



Pawtucket Central Falls



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Municipal Resilience Program Community Resilience Building Workshop Summary of Findings October 2020



City of Pawtucket & City of Central Falls Community Resilience Building Workshop

Summary of Findings

Overview

The need for municipalities, regional planning organizations, states, and federal agencies to increase resilience and adapt to extreme weather events and a changing climate is strikingly evident amongst the communities of the state of Rhode Island. Recent events such as Tropical Storm Irene and Super Storm Sandy have reinforced this urgency and compelled leading communities like the City of Pawtucket and the City of Central Falls to proactively collaborate on planning and mitigating risks. Ultimately, this type of leadership is to be commended because it will reduce the vulnerability and reinforce the strengths of people, infrastructure, and ecosystems and serve as a model for other communities across Rhode Island, New England, and the Nation.

In February of 2020, the City of Pawtucket and the City of Central Falls jointly embarked on certification within the newly established state of Rhode Island's Municipal Resilience Program (MRP). As an important step towards certification, Rhode Island Infrastructure Bank (RIIB) and the Nature Conservancy (TNC) provided the two Cities with a joint, community-driven process to assess current hazard and climate change impacts and to surface projects, plans, and policies for improved resilience. In October, 2020, the Pawtucket & Central Falls Core Project Team organized a Community Resilience Building Workshop lead by TNC in partnership with RIIB. The core directive of this effort was the engagement with and between community stakeholders to define strengths and vulnerabilities and the development, planning, and ultimately, implementation of priority resilience actions for the cities of Pawtucket and Central Falls.

The Pawtucket & Central Falls Community Resilience Building Workshop's central objectives were to:

- Define top local natural and climate-related hazards of concern;
- Identify existing and future strengths and vulnerabilities;
- Identify and prioritize actions for the two Cities (individually and jointly);
- Identify opportunities to collaboratively advance actions to increase resilience alongside the other municipalities and organizations across the two Cities

The Cities of Pawtucket and Central Falls employed a unique “anywhere at any scale”, community-driven process called Community Resilience Building (CRB) (www.CommunityResilienceBuilding.org). The CRB’s tools, other relevant reports, and local maps were integrated into the workshop process to provide both decision-support and visualization around shared issues and priorities across Pawtucket and Central. The joint Pawtucket & Central Falls Natural Hazard Mitigation Plan (2018), Comprehensive Plans (Pawtucket - 2017; Central Falls - 2007), and Chapter 1 of Resilient Rhody were particularly instructive. Using the CRB process, rich with information, experience and dialogue, the participants produced the findings presented in this summary report including an overview of the top hazards, current concerns and challenges, existing strengths, and proposed actions to improve resilience to hazards and climate change today, and in the future.

The summary of findings transcribed in this report, like any that concern the evolving nature of risk assessment and associated action, are proffered for comments, corrections and updates from workshop attendees and other stakeholders alike. The leadership displayed by the cities of Pawtucket and Central Falls on community resilience building will benefit from the continuous and expanding participation of all those concerned.

Summary of Findings

Top Hazards and Vulnerable Areas for the Community

Prior to the CRB Workshop, the Core Project Team identified the top hazards for Pawtucket and Central Falls. The hazards of greatest concern are riverine flooding, Nor’easters that bring heavy precipitation and high winds, and heatwaves. The other hazards discussed during the CRB workshop included pandemics, fires, flooding from stormwater runoff from heavy precipitation, and winter storms with associated snow and ice accumulations. These hazards have direct and increasing impacts on the residents and resources such as its neighborhoods, natural areas (rivers, wetlands, shorelines, parks), streets, sidewalks, bridges, dams, businesses, municipal facilities, social support services for disproportionately disadvantaged populations, and other critical infrastructure and community assets.

Top Hazards and Areas of Concern for the Community

Top Hazards

- Riverine and Urban Flooding
- Nor'easters/High Precipitation Storms (Wind Damage & Flooding)
- Extreme and Extended Temperatures (Heatwaves, Cold Snaps, Drought)

Areas of Concern in Pawtucket and Central Falls* - Several categories and locations were identified as being particularly vulnerable by workshop participants including:

Infrastructure: Repetitive Loss Properties (4 - Pawtucket; 5 - Central Falls), Pawtucket DPW Fuel Depots, Privately-owned Dams (Cumberland), High-hazard Dams (Attleboro), Galego Court (Pawtucket public housing units), Tower - Pawtucket City Hall, Gas Pipes and Electrical Wiring (on low lying bridges over three main rivers in Pawtucket), Water Supply Lines, Masonry Apartments, Mill Buildings, National Grid Electric's Substation, Backflow Preventors (private properties), McCabe and Varieur Schools (emergency power sources for mass care facilities), Businesses, Evacuation Routes, Lightning Rods, Power Lines (trees), Properties along Blackstone River, Woonsocket Falls Dam (Significant Hazard Dam), Hebronville Pond Dam (High Hazard Dam), Pawtucket City Hall, Slater Mill, Grove Street High-rise, Riverfront Lofts, Roosevelt Ave Fire Station, Pawtucket Police Station, Bridge Mill Power Plant, Veterans Park Amphitheater, Cemeteries.

Ecosystems/Parks: Moshassuck River, Ten Mile River, Blackstone River, Water Supply Reservoirs and Supporting Open Space, Urban Tree Canopy, Parks along Blackstone River, Seekonk River, Hodgson Rotary Park, Town Landing, Festival Pier, Pierce Park, Valley Falls Pond, Scott Pond, Blackstone River Fish Passage, Blackstone Falls.

Roads, Bridges, and Road Network: Pawtucket - Armistice Boulevard (vicinity of DPW Center), Mineral Spring Avenue, Pinecrest Drive, Grand Avenue/London Avenue intersection, Grenville Street/Grotto Avenue (vicinity of Moshassuck River). Central Falls - River Street, Crown Street, Courtland Avenue, New Haven Avenue, Higginson Avenue. Low-lying Bridges/Culverts over/near Moshassuck or Blackstone Rivers (Interstate 95, Mineral Spring Avenue culvert, Roosevelt Avenue Bridge, Exchange Street Bridge).

Neighborhoods/Areas: Woodlawn, Samoset, Pine Crest, Darlington, Quality Hill, Fairlawn, Oak Hill, Conant Thread District.

Vulnerable Populations: Elderly/Senior Citizens, Non-English Speakers, Undocumented Residents, Children, Residents with Special Needs and Disabled Residents, Visitors and Tourists, Local Business Owners, Veterans, Low-Income Residents, Working Poor, Long-term Renters.

*Information from workshop participants augmented via the Cities of Pawtucket and Central Falls Multi-jurisdictional NHMP (2018). *See Appendix A for full list of mitigation actions from the Cities of Pawtucket and Central Falls NHMP (i.e. Section 4.0: Section 4.2 (Table 4.1); Section 4.5 (Table 4.2)).*

Current Concerns and Challenges Presented by Hazards

The cities of Pawtucket and Central Falls has several concerns and faces multiple challenges related to the impacts of natural hazards and climate change. In recent years, Pawtucket and Central Falls have experienced a series of highly disruptive and damaging weather events including March 2010 floods, Tropical Storm Irene (August 2011), Super Storm Sandy (October 2012), winter storm Nemo (February 2013), winter storm Juno (“Snowmageddon”) (January 2015), and other less impactful, but more frequent events. Impacts from Irene included heavy, rain-induced, inland flooding and wind damage. Sandy caused extensive coastal erosion and power outages across portions of two Cities. The winter storms Nemo (19”-20”) and Juno (24”) dropped snow on the Cities knocking out power and isolating residents and neighborhoods due to extended road closures. The magnitude and intensity of these events and others across Rhode Island has increased awareness of natural hazards and climate change, while motivating communities like Pawtucket and Central Falls to proactively and comprehensively improve resilience.

