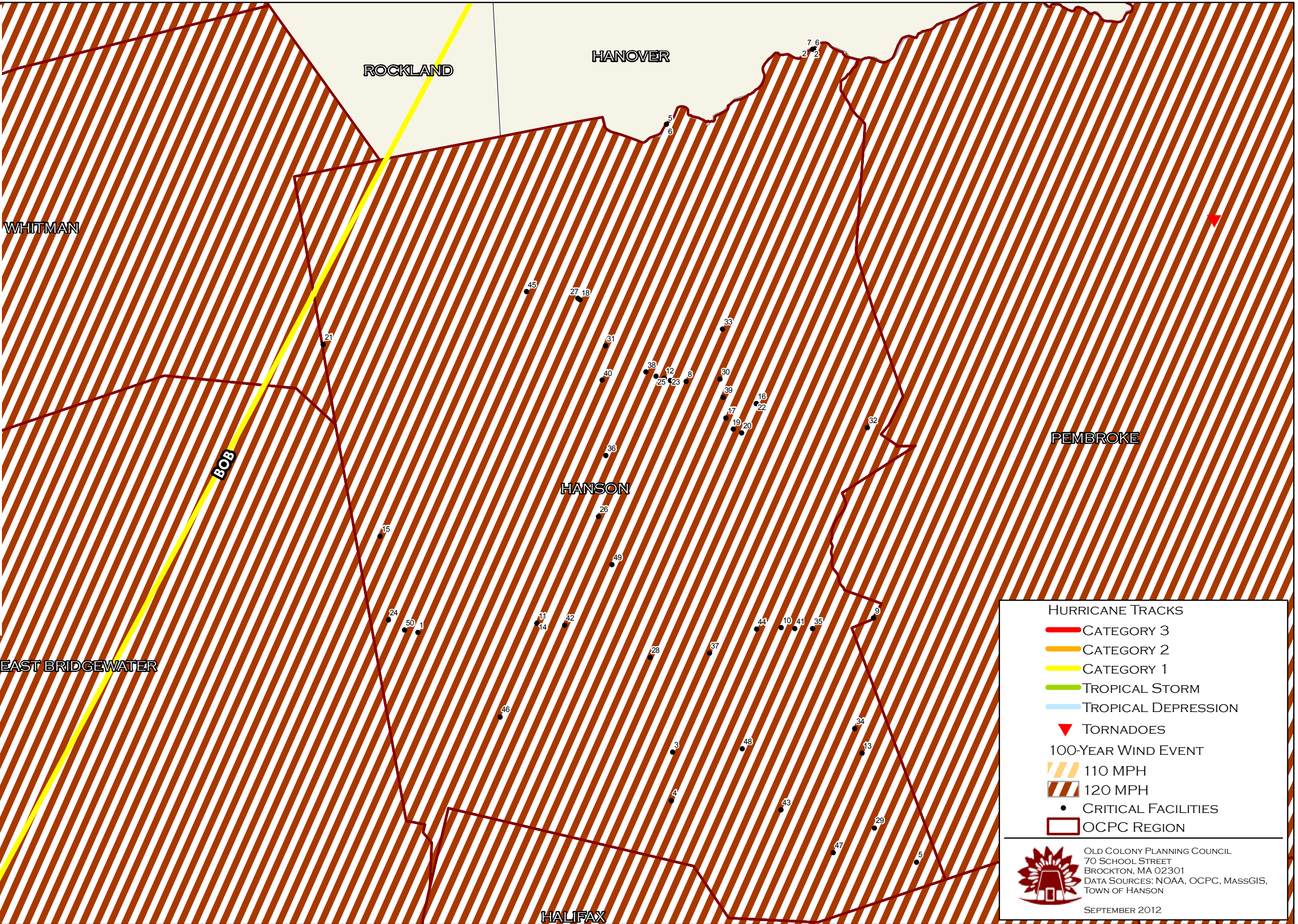
- A
- AE
- X500
- CRITICAL FACILITIES
- OCPC REGION


OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: FEMA, OCPC, MASSGIS,
 TOWN OF HANSON
 SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - HANSON



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HURRICANE TRACKS

- CATEGORY 3
- CATEGORY 2
- CATEGORY 1
- TROPICAL STORM
- TROPICAL DEPRESSION
- ▼ TORNADOES

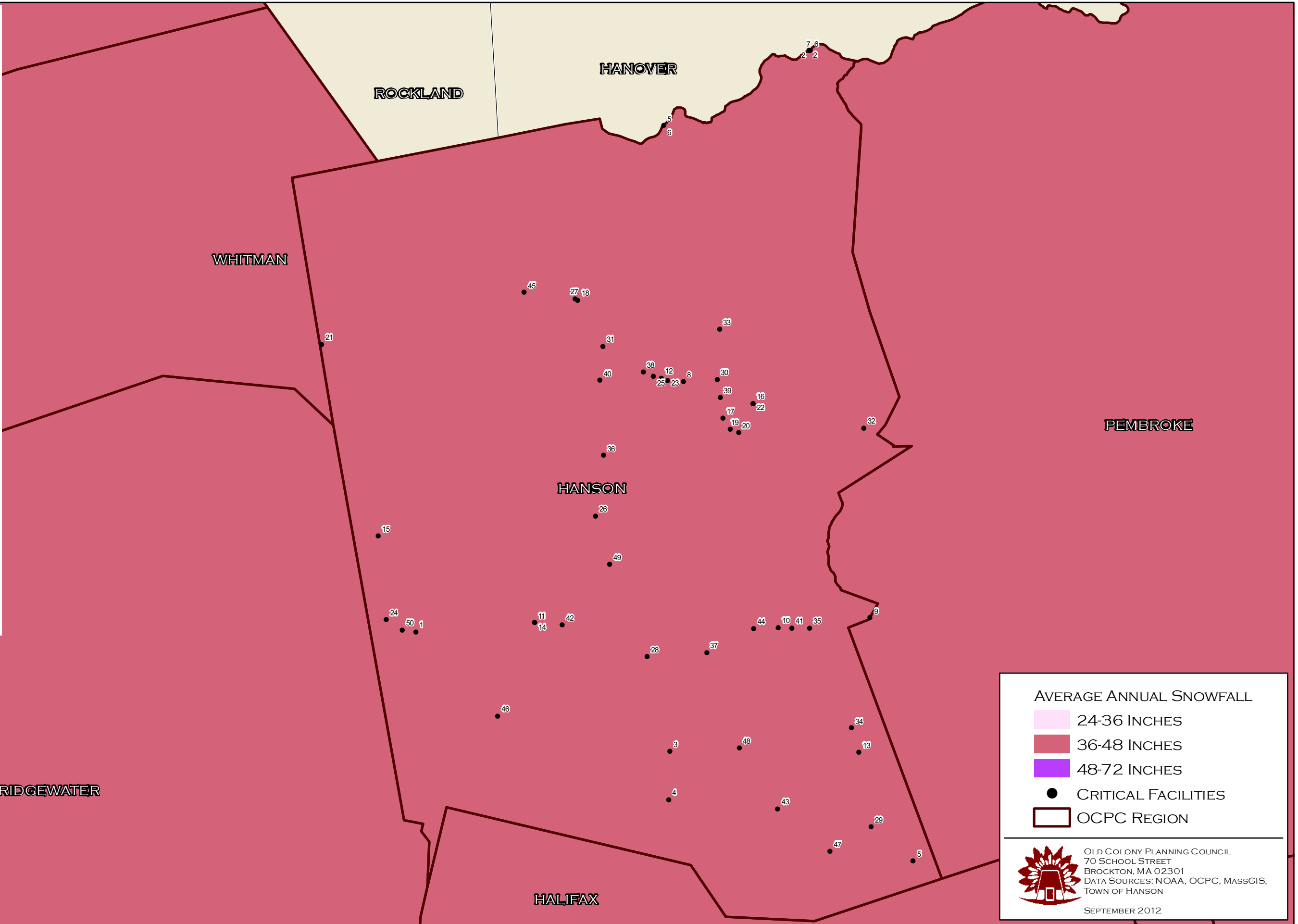
100-YEAR WIND EVENT

- ▨ 110 MPH
- ▨ 120 MPH
- CRITICAL FACILITIES
- ▭ OCPC REGION

AVERAGE ANNUAL SNOWFALL - HANSON



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AVERAGE ANNUAL SNOWFALL

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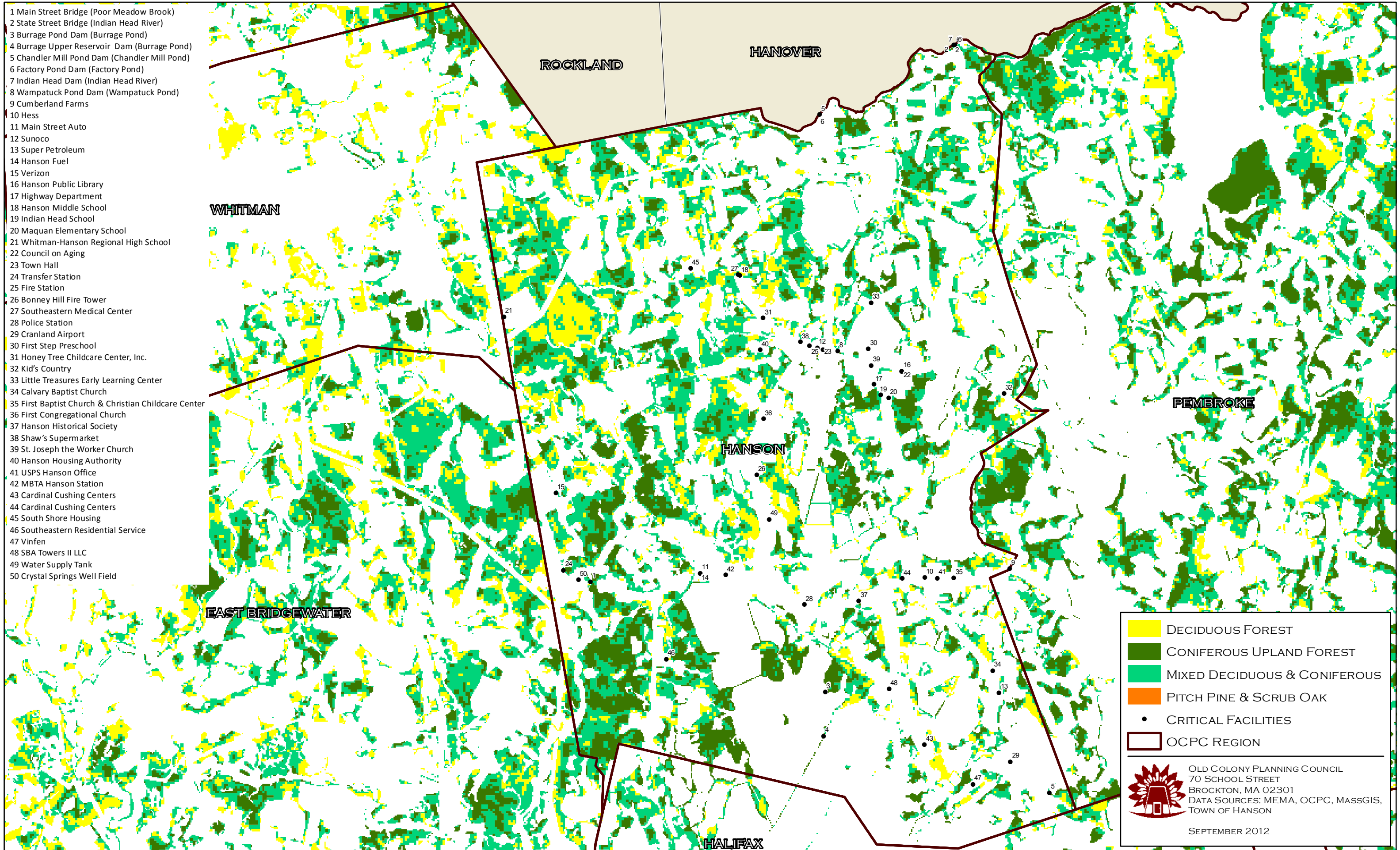
OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF HANSON

SEPTEMBER 2012


WILDFIRE SUSCEPTIBILITY - HANSON



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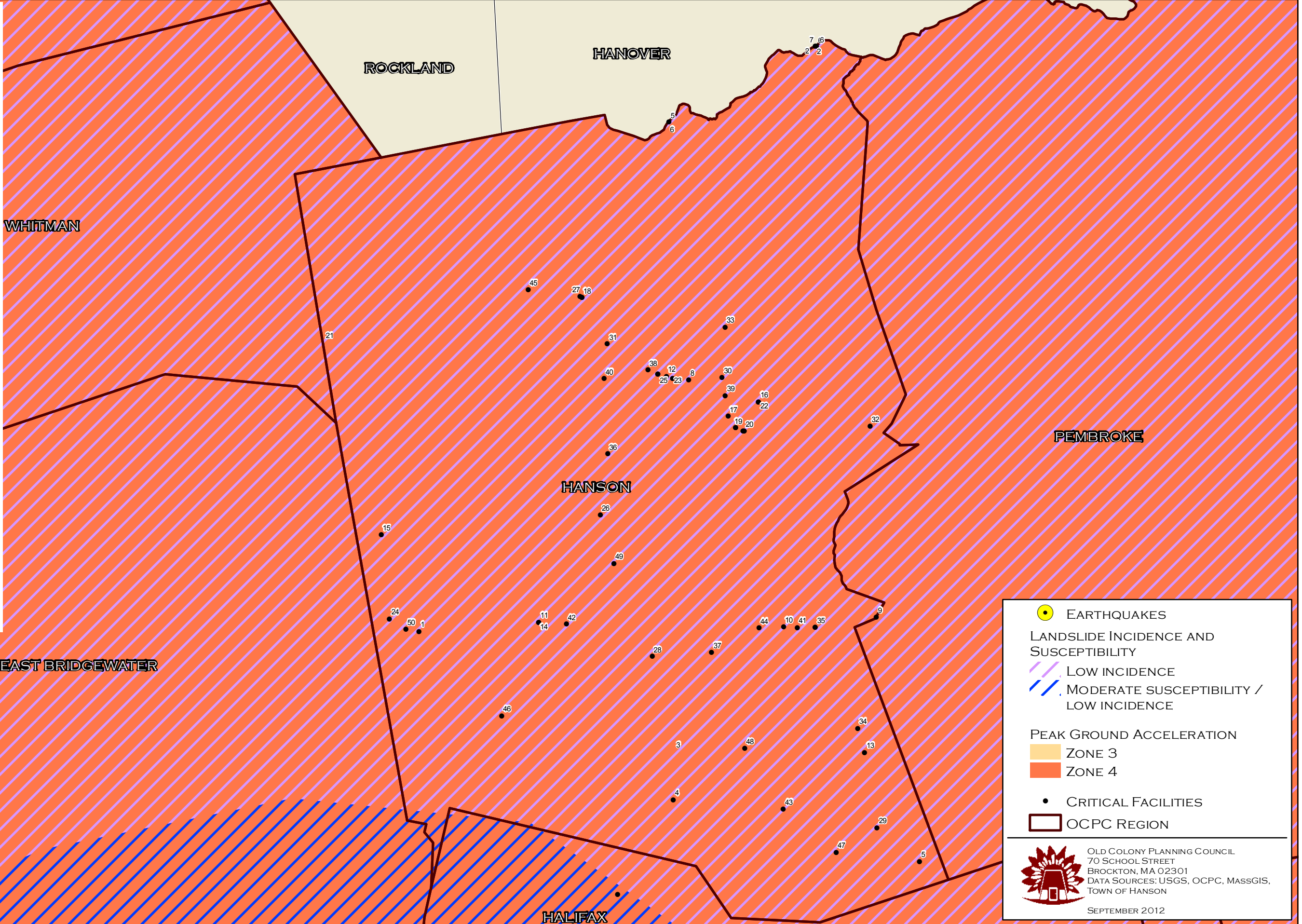
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- 38 Shaw's Supermarket
- 39 St. Joseph the Worker Church
- 40 Hanson Housing Authority
- 41 USPS Hanson Office
- 42 MBTA Hanson Station
- 43 Cardinal Cushing Centers
- 44 Cardinal Cushing Centers
- 45 South Shore Housing
- 46 Southeastern Residential Service
- 47 Vinfen
- 48 SBA Towers II LLC
- 49 Water Supply Tank
- 50 Crystal Springs Well Field



- EARTHQUAKES

LANDSLIDE INCIDENCE AND SUSCEPTIBILITY

- ▨ LOW INCIDENCE
- ▨ MODERATE SUSCEPTIBILITY / LOW INCIDENCE

PEAK GROUND ACCELERATION

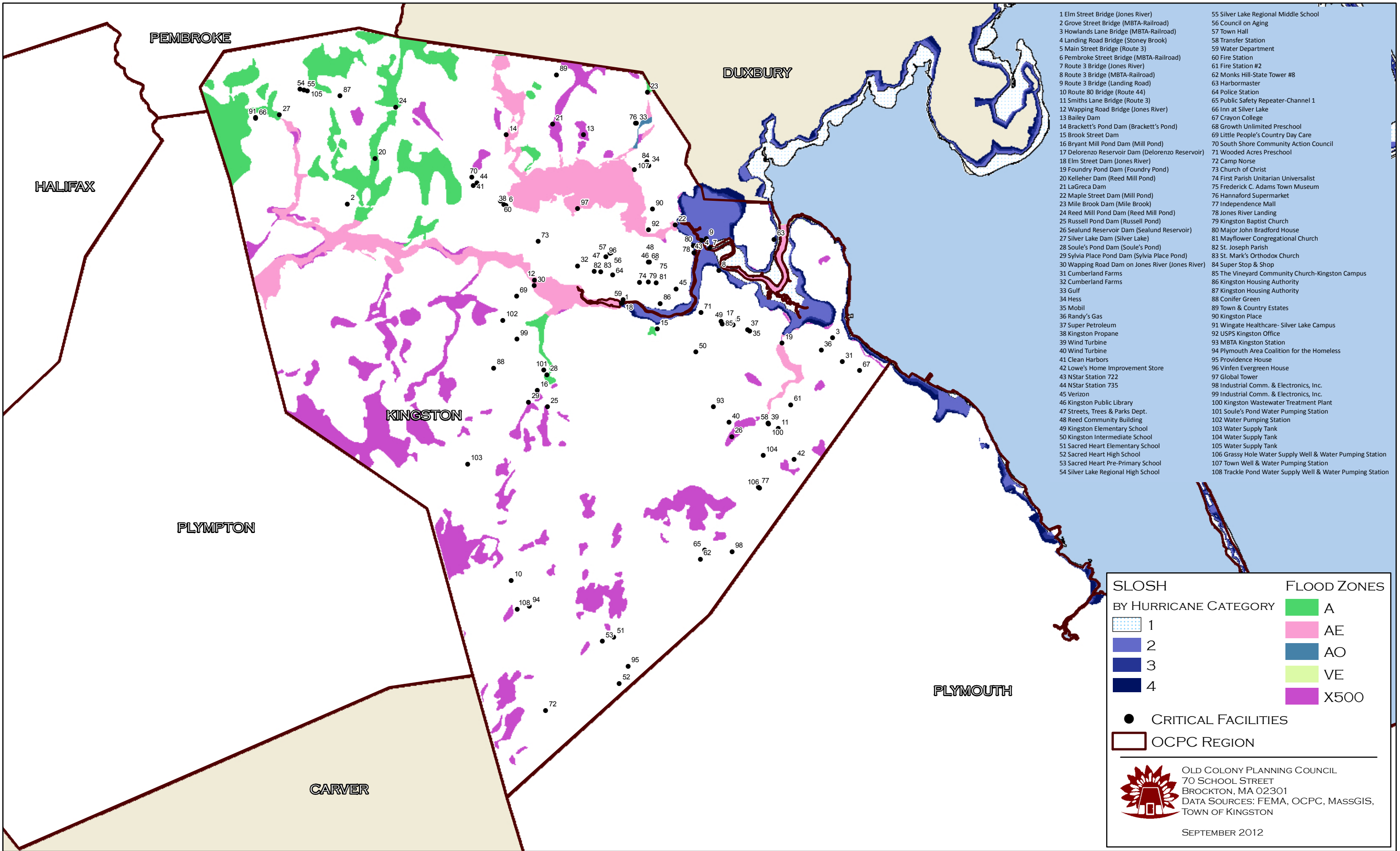
- ZONE 3
- ZONE 4

- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF HANSON

SEPTEMBER 2012

FLOOD ZONES AND SLOSH - KINGSTON



- 1 Elm Street Bridge (Jones River)
- 2 Grove Street Bridge (MBTA-Railroad)
- 3 Howlands Lane Bridge (MBTA-Railroad)
- 4 Landing Road Bridge (Stoney Brook)
- 5 Main Street Bridge (Route 3)
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- 29 Sylvia Place Pond Dam (Sylvia Place Pond)
- 30 Wapping Road Dam on Jones River (Jones River)
- 31 Cumberland Farms
- 32 Cumberland Farms
- 33 Gulf
- 34 Hess
- 35 Mobil
- 36 Randy's Gas
- 37 Super Petroleum
- 38 Kingston Propane
- 39 Wind Turbine
- 40 Wind Turbine
- 41 Clean Harbors
- 42 Lowe's Home Improvement Store
- 43 NStar Station 722
- 44 NStar Station 735
- 45 Verizon
- 46 Kingston Public Library
- 47 Streets, Trees & Parks Dept.
- 48 Reed Community Building
- 49 Kingston Elementary School
- 50 Kingston Intermediate School
- 51 Sacred Heart Elementary School
- 52 Sacred Heart High School
- 53 Sacred Heart Pre-Primary School
- 54 Silver Lake Regional High School
- 55 Silver Lake Regional Middle School
- 56 Council on Aging
- 57 Town Hall
- 58 Transfer Station
- 59 Water Department
- 60 Fire Station
- 61 Fire Station #2
- 62 Monks Hill-State Tower #8
- 63 Harbormaster
- 64 Police Station
- 65 Public Safety Repeater-Channel 1
- 66 Inn at Silver Lake
- 67 Crayon College
- 68 Growth Unlimited Preschool
- 69 Little People's Country Day Care
- 70 South Shore Community Action Council
- 71 Wooded Acres Preschool
- 72 Camp Norse
- 73 Church of Christ
- 74 First Parish Unitarian Universalist
- 75 Frederick C. Adams Town Museum
- 76 Hannafood Supermarket
- 77 Independence Mall
- 78 Jones River Landing
- 79 Kingston Baptist Church
- 80 Major John Bradford House
- 81 Mayflower Congregational Church
- 82 St. Joseph Parish
- 83 St. Mark's Orthodox Church
- 84 Super Stop & Shop
- 85 The Vineyard Community Church-Kingston Campus
- 86 Kingston Housing Authority
- 87 Kingston Housing Authority
- 88 Conifer Green
- 89 Town & Country Estates
- 90 Kingston Place
- 91 Wingate Healthcare- Silver Lake Campus
- 92 USPS Kingston Office
- 93 MBTA Kingston Station
- 94 Plymouth Area Coalition for the Homeless
- 95 Providence House
- 96 Vinfen Evergreen House
- 97 Global Tower
- 98 Industrial Comm. & Electronics, Inc.
- 99 Industrial Comm. & Electronics, Inc.
- 100 Kingston Wastewater Treatment Plant
- 101 Soule's Pond Water Pumping Station
- 102 Water Pumping Station
- 103 Water Supply Tank
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- 105 Water Supply Tank
- 106 Grassy Hole Water Supply Well & Water Pumping Station
- 107 Town Well & Water Pumping Station
- 108 Trackle Pond Water Supply Well & Water Pumping Station

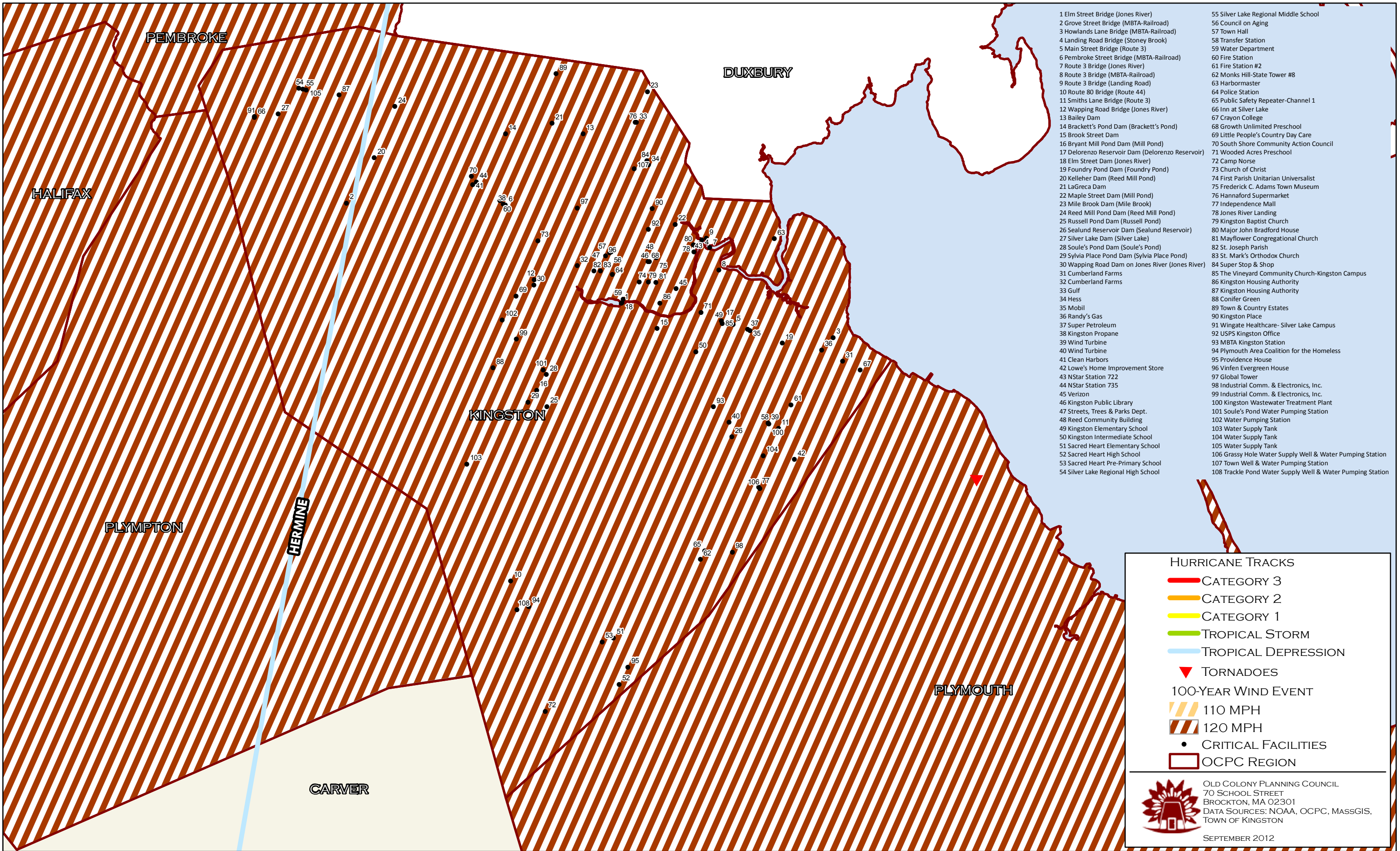
SLOSH
BY HURRICANE CATEGORY

	1		A
	2		AE
	3		AO
	4		VE
			X500

● CRITICAL FACILITIES
 OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: FEMA, OCPC, MASSGIS,
 TOWN OF KINGSTON
 SEPTEMBER 2012

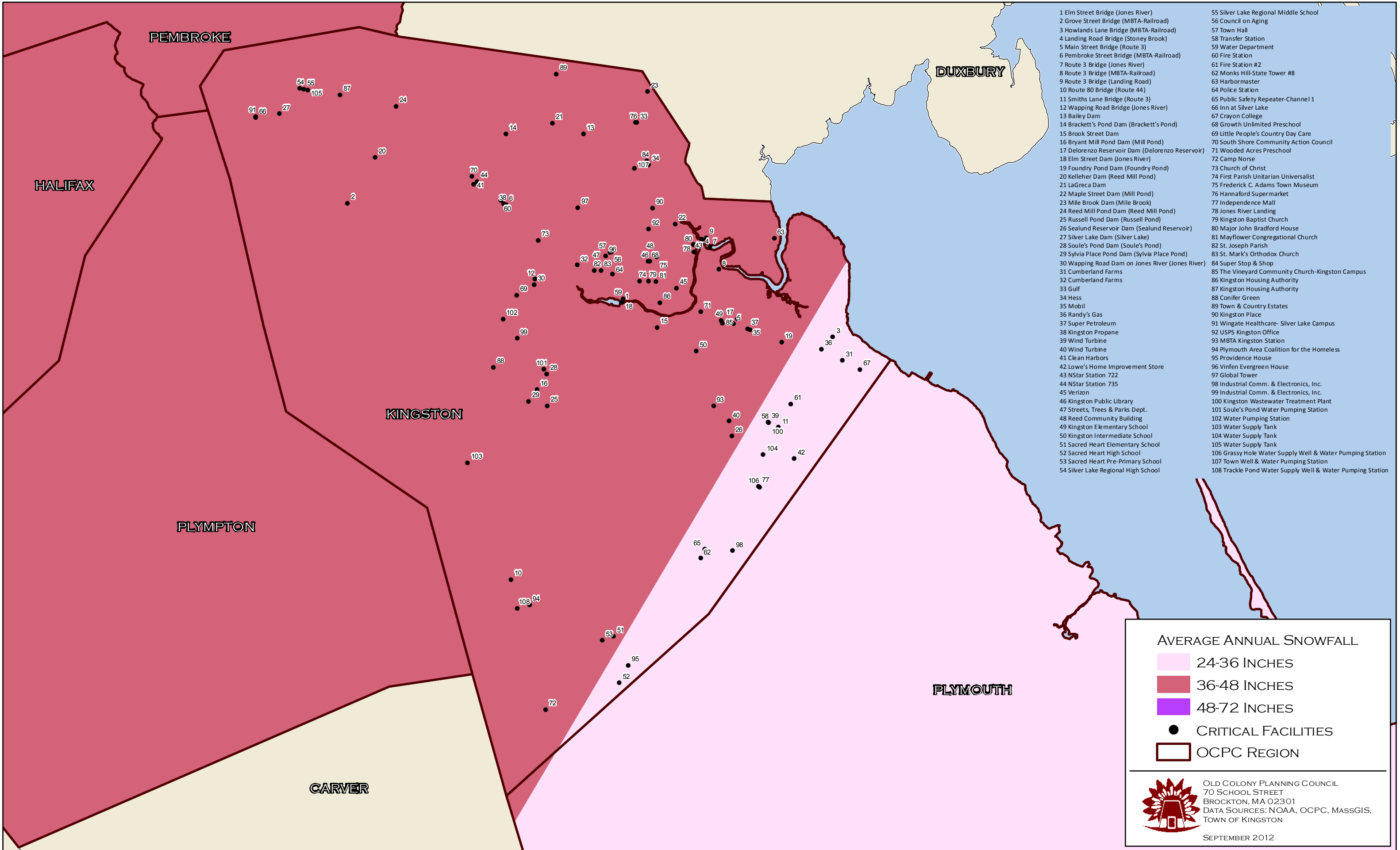
HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - KINGSTON



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- 34 Hess
- 35 Mobil
- 36 Randy's Gas
- 37 Super Petroleum
- 38 Kingston Propane
- 39 Wind Turbine
- 40 Wind Turbine
- 41 Clean Harbors
- 42 Lowe's Home Improvement Store
- 43 NStar Station 722
- 44 NStar Station 735
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- 46 Kingston Public Library
- 47 Streets, Trees & Parks Dept.
- 48 Reed Community Building
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- 51 Sacred Heart Elementary School
- 52 Sacred Heart High School
- 53 Sacred Heart Pre-Primary School
- 54 Silver Lake Regional High School
- 55 Silver Lake Regional Middle School
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- 57 Town Hall
- 58 Transfer Station
- 59 Water Department
- 60 Fire Station
- 61 Fire Station #2
- 62 Monks Hill-State Tower #8
- 63 Harbormaster
- 64 Police Station
- 65 Public Safety Repeater-Channel 1
- 66 Inn at Silver Lake
- 67 Crayon College
- 68 Growth Unlimited Preschool
- 69 Little People's Country Day Care
- 70 South Shore Community Action Council
- 71 Wooded Acres Preschool
- 72 Camp Norse
- 73 Church of Christ
- 74 First Parish Unitarian Universalist
- 75 Frederick C. Adams Town Museum
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- 82 St. Joseph Parish
- 83 St. Mark's Orthodox Church
- 84 Super Stop & Shop
- 85 The Vineyard Community Church-Kingston Campus
- 86 Kingston Housing Authority
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- 88 Conifer Green
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- 106 Grassy Hole Water Supply Well & Water Pumping Station
- 107 Town Well & Water Pumping Station
- 108 Trackle Pond Water Supply Well & Water Pumping Station

- HURRICANE TRACKS**
- CATEGORY 3
 - CATEGORY 2
 - CATEGORY 1
 - TROPICAL STORM
 - TROPICAL DEPRESSION
 - ▼ TORNADOES
- 100-YEAR WIND EVENT**
- 110 MPH
 - 120 MPH
 - CRITICAL FACILITIES
 - OCPC REGION

AVERAGE ANNUAL SNOWFALL - KINGSTON



- | | |
|--|--|
| 1 Elm Street Bridge (Jones River) | 55 Silver Lake Regional Middle School |
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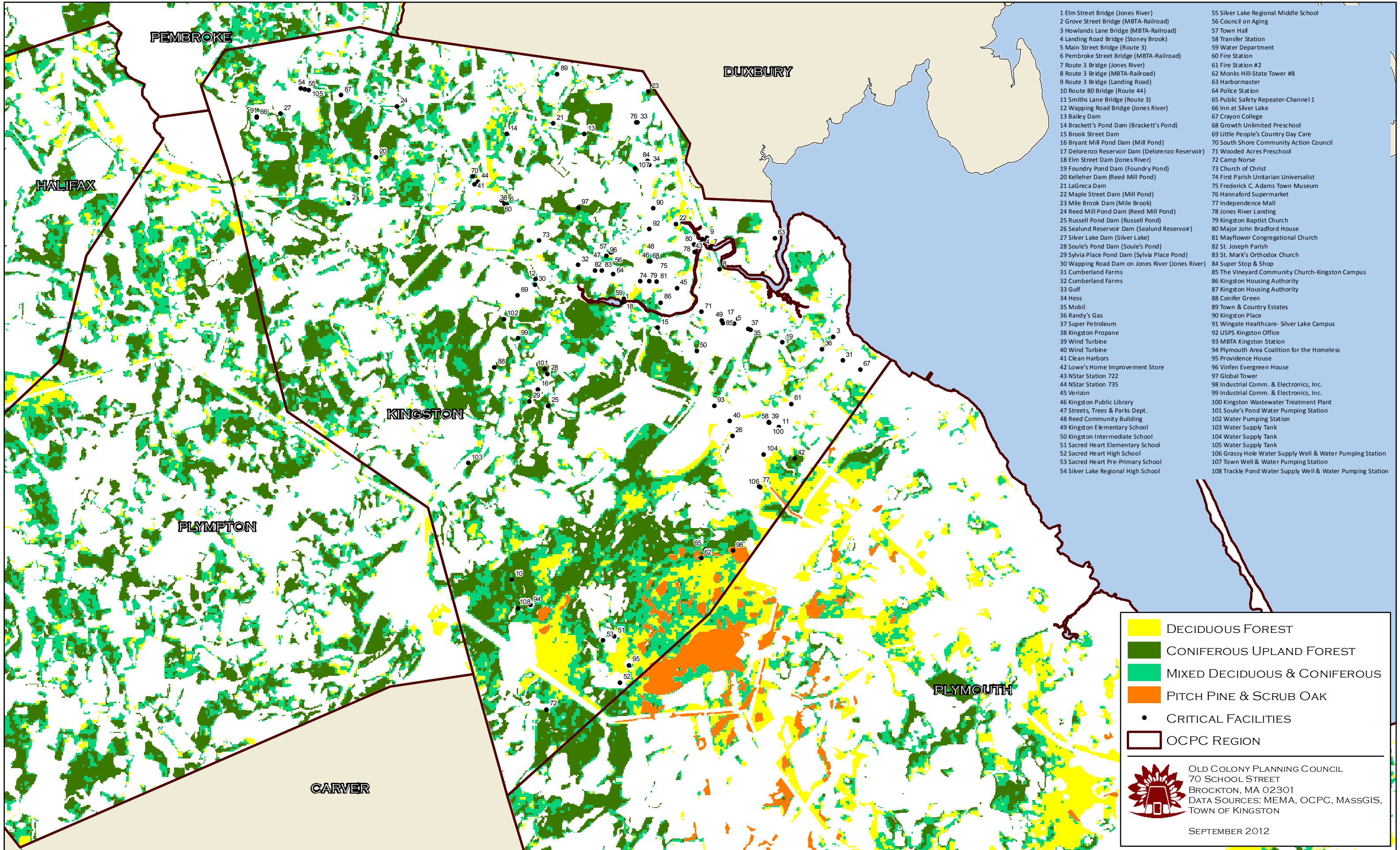
AVERAGE ANNUAL SNOWFALL

- 24-36 INCHES
- 36-48 INCHES
- 48-72 INCHES
- CRITICAL FACILITIES
- OCPC REGION




OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF KINGSTON
 SEPTEMBER 2012

WILDFIRE SUSCEPTIBILITY - KINGSTON

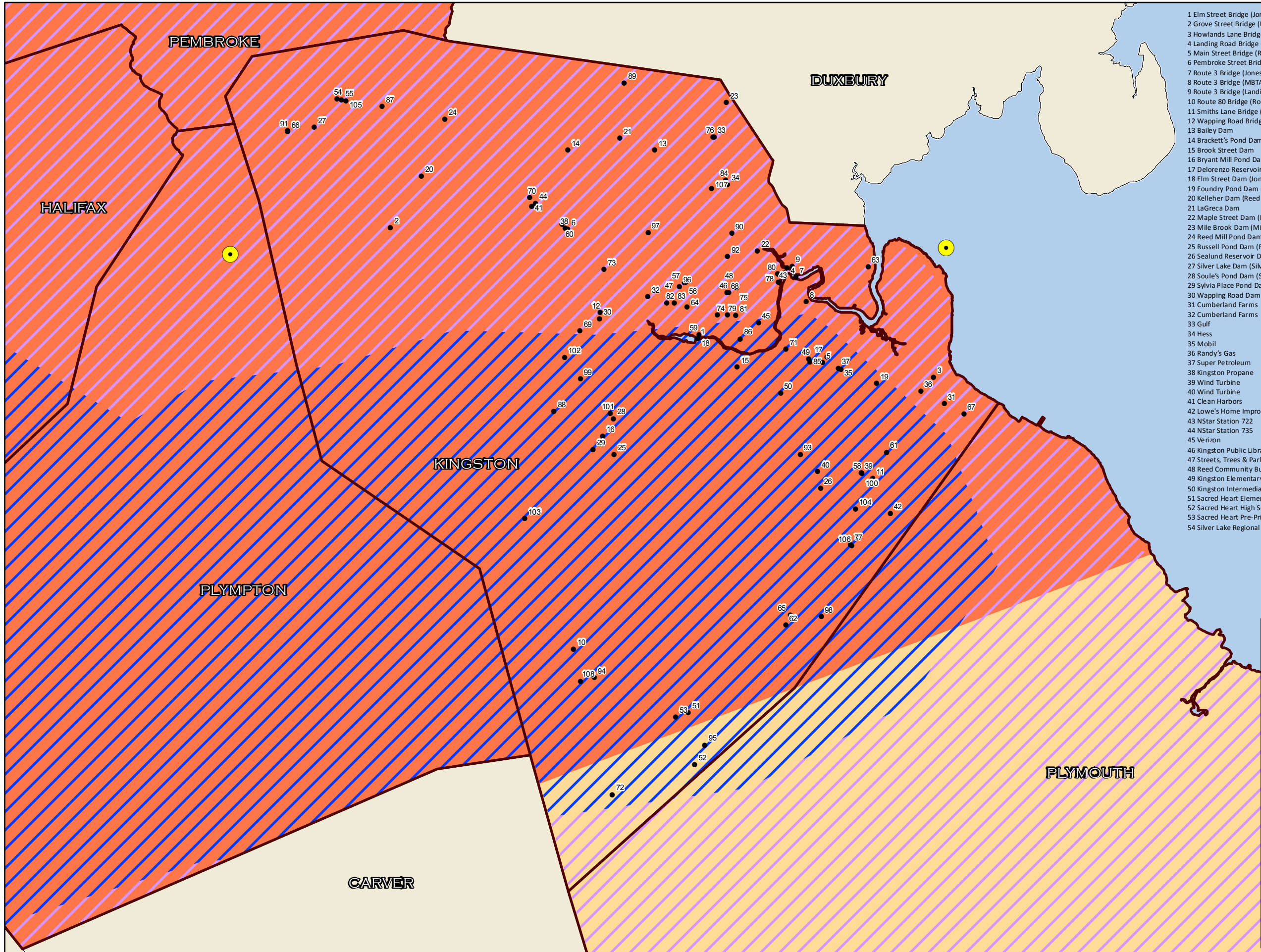


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	DECIDUOUS FOREST
	CONIFEROUS UPLAND FOREST
	MIXED DECIDUOUS & CONIFEROUS
	PITCH PINE & SCRUB OAK
	CRITICAL FACILITIES
	OCPC REGION


OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: MEMA, OCPC, MASSGIS,
 TOWN OF KINGSTON
 SEPTEMBER 2012

EARTHQUAKE & LANDSLIDE - KINGSTON



- | | |
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EARTHQUAKES
 EARTHQUAKES

LANDSLIDE INCIDENCE AND SUSCEPTIBILITY
 LOW INCIDENCE
 MODERATE SUSCEPTIBILITY / LOW INCIDENCE

PEAK GROUND ACCELERATION
 ZONE 3
 ZONE 4

CRITICAL FACILITIES
 CRITICAL FACILITIES

OCPC REGION
 OCPC REGION

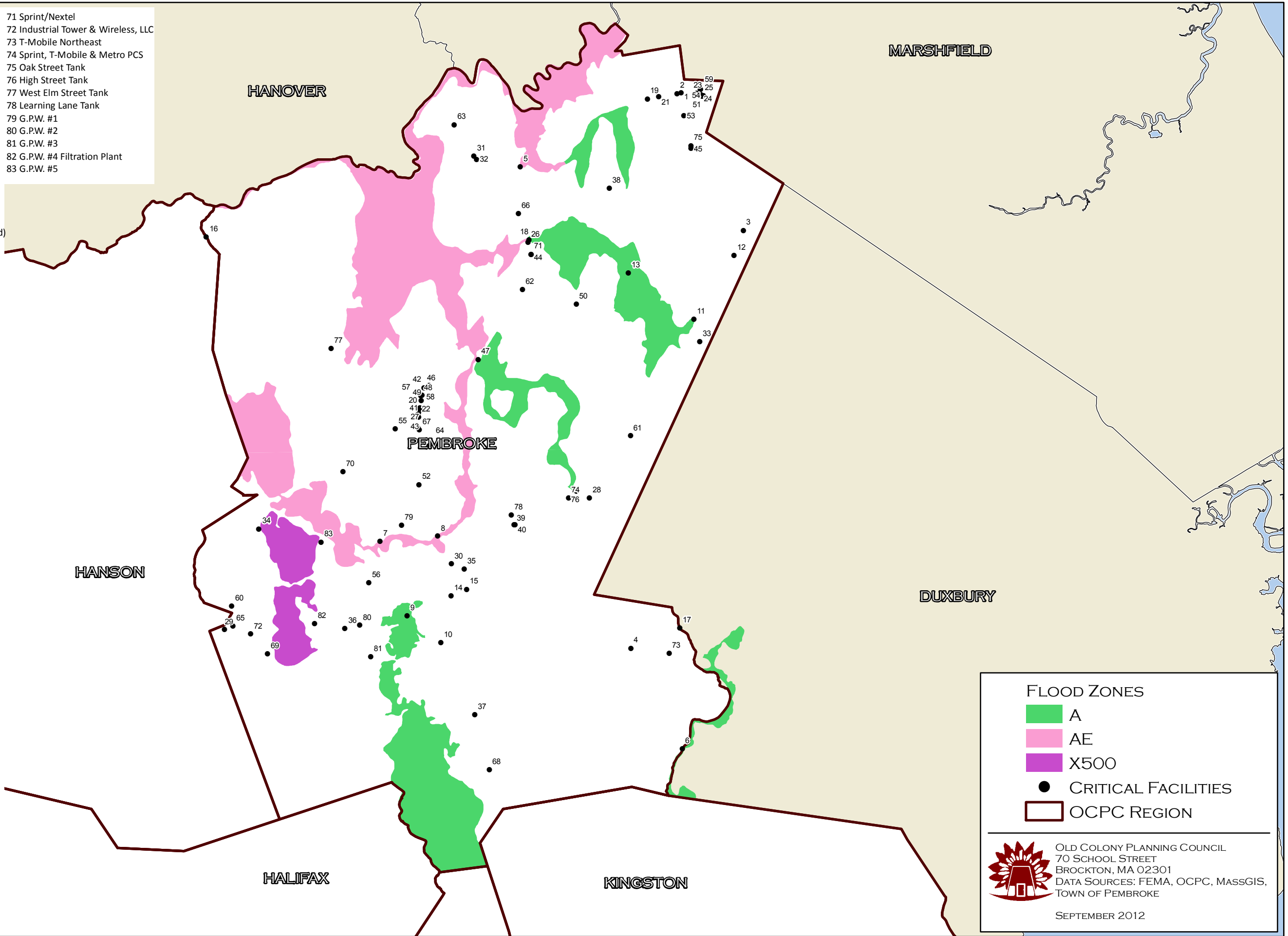
OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF KINGSTON
 SEPTEMBER 2012

FLOOD AND SLOSH - PEMBROKE



- 1 Route 3 NB Bridge (Church Street)
- 2 Route 3 SB Bridge (Church Street)
- 3 Arnold Reservoir Dam (Arnold Reservoir)
- 4 Hill Pond Dam (Hill Pond)
- 5 Iacabucci Dam
- 6 Lower Chandler Pond Dam (Lower Chandler Pond)
- 7 Mill Pond/Furnace Pond Dam (Mill Pond)
- 8 Mill Pond Upper Dam (Mill Pond)
- 9 Monroe Street Bog East Dam (Monroe Street Bog)
- 10 Monroe Street Bog West Dam (Monroe Street Bog)
- 11 Pleasant Street Pond Dam (Pleasant Street Pond)
- 12 Randall Pond Dam (Randall Pond)
- 13 Stump Pond Dam (Stump Pond)
- 14 Stumpy Pond Lower Dam (Stumpy Pond)
- 15 Stumpy Pond Upper Dam (Stumpy Pond)
- 16 Trout Pond Dam (Trout Pond)
- 17 Upper Chandler Pond Dam (Upper Chandler Pond)
- 18 Washington Street Pond Dam (Washington Street Pond)
- 19 Stop & Shop
- 20 Cumberland Farms
- 21 Mobil
- 22 Firehouse Gas
- 23 Mobil
- 24 Gulf
- 25 Shell
- 26 Sunoco
- 27 Pembroke Public Library
- 28 Lydia Drake Library
- 29 Cobb Library
- 30 Hobomock Arena
- 31 St. Thecla's Church
- 32 Bethel Chapel
- 33 North Pembroke Community Club
- 34 Department of Public Works
- 35 Recycling Center
- 36 Bryantville Elementary School
- 37 Pembroke Community Middle School
- 38 North Pembroke Elementary School
- 39 Pembroke High School
- 40 Hobomock Elementary School
- 41 Pembroke Council on Aging
- 42 Town Hall
- 43 Pembroke Center Fire Station
- 44 North Pembroke Fire Station
- 45 Pembroke Hospital
- 46 Police Station
- 47 Allen B. Sherman
- 48 Community Nursery Kindergarten
- 49 Center Pre-School & Child Care
- 50 Kids Time Preschool & Daycare, Inc.
- 51 The Magical Years Early Learning Center, Inc.
- 52 Little Neighbors Early Childhood Center
- 53 Kidbridge Learning Centers, LLC
- 54 Bright Horizons Early Education & Child Care
- 55 Here We Grow Day Care, Inc.
- 56 Early Bird Academy, Inc.
- 57 First Church in Pembroke
- 58 Pembroke Historical Society
- 59 North River Community Church
- 60 Bryantville United Methodist Church
- 61 Pembroke Assembly of God
- 62 Adah F. Hall House
- 63 Quaker Meeting House
- 64 Pembroke Housing Authority
- 65 USPS Bryantville Office
- 66 USPS N. Pembroke Office
- 67 USPS Pembroke Office
- 68 New England Villages
- 69 Road to Responsibility
- 70 American Towers, Inc.

- 71 Sprint/Nextel
- 72 Industrial Tower & Wireless, LLC
- 73 T-Mobile Northeast
- 74 Sprint, T-Mobile & Metro PCS
- 75 Oak Street Tank
- 76 High Street Tank
- 77 West Elm Street Tank
- 78 Learning Lane Tank
- 79 G.P.W. #1
- 80 G.P.W. #2
- 81 G.P.W. #3
- 82 G.P.W. #4 Filtration Plant
- 83 G.P.W. #5



FLOOD ZONES

- A
- AE
- X500
- CRITICAL FACILITIES
- OCPC REGION

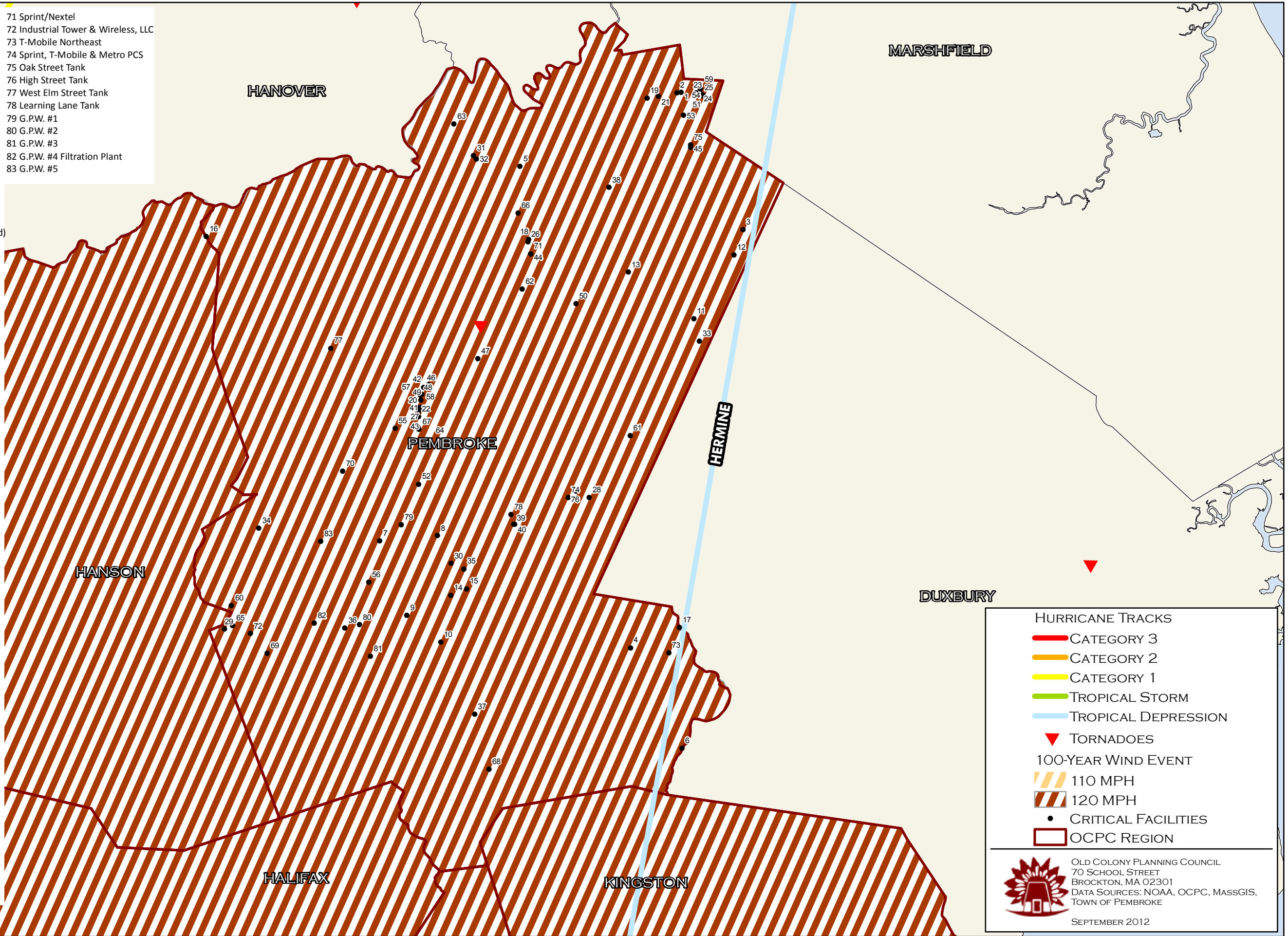
OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: FEMA, OCPC, MASSGIS,
 TOWN OF PEMBROKE
 SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - PEMBROKE



- 1 Route 3 NB Bridge (Church Street)
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- 32 Bethel Chapel
- 33 North Pembroke Community Club
- 34 Department of Public Works
- 35 Recycling Center
- 36 Bryantville Elementary School
- 37 Pembroke Community Middle School
- 38 North Pembroke Elementary School
- 39 Pembroke High School
- 40 Hobomock Elementary School
- 41 Pembroke Council on Aging
- 42 Town Hall
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- 62 Adah F. Hall House
- 63 Quaker Meeting House
- 64 Pembroke Housing Authority
- 65 USPS Bryantville Office
- 66 USPS N. Pembroke Office
- 67 USPS Pembroke Office
- 68 New England Villages
- 69 Road to Responsibility
- 70 American Towers, Inc.