This series of extreme weather events highlights that the impacts from hazards are diverse: ranging from riverine flooding of critical infrastructure, bridges, roads, and low-lying areas; urban flooding from stormwater runoff during intense storms and heavy precipitation events; property damage from trees, wind, snow, and ice. Longer periods of elevated heat, particularly in July and August, have raised concerns about vulnerable segments of the population including the elderly and disabled. The combination of these issues presents a challenge to preparedness and mitigation priorities and requires comprehensive yet tailored action for particular locations and/or areas.

The workshop participants were generally in agreement that Pawtucket and Central Falls are experiencing more intense and frequent storm events and heat waves. Additionally, there was a general concern about the increasing challenges of being prepared for the worst case scenarios (i.e. major disasters, storms, major hurricanes (Cat-3 or above)) throughout the year, but particularly in the fall/winter months due to more intense snow and ice storms coupled with colder weather.

Specific Categories of Concerns and Challenges

As in any community, Pawtucket and Central Falls are not uniformly vulnerable to hazards and climate change, and certain locations, assets, and populations have and will be affected to a greater degree than others. Workshop participants identified the following items as their community's key areas of concern and challenges across three broad categories - Infrastructure, Societal, and Environmental.

Infrastructure Concerns and Challenges

Roads, Bridges, and Road Networks:

- Low-lying roads and buildings (e.g. mills) close to riverine systems subjected to erosion and routine flooding from rivers and stormwater runoff.
- Lack of viable, convenient public transportation and unreliability of bus routes.
- Limited bike lanes, walking paths, and low tree coverage on existing sidewalks negatively impact pedestrians' safety and mobility.
- Small, compact roads create parking and plowing difficulties.

Stormwater Management:

- High levels of impervious surfaces (>60%) create stormwater runoff issues.
- Lack of green space for runoff in neighborhoods.
- Aged sewer and stormwater infrastructure are prone to being at-capacity and cause flooding.
- Combined sewer/stormwater systems exacerbate capacity of piped systems and overflows to riverine systems.
- Overflows into rivers that flood beyond their banks will affect residents' homes, businesses, and vulnerable populations.

Emergency Management and Preparedness:

- Pawtucket City Hall, Fire Station, and Police Station are within a flood plain; emergency agencies are likely to be inundated during a weather event, hindering the communities' response and recovery.
- Lack of community center and sufficient spaces to provide shelter during emergencies.

Housing:

- Direct impacts to structures from storms.
- Lack of education regarding the potential for current & future impacts to structures including privately owned buildings and houses.
- Absentee and/or negligent landlords and property owners.
- Lack of affordable housing, including affordable senior housing with mobility access.
- Poverty contributes to a lack of investment in properties.

Infrastructure Concerns and Challenges (cont'd)

Power:

- Occasional power outages to residential homes and businesses, particularly during the winter months.
- Low-income households vulnerability due to power outages.
- The outdated electrical grid frequently causes power outages during storms.
- Inadequate generator capacity in both Cities.

Societal Concerns and Challenges

Vulnerable Populations:

- Implications for disproportionately disadvantaged populations (i.e. homeless, elderly, low-income, non-English speakers) from flooding, winter storms, and heatwaves.
- Emergency communications with and outreach among non-English speakers.
- Severe homelessness resulting in numerous cascading impacts.
- High rates of food insecurity across both Cities.

Development and Historic Sites:

- Lack of access to timely funds to procure properties on the market for conversion to open space/stormwater infrastructure improvements.
- Lack of developable space and limited to rehabilitation of existing infrastructure.
- Communities should prepare for an influx of new residents and climate refugees as people leave areas vulnerable to flooding or severe weather events.
- The limited tax base limits funds for municipal-based projects.
- Central Falls has Rhode Island's lowest median income, causing residents to struggle with education attainment, homeownership, etc.
- Public perception that areas are unsafe places to visit impacts tourism.
- Many historic buildings are located in the floodplain.

Environmental Concerns and Challenges

Rivers:

- Flooding from Blackstone River and Ten Mile River.
- Drainage and sewer overflows pollute the rivers - including pollutants from contaminated mill sites. Issue exacerbated when contaminants infiltrate homes and businesses when rivers overtop their banks.

Trees and Forests:

- Prevalent heat islands pose threats to residents during extreme heat events.
- Lack of trees at bus stops, heat-sensitive areas, and other vulnerable locations.

Current Strengths and Assets

Just as certain locations, assets, and populations in Pawtucket and Central Falls stand out as particularly vulnerable to the effects of hazards and climate change, other features are notably affirmative assets for Pawtucket and Central Falls resilience building. Workshop participants identified the following items as their community's key strengths and expressed interest in using them as the core of future resilience building actions.

- Clearly, the responsive and committed leadership exhibited by officials and staff is a very appreciated strength within and across Pawtucket and Central Falls. Ongoing collaboration between the Cities, business community, faith-based organizations, NGOs, adjoining municipalities along the Blackstone River Corridor, and state-level organizations, among others on priorities identified will help advance comprehensive, cost-effective, community resilience building actions.
- The Cities have highly experienced staff with access to adequate resources for most emergency situations. The coordination amongst various departments including leadership, Police, Fire, and EMS within and across the cities was cited as a highly valued community strength. A signed memorandum of understanding builds off a cost-sharing pilot program (2015) that merged the emergency management services of the two cities.
- The development and maintenance of a joint Hazard Mitigation Plan with a shared Emergency Manager is a unique and important testament to the deep coordination between Pawtucket and Central Falls and reflects the strong emphasis on a preparedness culture.
- The Cities are highly diverse and multicultural. Their small sizes facilitate a high degree of interconnectedness and approachability among residents and leadership.
- Pawtucket is a participant in the National Flood Insurance Program's Community Rating System (Class 8).
- Presence and deep involvement of the NGO communities both locally and regionally across the two Cities.
- Pawtucket and Central Falls recently completed a Riverfront Corridor Market Analysis with commitments to working in tandem to develop employment and industry opportunities.

Current Strengths and Assets (cont'd)

- Numerous public amenities and open spaces that improve residents' quality of life in Pawtucket and Central Falls - particularly along the Blackstone River.
- Strong focus by municipality on utilizing natural systems to help minimize the impacts of extreme weather and climate change via nature-based solutions.
- Emphasis by residents on volunteering time and resources to strengthen their community and help other residents thrive.
- Blackstone and Ten Mile River dams as classified by DEM as "low hazard".
- Existing flood mitigation efforts at Slater Dam and the riverfront.
- Strong emphasis on riverfront access in both Pawtucket and Central Falls waterfront parks coupled with public education about the importance of Blackstone River.
- The Tree Planting and Rain Barrel Programs increase public greenery and shade.
- The Broad Street Regeneration Initiative improved Broad Street's walkability, streetscape, drainage structures, and road surface.
- Recent public infrastructure projects focused on removing dilapidated housing and replacing it with new housing.
- The Macomber Stadium renovation and newly developed soccer field will offer quality recreational opportunities for residents.
- Redundant road network ensures emergency services can easily access points across the community.
- Train Station under construction will likely bring new development and jobs to the Cities.
- New community health station addresses communities' health care needs.
- Affordable housing is highly prioritized in both Cities.
- National Historical Park could continue to be a catalyst for improvements in river ecology, expansion of river access, STEM activities in classrooms, tourism, and job growth.
- Pawtucket-Central Falls water parks help families stay safe and cool during extreme heat events.

Recommendations to Improve Resilience

A common thread throughout the workshop discussions was the recognition that Pawtucket and Central Falls need to be better prepared through longer term, community-based, planning and respective actions across the areas of concern. To that end, the workshop participants reached agreement on several key topics requiring more immediate and/or ongoing attention including:

- Infrastructure improvements (i.e. wastewater treatment system and facilities, stormwater management systems, green stormwater infrastructure);
- Quality of life improvements (i.e. greening of neighborhoods, walkability, sustainability, park access improvements, green infrastructure, community events, affordable housing, improved job opportunities, transportation);
- Emergency management (i.e. preparedness, communications, sheltering, heating/cooling centers, continuation of services, parking).

In direct response, the workshop participants developed the high priority actions below organized across several sub-categories including capacity building, projects, plans/preparedness/studies/outreach, and policy. Mitigation actions from the joint Pawtucket and Central Falls NHMP (2018) are provided in Appendix A for cross reference.

Higher Priority Actions

Capacity Building:

- Secure funding to hire a joint Pawtucket-Central Falls coordinator to oversee both communities' sustainability and resiliency efforts, engagements, and programs.
- Expand funding for affordable housing through grants and by advocating for additional state-bond and state-funding mechanisms.
- Leverage existing relationships between the leadership of both communities to increase residents' utilization of existing facilities and public services, expand outreach regarding climate change impacts, and increase shelter capacity during extended extreme weather events.
- Explore and secure federal funding (e.g. FEMA, RIDEM, National Park Service River, Trails & Conservation Assistance, ACOE) for resiliency efforts and/or to increase staffing capacity.

Higher Priority Actions (cont'd)

Projects:

- Expand rain barrel and tree-planting programs to reduce stormwater runoff and heat island effects and other programs that prioritize equity and resident's needs.
- Create household and common gardening programs to help reduce food insecurity.
- Implement green stormwater infrastructure projects (rain gardens, bioswales, etc.) to reduce localized flooding and improve water quality in receiving water bodies.
- Construct new and retrofitted heating and cooling centers with back-up power in areas that will maximize the benefits to vulnerable communities.

Plans/Preparedness/Studies/Outreach:

- Update Central Fall's Comprehensive Plan and ensure for close interconnections with Pawtucket's Comprehensive Plan (i.e. common zoning designations, future growth areas, transportation, etc.)
- Continue to collaboratively build and complete the Pawtucket-Central Falls Economic Development Plan.
- Create green schoolyards strategic plan and fund pilot green stormwater projects.
- Expand outreach on resilience and climate-related issues in coordination with youth programs and local NGOs and ensure resources are available in multiple languages.
- Consider planning for the development a "Resident Resilience Task Force".
- Prioritize the need for utility upgrades, including electrical upgrades across Cities.
- Use the Pawtucket-Central Falls Walk-Bike Master Plan to identify priority areas for improved quality of life and access across both Cities.
- Identify and create new green spaces to serve multiple functions, including recreation, flood reduction, parking during emergencies, snow removal, stormwater mitigation, etc.
- Build upon existing work with the Narragansett Bay Commission to conduct inventory across both communities of streets and other public spaces in need of green stormwater infrastructure.

Higher Priority Actions (cont'd)

- Develop a senior housing strategy to help improve access to green, affordable, and energy-efficient housing.
- Develop emergency parking plan - especially during winter months - and promote parking efficiency for underused lots as part of larger transportation improvement efforts and strategy.
- Create additional public parking opportunities for large storm events that are increasing in intensity and frequency (more specifically snow events) to help remove cars from compact streets where snow removal operations are severely compromised and create public safety impacts.
- Gather communities together for events that promote community involvement in resiliency and conservation efforts (e.g. Earth Day, tree-planting, river clean-up).
- Create a vision for the future use of the OSRAM-Sylvania plant, redevelopment of Conant Thread District, and abandoned Pawtucket-Central Falls Train Station.
- Convene and strategically identify open space parcels for future acquisition that will improve the overall resilience of Pawtucket and Central Falls and dedicate funding via bonding and other sources of funds to secure priority parcels that will increase quality of life and reduce risk of flooding and heatwaves for residents.

Policy:

- Consider establishing policies that require development plans to include maximum use of green infrastructure (i.e. tree planting, green stormwater infrastructure, etc.).
- Establish zoning consistency between both Cities and continue to work collectively to attract and retain business in a unified manner.

Priority Actions

In addition to these higher priority actions, the workshop participants identified the list of priority actions below organized across several sub-categories including capacity building, projects, plans/preparedness/studies/outreach, and policy. These actions are considered important or “priority” for Pawtucket and Central Falls, but not as high priority as the preceding list, currently.

Priority Actions (cont'd)

Capacity Building:

- Review and modify on an annual basis the respective Capital Plans to ensure resilience in fully integrated into funded projects and other budgeted expenditures.
- Increase funding for Rain Barrels and Tree Planting Programs to scale up both programs and improve their accessibility to front-line communities and non-English speakers.
- Create an Emergency Defense Fund to help businesses and community members following extreme weather events or other major crises.
- Hire a grant-writer who can bring more funds for resiliency-related projects and programs into Central Falls and Pawtucket.
- Increase regional collaboration on projects to better compete against coastal communities for resilience and sustainability funds (i.e. work with Cumberland and other municipalities along the Blackstone River Corridor).
- Offer incentives and training to associations and organizations to ensure that volunteers are trained and equipped to support emergency personnel.
- Invest further in mental health support and resources to help improve the overall mental resilience of the Cities' residents.

Projects:

- Construct bike path along Blackstone River as part of Blackstone Bikeway.
- Use green infrastructure along Broad Street to limit impacts of stormwater runoff.
- Improve public transportation and streets' walkability across and between both Cities.
- Fix broken pedestrian-crossing signs in Pawtucket and improve crosswalks to increase the safety of residents.
- Plant trees and greenery to reduce communities' vulnerability to heat, including at bus stops, school yards, play grounds, and other vulnerable neighborhoods.
- Conduct small-scale, de-paving projects in areas experiencing routine flooding. Conduct fundraise to build a new community center.

Priority Actions (cont'd)

- Update Blackstone River Fish Passage's infrastructure and utilize it as an opportunity to reexamine replacement of historic armoring of the riverbank.
- Invest in solar power to supply residential areas and municipal facilities.
- Redevelop brownfields and remove toxic materials.