- 71 Sprint/Nextel
- 72 Industrial Tower & Wireless, LLC
- 73 T-Mobile Northeast
- 74 Sprint, T-Mobile & Metro PCS
- 75 Oak Street Tank
- 76 High Street Tank
- 77 West Elm Street Tank
- 78 Learning Lane Tank
- 79 G.P.W. #1
- 80 G.P.W. #2
- 81 G.P.W. #3
- 82 G.P.W. #4 Filtration Plant
- 83 G.P.W. #5



HURRICANE TRACKS

- CATEGORY 3
- CATEGORY 2
- CATEGORY 1
- TROPICAL STORM
- TROPICAL DEPRESSION
- ▼ TORNADOES

100-YEAR WIND EVENT

- 110 MPH
- 120 MPH
- CRITICAL FACILITIES
- OCPC REGION

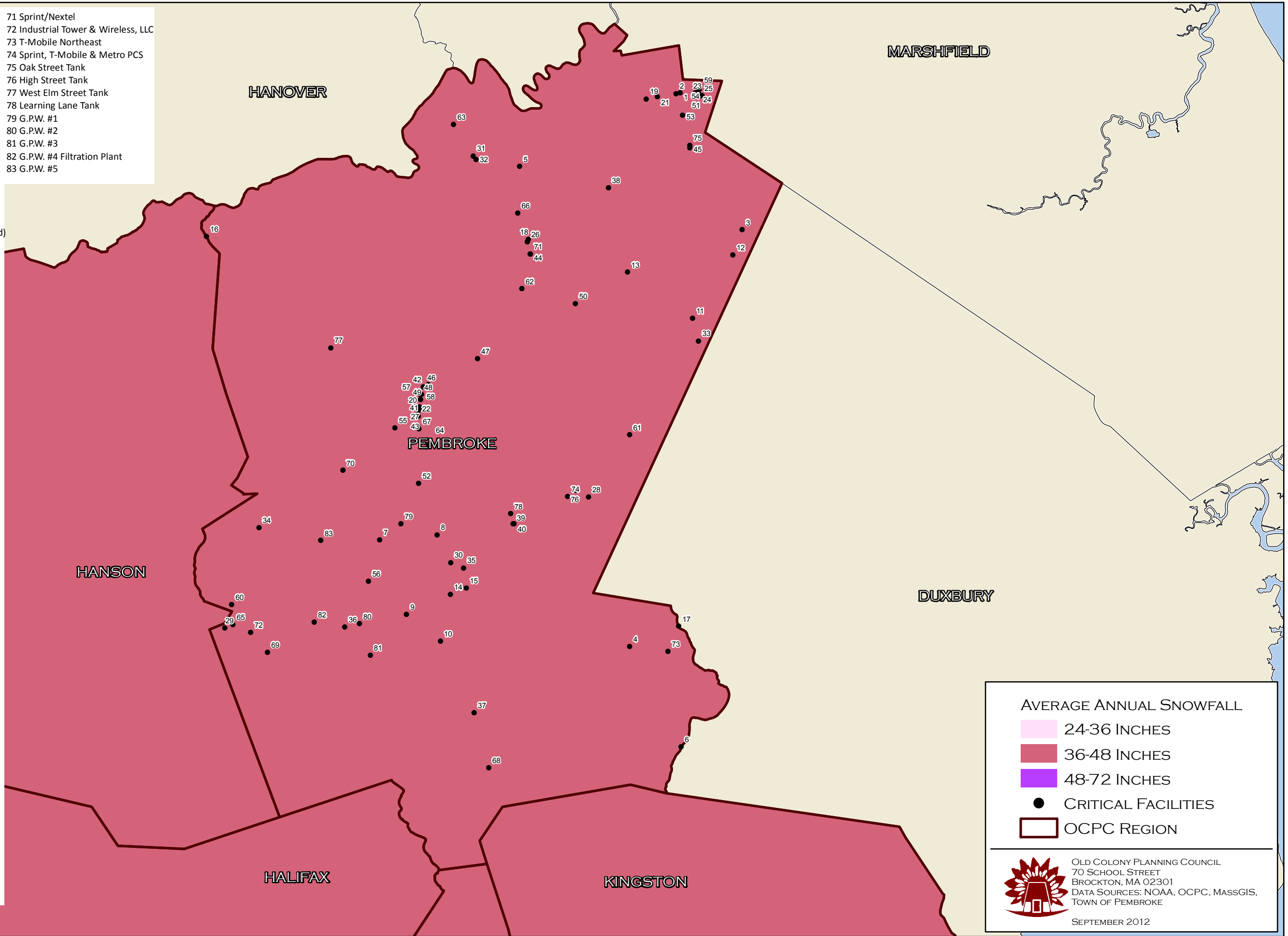
OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
BROCKTON, MA 02301
DATA SOURCES: NOAA, OCPC, MASSGIS,
TOWN OF PEMBROKE
SEPTEMBER 2012

AVERAGE ANNUAL SNOWFALL - PEMBROKE



- 1 Route 3 NB Bridge (Church Street)
- 2 Route 3 SB Bridge (Church Street)
- 3 Arnold Reservoir Dam (Arnold Reservoir)
- 4 Hill Pond Dam (Hill Pond)
- 5 Iacabucci Dam
- 6 Lower Chandler Pond Dam (Lower Chandler Pond)
- 7 Mill Pond/Furnace Pond Dam (Mill Pond)
- 8 Mill Pond Upper Dam (Mill Pond)
- 9 Monroe Street Bog East Dam (Monroe Street Bog)
- 10 Monroe Street Bog West Dam (Monroe Street Bog)
- 11 Pleasant Street Pond Dam (Pleasant Street Pond)
- 12 Randall Pond Dam (Randall Pond)
- 13 Stump Pond Dam (Stump Pond)
- 14 Stumpy Pond Lower Dam (Stumpy Pond)
- 15 Stumpy Pond Upper Dam (Stumpy Pond)
- 16 Trout Pond Dam (Trout Pond)
- 17 Upper Chandler Pond Dam (Upper Chandler Pond)
- 18 Washington Street Pond Dam (Washington Street Pond)
- 19 Stop & Shop
- 20 Cumberland Farms
- 21 Mobil
- 22 Firehouse Gas
- 23 Mobil
- 24 Gulf
- 25 Shell
- 26 Sunoco
- 27 Pembroke Public Library
- 28 Lydia Drake Library
- 29 Cobb Library
- 30 Hobomock Arena
- 31 St. Thecla's Church
- 32 Bethel Chapel
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- 73 T-Mobile Northeast
- 74 Sprint, T-Mobile & Metro PCS
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- 76 High Street Tank
- 77 West Elm Street Tank
- 78 Learning Lane Tank
- 79 G.P.W. #1
- 80 G.P.W. #2
- 81 G.P.W. #3
- 82 G.P.W. #4 Filtration Plant
- 83 G.P.W. #5



AVERAGE ANNUAL SNOWFALL

- 24-36 INCHES
- 36-48 INCHES
- 48-72 INCHES
- CRITICAL FACILITIES
- OCPC REGION

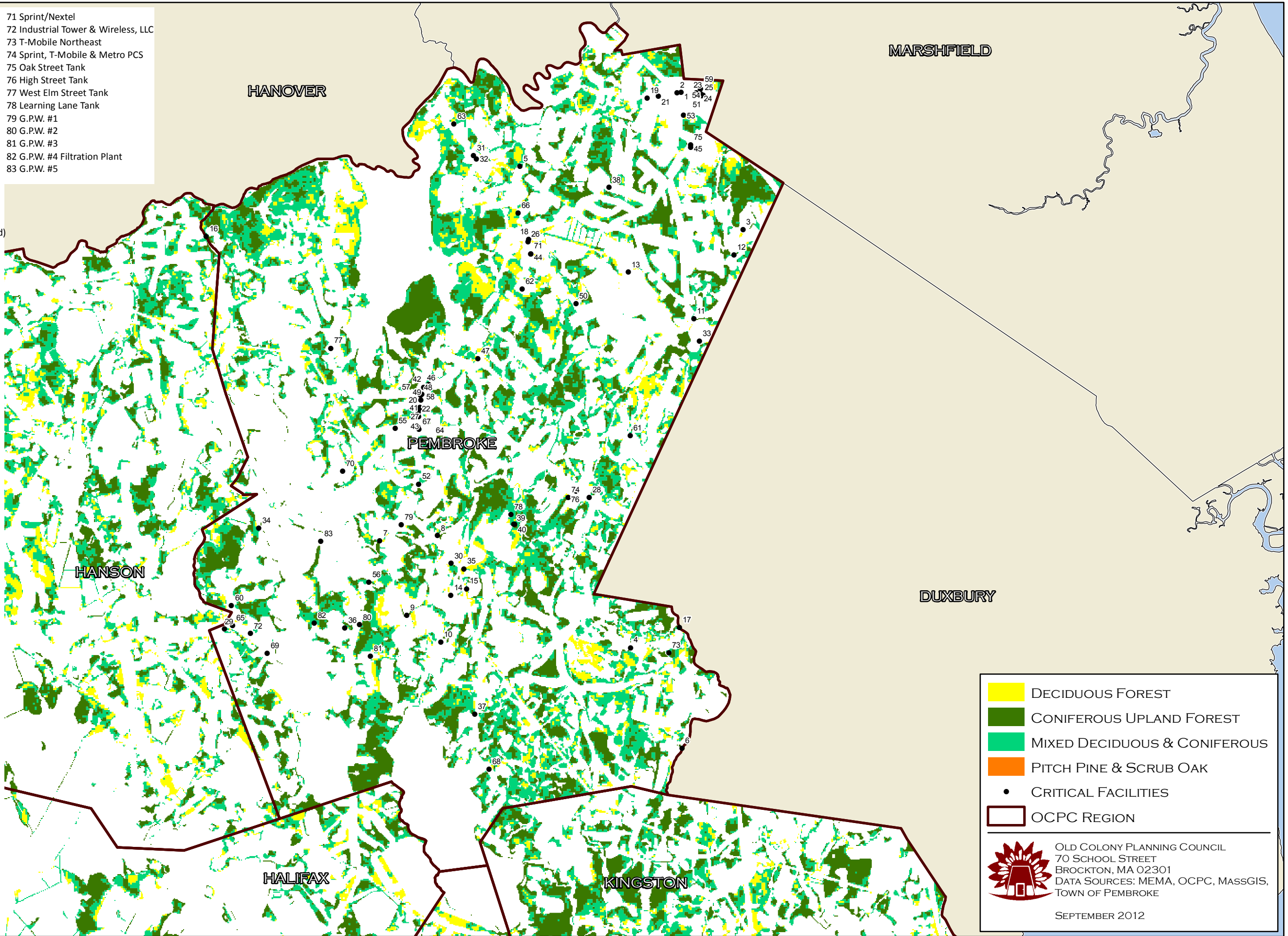
OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF PEMBROKE
 SEPTEMBER 2012

WILDFIRE SUSCEPTIBILITY - PEMBROKE




- 1 Route 3 NB Bridge (Church Street)
- 2 Route 3 SB Bridge (Church Street)
- 3 Arnold Reservoir Dam (Arnold Reservoir)
- 4 Hill Pond Dam (Hill Pond)
- 5 Iacabucci Dam
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- 24 Gulf
- 25 Shell
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- 80 G.P.W. #2
- 81 G.P.W. #3
- 82 G.P.W. #4 Filtration Plant
- 83 G.P.W. #5



- DECIDUOUS FOREST
- CONIFEROUS UPLAND FOREST
- MIXED DECIDUOUS & CONIFEROUS
- PITCH PINE & SCRUB OAK
- CRITICAL FACILITIES
- OCPC REGION

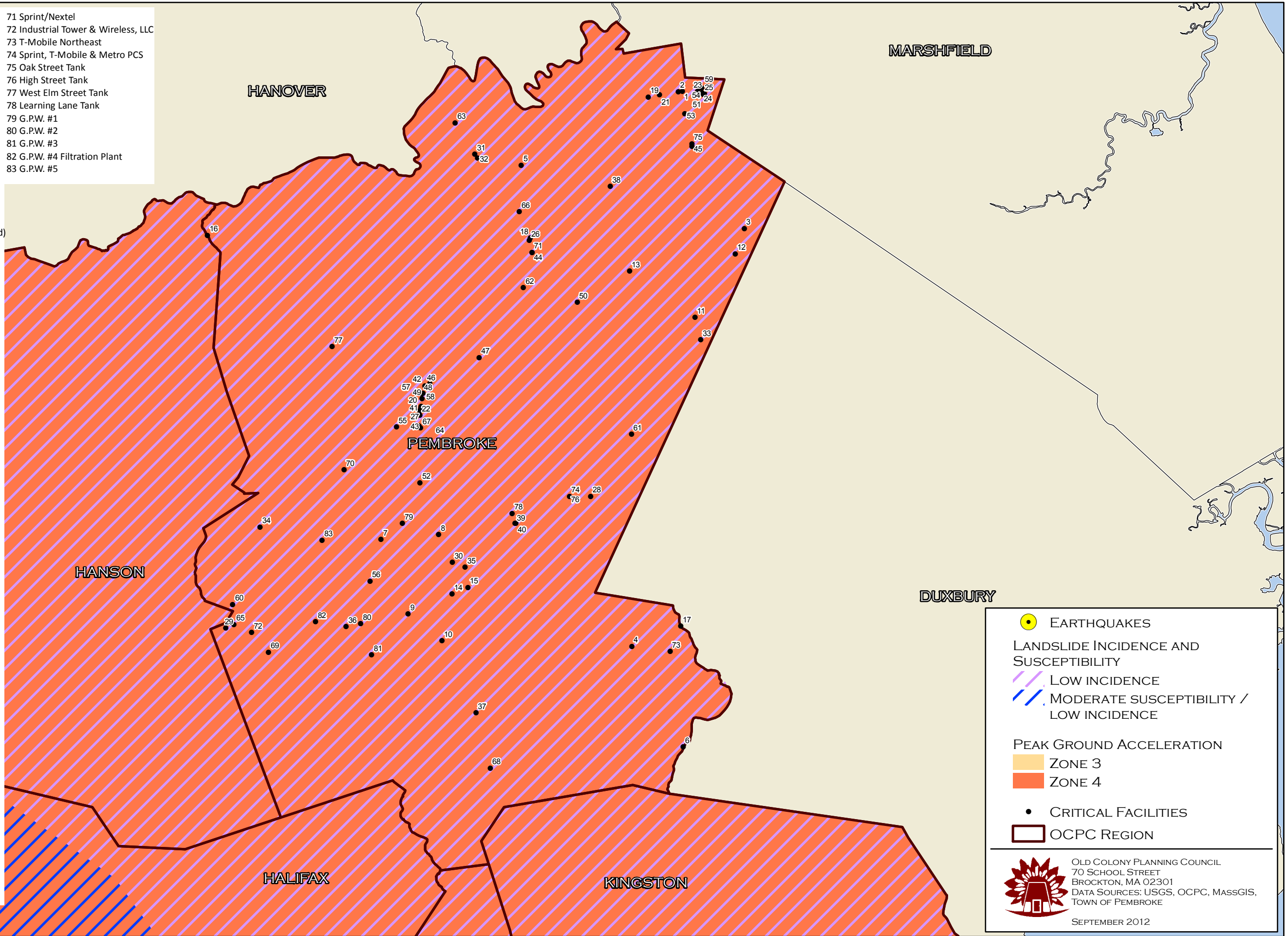

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: MEMA, OCPC, MASSGIS,
 TOWN OF PEMBROKE
 SEPTEMBER 2012

EARTHQUAKE & LANDSLIDE - PEMBROKE



- 1 Route 3 NB Bridge (Church Street)
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- 3 Arnold Reservoir Dam (Arnold Reservoir)
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- 80 G.P.W. #2
- 81 G.P.W. #3
- 82 G.P.W. #4 Filtration Plant
- 83 G.P.W. #5



- EARTHQUAKES

LANDSLIDE INCIDENCE AND SUSCEPTIBILITY

- ▨ LOW INCIDENCE
- ▨ MODERATE SUSCEPTIBILITY / LOW INCIDENCE

PEAK GROUND ACCELERATION

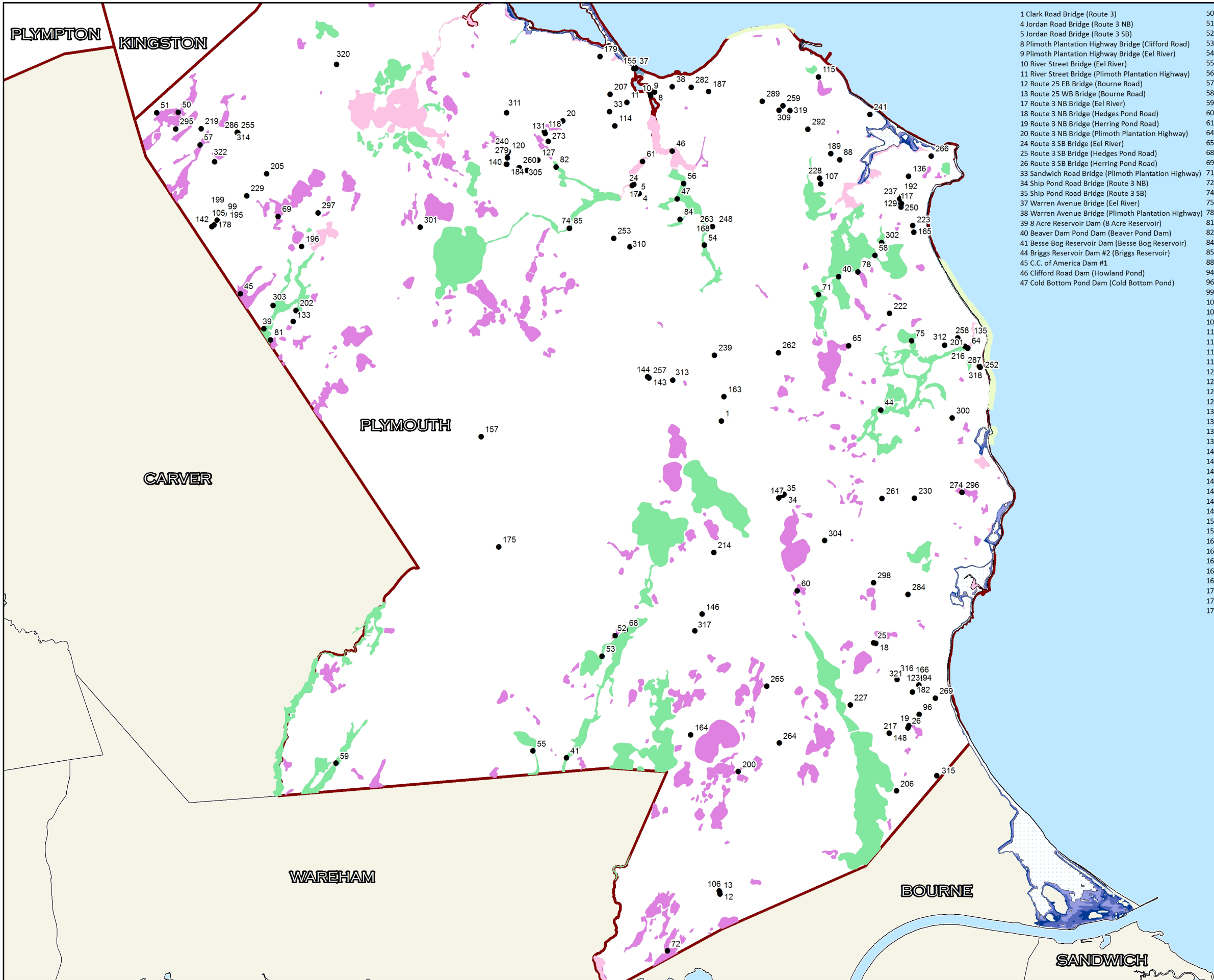
- ZONE 3
- ZONE 4

- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF PEMBROKE

SEPTEMBER 2012

FLOOD ZONES AND SLOSH - PLYMOUTH



- 1 Clark Road Bridge (Route 3)
- 4 Jordan Road Bridge (Route 3 NB)
- 5 Jordan Road Bridge (Route 3 SB)
- 8 Plimoth Plantation Highway Bridge (Clifford Road)
- 9 Plimoth Plantation Highway Bridge (Eel River)
- 10 River Street Bridge (Eel River)
- 11 River Street Bridge (Plimoth Plantation Highway)
- 12 Route 25 EB Bridge (Bourne Road)
- 13 Route 25 WB Bridge (Bourne Road)
- 17 Route 3 NB Bridge (Eel River)
- 18 Route 3 NB Bridge (Hedges Pond Road)
- 19 Route 3 NB Bridge (Herring Pond Road)
- 20 Route 3 NB Bridge (Plimoth Plantation Highway)
- 24 Route 3 SB Bridge (Eel River)
- 25 Route 3 SB Bridge (Hedges Pond Road)
- 26 Route 3 SB Bridge (Herring Pond Road)
- 33 Sandwich Road Bridge (Plimoth Plantation Highway)
- 34 Ship Pond Road Bridge (Route 3 NB)
- 35 Ship Pond Road Bridge (Route 3 SB)
- 37 Warren Avenue Bridge (Eel River)
- 38 Warren Avenue Bridge (Plimoth Plantation Highway)
- 39 8 Acre Reservoir Dam (8 Acre Reservoir)
- 40 Beaver Dam Pond Dam (Beaver Pond Dam)
- 41 Besse Bog Reservoir Dam (Besse Bog Reservoir)
- 44 Briggs Reservoir Dam #2 (Briggs Reservoir)
- 45 C.C. of America Dam #1
- 46 Clifford Road Dam (Howland Pond)
- 47 Cold Bottom Pond Dam (Cold Bottom Pond)
- 50 Darby Pond Outlet (Darby Pond)
- 51 Darby Pond West Outlet (Darby Pond)
- 52 Eagle Hill Reservoir Dam (Eagle Reservoir)
- 53 Fawn Pond Dam (Fawn Pond)
- 54 Federal Pond Dam (Federal Pond)
- 55 Five Mile Pond Dam (Five Mile Pond)
- 56 Forge Pond Dam (Forge Pond)
- 57 Four Mile Brook Dam (Four Mile Brook)
- 58 Fresh Pond Dam (Fresh Pond)
- 59 Frogfoot Reservoir Dam (Frogfoot Brook)
- 60 Grassy Pond Dam (Grassy Pond)
- 61 Hayden Pond Dam (Hayden Pond)
- 64 Indian Brook Dam (Indian Brook Pond)
- 65 Island Pond Dam (Island Pond)
- 68 Kennard Reservoir Dam (Kennard Reservoir)
- 69 Little Grassy Pond Dam (Little Grassy Pond)
- 71 Long Island Pond Dam (Long Island Pond)
- 72 Nye Bog Reservoir Dam (Nye Bog Reservoir)
- 74 Saw Mill Pond Dam (Saw Mill Pond)
- 75 Shallow Pond Dam (Shallow Pond)
- 78 The Arm Pond Dam (The Arm Pond)
- 81 United Cape Cod Cranberry Co. #1 Dam (United Cape Cod Pond)
- 82 Warren Wells Pond Dam (Warren Wells Pond)
- 84 Whipple Reservoir Dam (Whipple Reservoir)
- 85 Frogfoot Reservoir Dam (Frogfoot Reservoir)
- 88 7-Eleven
- 94 Mobil
- 96 Sunoco
- 99 Citgo
- 105 Volta Oil
- 106 NSTAR Station 715
- 107 NSTAR Station 721
- 114 Entergy Training Facility
- 115 Pilgrim Nuclear Power Station
- 117 Churchill's Oil & Gas Facility
- 118 Churchill's Propane Storage Facility
- 120 DCR John Armstrong Ice Rink
- 123 First Student Transportation
- 127 Trugreen Chemlawn
- 129 Manomet Branch Library
- 131 Department of Public Works
- 133 Federal Furnace Elementary School
- 135 Indian Brook Elementary School
- 136 Manomet Elementary School
- 140 Plymouth Community Intermediate School
- 142 Plymouth Public School Admin.
- 143 Plymouth South High School
- 144 Plymouth South Middle School
- 146 South Elementary School
- 147 The Baird Center
- 148 The New Testament Christian School
- 155 Plimoth Plantation
- 157 Myles Standish State Forest
- 163 Fire Station #3
- 164 Fire Station #4
- 165 Fire Station #5
- 166 Fire Station #6
- 168 DCR Fire Tower
- 175 MCI Plymouth
- 178 Plymouth Municipal Airport
- 179 Emeritus at Plymouth Beach
- 182 Bright Ideas Childcare
- 184 Community Care ASP
- 187 Garden of Knowledge
- 189 Kinder Kollege
- 192 Leaping Frogs Preschool
- 195 Miss JoAnne's Bright Beginnings
- 196 Pinewood School of Montessori
- 199 South Shore Community Action Council
- 200 The Pond's Child Care Center, Inc.
- 201 Tiny Town Children's Center
- 202 Woodside School
- 205 Blessed Kateri Roman Catholic Church
- 206 Capeway Baptist Church
- 207 Chiltonville Congregational Church
- 214 Faunce Memorial Church
- 216 Manomet Bible Church
- 217 New Testament Church
- 219 Plymouth Rock Bible Church
- 222 Plymouth United Pentecostal Church
- 223 St. Bonaventure Roman Catholic Church
- 227 Long Pond Village
- 228 Mayflower Mobile Estates
- 229 Pinehurst Mobile Home Village
- 230 Plymouth Commons Co-op
- 237 USPS Manomet Office
- 239 USPS Pinehills Office
- 240 USPS Plymouth Postal Facility
- 241 USPS White Horse Beach Office
- 248 Plymouth County Public Safety Comms.
- 250 Verizon Manomet CO
- 252 AT&T Wireless Cell Site
- 253 AT&T Wireless, Metro PCS, & Sprint Cell Site
- 255 Sprint PCS Wireless Cell Site
- 257 T-Mobile Wireless Cell Site
- 258 TowerCo Wireless Cell Site
- 259 Verizon Wireless Cell Site
- 260 Verizon Wireless Cell Site
- 261 Verizon Wireless Cell Site
- 262 Pinehills Water Company
- 263 Pinehills Water Supply Tank
- 264 Plymouth Water Company Well 1
- 265 Plymouth Water Company Well 2
- 266 Ocean Point WWTP
- 269 White Cliffs Condominiums WWTP
- 273 Plymouth Wastewater Treatment Plant
- 274 Cedarville BPS (inactive)
- 279 Long Pond Road PS
- 282 Pine Hills BPS
- 284 Cedarville Reservoir
- 286 Harrington Standpipe
- 287 Indian Hill Reservoir
- 289 North Pinehills Reservoir
- 292 South Pinehills Reservoir
- 295 Darby Pond Well
- 296 Ellisville Well
- 297 Federal Furnace Road Well
- 298 John Holmes/ Savory Pond Well
- 300 Ship Pond Well
- 301 South Pond Wells
- 302 Wannos Pond Well
- 303-305 Cell Phone Towers
- 309-322 Cell Phone Towers

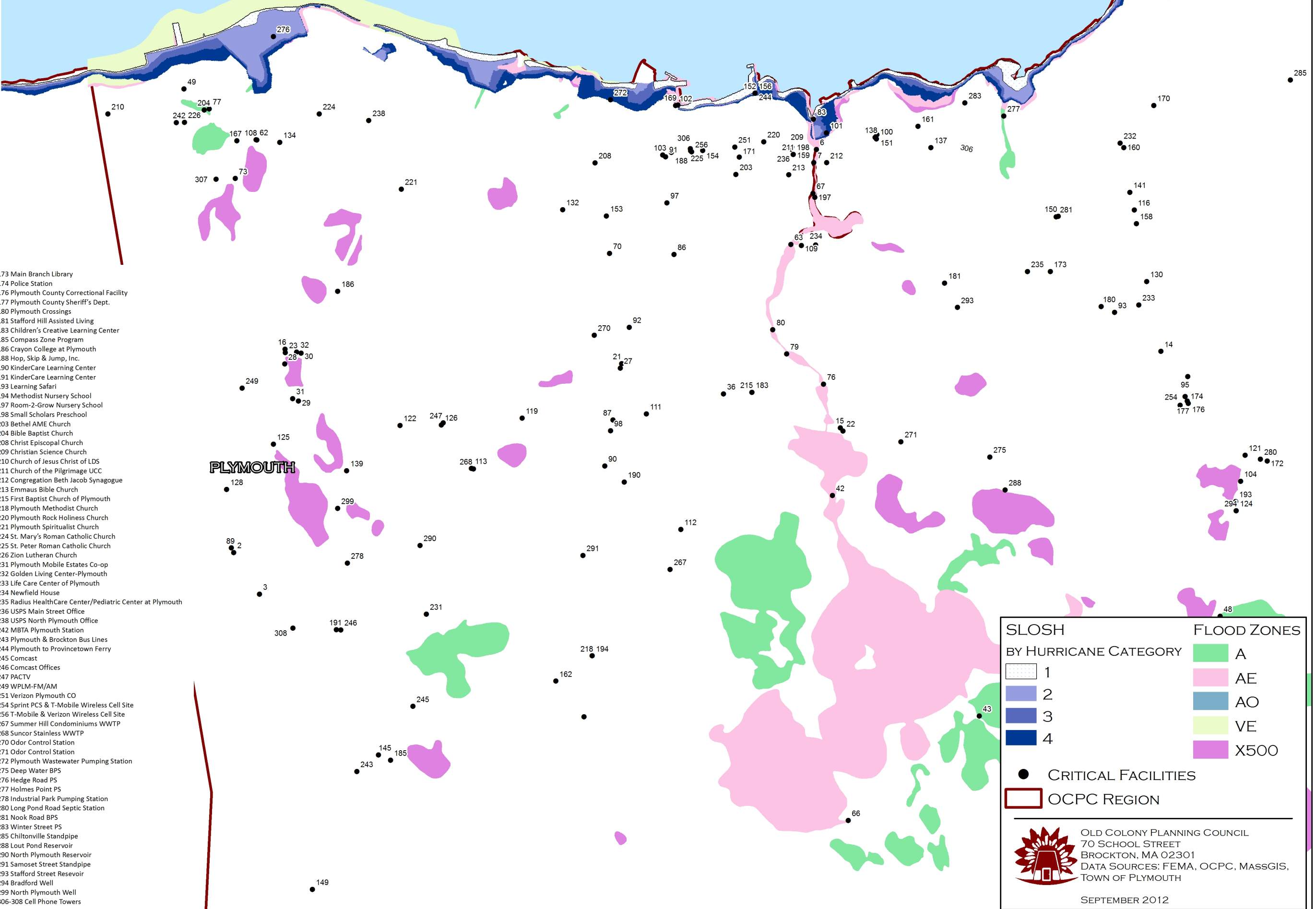
SLOSH	FLOOD ZONES
BY HURRICANE CATEGORY	
1	A
2	AE
3	AO
4	VE
	X500
● CRITICAL FACILITIES	
OCPC REGION	