Plans/Preparedness/Studies/Outreach:

- Examine the efficacy of existing policies limiting carbon emissions and/or consider alternative policies.
- Expand environmental education in schools and create multilingual environmental awareness programs for residents.
- Address historic buildings and sites flooded in 2005.
- Create an emergency alert system that reaches majority of residents - consider using the Blackstone Alert model.
- Conduct feasibility assessment for undergrounding utility lines in high risk areas.
- Reevaluate risk to residential housing and implications of housing density in neighborhoods with vulnerable populations (i.e. elderly, working poor) and with evacuation routes subjected to closure during major events.
- Cooperate with local businesses to identify potential heating and cooling centers in proximity to vulnerable populations and at-risk neighborhoods.
- Refine evacuation routes, emergency plans, and extreme weather event plans.
- Conduct community information sessions on recycling.
- Promote the use of the new train station and ensure it remains accessible by bus, bike, and pedestrians.
- Explore using athletic fields for stormwater management storage options.
- Examine how to best communicate with residents without internet access and considering the use of youth ambassadors to strengthen response.
- Research and share information about the health effects of climate change.
- Consider supporting restaurants as cooling centers.

Priority Actions (cont'd)

- Evaluate the clearing of unused property to develop more public parking, incorporating the trade-off between funding improvements in parking versus housing and education.
- Meet with the owners of designated refuge buildings and organizations to ensure that they are properly equipped and able to offer the necessary accommodations to residents during emergencies.

Policy:

- Introduce new and/or strengthen existing Low Impact Development ordinances across both Cities.
- Modify zoning laws to allow for higher density housing and less parking to reduce housing costs and oversupply of parking.
- Examine zoning codes and ordinances for development and land use to see where resiliency and sustainability can be incorporated and incentivized.
- Implement, improve, and broaden types of infrastructure and development eligible for financing under Super TIFs (Tax Increment Financing).
- Improve enforcement of existing policies and executive orders relating to wetlands, floodplains, and stormwater management.



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CRB Workshop Participants: Department/Organization

City of Central Falls - Office of the Mayor

City of Pawtucket - Office of the Mayor

City of Pawtucket - Fire

City of Central Falls - Police Department

City of Pawtucket - Planning

City of Central Falls - Planning

City of Pawtucket - Department of Public Works

City of Central Falls - Department of Public Works

City of Central Falls - Legal Department

City of Pawtucket & Central Falls Emergency Management Agency

City of Central Falls - Planning Board

Pawtucket-Central Falls Development

Central Falls Housing Authority

Groundwork Rhode Island

Blackstone Valley Tourism Council

Northern Rhode Island Chamber of Commerce

Keep Blackstone Valley Beautiful

National Park Service

Progreso Latino

Pare Corporation

Pawtucket and Central Falls Core Project Team

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Online CRB Workshop Facilitation Team

Rhode Island Infrastructure Bank - Shaun O'Rourke (Program Lead & Facilitator)

The Nature Conservancy - Adam Whelchel (Lead Facilitator)

The Nature Conservancy - Sue AnderBois (Lead Coordinator)

Audubon Society of Rhode Island - Meg Kerr (Facilitator)

Save the Bay - David Prescott (Facilitator)

The Nature Conservancy - Sheila Dormody (Facilitator)

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Recommended Citation

Cities of Pawtucket and City of Central Falls (2020). Online Community Resilience Building Workshop - Summary of Findings, State of Rhode Island Municipal Resilience Program. City of Pawtucket, City of Central Falls, Rhode Island Infrastructure Bank, The Nature Conservancy. Pawtucket and Central Falls, Rhode Island.

Acknowledgements

Special thanks to the City leadership, staff, and community members for their willingness to embrace the process in hopes of a more resilient future for Pawtucket and Central Falls. This online workshop was made possible in large part through the generous contribution of the facilitation team members including scribes who skillfully conducted the Pawtucket and Central Falls Community Resilience Building workshop in close partnership with the joint City Core Project Team.

Appendix A

Cities of Pawtucket & Central Falls Natural Hazard Mitigation Plan (2018)

Section 4.0 Mitigation Strategies

(Section 4.2 - Table 4.1)

(Section 4.5 - Table 4.2)

prepared by

Punchard Consulting & Jamie Caplan Consulting

Table 4-1: Mitigation Goals

Goal #1	Protect the lives and property of community members from natural hazards.
Goal #2	Protect existing and future critical facilities and infrastructure from natural hazards.
Goal #3	Protect cultural, historic, and natural resources from natural hazards.
Goal #4	Prepare community members for the types of natural hazards that can affect the area through education and outreach initiatives.

Table 4-2: Mitigation Action Plan (MAP) Summary, City of Pawtucket

Action #	Action Title	Mitigation Goal	Mitigation Category	Hazard(s) Addressed	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
1	EMAP Accreditation	1, 2	Local Plans and Regulations	Multiple	Staff time, consultant time	RIEMA, FEMA, City Budget	Pawtucket EMA	January 2019	High
2	Increased CRS Rating	1, 2, 3	Local Plans and Regulations	Flood	Staff time, consultant time	City Budget	Pawtucket EMA, DPR	January 2020	Medium
3	Debris Management Plan	1, 3	Local Plans and Regulations	Multiple	Staff time	City Budget, grants	Pawtucket EMA	January 2019	Medium
4	Maintain and Regularly Update Parcel-Base GIS Database	1	Local Plans and Regulations	Multiple	Staff time	RIDEM, City Budget	Public Works	2018-2023	High
5	Building Code Compliance Enforcement	1, 4	Local Plans and Regulations	Multiple	Staff time	Private land owners, RIEMA, FEMA	Building and Code Enforcement	2018-2023	High
6	Low-Impact Development	1, 3	Local Plans and Regulations	Flood	Staff time	N/A	DPR	January 2019	Medium
7	Recovery and Reconstruction Ordinance	1, 2	Local Plans and Regulations	Multiple	\$15,000	City Budget, grants	Pawtucket EMA, DPR, Zoning	January 2021	Medium
8	Publicly-Owned Dam Inspection, Classification, and Maintenance	1, 2	Structure and Infrastructure Projects	Dam Failure	Staff time	PWSB Budget	Pawtucket EMA, Pawtucket Water Supply Board (PWSB)	2018-2023	Medium
9	Develop Actionable Strategy to Address Repetitive Loss Properties	1, 4	Structure and Infrastructure Projects	Flood	Staff time	REIMA, City Budget	Pawtucket DPR	July 2019	High
10	Increase Green Infrastructure	1, 2, 3	Structure and Infrastructure Projects	Flood, Extreme Heat	Staff time	City Budget, RIDEM	Pawtucket DPW	January 2020	High

Action #	Action Title	Mitigation Goal	Mitigation Category	Hazard(s) Addressed	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
11	Relocate the City's Fuel Depots	2	Structure and Infrastructure Projects	Flood	High	FEMA (HMA)	DPW	January 2021	Medium
12	Privately-Owned Dam/Flood Control Devices Inspection, Classification, and Maintenance	1, 2	Structure and Infrastructure Projects	Dam Failure	Private ownership	Private funding	Pawtucket Water Supply Board (PWSB)	2018-2023	Medium
13	Public Housing Units	1, 2	Structure and Infrastructure Projects	Multiple	Varies dependent upon remediation measure	Pawtucket Housing Authority Budget, HUD, RIEMA, FEMA	Pawtucket Housing Authority	January 2020	Medium
14	Ensuring the Safety of Elderly Housing and Public Housing	1, 2	Structure and Infrastructure Projects	Multiple	Varies dependent upon remediation measure	Grants	Private Property Owners	January 2021	Low
15	City Hall	2	Structure and Infrastructure Projects	Coastal Storm; Severe Weather	High	CIP, RIEMA, FEMA, City Bond	DPW (Public Buildings)	January 2023	Medium
16	Installation of Underground Overflow Tanks	2	Structure and Infrastructure Projects	Flood	Variable but estimated at \$40,000 per installation	RIEMA, FEMA, City Capital Improvement Program (CIP)	DPW (Highway and Bridges Division)	January 2022	Medium
17	Localized Flooding of Roadways	2	Structure and Infrastructure Projects	Flood	Varies dependent upon structure/remediation measure	City budget, City Bond, CIP	DPW (Highway and Bridges Division)	January 2020	High

Action #	Action Title	Mitigation Goal	Mitigation Category	Hazard(s) Addressed	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
18	Bridge Inspection	2	Structure and Infrastructure Projects	Flood; Earthquake	Varies dependent upon structure/re mediation measure	RIEMA, FEMA, CIP, RIDOT	DPW (Highway and Bridges Division)	2018-2023	Medium
19	Emergency Procedure for Gas/Electrical Lines Running on Bridges	2	Structure and Infrastructure Projects	Flood; Severe Winter Storm	Approximately \$10,000 per bridge	RIEMA, FEMA, CIP	DPW (Highway and Bridges Division)	January 2020	Medium
20	Emergency Procedure for Water Lines Running on Bridges	2	Structure and Infrastructure Projects	Flood; Earthquake	Staff time	Pawtucket Water Supply Board	DPW (Highway and Bridges Division), Pawtucket Water Supply Board	2018-2023	Low
21	Elevate Low-Lying Bridges/Culverts	2	Structure and Infrastructure Projects	Flood	Varies dependent on scope of modification	RIDOT; City Bond, CIP	DPW (Highway and Bridges Division)	January 2022	Low
22	Industries in the Floodplain	1, 2	Structure and Infrastructure Projects	Flood	Varies dependent on scope of improvements, private property owners	Private land owners, RIEMA, FEMA	Building and Code Enforcement	2018-2023	High
23	Develop Retrofit (Dry/Wet Floodproof, Elevation) Program	1, 2	Structure and Infrastructure Projects	Flood	N/A	Private land owners, RIEMA, FEMA	Building and Code Enforcement	January 2020	Medium
24	Masonry Apartments and Mill Buildings	1, 2	Structure and Infrastructure Projects	Earthquake	Staff time	Private land owners, RIEMA, FEMA	Building and Code Enforcement	January 2021	Medium

Action #	Action Title	Mitigation Goal	Mitigation Category	Hazard(s) Addressed	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
25	School Vulnerability	2	Structure and Infrastructure Projects	Multiple	Staff time	Pawtucket School Department Budget, CIP	Building and Code Enforcement, Fire Department	2018-2023	Medium
26	Installation of Video Monitoring System - Monitor Capacity and Condition of Sewer Infrastructure	2	Structure and Infrastructure Projects	Flood	\$50,000	RIEMA, FEMA, CIP, DEM	DPW (Sewer and Sanitation Division)	January 2020	High
27	Continue to Implement Infrastructure Replacement Plan	2	Structure and Infrastructure Projects	Flood	Variable (Dependent on Location and Damage)	RIEMA, FEMA, CIP, RIDOT	DPW (Sewer and Sanitation Division)	2018-2023	Medium
28	Installation of Seawall at Narragansett Electric's Substation	2	Structure and Infrastructure Projects	Flood	High	Private funding	Narragansett Electric (National Grid)	January 2023	Medium
29	Backflow Prevention Valve Rebate Program	1, 4	Structure and Infrastructure Projects	Flood	\$500 per rebate	RIEMA, FEMA, City Budget, Private land owners	DPR	January 2021	Low
30	Acquire and Preserve Open Space along the Moshassuck River	3	Natural Systems Protection	Flood	Variable dependent on size, location, condition of land	CDBG, CIP, RIDEM	DPR, PRA, Mayor's Office	January 2021	Medium
31	Preservation of Water Supply Reservoirs and their Watersheds	3	Natural Systems Protection	Flood	Varies dependent upon property acquisition	City budget, Water Resources Board, DEM, Cumberland Land Trust	Pawtucket Water Supply Board (PWSB)	January 2020	Low

Action #	Action Title	Mitigation Goal	Mitigation Category	Hazard(s) Addressed	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
32	Contain Hazardous Materials	3	Natural Systems Protection	Coastal Storm	Staff time	N/A	Pawtucket Fire Department	January 2022	Medium
33	Open Space Acquisition	3	Natural Systems Protection	Flood	Varies dependent upon property acquisition	City budget, grants, FEMA, DEM	DPR, PRA, Mayor's Office	January 2023	Medium
34	Volunteer Disaster Resistance Program	1, 4	Education and Awareness Programs	Sea Level Rise / Climate Change Impacts	Staff time or dependent upon level of training	City Budget, grants	Pawtucket EMA	January 2019	Medium
35	Public Information, Outreach and Incentive Program	1, 4	Education and Awareness Programs	Multiple	Staff time	Private land owners, RIEMA, FEMA	Building and Code Enforcement	2018-2023	High
36	Information Brochure	1, 4	Education and Awareness Programs	Multiple	Staff time	City budget, grants	Pawtucket EMA	2018-2023	Medium
37	Mass Care Facility Equipment	1	Emergency Services	Multiple	\$160,000 each	FEMA (EMPG); City budget/soft-match	Pawtucket EMA	July 2019	High
38	Volunteer Disaster Assistance Officer	1, 4	Emergency Services	Multiple	Staff time	City Budget, grants	Pawtucket EMA	2018-2023	Medium
39	Elderly and Special Needs Residents	1	Emergency Services	Multiple	Staff time	N/A	Pawtucket Housing Authority	2018-2023	High
40	Business Continuation	1, 4	Emergency Services	Multiple	Staff time	N/A	Pawtucket Police Department	January 2020	Medium
41	Coordinate Evacuation Plans with Neighboring Municipalities	1	Emergency Services	Multiple	Staff time	N/A	Pawtucket Police Department	January 2020	Medium