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: FEMA, OCPC, MASSGIS,
 TOWN OF PLYMOUTH
 SEPTEMBER 2012

FLOOD ZONES AND SLOSH - PLYMOUTH (DOWNTOWN)



- 2 Commerce Way Bridge (P.A. Landers Access Road)
- 3 Commerce Way Bridge (Route 44)
- 6 Main Street Bridge (Town Brook)
- 7 Market Street Bridge (Town Brook)
- 14 Route 3 Bridge (Long Pond Road)
- 15 Route 3 NB Bridge (Billington Street)
- 16 Route 3 NB Bridge (Cherry Street)
- 21 Route 3 NB Bridge (Route 44)
- 22 Route 3 SB Bridge (Billington Street)
- 23 Route 3 SB Bridge (Cherry Street)
- 27 Route 3 SB Bridge (Route 44)
- 28 Route 44 Bridge (Cherry Street)
- 29 Route 44 EB Bridge (Industrial Park Road)
- 30 Route 44 EB Bridge (Route 3)
- 31 Route 44 WB Bridge (Industrial Park Road)
- 32 Route 44 WB Bridge (Route 3)
- 36 Summer Street Bridge (Route 3)
- 42 Billington Sea Dam (Billington Sea)
- 43 Briggs Reservoir Dam #1 (Briggs Reservoir)
- 48 Cooks Pond Dam (Cooks Pond)
- 49 Cordage Pond Dam (Cordage Pond)
- 62 Hedges Pond Dam (Hedges Pond)
- 63 Holmes Playground Dam (Town Brook)
- 66 Jackson Brook Dam (Jackson Brook)
- 67 Jenny (Arms House) Pond Dam (Arms House Pond)
- 70 Little Hedge Pond Dam (Little Hedge Pond)
- 73 Russell Pond Dam (Russell Mill Pond)
- 76 Standish Mill Pond Dam (Standish Mill Pond)
- 77 Store Pond Dam (Store Pond)
- 79 Town Brook #1 Dam (Town Brook)
- 80 Town Brook #2 Dam (Town Brook)
- 83 Water Street Dam (Town Brook)
- 86 Sawmill Pond Dam (Sawmill Pond)
- 87 Spectra Energy
- 89 Mobil
- 90 Cumberland Farms
- 91 Gulf
- 92 Hess Express
- 93 Mayflower Service Station
- 95 Shell
- 97 Route 44 Gasoline
- 98 Mobil
- 100 Super Petroleum
- 101 Town Brook Service Station
- 102 Town Wharf Enterprises
- 103 Mobil
- 104 Dunlaps Oil Service
- 108 NSTAR Station 734
- 109 NSTAR Station 736
- 110 NSTAR Station 737
- 111 NSTAR Station 742
- 112 Plymouth Regional Service Center
- 113 Entergy Offices / JIC
- 116 Entergy EOC
- 119 Comcast
- 121 Dunlap's Propane Storage Facility
- 122 Electropolishing Systems
- 124 First Student Transportation
- 125 T.L. Edwards, Inc.
- 126 Tech Etch
- 128 Waste Management of MA, Inc.
- 130 MassDOT District 5 Substation
- 132 Cold Spring Elementary School
- 134 Hedge Elementary School
- 137 Mount Pleasant School
- 138 Nathaniel Morton Elementary School
- 139 Pilgrim Academy
- 141 Plymouth North High School
- 145 Rising Tide Public Charter School
- 149 West Elementary School
- 150 Council on Aging
- 151 Town Hall
- 152 Mayflower II
- 153 National Forefathers Monument
- 154 Pilgrim Hall Museum
- 156 Plymouth Rock
- 158 Plymouth Trial Court
- 159 Plymouth County District Attorney
- 160 American Medical Response
- 161 Fire Station #1
- 162 Fire Station #2
- 167 Fire Station #7
- 169 Harbormaster
- 170 Jordan Hospital
- 171 Department of Public Works
- 172 Department of Public Works



- 173 Main Branch Library
- 174 Police Station
- 176 Plymouth County Correctional Facility
- 177 Plymouth County Sheriff's Dept.
- 180 Plymouth Crossings
- 181 Stafford Hill Assisted Living
- 183 Children's Creative Learning Center
- 185 Compass Zone Program
- 186 Crayon College at Plymouth
- 188 Hop, Skip & Jump, Inc.
- 190 KinderCare Learning Center
- 191 KinderCare Learning Center
- 193 Learning Safari
- 194 Methodist Nursery School
- 197 Room-2-Grow Nursery School
- 198 Small Scholars Preschool
- 203 Bethel AME Church
- 204 Bible Baptist Church
- 208 Christ Episcopal Church
- 209 Christian Science Church
- 210 Church of Jesus Christ of LDS
- 211 Church of the Pilgrimage UCC
- 212 Congregation Beth Jacob Synagogue
- 213 Emmaus Bible Church
- 215 First Baptist Church of Plymouth
- 218 Plymouth Methodist Church
- 220 Plymouth Rock Holiness Church
- 221 Plymouth Spiritualist Church
- 224 St. Mary's Roman Catholic Church
- 225 St. Peter Roman Catholic Church
- 226 Zion Lutheran Church
- 231 Plymouth Mobile Estates Co-op
- 232 Golden Living Center-Plymouth
- 233 Life Care Center of Plymouth
- 234 Newfield House
- 235 Radius HealthCare Center/Pediatric Center at Plymouth
- 236 USPS Main Street Office
- 238 USPS North Plymouth Office
- 242 MBTA Plymouth Station
- 243 Plymouth & Brockton Bus Lines
- 244 Plymouth to Provincetown Ferry
- 245 Comcast
- 246 Comcast Offices
- 247 PACTV
- 249 WPLM-FM/AM
- 251 Verizon Plymouth CO
- 254 Sprint PCS & T-Mobile Wireless Cell Site
- 256 T-Mobile & Verizon Wireless Cell Site
- 267 Summer Hill Condominiums WWTP
- 268 Suncor Stainless WWTP
- 270 Odor Control Station
- 271 Odor Control Station
- 272 Plymouth Wastewater Pumping Station
- 275 Deep Water BPS
- 276 Hedge Road PS
- 277 Holmes Point PS
- 278 Industrial Park Pumping Station
- 280 Long Pond Road Septic Station
- 281 Nook Road BPS
- 283 Winter Street PS
- 285 Chiltonville Standpipe
- 288 Lout Pond Reservoir
- 290 North Plymouth Reservoir
- 291 Samoset Street Standpipe
- 293 Stafford Street Reservoir
- 294 Bradford Well
- 299 North Plymouth Well
- 306-308 Cell Phone Towers

SLOSH

BY HURRICANE CATEGORY

- 1
- 2
- 3
- 4

FLOOD ZONES

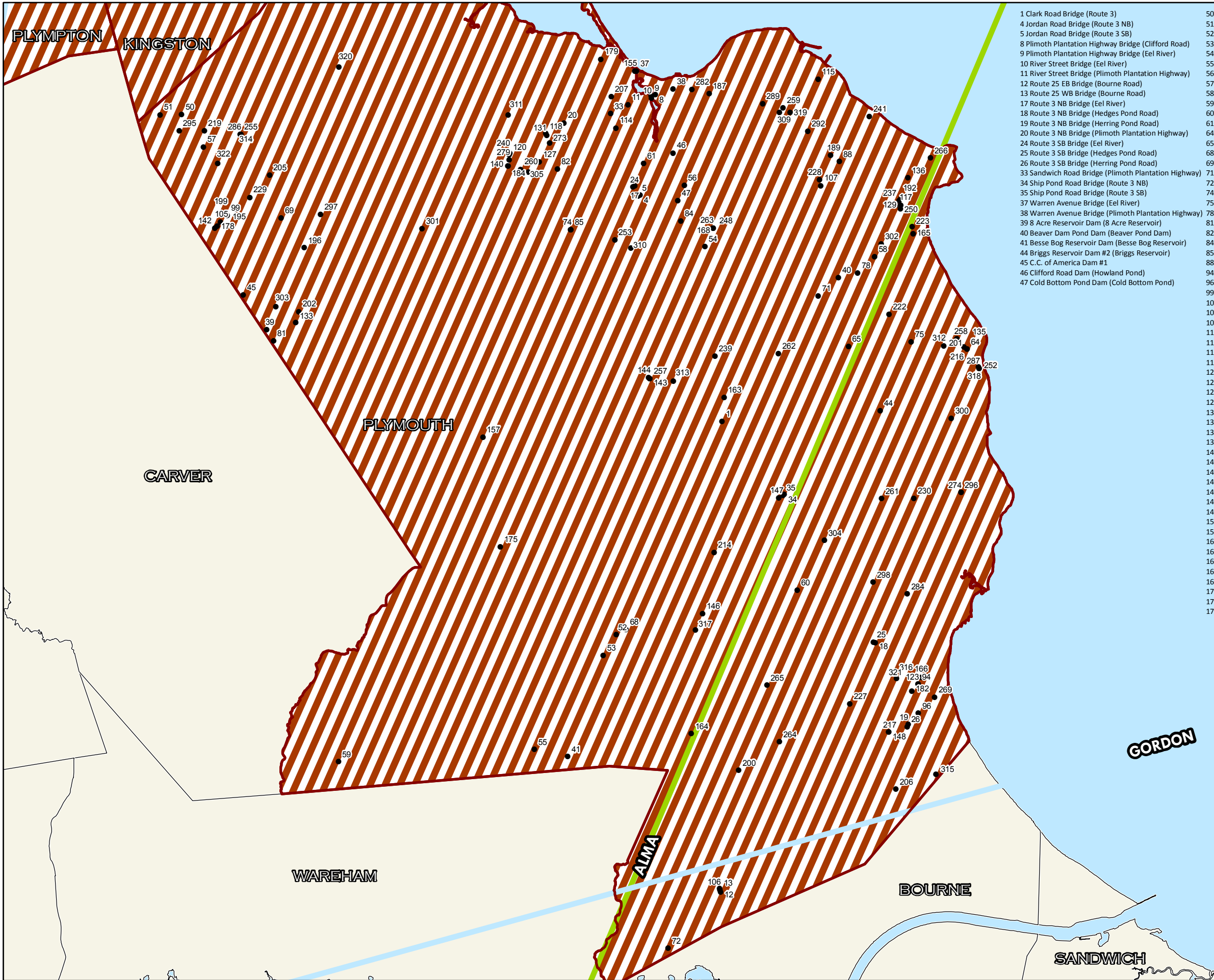
- A
- AE
- AO
- VE
- X500

- CRITICAL FACILITIES
- ▭ OCPC REGION

OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
BROCKTON, MA 02301
DATA SOURCES: FEMA, OCPC, MASSGIS,
TOWN OF PLYMOUTH

SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - PLYMOUTH



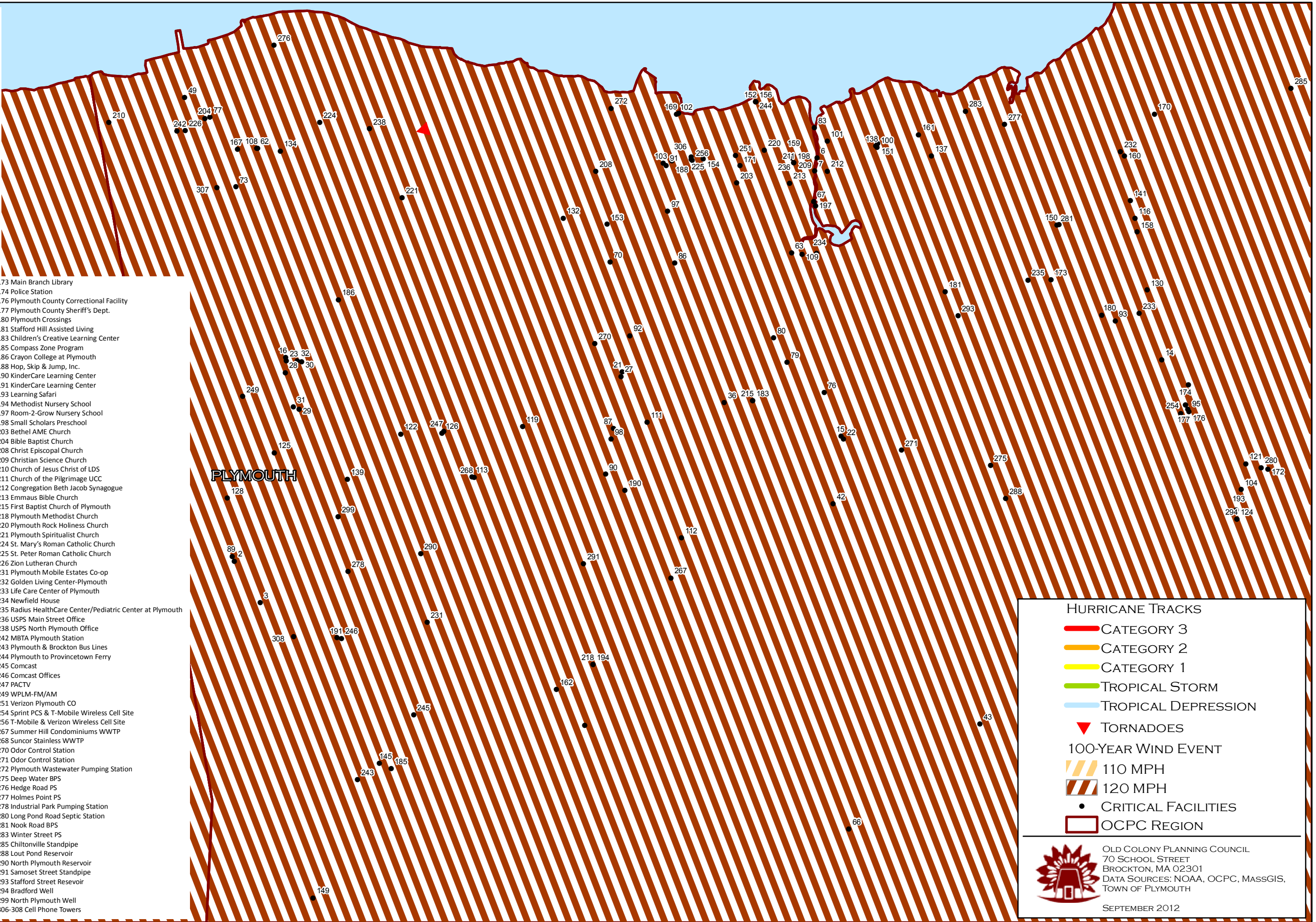
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- 4 Jordan Road Bridge (Route 3 NB)
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- 44 Briggs Reservoir Dam #2 (Briggs Reservoir)
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- 309-322 Cell Phone Towers

- HURRICANE TRACKS**
- CATEGORY 3
 - CATEGORY 2
 - CATEGORY 1
 - TROPICAL STORM
 - TROPICAL DEPRESSION
 - ▼ TORNADOES
- 100-YEAR WIND EVENT**
- 110 MPH
 - 120 MPH
- CRITICAL FACILITIES
 - OCPC REGION

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - PLYMOUTH (DOWNTOWN)



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- 27 Route 3 SB Bridge (Route 44)
- 28 Route 44 Bridge (Cherry Street)
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- 30 Route 44 EB Bridge (Route 3)
- 31 Route 44 WB Bridge (Industrial Park Road)
- 32 Route 44 WB Bridge (Route 3)
- 36 Summer Street Bridge (Route 3)
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- 76 Standish Mill Pond Dam (Standish Mill Pond)
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- 80 Town Brook #2 Dam (Town Brook)
- 83 Water Street Dam (Town Brook)
- 86 Sawmill Pond Dam (Sawmill Pond)
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- 89 Mobil
- 90 Cumberland Farms
- 91 Gulf
- 92 Hess Express
- 93 Mayflower Service Station
- 95 Shell
- 97 Route 44 Gasoline
- 98 Mobil
- 100 Super Petroleum
- 101 Town Brook Service Station
- 102 Town Wharf Enterprises
- 103 Mobil
- 104 Dunlaps Oil Service
- 108 NSTAR Station 734
- 109 NSTAR Station 736
- 110 NSTAR Station 737
- 111 NSTAR Station 742
- 112 Plymouth Regional Service Center
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- 116 Entergy EOC
- 119 Comcast
- 121 Dunlap's Propane Storage Facility
- 122 Electropolishing Systems
- 124 First Student Transportation
- 125 T.L. Edwards, Inc.
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- 128 Waste Management of MA, Inc.
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- 169 Harbormaster
- 170 Jordan Hospital
- 171 Department of Public Works
- 172 Department of Public Works



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- 293 Stafford Street Reservoir
- 294 Bradford Well
- 299 North Plymouth Well
- 306-308 Cell Phone Towers

HURRICANE TRACKS

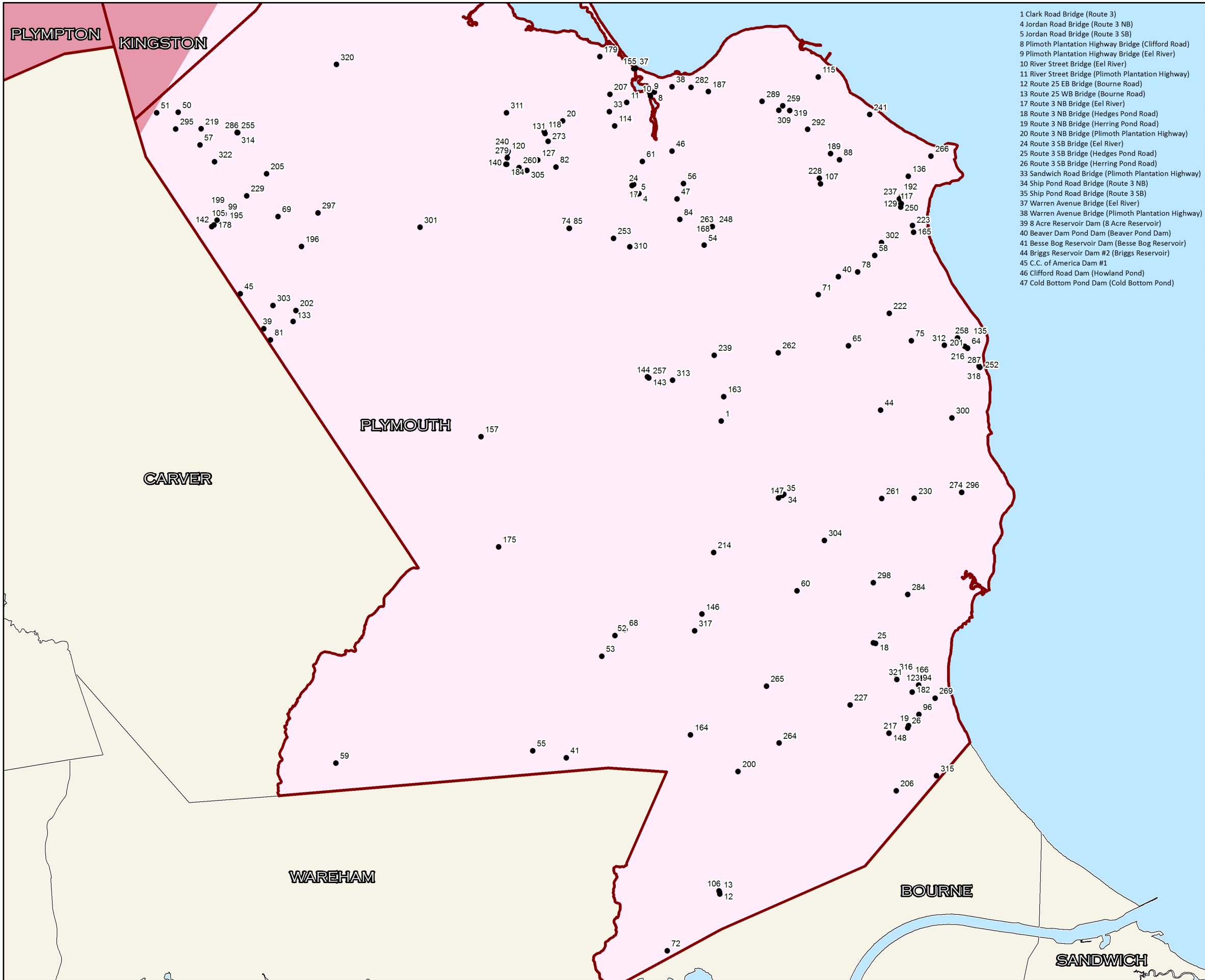
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OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF PLYMOUTH
 SEPTEMBER 2012

AVERAGE ANNUAL SNOWFALL - PLYMOUTH



- 1 Clark Road Bridge (Route 3)
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- 24-36 INCHES
- 36-48 INCHES
- 48-72 INCHES
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF PLYMOUTH
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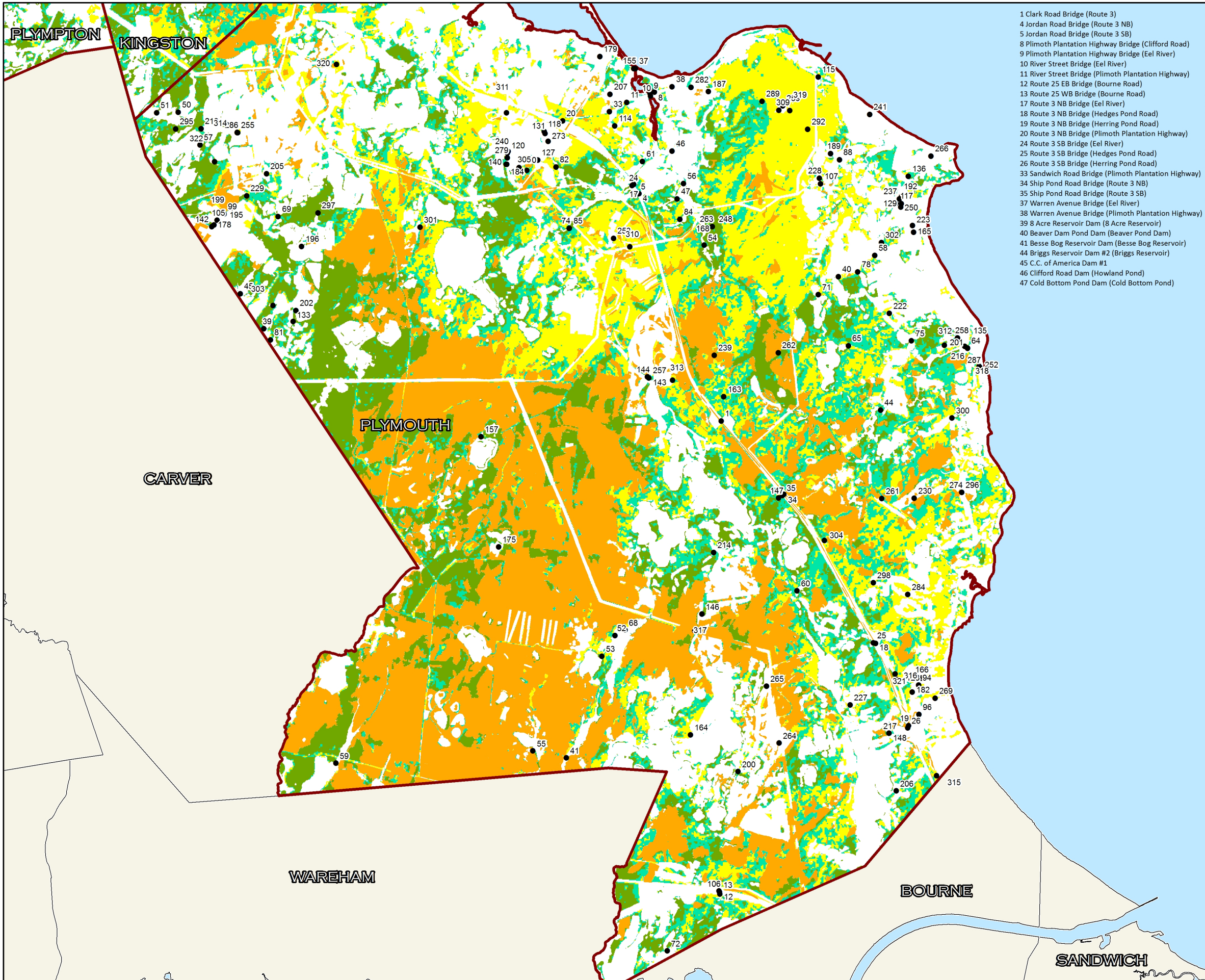
PLYMOUTH

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- 240 USPS Plymouth Postal Facility
- 241 USPS White Horse Beach Office
- 248 Plymouth County Public Safety Comms.
- 250 Verizon Manomet CO
- 252 AT&T Wireless Cell Site
- 253 AT&T Wireless, Metro PCS, & Sprint Cell Site
- 255 Sprint PCS Wireless Cell Site
- 257 T-Mobile Wireless Cell Site
- 258 TowerCo Wireless Cell Site
- 259 Verizon Wireless Cell Site
- 260 Verizon Wireless Cell Site
- 261 Verizon Wireless Cell Site
- 262 Pinehills Water Company
- 263 Pinehills Water Supply Tank
- 264 Plymouth Water Company Well 1
- 265 Plymouth Water Company Well 2
- 266 Ocean Point WWTP
- 269 White Cliffs Condominiums WWTP
- 273 Plymouth Wastewater Treatment Plant
- 274 Cedarville BPS (inactive)
- 279 Long Pond Road PS
- 282 Pine Hills BPS
- 284 Cedarville Reservoir
- 286 Harrington Standpipe
- 287 Indian Hill Reservoir
- 289 North Pinehills Reservoir
- 292 South Pinehills Reservoir
- 295 Darby Pond Well
- 296 Ellisville Well
- 297 Federal Furnace Road Well
- 298 John Holmes/ Savory Pond Well
- 300 Ship Pond Well
- 301 South Pond Wells
- 302 Wannos Pond Well
- 303-305 Cell Phone Towers
- 309-322 Cell Phone Towers

- DECIDUOUS FOREST
- CONIFEROUS UPLAND FOREST
- MIXED DECIDUOUS & CONIFEROUS
- PITCH PINE & SCRUB OAK
- CRITICAL FACILITIES
- OCPC REGION

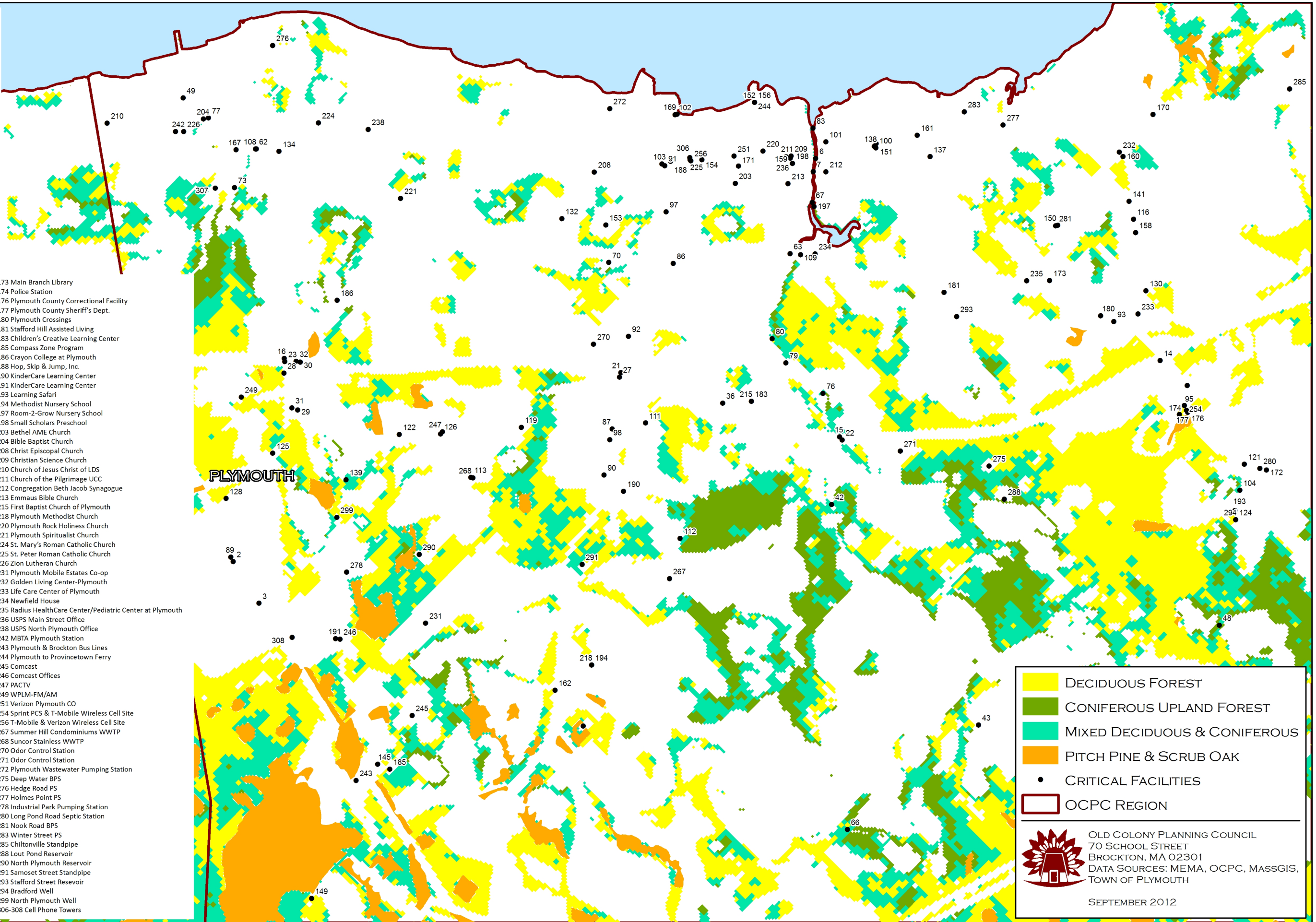


OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: MEMA, OCPC, MASSGIS,
 TOWN OF PLYMOUTH
 SEPTEMBER 2012

WILDFIRE SUSCEPTIBILITY - PLYMOUTH (DOWNTOWN)



- 2 Commerce Way Bridge (P.A. Landers Access Road)
- 3 Commerce Way Bridge (Route 44)
- 6 Main Street Bridge (Town Brook)
- 7 Market Street Bridge (Town Brook)
- 14 Route 3 Bridge (Long Pond Road)
- 15 Route 3 NB Bridge (Billington Street)
- 16 Route 3 NB Bridge (Cherry Street)
- 21 Route 3 NB Bridge (Route 44)
- 22 Route 3 SB Bridge (Billington Street)
- 23 Route 3 SB Bridge (Cherry Street)
- 27 Route 3 SB Bridge (Route 44)
- 28 Route 44 Bridge (Cherry Street)
- 29 Route 44 EB Bridge (Industrial Park Road)
- 30 Route 44 EB Bridge (Route 3)
- 31 Route 44 WB Bridge (Industrial Park Road)
- 32 Route 44 WB Bridge (Route 3)
- 36 Summer Street Bridge (Route 3)
- 42 Billington Sea Dam (Billington Sea)
- 43 Briggs Reservoir Dam #1 (Briggs Reservoir)
- 48 Cooks Pond Dam (Cooks Pond)
- 49 Cordage Pond Dam (Cordage Pond)
- 62 Hedges Pond Dam (Hedges Pond)
- 63 Holmes Playground Dam (Town Brook)
- 66 Jackson Brook Dam (Jackson Brook)
- 67 Jenny (Arms House) Pond Dam (Arms House Pond)
- 70 Little Hedge Pond Dam (Little Hedge Pond)
- 73 Russell Pond Dam (Russell Mill Pond)
- 76 Standish Mill Pond Dam (Standish Mill Pond)
- 77 Store Pond Dam (Store Pond)
- 79 Town Brook #1 Dam (Town Brook)
- 80 Town Brook #2 Dam (Town Brook)
- 83 Water Street Dam (Town Brook)
- 86 Sawmill Pond Dam (Sawmill Pond)
- 87 Spectra Energy
- 89 Mobil
- 90 Cumberland Farms
- 91 Gulf
- 92 Hess Express
- 93 Mayflower Service Station
- 95 Shell
- 97 Route 44 Gasoline
- 98 Mobil
- 100 Super Petroleum
- 101 Town Brook Service Station
- 102 Town Wharf Enterprises
- 103 Mobil
- 104 Dunlaps Oil Service
- 108 NSTAR Station 734
- 109 NSTAR Station 736
- 110 NSTAR Station 737
- 111 NSTAR Station 742
- 112 Plymouth Regional Service Center
- 113 Entergy Offices / JIC
- 116 Entergy EOC
- 119 Comcast
- 121 Dunlap's Propane Storage Facility
- 122 Electropolishing Systems
- 124 First Student Transportation
- 125 T.L. Edwards, Inc.
- 126 Tech Etch
- 128 Waste Management of MA, Inc.
- 130 MassDOT District 5 Substation
- 132 Cold Spring Elementary School
- 134 Hedge Elementary School
- 137 Mount Pleasant School
- 138 Nathaniel Morton Elementary School
- 139 Pilgrim Academy
- 141 Plymouth North High School
- 145 Rising Tide Public Charter School
- 149 West Elementary School
- 150 Council on Aging
- 151 Town Hall
- 152 Mayflower II
- 153 National Forefathers Monument
- 154 Pilgrim Hall Museum
- 156 Plymouth Rock
- 158 Plymouth Trial Court
- 159 Plymouth County District Attorney
- 160 American Medical Response
- 161 Fire Station #1
- 162 Fire Station #2
- 167 Fire Station #7
- 169 Harbormaster
- 170 Jordan Hospital
- 171 Department of Public Works
- 172 Department of Public Works



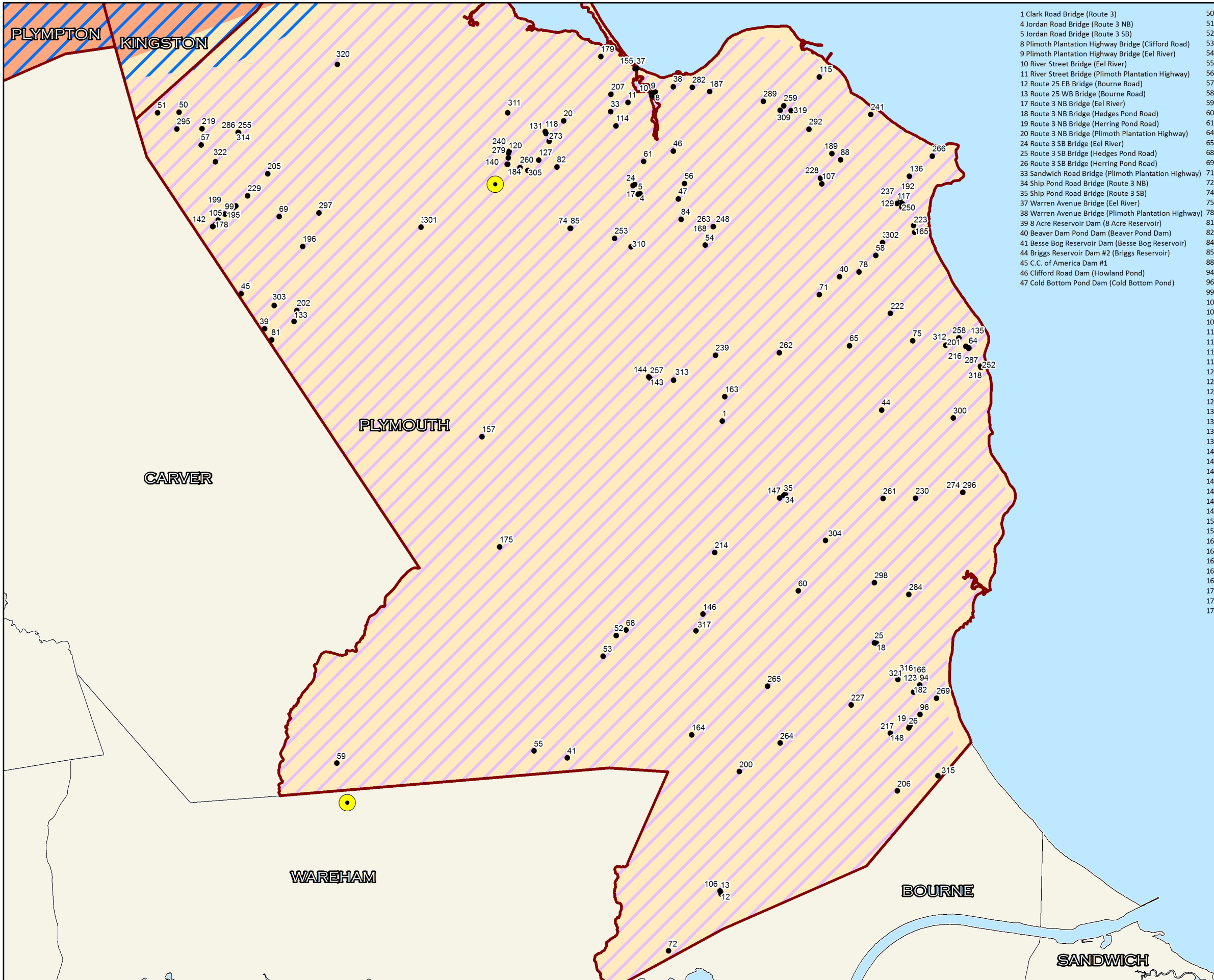
- 173 Main Branch Library
- 174 Police Station
- 176 Plymouth County Correctional Facility
- 177 Plymouth County Sheriff's Dept.
- 180 Plymouth Crossings
- 181 Stafford Hill Assisted Living
- 183 Children's Creative Learning Center
- 185 Compass Zone Program
- 186 Crayon College at Plymouth
- 188 Hop, Skip & Jump, Inc.
- 190 KinderCare Learning Center
- 191 KinderCare Learning Center
- 193 Learning Safari
- 194 Methodist Nursery School
- 197 Room-2-Grow Nursery School
- 198 Small Scholars Preschool
- 203 Bethel AME Church
- 204 Bible Baptist Church
- 208 Christ Episcopal Church
- 209 Christian Science Church
- 210 Church of Jesus Christ of LDS
- 211 Church of the Pilgrimage UCC
- 212 Congregation Beth Jacob Synagogue
- 213 Emmaus Bible Church
- 215 First Baptist Church of Plymouth
- 218 Plymouth Methodist Church
- 220 Plymouth Rock Holiness Church
- 221 Plymouth Spiritualist Church
- 224 St. Mary's Roman Catholic Church
- 225 St. Peter Roman Catholic Church
- 226 Zion Lutheran Church
- 231 Plymouth Mobile Estates Co-op
- 232 Golden Living Center-Plymouth
- 233 Life Care Center of Plymouth
- 234 Newfield House
- 235 Radius HealthCare Center/Pediatric Center at Plymouth
- 236 USPS Main Street Office
- 238 USPS North Plymouth Office
- 242 MBTA Plymouth Station
- 243 Plymouth & Brockton Bus Lines
- 244 Plymouth to Provincetown Ferry
- 245 Comcast
- 246 Comcast Offices
- 247 PACTV
- 249 WPLM-FM/AM
- 251 Verizon Plymouth CO
- 254 Sprint PCS & T-Mobile Wireless Cell Site
- 256 T-Mobile & Verizon Wireless Cell Site
- 267 Summer Hill Condominiums WWTP
- 268 Suncor Stainless WWTP
- 270 Odor Control Station
- 271 Odor Control Station
- 272 Plymouth Wastewater Pumping Station
- 275 Deep Water BPS
- 276 Hedge Road PS
- 277 Holmes Point PS
- 278 Industrial Park Pumping Station
- 280 Long Pond Road Septic Station
- 281 Nook Road BPS
- 283 Winter Street PS
- 285 Chiltonville Standpipe
- 288 Lout Pond Reservoir
- 290 North Plymouth Reservoir
- 291 Samoset Street Standpipe
- 293 Stafford Street Reservoir
- 294 Bradford Well
- 299 North Plymouth Well
- 306-308 Cell Phone Towers

- DECIDUOUS FOREST
- CONIFEROUS UPLAND FOREST
- MIXED DECIDUOUS & CONIFEROUS
- PITCH PINE & SCRUB OAK
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: MEMA, OCPC, MASSGIS,
 TOWN OF PLYMOUTH

SEPTEMBER 2012

EARTHQUAKE & LANDSLIDE - PLYMOUTH



- 1 Clark Road Bridge (Route 3)
- 4 Jordan Road Bridge (Route 3 NB)
- 5 Jordan Road Bridge (Route 3 SB)
- 8 Plimoth Plantation Highway Bridge (Clifford Road)
- 9 Plimoth Plantation Highway Bridge (Eel River)
- 10 River Street Bridge (Eel River)
- 11 River Street Bridge (Plimoth Plantation Highway)
- 12 Route 25 EB Bridge (Bourne Road)
- 13 Route 25 WB Bridge (Bourne Road)
- 17 Route 3 NB Bridge (Eel River)
- 18 Route 3 NB Bridge (Hedges Pond Road)
- 19 Route 3 NB Bridge (Herring Pond Road)
- 20 Route 3 NB Bridge (Plimoth Plantation Highway)
- 24 Route 3 SB Bridge (Eel River)
- 25 Route 3 SB Bridge (Hedges Pond Road)
- 26 Route 3 SB Bridge (Herring Pond Road)
- 33 Sandwich Road Bridge (Plimoth Plantation Highway)
- 34 Ship Pond Road Bridge (Route 3 NB)
- 35 Ship Pond Road Bridge (Route 3 SB)
- 37 Warren Avenue Bridge (Eel River)
- 38 Warren Avenue Bridge (Plimoth Plantation Highway)
- 39 8 Acre Reservoir Dam (8 Acre Reservoir)
- 40 Beaver Dam Pond Dam (Beaver Pond Dam)
- 41 Besse Bog Reservoir Dam (Besse Bog Reservoir)
- 44 Briggs Reservoir Dam #2 (Briggs Reservoir)
- 45 C.C. of America Dam #1
- 46 Clifford Road Dam (Howland Pond)
- 47 Cold Bottom Pond Dam (Cold Bottom Pond)
- 50 Darby Pond Outlet (Darby Pond)
- 51 Darby Pond West Outlet (Darby Pond)
- 52 Eagle Hill Reservoir Dam (Eagle Reservoir)
- 53 Fawn Pond Dam (Fawn Pond)
- 54 Federal Pond Dam (Federal Pond)
- 55 Five Mile Pond Dam (Five Mile Pond)
- 56 Forge Pond Dam (Forge Pond)
- 57 Four Mile Brook Dam (Four Mile Brook)
- 58 Fresh Pond Dam (Fresh Pond)
- 59 Frogfoot Reservoir Dam (Frogfoot Brook)
- 60 Grassy Pond Dam (Grassy Pond)
- 61 Hayden Pond Dam (Hayden Pond)
- 64 Indian Brook Dam (Indian Brook Pond)
- 65 Island Pond Dam (Island Pond)
- 68 Kennard Reservoir Dam (Kennard Reservoir)
- 69 Little Grassy Pond Dam (Little Grassy Pond)
- 71 Long Island Pond Dam (Long Island Pond)
- 72 Nye Bog Reservoir Dam (Nye Bog Reservoir)
- 74 Saw Mill Pond Dam (Saw Mill Pond)
- 75 Shallow Pond Dam (Shallow Pond)
- 78 The Arm Pond Dam (The Arm Pond)
- 81 United Cape Cod Cranberry Co. #1 Dam (United Cape Cod Pond)
- 82 Warren Wells Pond Dam (Warren Wells Pond)
- 84 Whipple Reservoir Dam (Whipple Reservoir)
- 85 Frogfoot Reservoir Dam (Frogfoot Reservoir)
- 88 7-Eleven
- 94 Mobil
- 96 Sunoco
- 99 Citgo
- 105 Volta Oil
- 106 NSTAR Station 715
- 107 NSTAR Station 721
- 114 Entergy Training Facility
- 115 Pilgrim Nuclear Power Station
- 117 Churchill's Oil & Gas Facility
- 118 Churchill's Propane Storage Facility
- 120 DCR John Armstrong Ice Rink
- 123 First Student Transportation
- 127 Trugreen Chemlawn
- 129 Manomet Branch Library
- 131 Department of Public Works
- 133 Federal Furnace Elementary School
- 135 Indian Brook Elementary School
- 136 Manomet Elementary School
- 140 Plymouth Community Intermediate School
- 142 Plymouth Public School Admin.
- 143 Plymouth South High School
- 144 Plymouth South Middle School
- 146 South Elementary School
- 147 The Baird Center
- 148 The New Testament Christian School
- 155 Plimoth Plantation
- 157 Myles Standish State Forest
- 163 Fire Station #3
- 164 Fire Station #4
- 165 Fire Station #5
- 166 Fire Station #6
- 168 DCR Fire Tower
- 175 MCI Plymouth
- 178 Plymouth Municipal Airport
- 179 Emeritus at Plymouth Beach
- 182 Bright Ideas Childcare
- 184 Community Care ASP
- 187 Garden of Knowledge
- 189 Kinder Kollege
- 192 Leaping Frogs Preschool
- 195 Miss JoAnne's Bright Beginnings
- 196 Pinewood School of Montessori
- 199 South Shore Community Action Council
- 200 The Pond's Child Care Center, Inc.
- 201 Tiny Town Children's Center
- 202 Woodside School
- 205 Blessed Kateri Roman Catholic Church
- 206 Capeway Baptist Church
- 207 Chiltonville Congregational Church
- 214 Faunce Memorial Church
- 216 Manomet Bible Church
- 217 New Testament Church
- 219 Plymouth Rock Bible Church
- 222 Plymouth United Pentecostal Church
- 223 St. Bonaventura Roman Catholic Church
- 227 Long Pond Village
- 228 Mayflower Mobile Estates
- 229 Pinehurst Mobile Home Village
- 230 Plymouth Commons Co-op
- 237 USPS Manomet Office
- 239 USPS Pinehills Office
- 240 USPS Plymouth Postal Facility
- 241 USPS White Horse Beach Office
- 248 Plymouth County Public Safety Comms.
- 250 Verizon Manomet CO
- 252 AT&T Wireless Cell Site
- 253 AT&T Wireless, Metro PCS, & Sprint Cell Site
- 255 Sprint PCS Wireless Cell Site
- 257 T-Mobile Wireless Cell Site
- 258 TowerCo Wireless Cell Site
- 259 Verizon Wireless Cell Site
- 260 Verizon Wireless Cell Site
- 261 Verizon Wireless Cell Site
- 262 Pinehills Water Company
- 263 Pinehills Water Supply Tank
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- 298 John Holmes/ Savory Pond Well
- 300 Ship Pond Well
- 301 South Pond Wells
- 302 Wannos Pond Well
- 303-305 Cell Phone Towers
- 309-322 Cell Phone Towers

EARTHQUAKES
 EARTHQUAKES

LANDSLIDE INCIDENCE AND SUSCEPTIBILITY
 LOW INCIDENCE
 MODERATE SUSCEPTIBILITY / LOW INCIDENCE

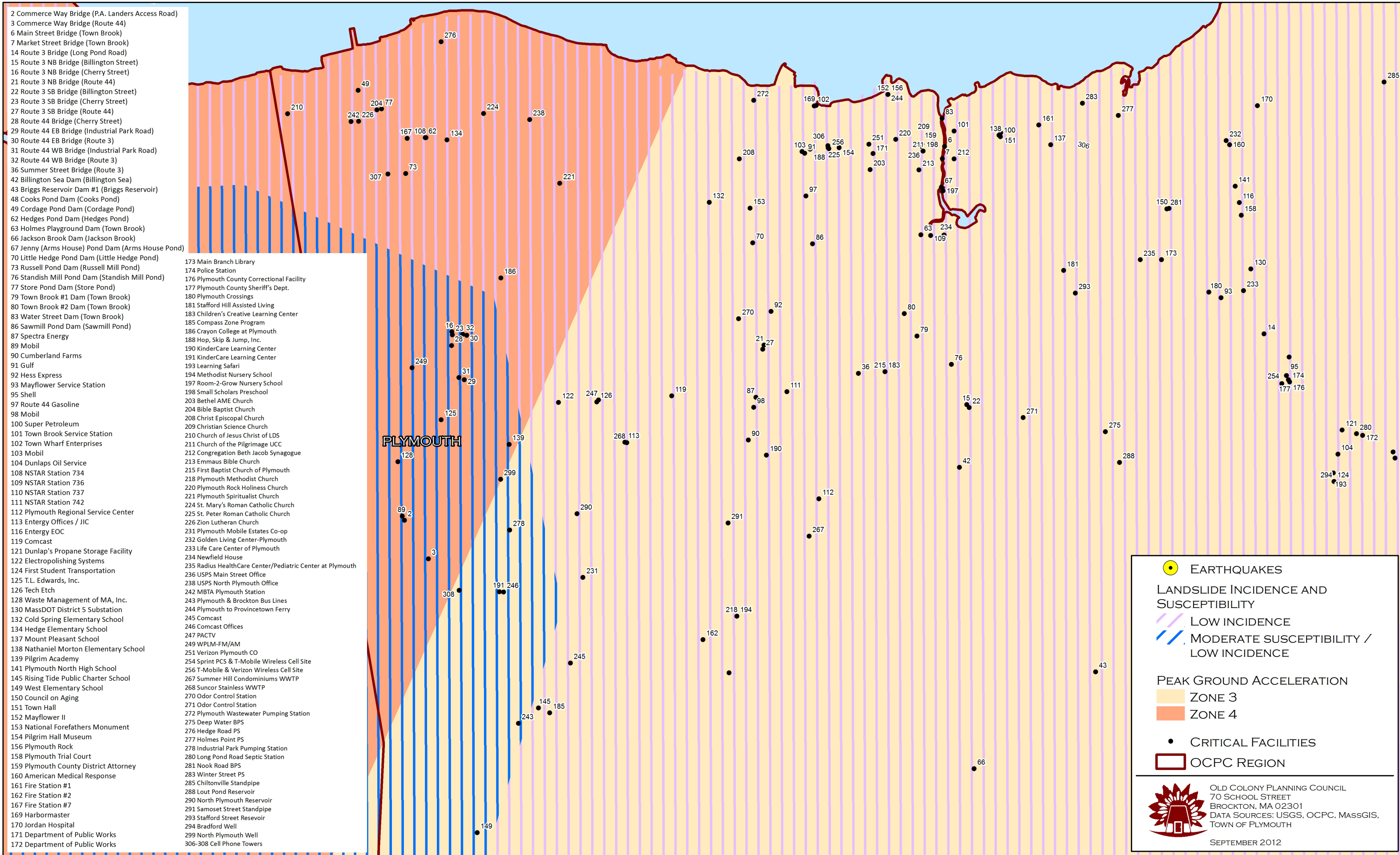
PEAK GROUND ACCELERATION
 ZONE 3
 ZONE 4

CRITICAL FACILITIES
 CRITICAL FACILITIES

OCPC REGION
 OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF PLYMOUTH
 SEPTEMBER 2012

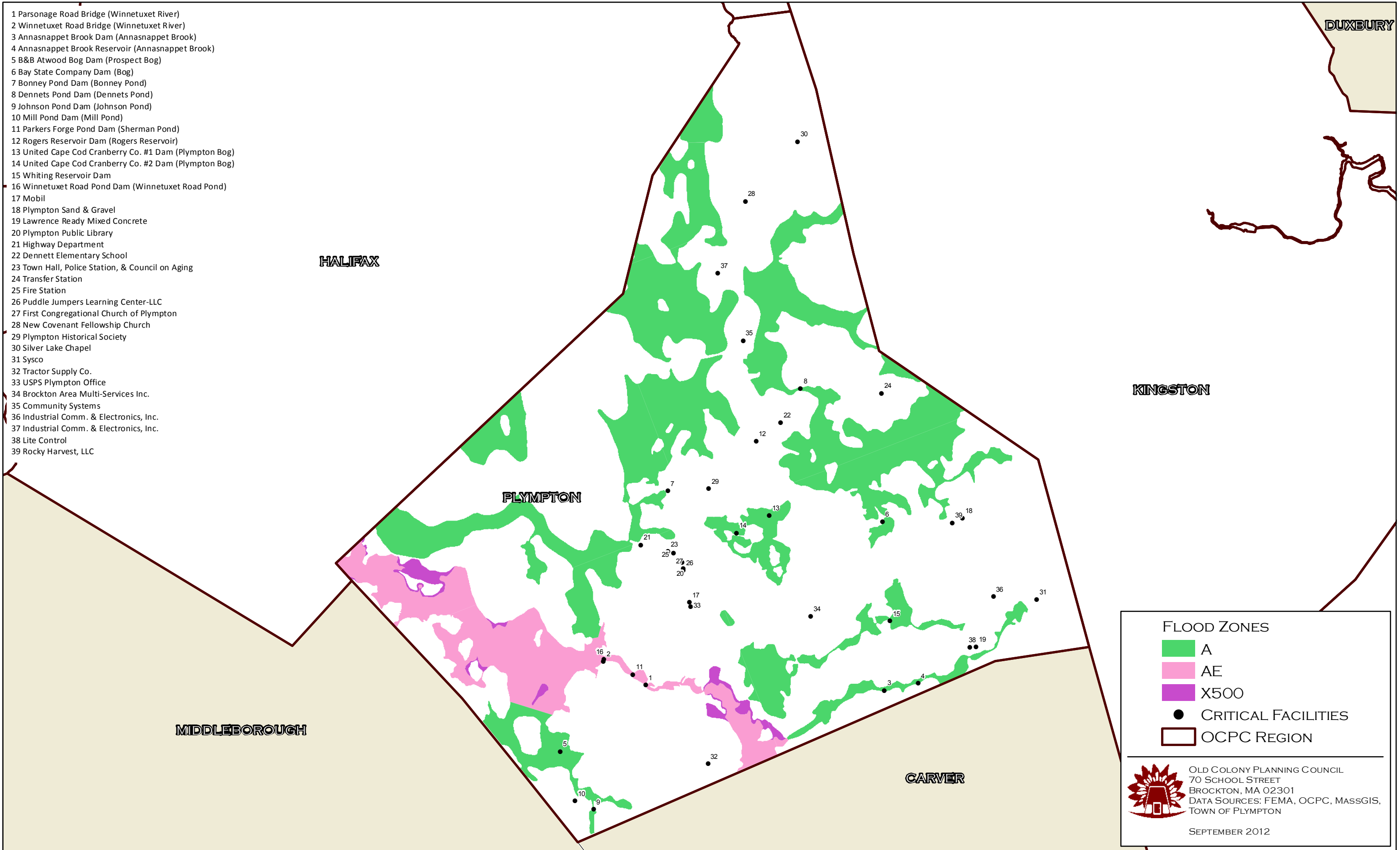
EARTHQUAKE & LANDSLIDE - PLYMOUTH (DOWNTOWN)