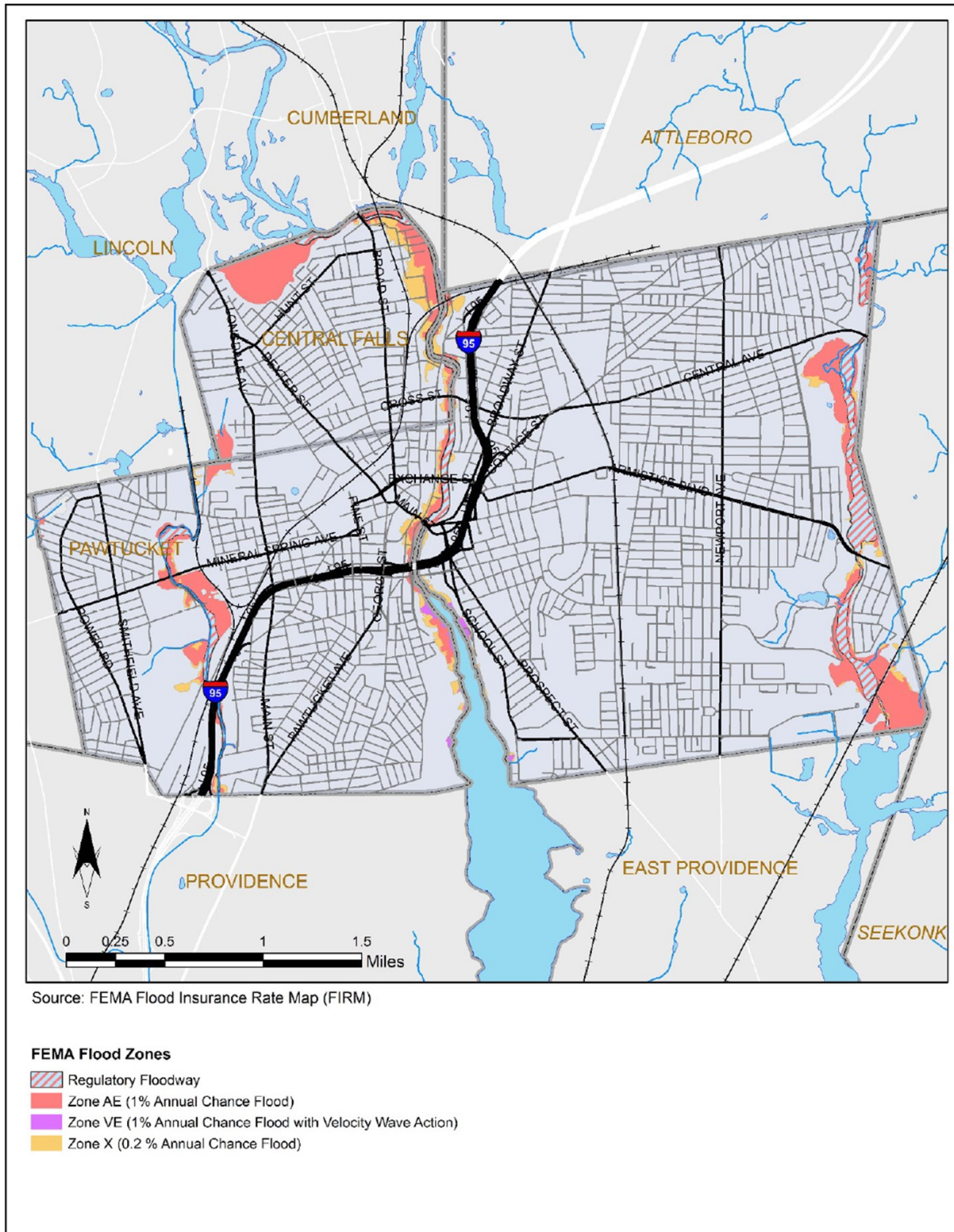
Action #	Action Title	Mitigation Goal	Mitigation Category	Hazard(s) Addressed	Estimated Cost	Potential Funding Source	Lead Department	Implementation Schedule	Priority
42	Maintain Viable Evacuation Routes	1, 2	Emergency Services	Multiple	Staff time	N/A	DPW (Highway and Bridges Division)	January 2020	Medium
43	GIS Integration Citywide	1	Emergency Services	Multiple	Staff time	RIEMA, FEMA, City Budget	DPR	2018-2023	High
44	Publish Evacuation Routes	1	Emergency Services	Multiple	Staff time	N/A	DPR	January 2019	High

Appendix B

Pawtucket Central Falls Map Resource Packet* Used During Workshop

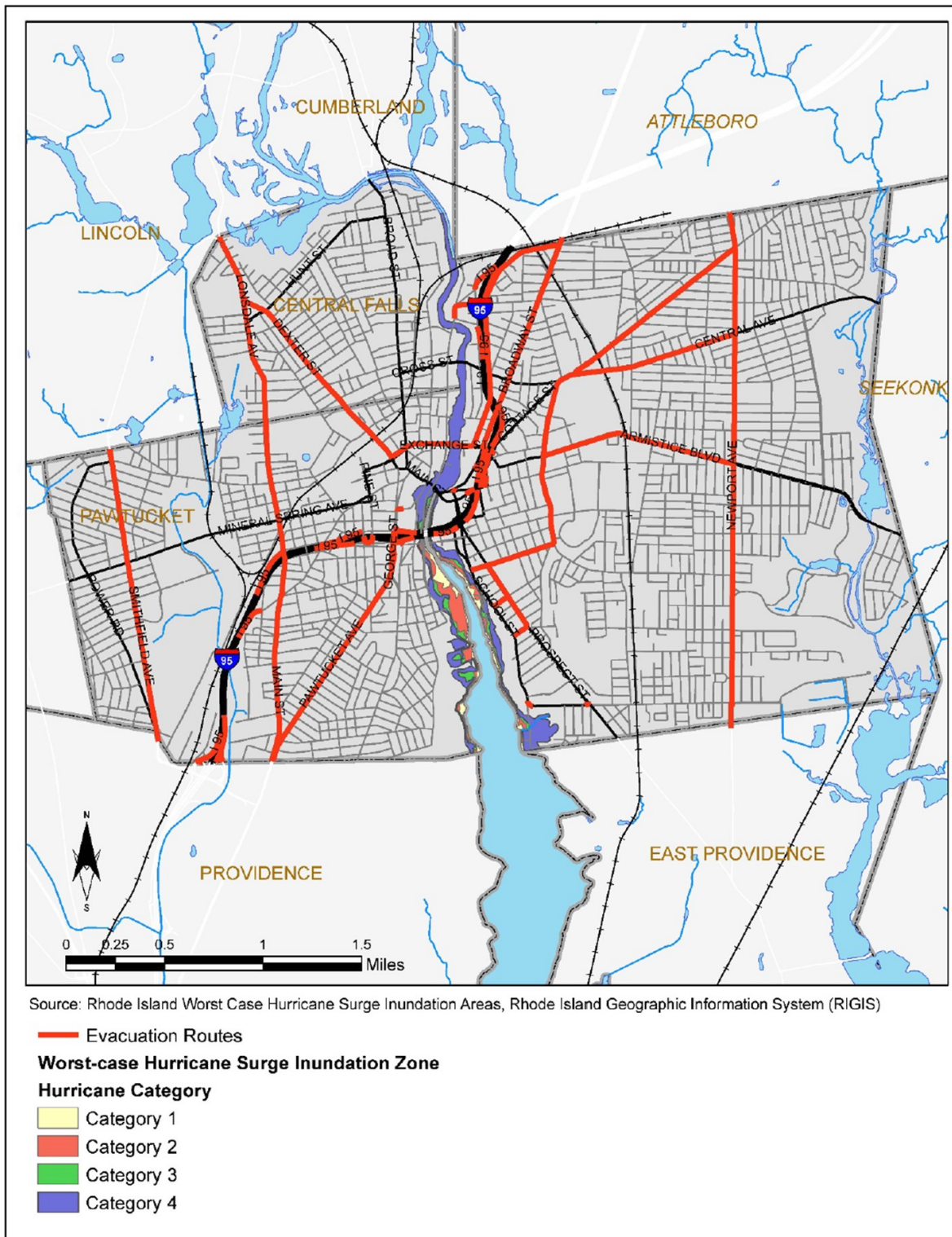
***Gathered from Pawtucket & Central Falls Hazard Mitigation Plan (2018) & Comprehensive Plan (Pawtucket - 2017; Central Fall - 2007)**