FLOOD ZONES AND SLOSH - PLYMPTON




- 1 Parsonage Road Bridge (Winnetuxet River)
- 2 Winnetuxet Road Bridge (Winnetuxet River)
- 3 Annasnappet Brook Dam (Annasnappet Brook)
- 4 Annasnappet Brook Reservoir (Annasnappet Brook)
- 5 B&B Atwood Bog Dam (Prospect Bog)
- 6 Bay State Company Dam (Bog)
- 7 Bonney Pond Dam (Bonney Pond)
- 8 Dennets Pond Dam (Dennets Pond)
- 9 Johnson Pond Dam (Johnson Pond)
- 10 Mill Pond Dam (Mill Pond)
- 11 Parkers Forge Pond Dam (Sherman Pond)
- 12 Rogers Reservoir Dam (Rogers Reservoir)
- 13 United Cape Cod Cranberry Co. #1 Dam (Plympton Bog)
- 14 United Cape Cod Cranberry Co. #2 Dam (Plympton Bog)
- 15 Whiting Reservoir Dam
- 16 Winnetuxet Road Pond Dam (Winnetuxet Road Pond)
- 17 Mobil
- 18 Plympton Sand & Gravel
- 19 Lawrence Ready Mixed Concrete
- 20 Plympton Public Library
- 21 Highway Department
- 22 Dennett Elementary School
- 23 Town Hall, Police Station, & Council on Aging
- 24 Transfer Station
- 25 Fire Station
- 26 Puddle Jumpers Learning Center-LLC
- 27 First Congregational Church of Plympton
- 28 New Covenant Fellowship Church
- 29 Plympton Historical Society
- 30 Silver Lake Chapel
- 31 Sysco
- 32 Tractor Supply Co.
- 33 USPS Plympton Office
- 34 Brockton Area Multi-Services Inc.
- 35 Community Systems
- 36 Industrial Comm. & Electronics, Inc.
- 37 Industrial Comm. & Electronics, Inc.
- 38 Lite Control
- 39 Rocky Harvest, LLC



FLOOD ZONES

- A
- AE
- X500
- CRITICAL FACILITIES
- OCPC REGION


OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: FEMA, OCPC, MASSGIS,
 TOWN OF PLYMPTON
 SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - PLYMPTON



- 1 Parsonage Road Bridge (Winnetuxet River)
- 2 Winnetuxet Road Bridge (Winnetuxet River)
- 3 Annasnappet Brook Dam (Annasnappet Brook)
- 4 Annasnappet Brook Reservoir (Annasnappet Brook)
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- 23 Town Hall, Police Station, & Council on Aging
- 24 Transfer Station
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- 28 New Covenant Fellowship Church
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- 37 Industrial Comm. & Electronics, Inc.
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HURRICANE TRACKS

- CATEGORY 3
- CATEGORY 2
- CATEGORY 1
- TROPICAL STORM
- TROPICAL DEPRESSION
- ▼ TORNADOES

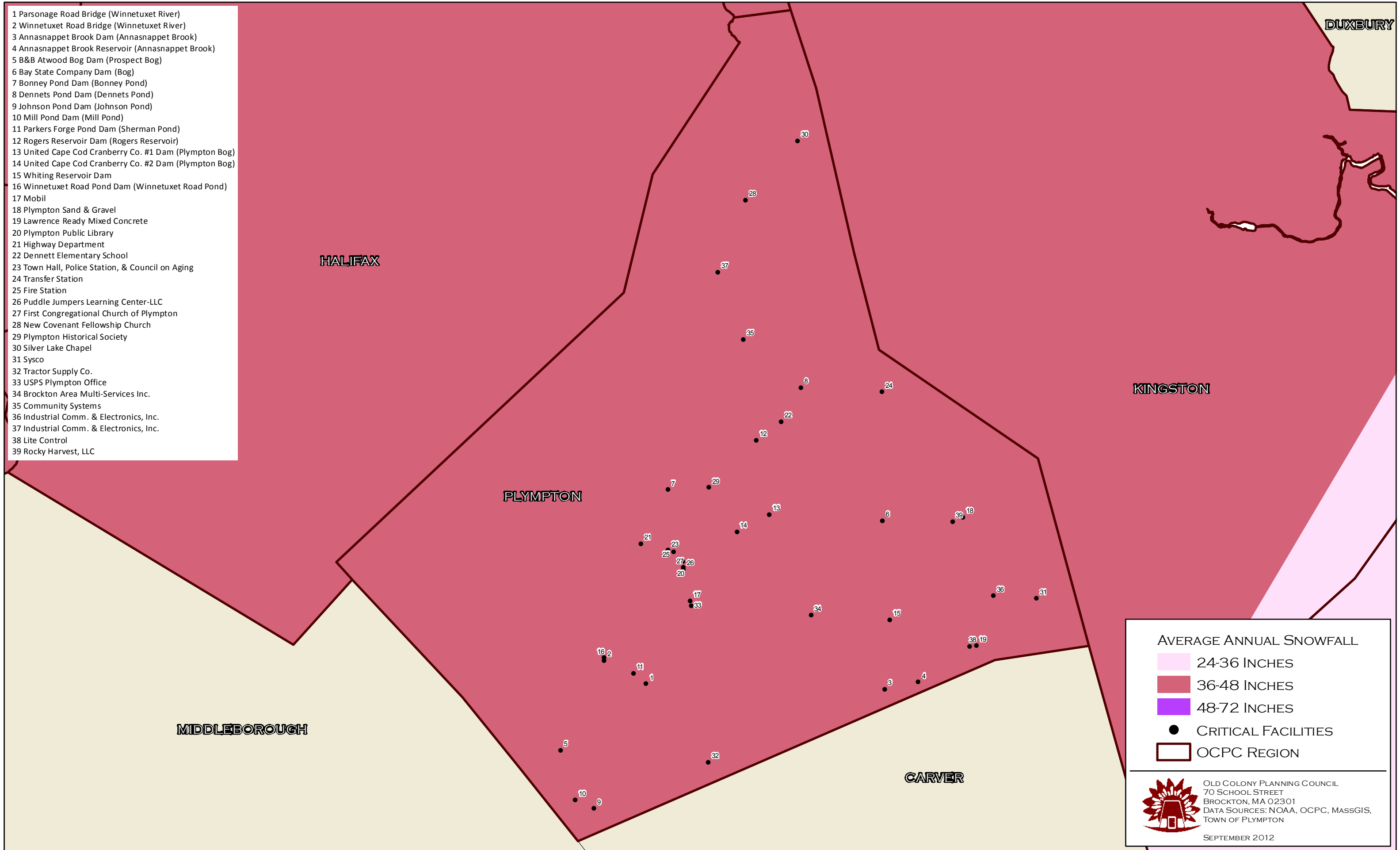
100-YEAR WIND EVENT

- ▨ 110 MPH
- ▨ 120 MPH
- CRITICAL FACILITIES
- ▭ OCPC REGION

AVERAGE ANNUAL SNOWFALL - PLYMPTON




- 1 Parsonage Road Bridge (Winnetuxet River)
- 2 Winnetuxet Road Bridge (Winnetuxet River)
- 3 Annasnappet Brook Dam (Annasnappet Brook)
- 4 Annasnappet Brook Reservoir (Annasnappet Brook)
- 5 B&B Atwood Bog Dam (Prospect Bog)
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- 10 Mill Pond Dam (Mill Pond)
- 11 Parkers Forge Pond Dam (Sherman Pond)
- 12 Rogers Reservoir Dam (Rogers Reservoir)
- 13 United Cape Cod Cranberry Co. #1 Dam (Plympton Bog)
- 14 United Cape Cod Cranberry Co. #2 Dam (Plympton Bog)
- 15 Whiting Reservoir Dam
- 16 Winnetuxet Road Pond Dam (Winnetuxet Road Pond)
- 17 Mobil
- 18 Plympton Sand & Gravel
- 19 Lawrence Ready Mixed Concrete
- 20 Plympton Public Library
- 21 Highway Department
- 22 Dennett Elementary School
- 23 Town Hall, Police Station, & Council on Aging
- 24 Transfer Station
- 25 Fire Station
- 26 Puddle Jumpers Learning Center-LLC
- 27 First Congregational Church of Plympton
- 28 New Covenant Fellowship Church
- 29 Plympton Historical Society
- 30 Silver Lake Chapel
- 31 Sysco
- 32 Tractor Supply Co.
- 33 USPS Plympton Office
- 34 Brockton Area Multi-Services Inc.
- 35 Community Systems
- 36 Industrial Comm. & Electronics, Inc.
- 37 Industrial Comm. & Electronics, Inc.
- 38 Lite Control
- 39 Rocky Harvest, LLC



AVERAGE ANNUAL SNOWFALL

- 24-36 INCHES
- 36-48 INCHES
- 48-72 INCHES
- CRITICAL FACILITIES
- OCPC REGION

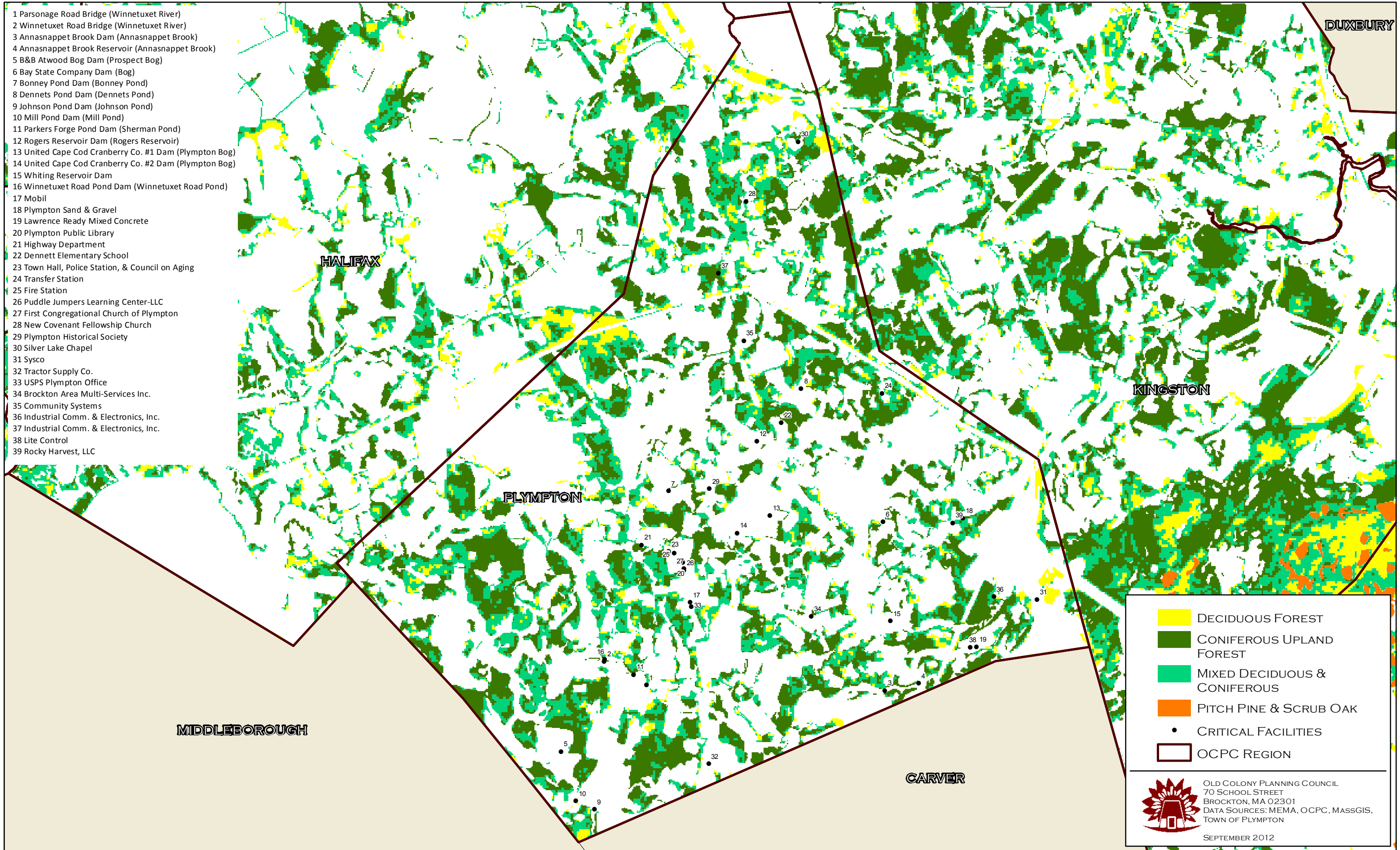


OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF PLYMPTON
 SEPTEMBER 2012


WILDFIRE SUSCEPTIBILITY - PLYMPTON



- 1 Parsonage Road Bridge (Winnetuxet River)
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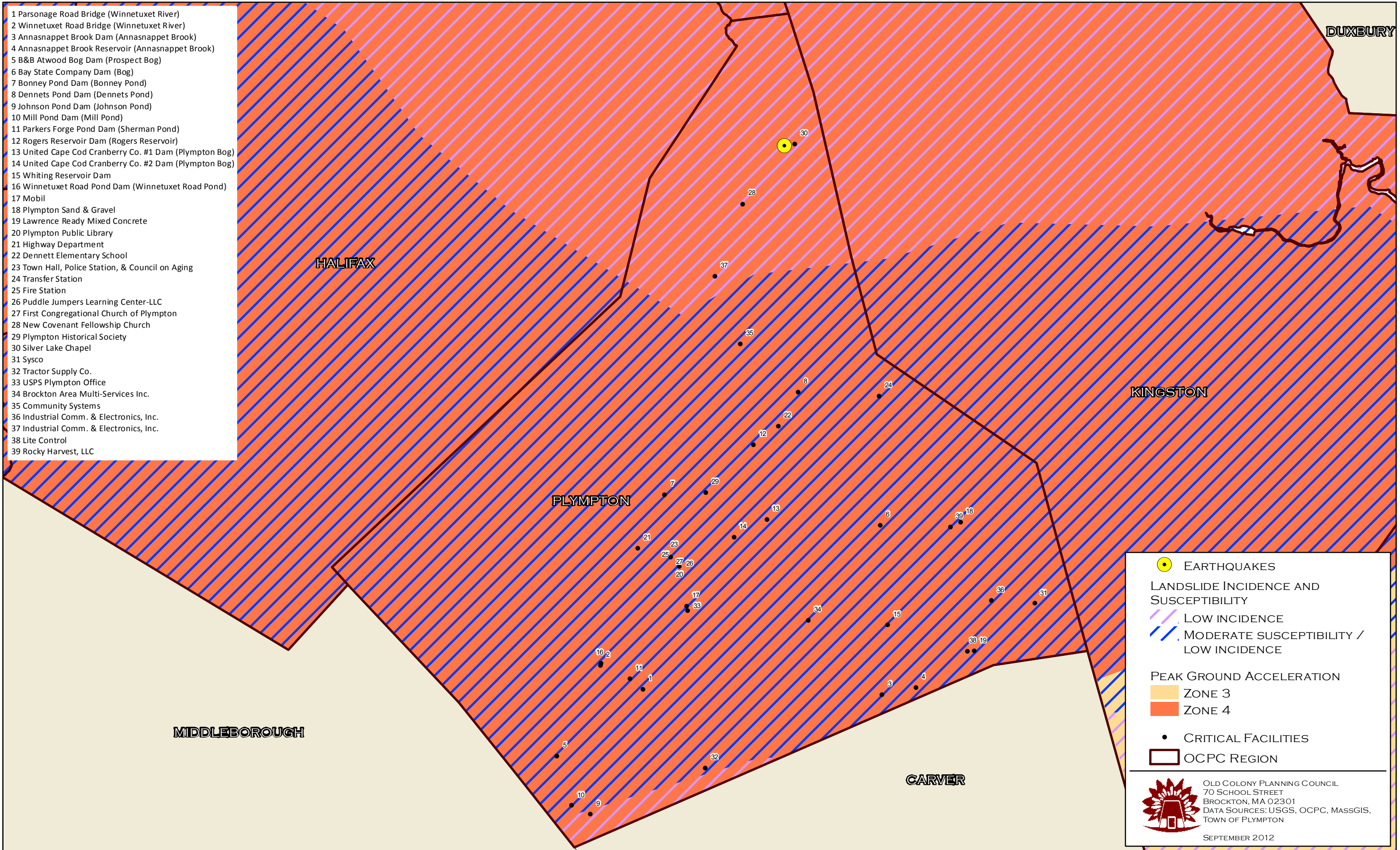
- DECIDUOUS FOREST
- CONIFEROUS UPLAND FOREST
- MIXED DECIDUOUS & CONIFEROUS
- PITCH PINE & SCRUB OAK
- CRITICAL FACILITIES
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 OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
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 TOWN OF PLYMPTON
 SEPTEMBER 2012

EARTHQUAKE & LANDSLIDE - PLYMPTON



- 1 Parsonage Road Bridge (Winnetuxet River)
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- EARTHQUAKES

LANDSLIDE INCIDENCE AND SUSCEPTIBILITY

- / / LOW INCIDENCE
- / / MODERATE SUSCEPTIBILITY / LOW INCIDENCE

PEAK GROUND ACCELERATION

- ZONE 3
- ZONE 4

- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF PLYMPTON

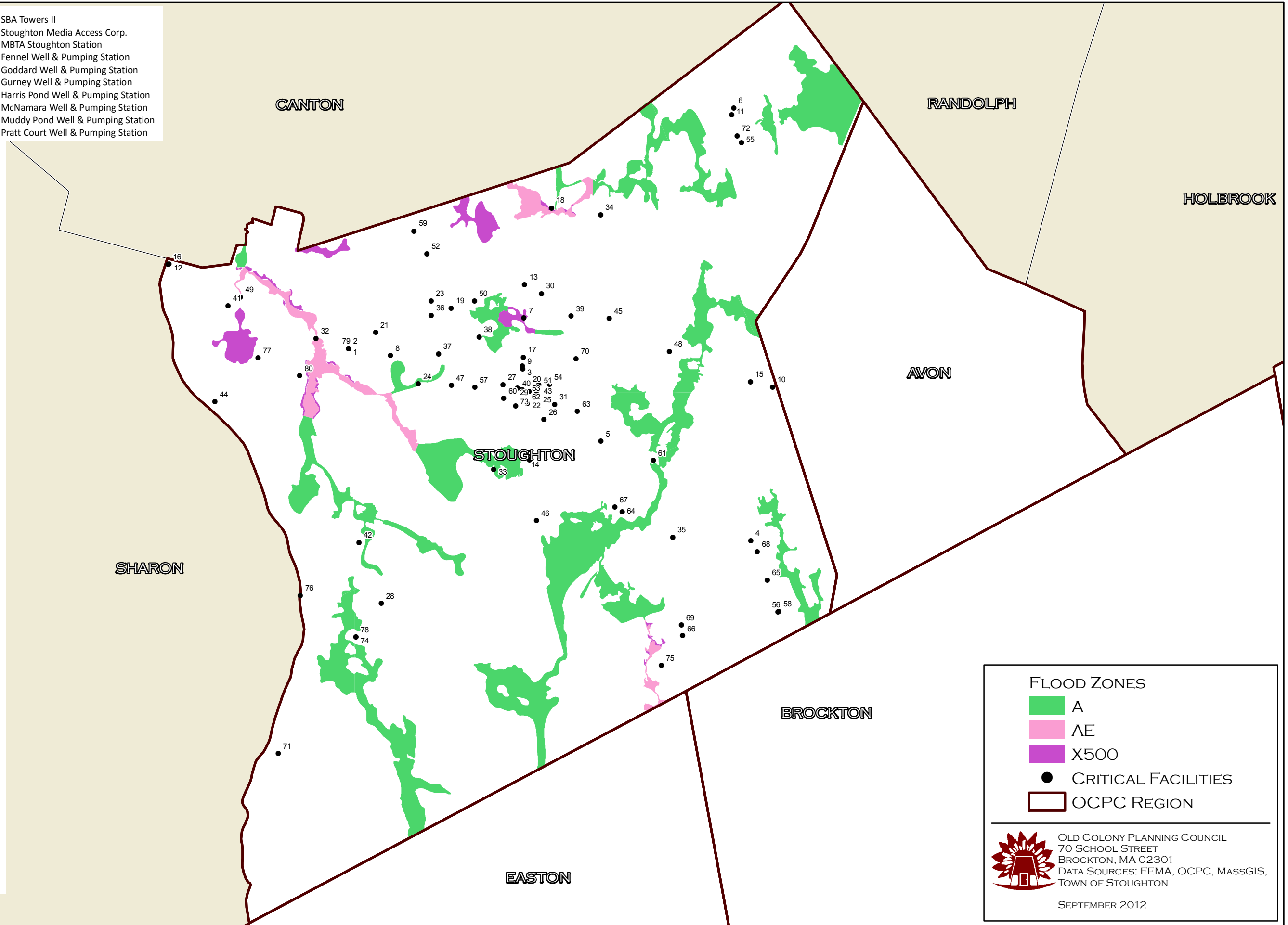
SEPTEMBER 2012

FLOOD AND SLOSH - STOUGHTON



- 1 Lindelof Ave. (Route 24)
- 2 Route 24 Bridge (Page Street)
- 3 BP
- 4 Citgo
- 5 Cumberland Farms
- 6 Cumberland Farms
- 7 Cumberland Farms
- 8 Getty
- 9 Getty
- 10 Gulf
- 11 Gulf
- 12 Mobil
- 13 Mobil
- 14 Petro Plus
- 15 Shell
- 16 Shell
- 17 Stoughton Gas
- 18 New England Sinai Hospital
- 19 Stoughton District Court
- 20 Fire Station #1
- 21 Fire Station #2
- 22 Stoughton Housing Authority
- 23 Stoughton Housing Authority
- 24 Stoughton Housing Authority
- 25 Stoughton Housing Authority
- 26 Stoughton Public Library
- 27 Police Station
- 28 USPS Sheldonville Office
- 29 USPS Stoughton Office
- 30 Public Works
- 31 Edwin A. Jones Early Childhood Center
- 32 Helen H. Hansen Elementary School
- 33 Joseph H. Gibbons Elementary School
- 34 Joseph R. Dawe, Jr. Elementary School
- 35 South Elementary School
- 36 West Elementary School
- 37 O'Donnell Middle School
- 38 Stoughton High School
- 39 Council on Aging
- 40 Town Hall
- 41 Arbors at Stoughton
- 42 Academy Preschool
- 43 Crayon College Too, Inc.
- 44 Creative Preschool
- 45 Hugs Plus Learning Center
- 46 Kiddie Academy of Stoughton
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FLOOD ZONES

- A
- AE
- X500
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: FEMA, OCPC, MASSGIS,
 TOWN OF STOUGHTON

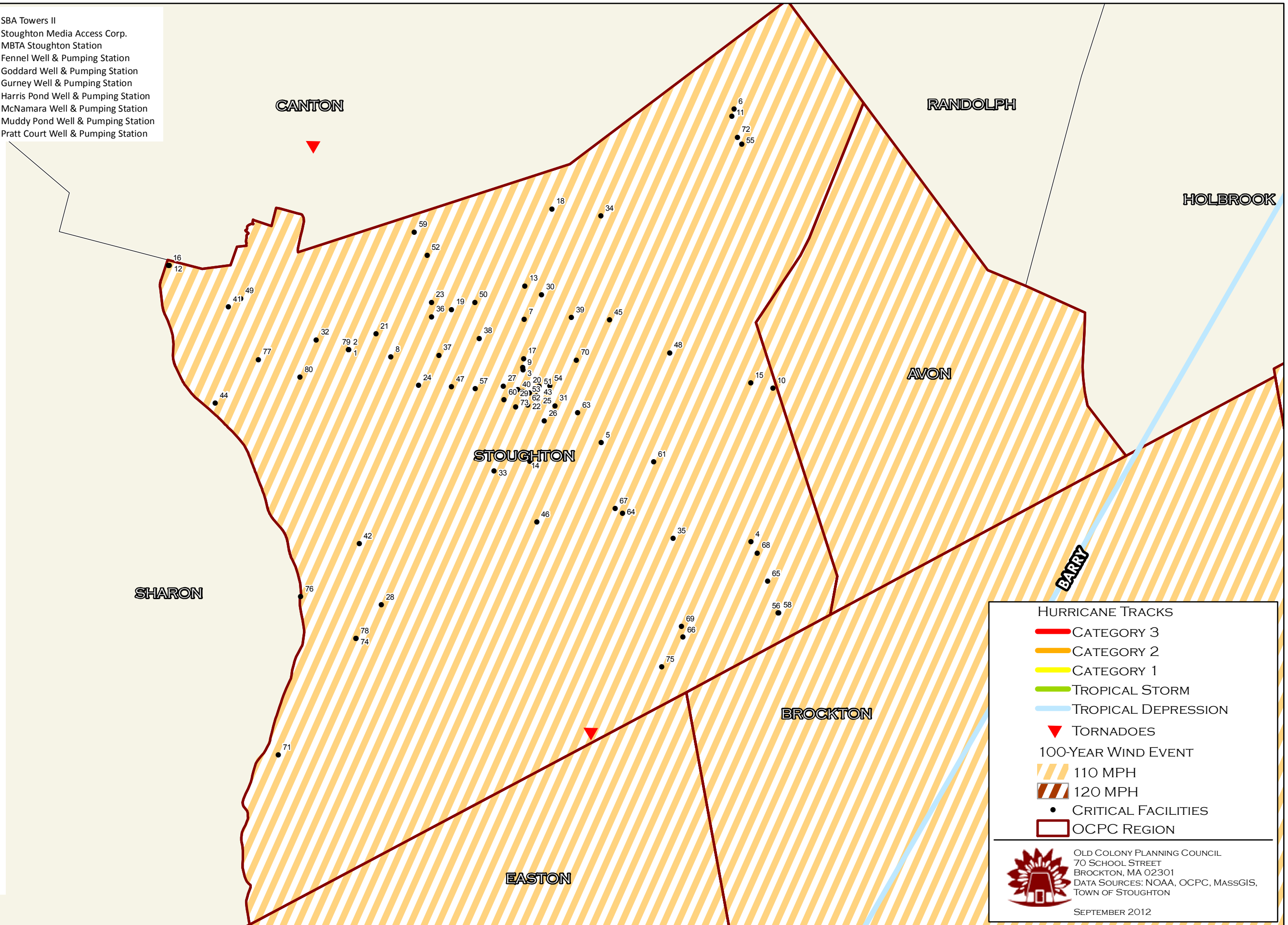
SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - STOUGHTON



- 1 Lindelof Ave. (Route 24)
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HURRICANE TRACKS

- CATEGORY 3
- CATEGORY 2
- CATEGORY 1
- TROPICAL STORM
- TROPICAL DEPRESSION
- ▼ TORNADOES

100-YEAR WIND EVENT

- 110 MPH
- 120 MPH
- CRITICAL FACILITIES
- OCPC REGION

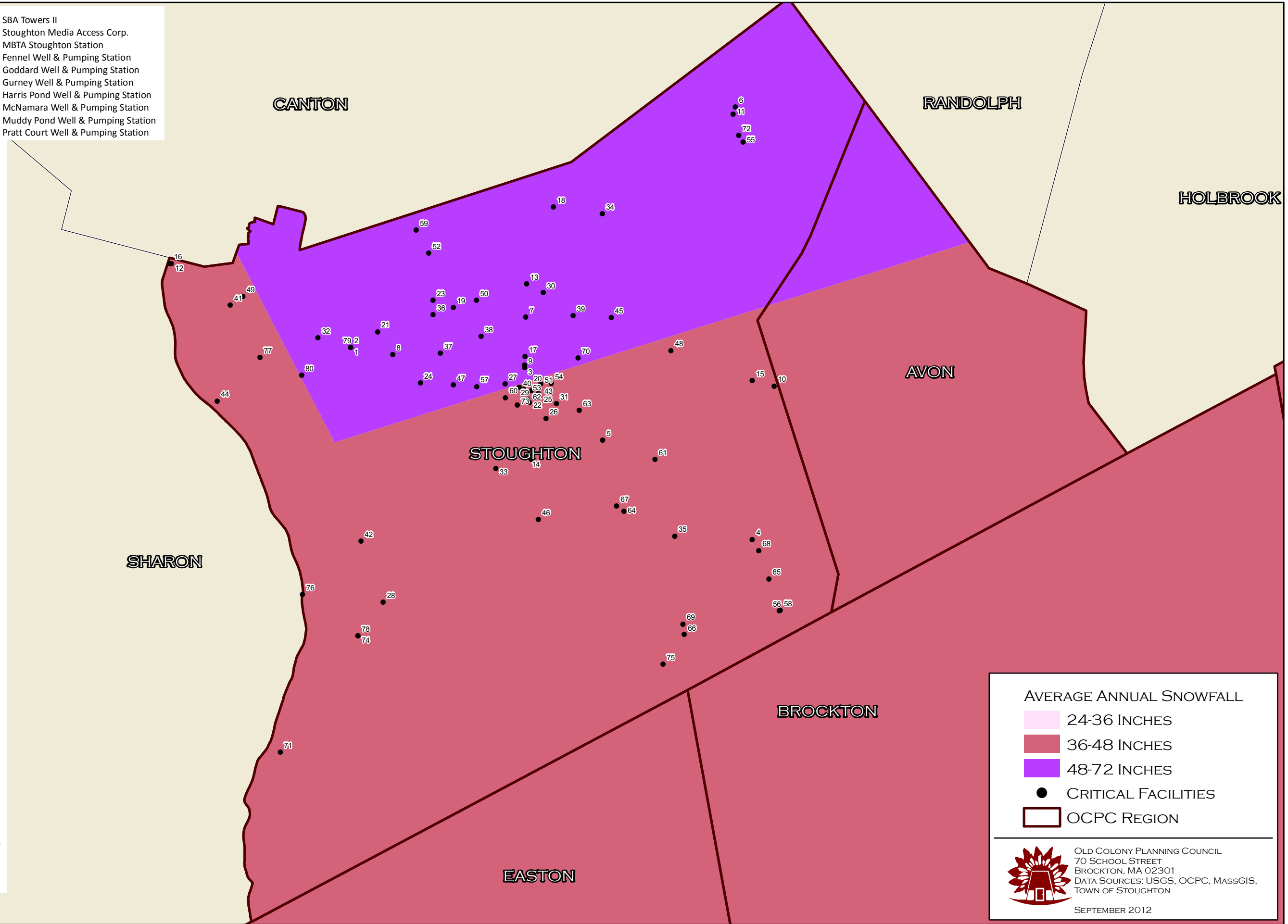
OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF STOUGHTON
 SEPTEMBER 2012

AVERAGE ANNUAL SNOWFALL - STOUGHTON




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AVERAGE ANNUAL SNOWFALL

- 24-36 INCHES
- 36-48 INCHES
- 48-72 INCHES
- CRITICAL FACILITIES
- OCPC REGION



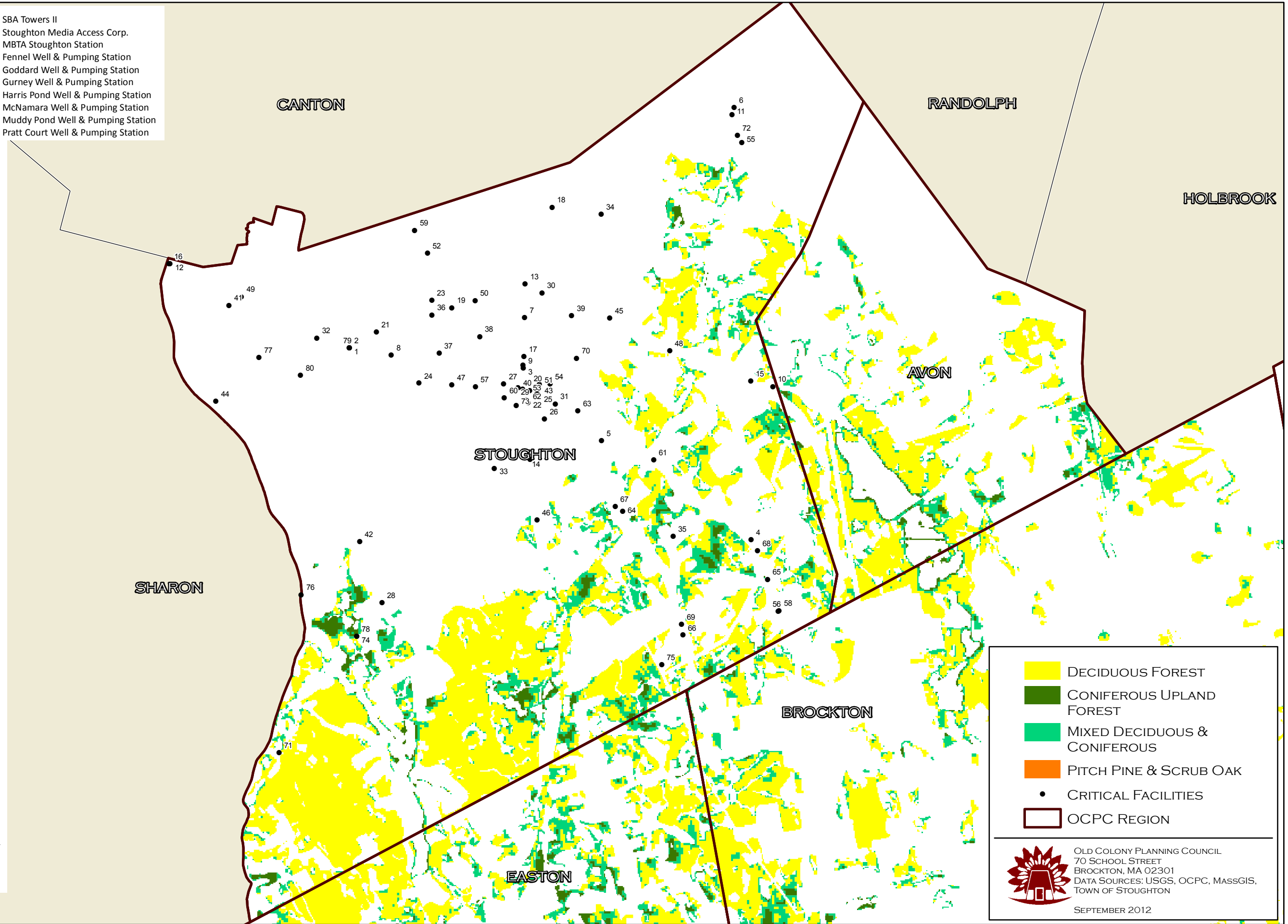
OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
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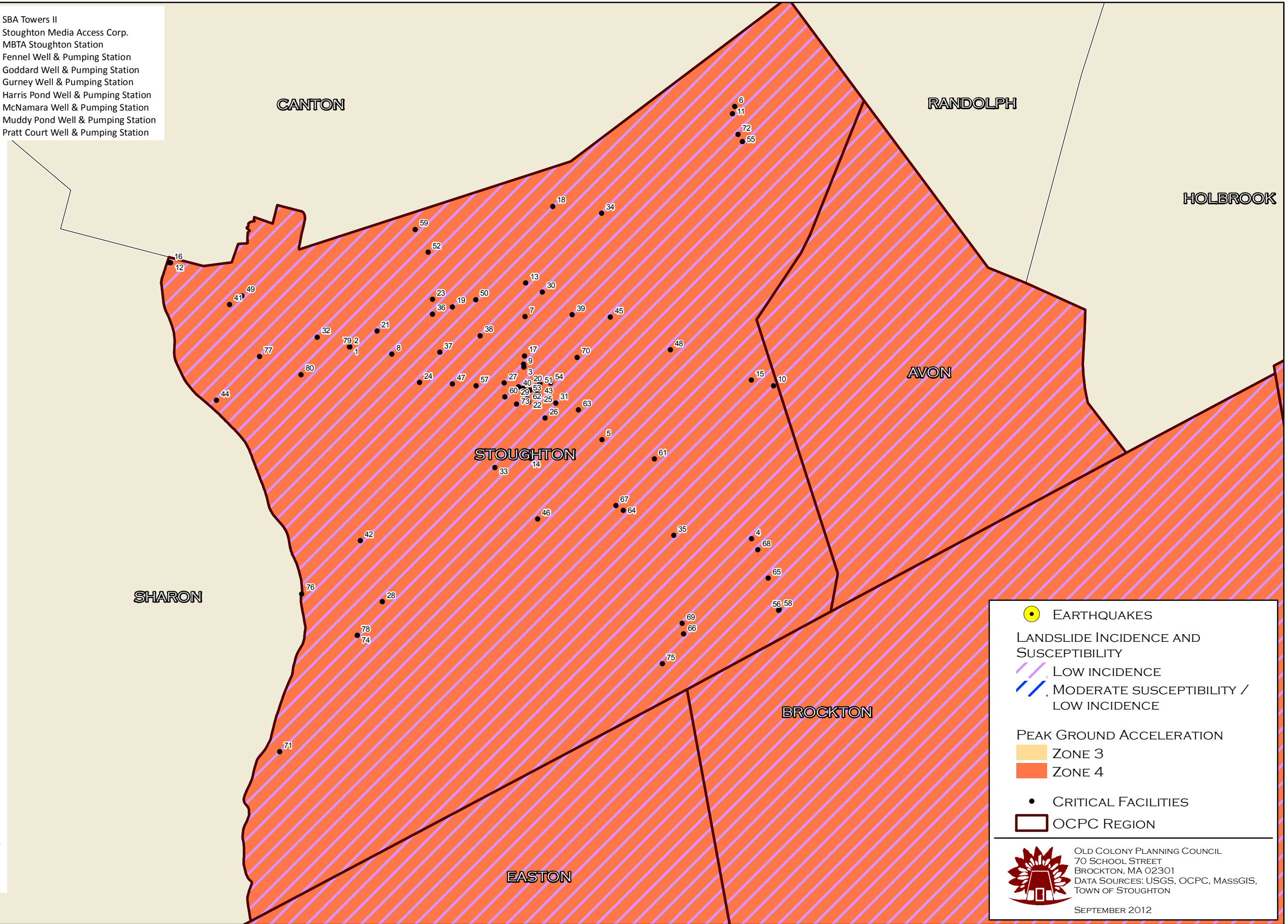
- DECIDUOUS FOREST
- CONIFEROUS UPLAND FOREST
- MIXED DECIDUOUS & CONIFEROUS
- PITCH PINE & SCRUB OAK
- CRITICAL FACILITIES
- OCPC REGION

EARTHQUAKE & LANDSLIDE - STOUGHTON



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- EARTHQUAKES
- LANDSLIDE INCIDENCE AND SUSCEPTIBILITY
 - / / / LOW INCIDENCE
 - / / / MODERATE SUSCEPTIBILITY / LOW INCIDENCE
- PEAK GROUND ACCELERATION
 - ZONE 3
 - ZONE 4
- CRITICAL FACILITIES
- OCPC REGION

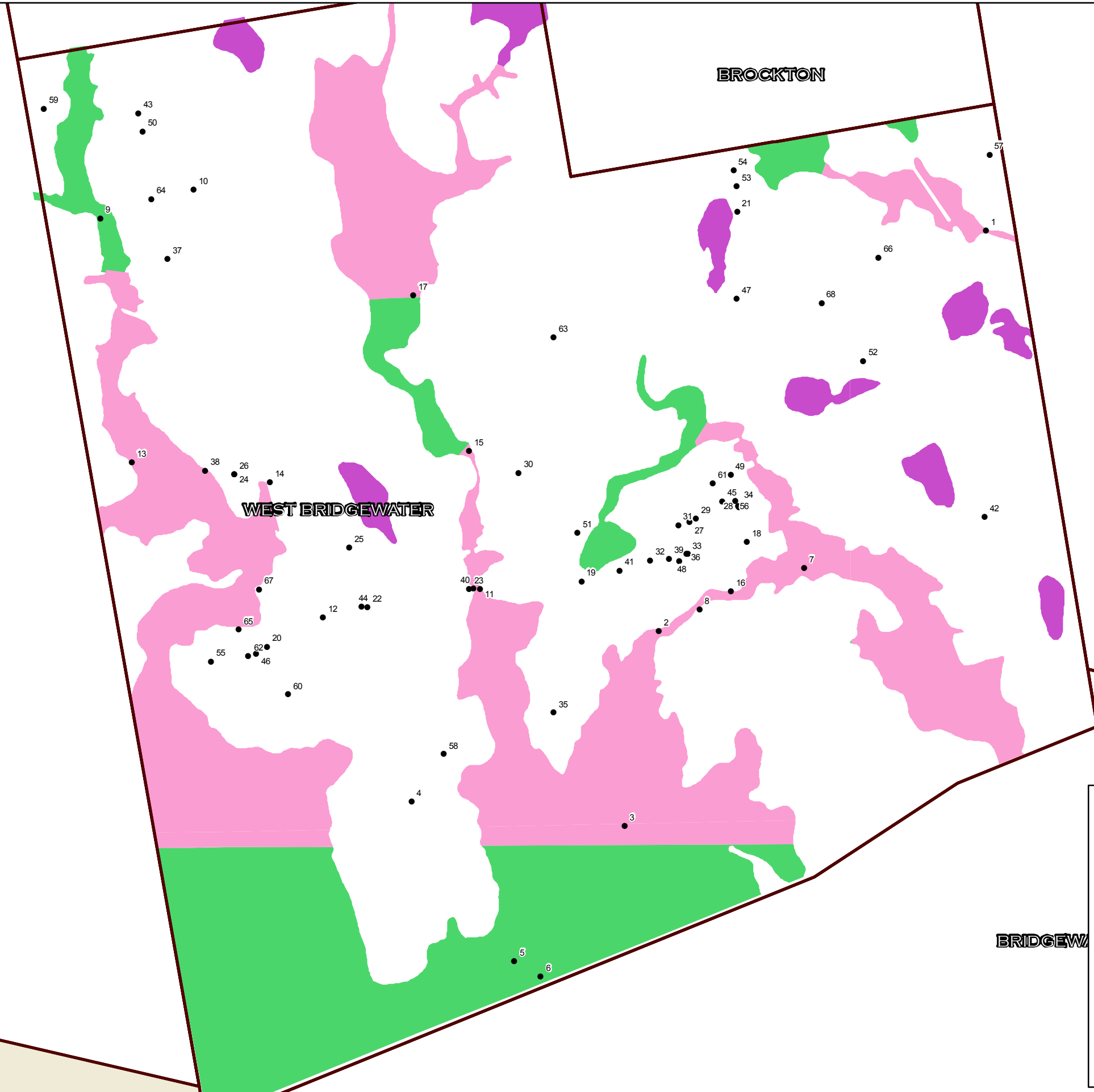
OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF STOUGHTON

SEPTEMBER 2012

FLOOD ZONES AND SLOSH - WEST BRIDGEWATER



- 1 Belmont Street Bridge (Salisbury Plain River)
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- 59 Crown Atlantic Company
- 60 Industrial Comm. & Electronics, Inc.
- 61 Mobilite Investments
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- 66 Cyr Street Well & Pumping Station
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EAST BRIDGEWATER

BRIDGEWATER

TAUNTON
RAYNHAM

FLOOD ZONES

- A
- AE
- X500
- CRITICAL FACILITIES
- OCPC REGION



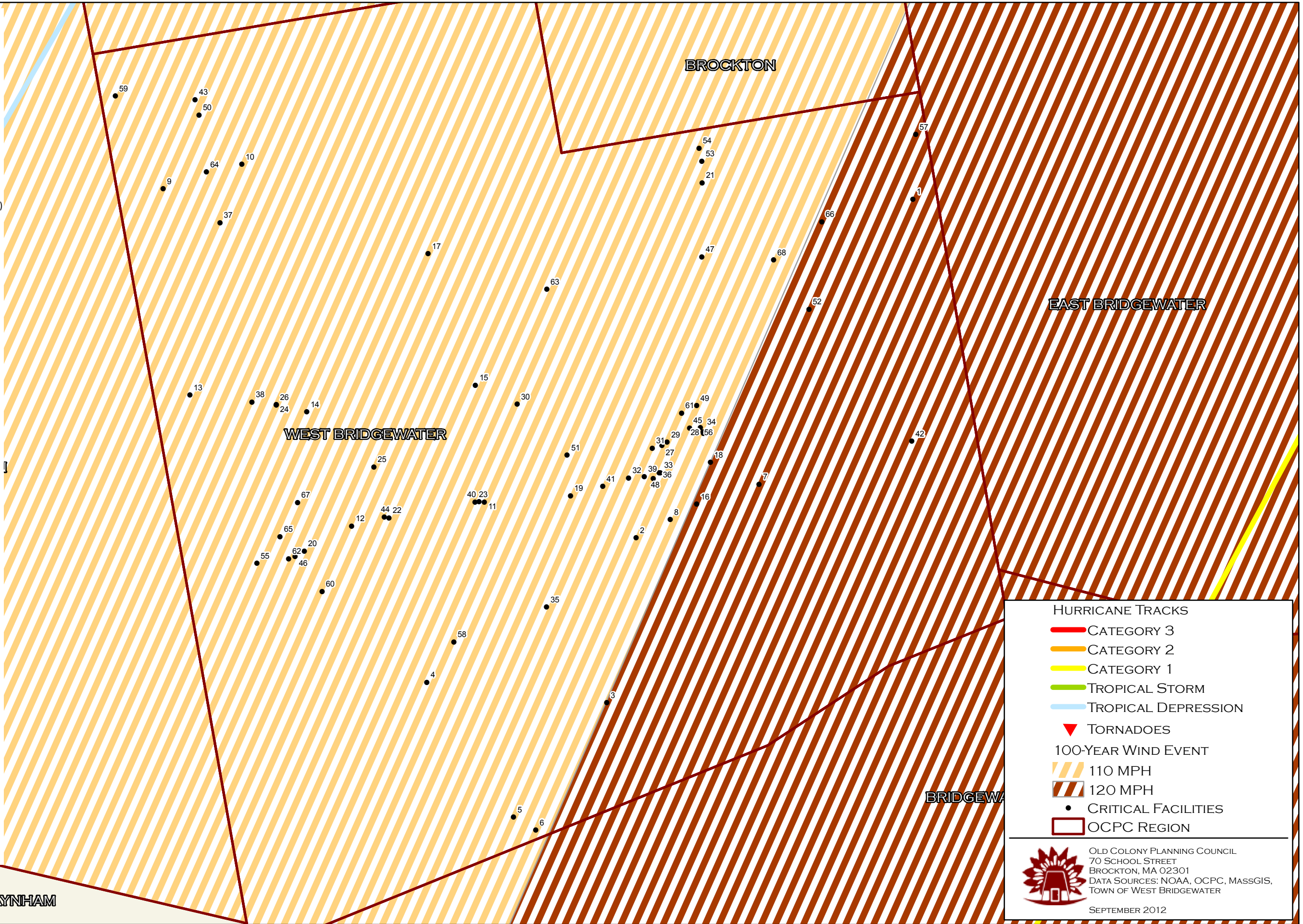
OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
BROCKTON, MA 02301
DATA SOURCES: FEMA, OCPC, MASSGIS,
TOWN OF WEST BRIDGEWATER

SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - WEST BRIDGEWATER



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HURRICANE TRACKS

- CATEGORY 3
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- CATEGORY 1
- TROPICAL STORM
- TROPICAL DEPRESSION
- ▼ TORNADOES

100-YEAR WIND EVENT

- 110 MPH
- 120 MPH

CRITICAL FACILITIES

-

OCPC REGION

-

TAUNTON **RAYNHAM**

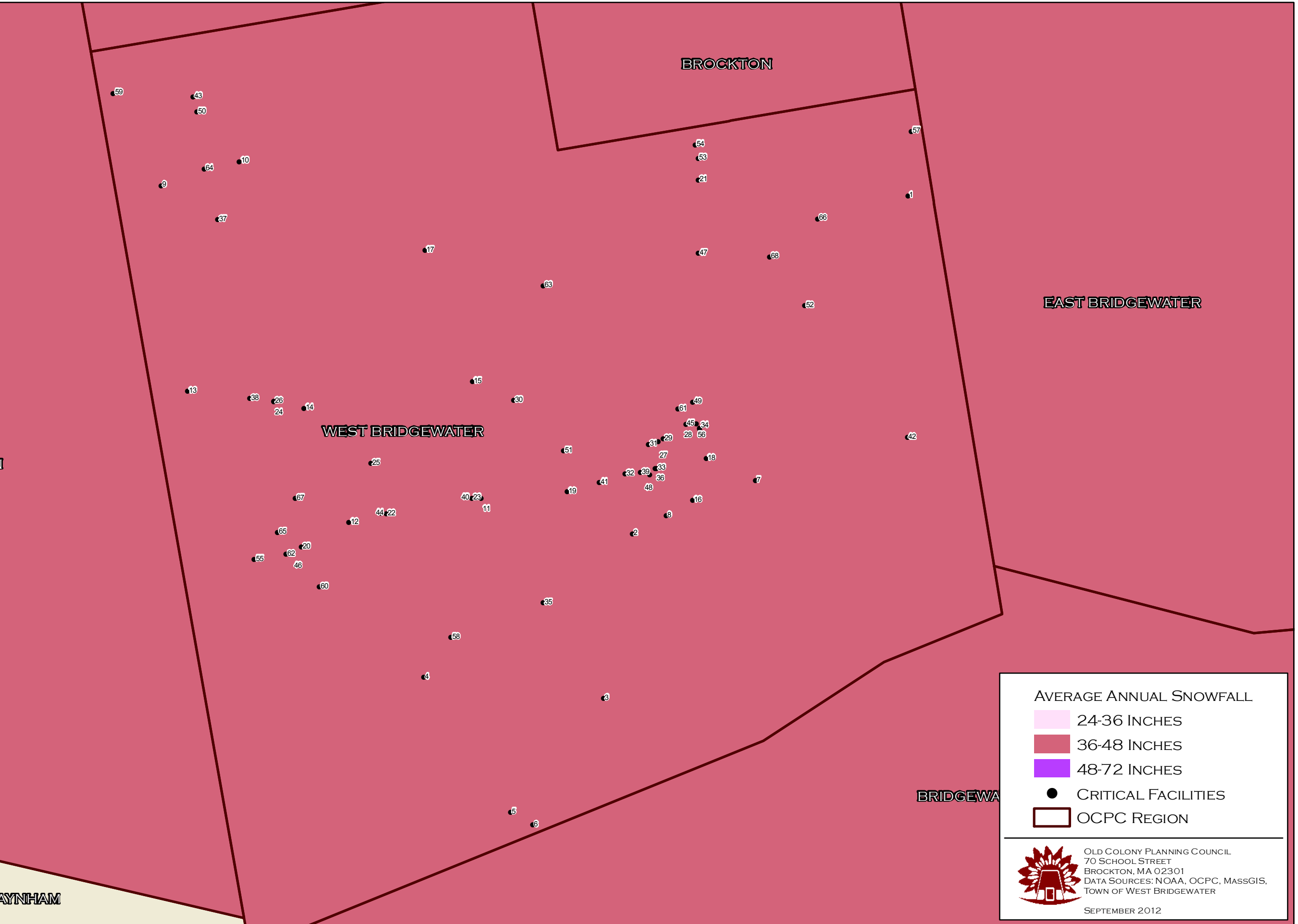
BRIDGEWATER

OLD COLONY PLANNING COUNCIL
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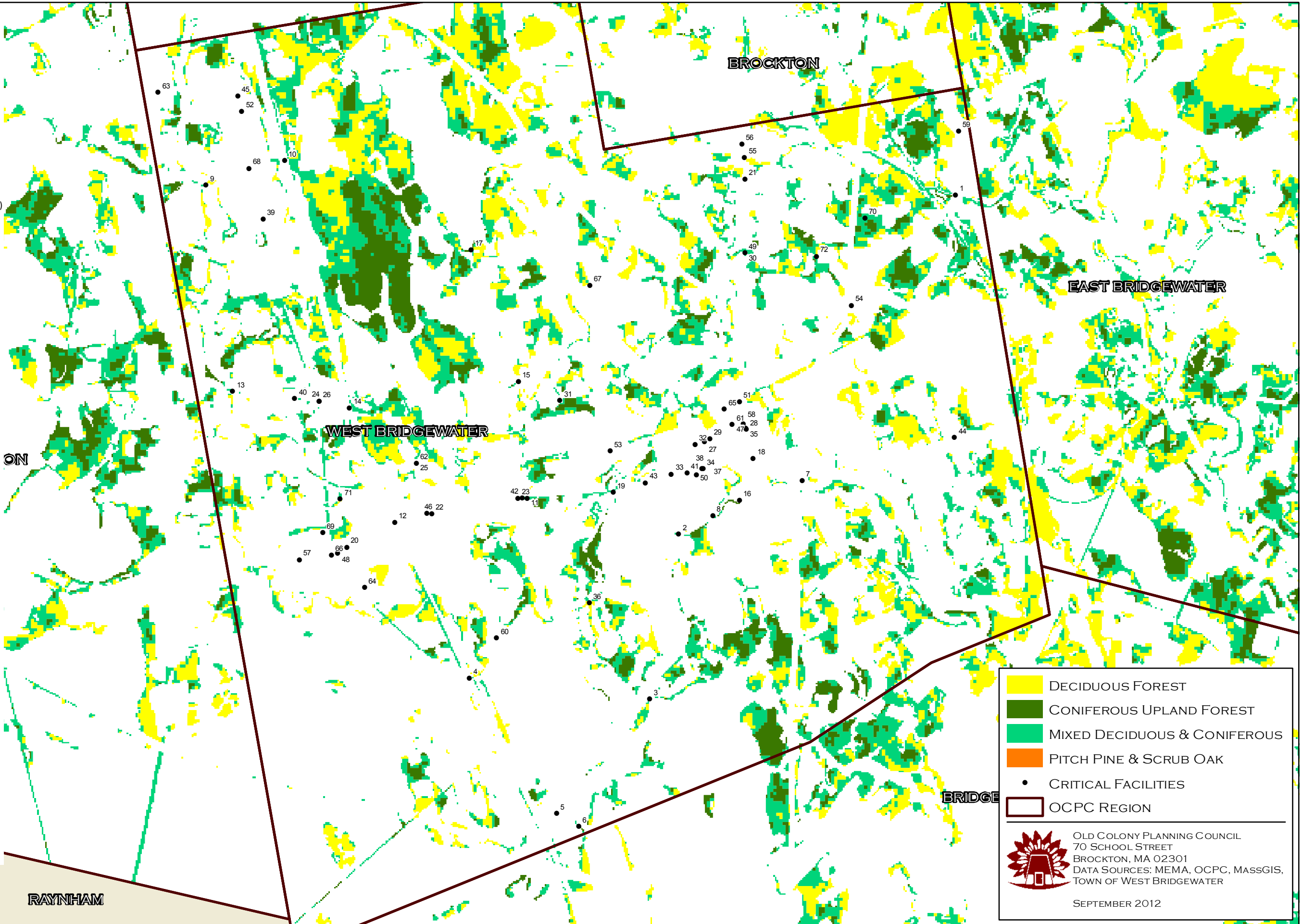
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 TOWN OF WEST BRIDGEWATER

SEPTEMBER 2012


WILDFIRE SUSCEPTIBILITY - WEST BRIDGEWATER



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	DECIDUOUS FOREST
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 SEPTEMBER 2012