Figure A-6: Special Flood Hazard Areas



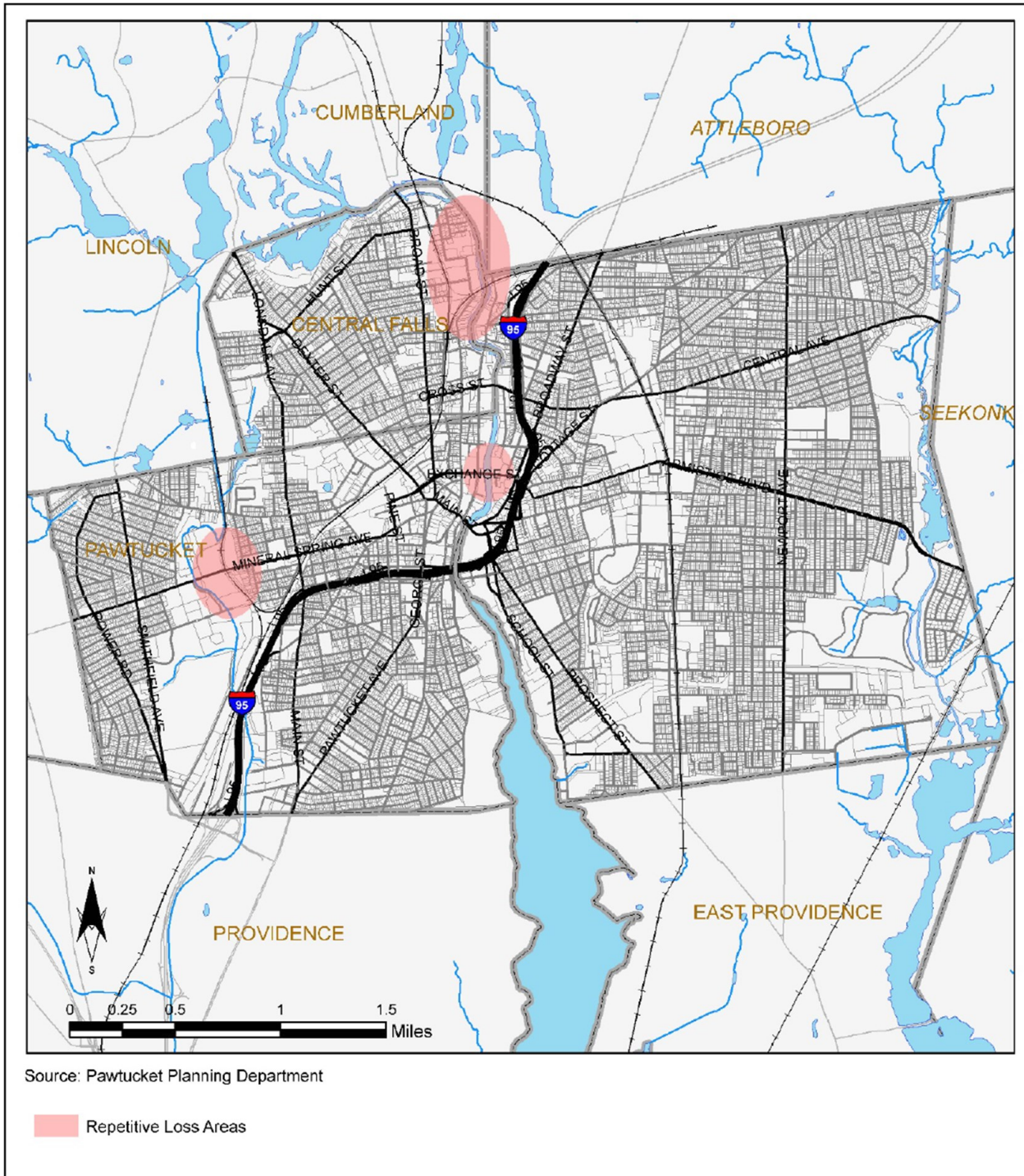
Source: FEMA

Figure A-7: Hurricane Storm Surge Inundation Areas



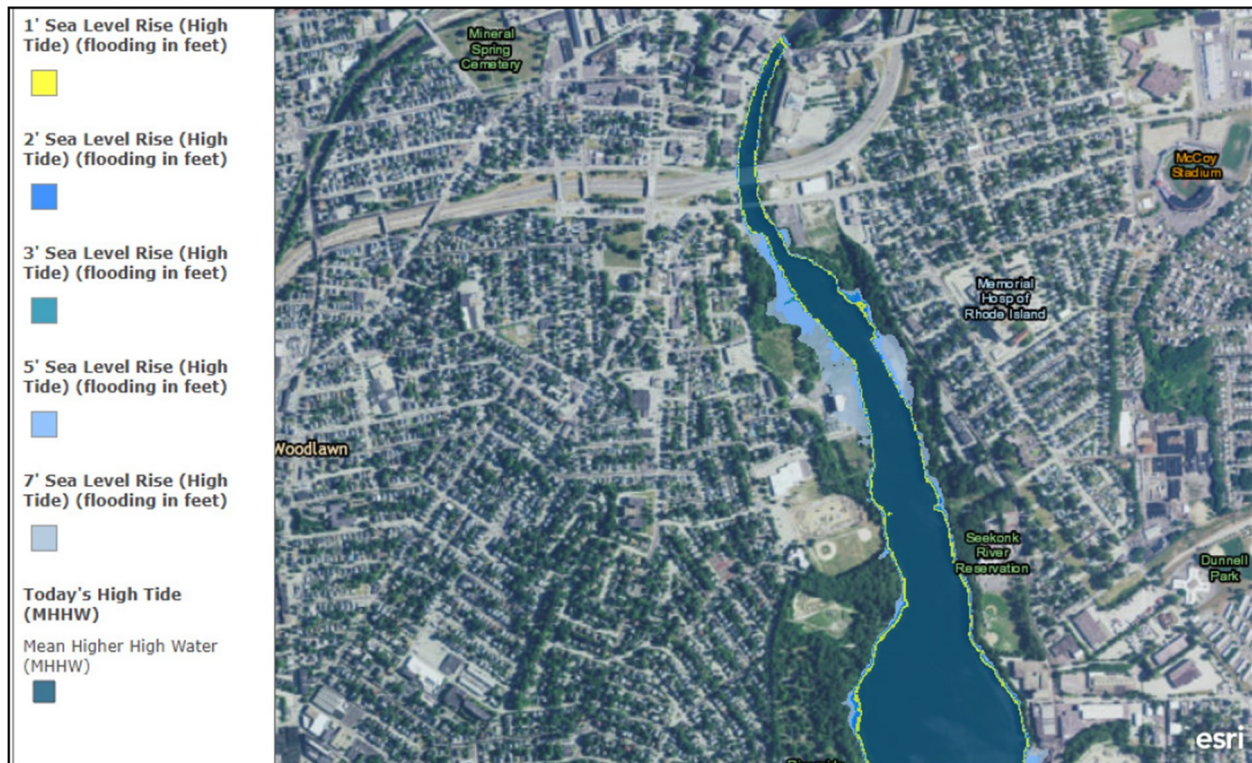
Source: U.S. Army Corps of Engineers, New England District