TAUNTON

RAYNHAM

BROCKTON

EAST BRIDGEWATER

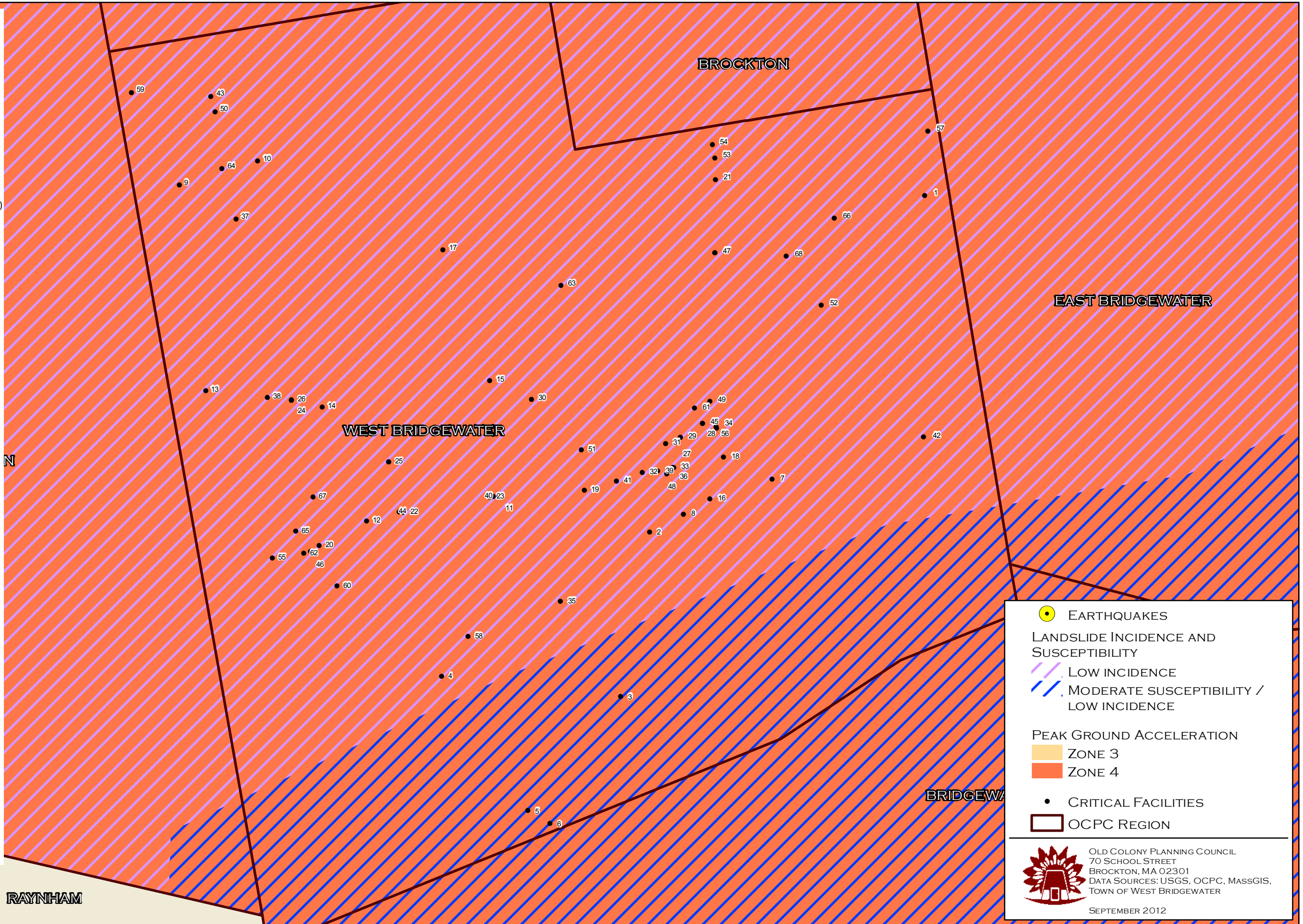
WEST BRIDGEWATER

BRIDGE

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- 1 Belmont Street Bridge (Salisbury Plain River)
- 2 Forest Street Bridge (Town River)
- 3 Forest Street Bridge (Town River)
- 4 Route 24 Bridge (South Elm Street)
- 5 Route 24 Bridge (Town River)
- 6 Scotland Street Bridge (Town River)
- 7 South Main Street Bridge (Town River)
- 8 South Street Bridge (Town River)
- 9 Walnut Street Bridge (Coweaset Brook)
- 10 Walnut Street Bridge (Route 24)
- 11 West Center Street Bridge (Hockomock River)
- 12 West Center Street Bridge (Route 24)
- 13 West Street Bridge (Coweaset Brook)
- 14 West Street Bridge (Route 24)
- 15 Mill Pond Dam (Mill Pond)
- 16 War Memorial Park Dam (Memorial Park Pond)
- 17 West Meadow Dam (West Meadow Pond)
- 18 Cumberland Farms
- 19 Hess
- 20 Mobil
- 21 Motion Gas
- 22 Shell
- 23 Tedeschi
- 24 ABF Freight
- 25 J.P. Noonan Transportation
- 26 Ryder Truck
- 27 West Bridgewater Public Library
- 28 Highway Department
- 29 Howard Elementary School
- 30 Rose L. McDonald Elementary School
- 31 Spring Street School
- 32 West Bridgewater Middle/Senior High School
- 33 Council on Aging
- 34 Town Hall
- 35 Transfer Station
- 36 Fire Station & Police Station
- 37 Children's Express Learning Center
- 38 Cowlicks + Pigtails Child Care Center
- 39 Four Seasons Creative Learning Center
- 40 KinderCare Learning Center
- 41 KinderCare Learning Center #1318
- 42 Magic Touch Nursery Preschool
- 43 Church of Jesus Christ of Latter Day Saints
- 44 Cochessett United Methodist Church
- 45 First Church
- 46 Lowe's Home Improvement Store
- 47 New England Baptist Church
- 48 Old Bridgewater Historical Society
- 49 St. Ann's Catholic Church
- 50 Temple Baptist Church
- 51 West Bridgewater Baptist Church
- 52 West Bridgewater Housing Authority
- 53 Matfield Woods
- 54 Westbridge Landing
- 55 Life Care Center of West Bridgewater
- 56 USPS West Bridgewater Office
- 57 Brockton Area Multi-Services, Inc.
- 58 Brockton Area Multi-Services, Inc.
- 59 Crown Atlantic Company
- 60 Industrial Comm. & Electronics, Inc.
- 61 Mobilite Investments
- 62 National Grid
- 63 Spring Street Water Storage Tank
- 64 Walnut Street Water Storage Tank
- 65 Water Treatment Facility
- 66 Cyr Street Well & Pumping Station
- 67 Manley Street Well & Pumping Station
- 68 Norman Avenue Well & Pumping Station



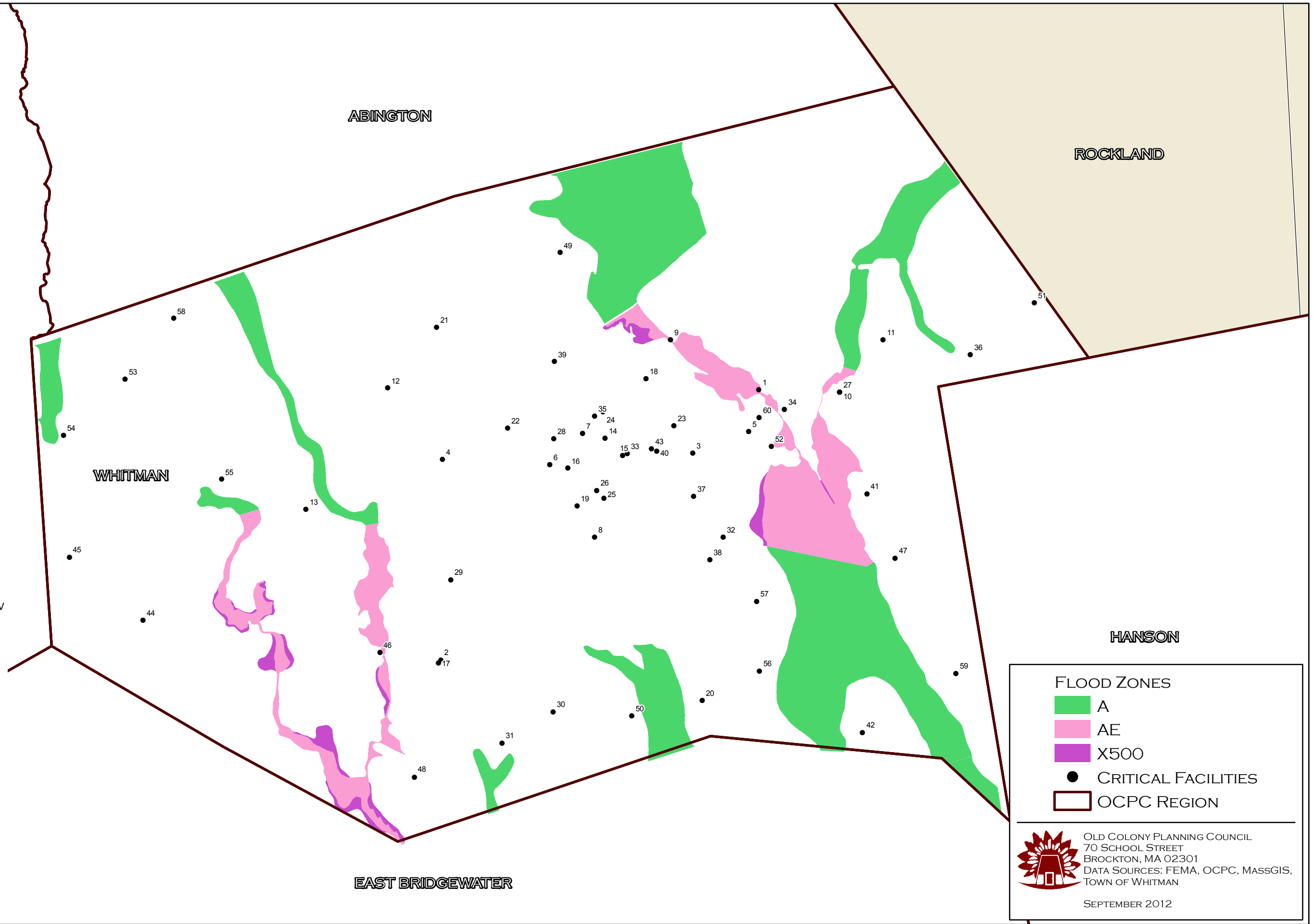
- EARTHQUAKES
- LANDSLIDE INCIDENCE AND SUSCEPTIBILITY
 - ▨ LOW INCIDENCE
 - ▨ MODERATE SUSCEPTIBILITY / LOW INCIDENCE
- PEAK GROUND ACCELERATION
 - ZONE 3
 - ZONE 4
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: USGS, OCPC, MASSGIS,
 TOWN OF WEST BRIDGEWATER
 SEPTEMBER 2012

FLOOD ZONES AND SLOSH - WHITMAN



- 1 Hobart Pond Dam (Hobart Pond)
- 2 7-Eleven
- 3 Citgo
- 4 Cumberland Farms
- 5 Diamond Fuel
- 6 Prime Energy
- 7 Verizon
- 8 Whitman Public Library
- 9 Public Works
- 10 Hope Christian School
- 11 John H. Duval, Jr. Elementary School
- 12 Louise A. Conley Elementary School
- 13 Whitman Middle School
- 14 Council on Aging
- 15 Town Hall
- 16 Fire Station
- 17 Beth Israel Deaconess Medical
- 18 Police Station
- 19 A Child's Place Pre-School
- 20 Busy Bee Pre-School #2
- 21 Jack-n-Jill Child Care of Whitman
- 22 Merry Deb Nursery School
- 23 Self Help Inc. Head Start-Whitman
- 24 All Saints Episcopal Church
- 25 Congregational Church of Whitman
- 26 Holy Ghost Church
- 27 Methodist Church
- 28 South Shore Pentecostal Church
- 29 Stop & Shop Supermarket
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- 32 Whitman Housing Authority
- 33 USPS Whitman Office
- 34 MBTA Whitman Station
- 35 Choice Residence
- 36 Road to Responsibility
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- 60 The Whitman Company



FLOOD ZONES

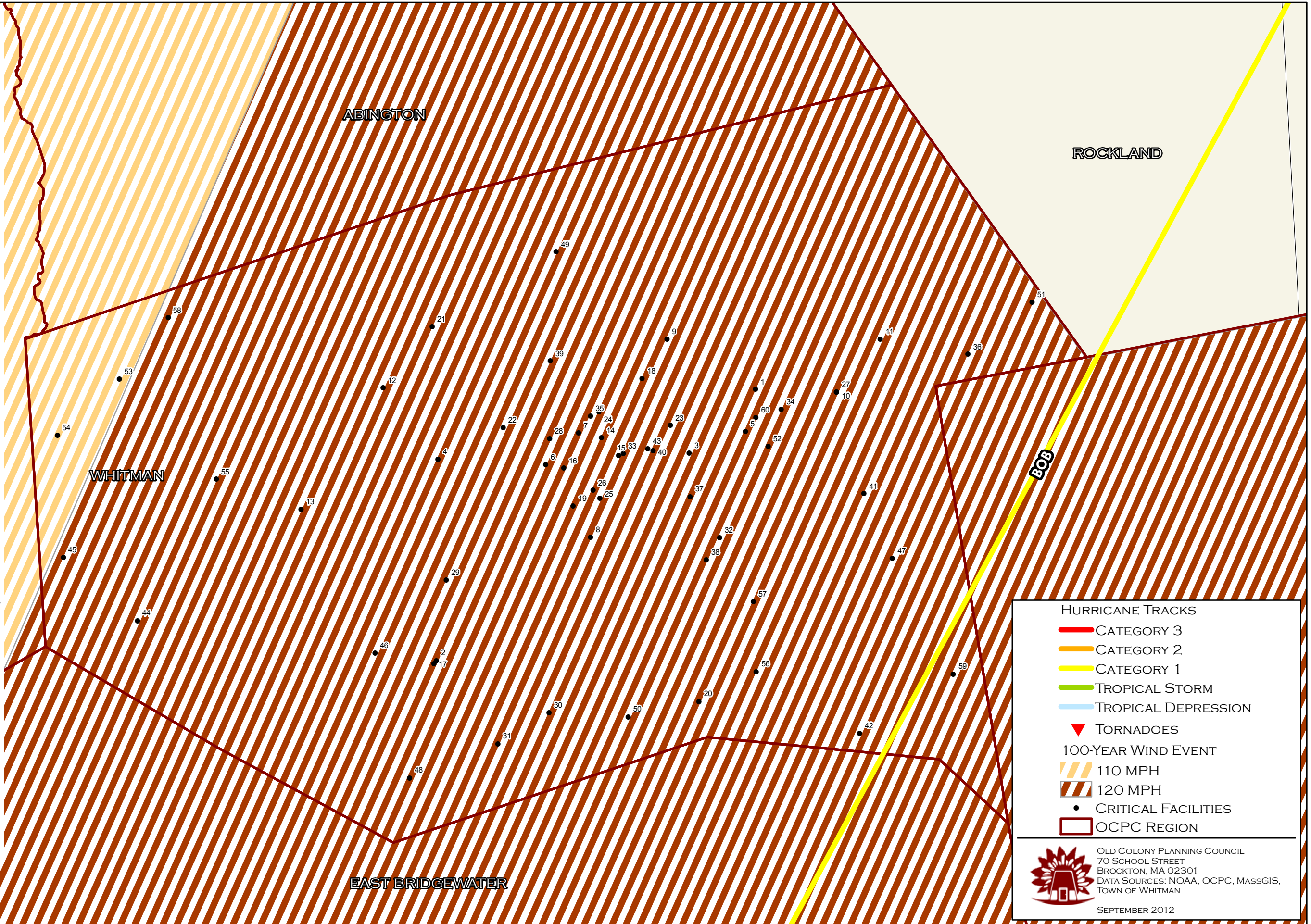
- A
- AE
- X500
- CRITICAL FACILITIES
- OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: FEMA, OCPC, MASSGIS,
 TOWN OF WHITMAN
 SEPTEMBER 2012

HURRICANES, TROPICAL STORMS AND EXTREME WIND EVENTS - WHITMAN



- 1 Hobart Pond Dam (Hobart Pond)
- 2 7-Eleven
- 3 Citgo
- 4 Cumberland Farms
- 5 Diamond Fuel
- 6 Prime Energy
- 7 Verizon
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- 60 The Whitman Company



HURRICANE TRACKS

- CATEGORY 3
- CATEGORY 2
- CATEGORY 1
- TROPICAL STORM
- TROPICAL DEPRESSION
- ▼ TORNADOES

100-YEAR WIND EVENT

- ▨ 110 MPH
- ▨ 120 MPH

CRITICAL FACILITIES

-

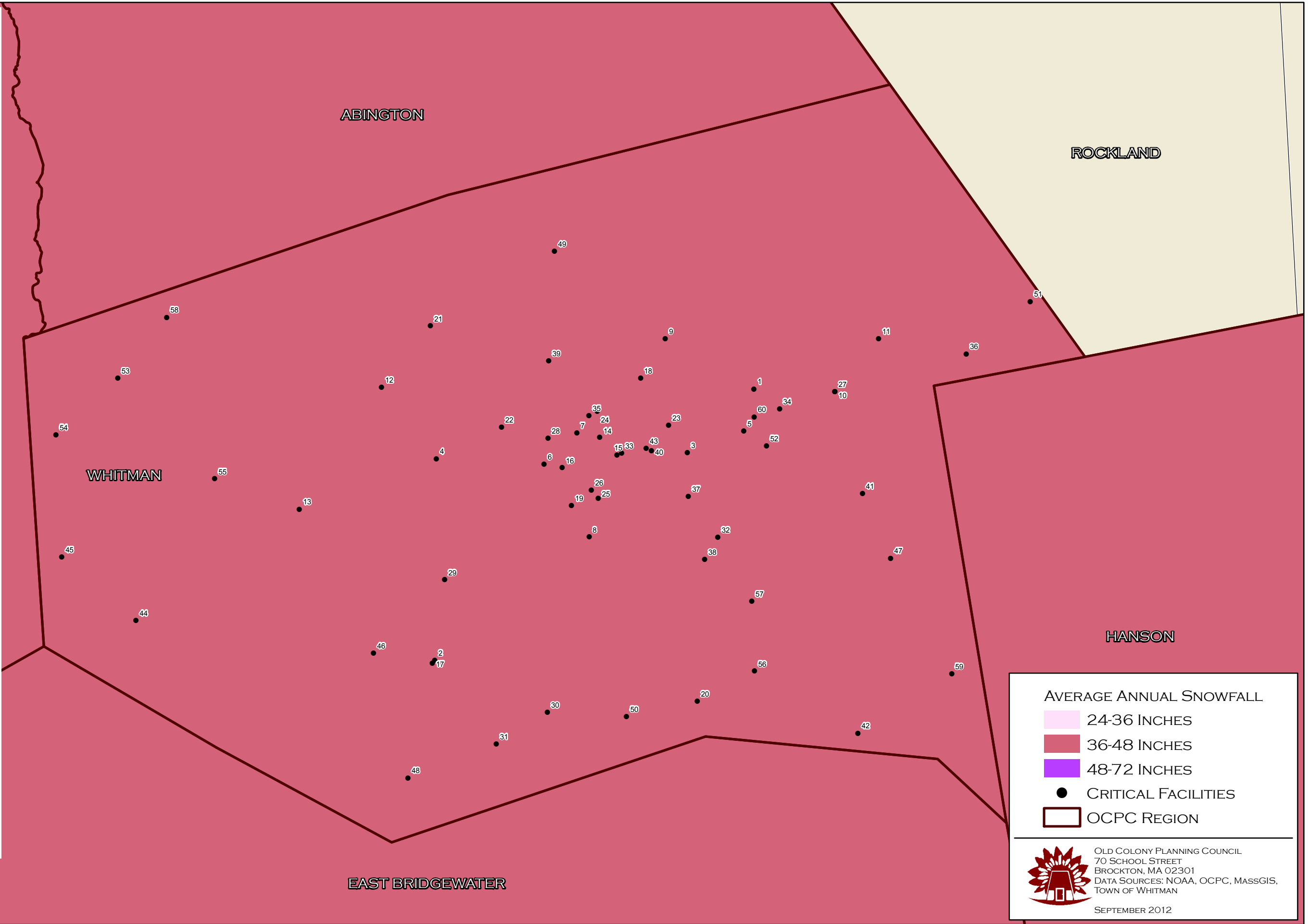
OCPC REGION

-

AVERAGE ANNUAL SNOWFALL - WHITMAN




- 1 Hobart Pond Dam (Hobart Pond)
- 2 7-Eleven
- 3 Citgo
- 4 Cumberland Farms
- 5 Diamond Fuel
- 6 Prime Energy
- 7 Verizon
- 8 Whitman Public Library
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AVERAGE ANNUAL SNOWFALL

- 24-36 INCHES
- 36-48 INCHES
- 48-72 INCHES
- CRITICAL FACILITIES
- OCPC REGION

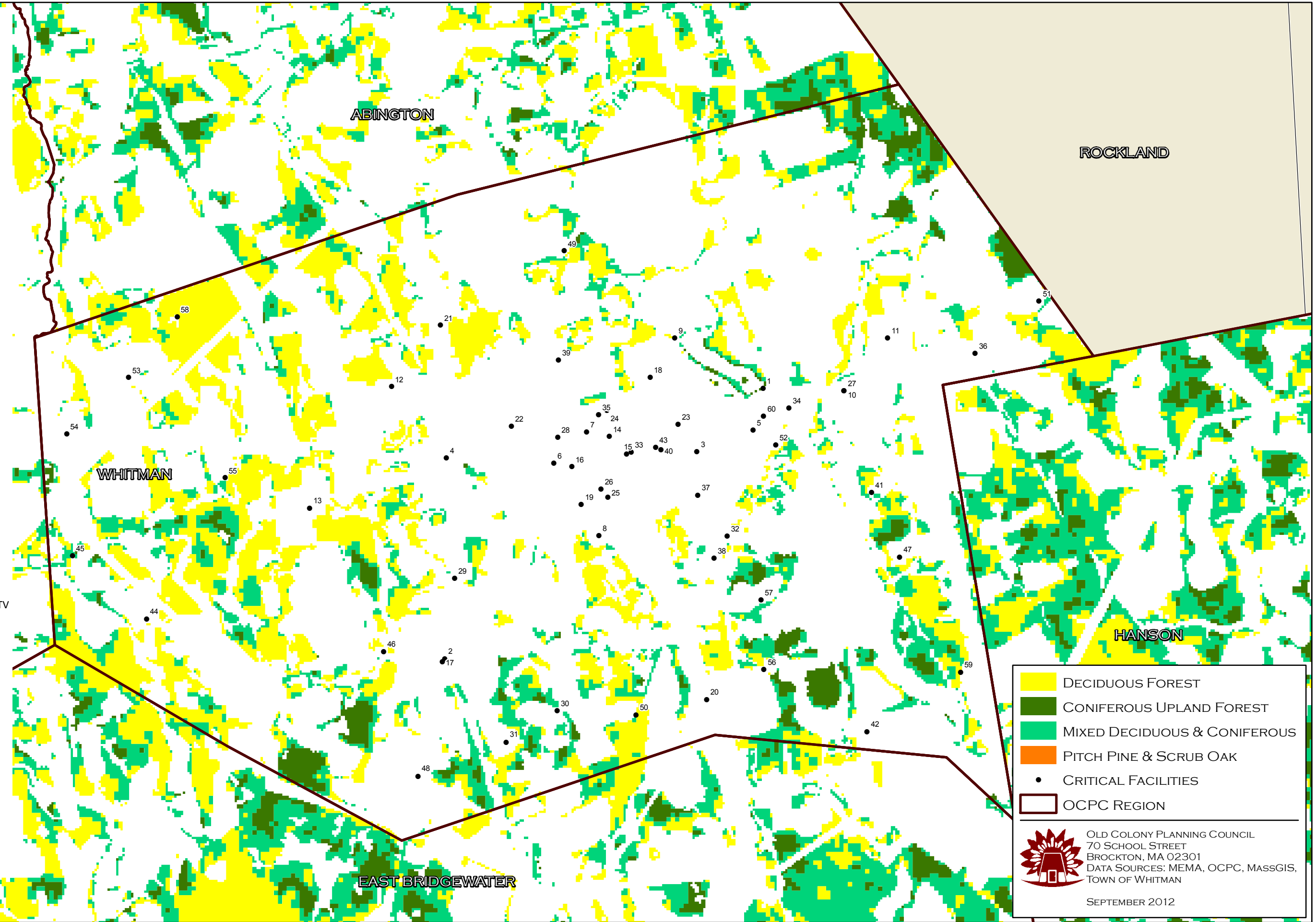


OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: NOAA, OCPC, MASSGIS,
 TOWN OF WHITMAN
 SEPTEMBER 2012

WILDFIRE SUSCEPTIBILITY - WHITMAN



- 1 Hobart Pond Dam (Hobart Pond)
- 2 7-Eleven
- 3 Citgo
- 4 Cumberland Farms
- 5 Diamond Fuel
- 6 Prime Energy
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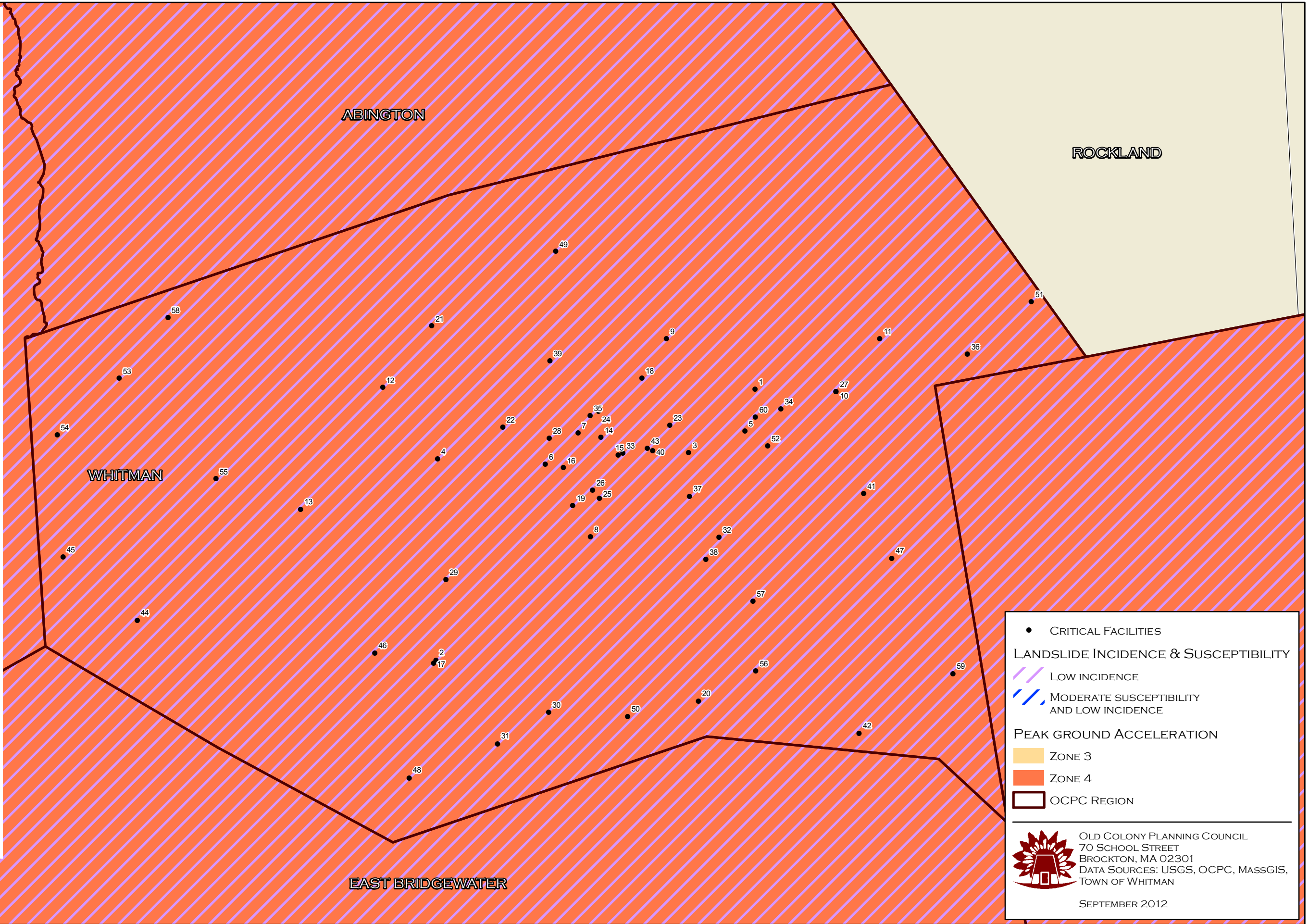
	DECIDUOUS FOREST
	CONIFEROUS UPLAND FOREST
	MIXED DECIDUOUS & CONIFEROUS
	PITCH PINE & SCRUB OAK
	CRITICAL FACILITIES
	OCPC REGION

OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 DATA SOURCES: MEMA, OCPC, MASSGIS,
 TOWN OF WHITMAN
 SEPTEMBER 2012

EARTHQUAKE & LANDSLIDE - WHITMAN



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- CRITICAL FACILITIES

LANDSLIDE INCIDENCE & SUSCEPTIBILITY

- LOW INCIDENCE
- MODERATE SUSCEPTIBILITY AND LOW INCIDENCE

PEAK GROUND ACCELERATION

- ZONE 3
- ZONE 4
- OCPC REGION


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 DATA SOURCES: USGS, OCPC, MASSGIS,
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