Figure A-9: Repetitive Loss Areas

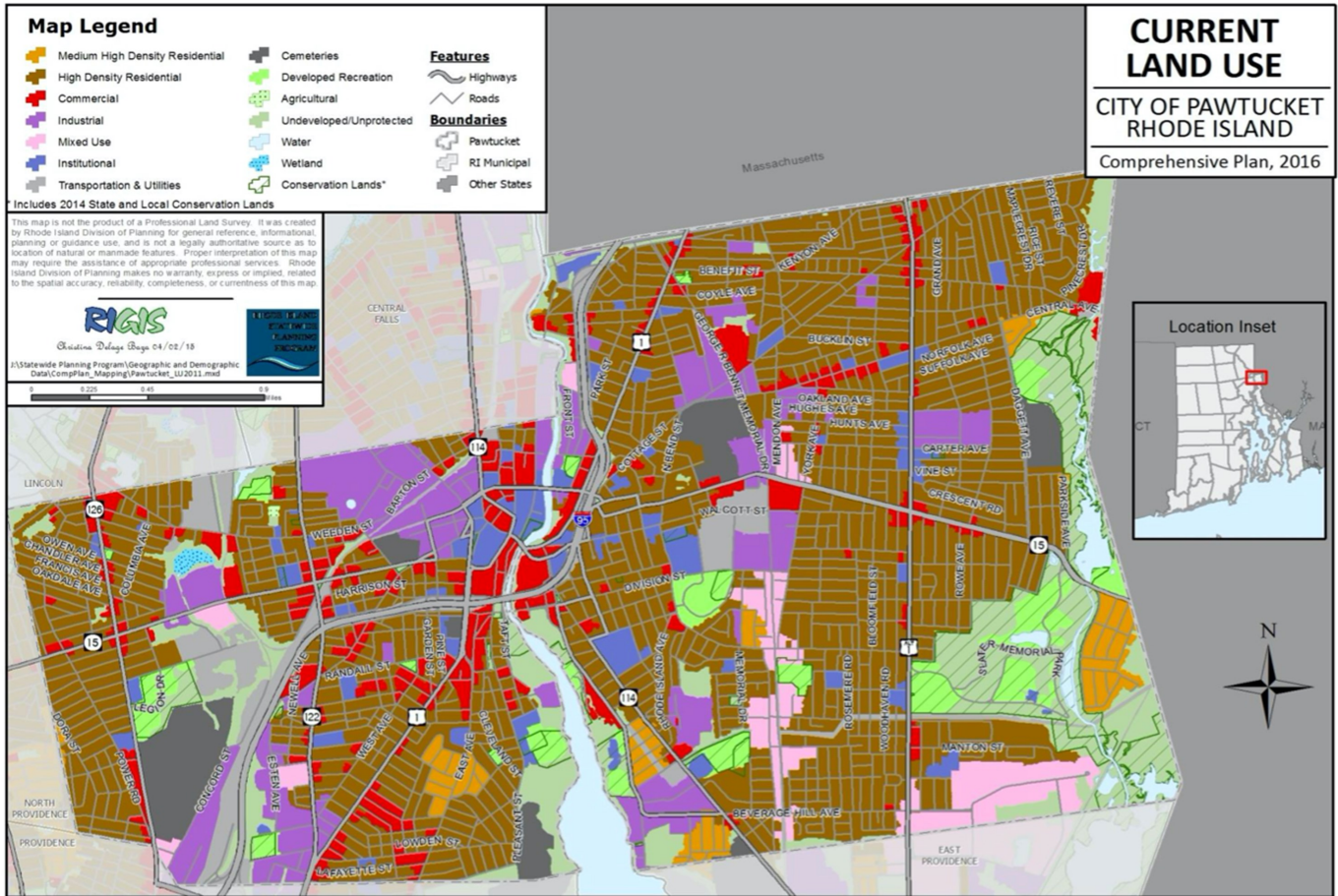


Source: City of Pawtucket Planning Department

Figure A-8: Potential Sea Level Rise Inundation for Pawtucket



Source: RI STORMTOOLS



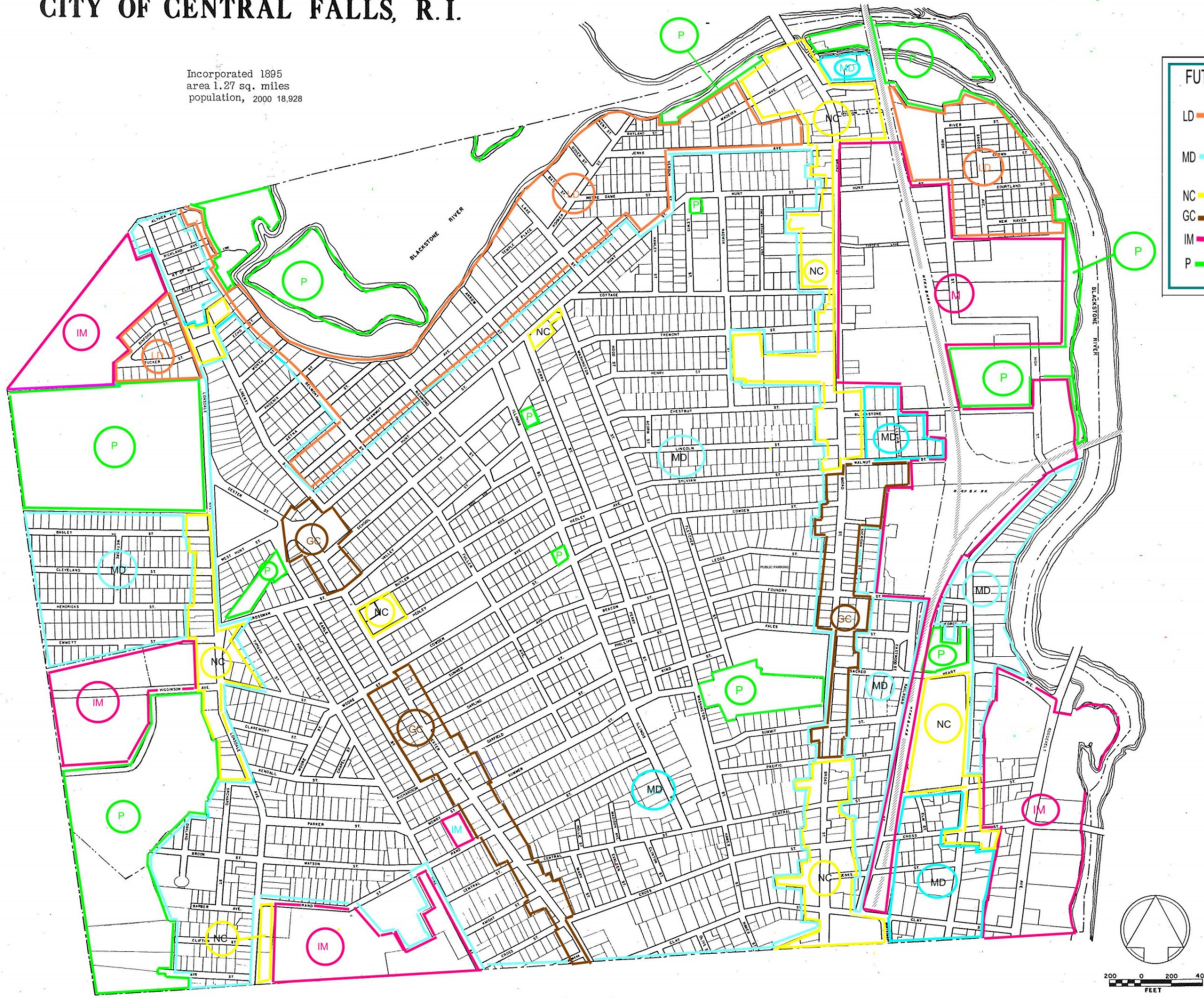
Map 4. Future Land Uses

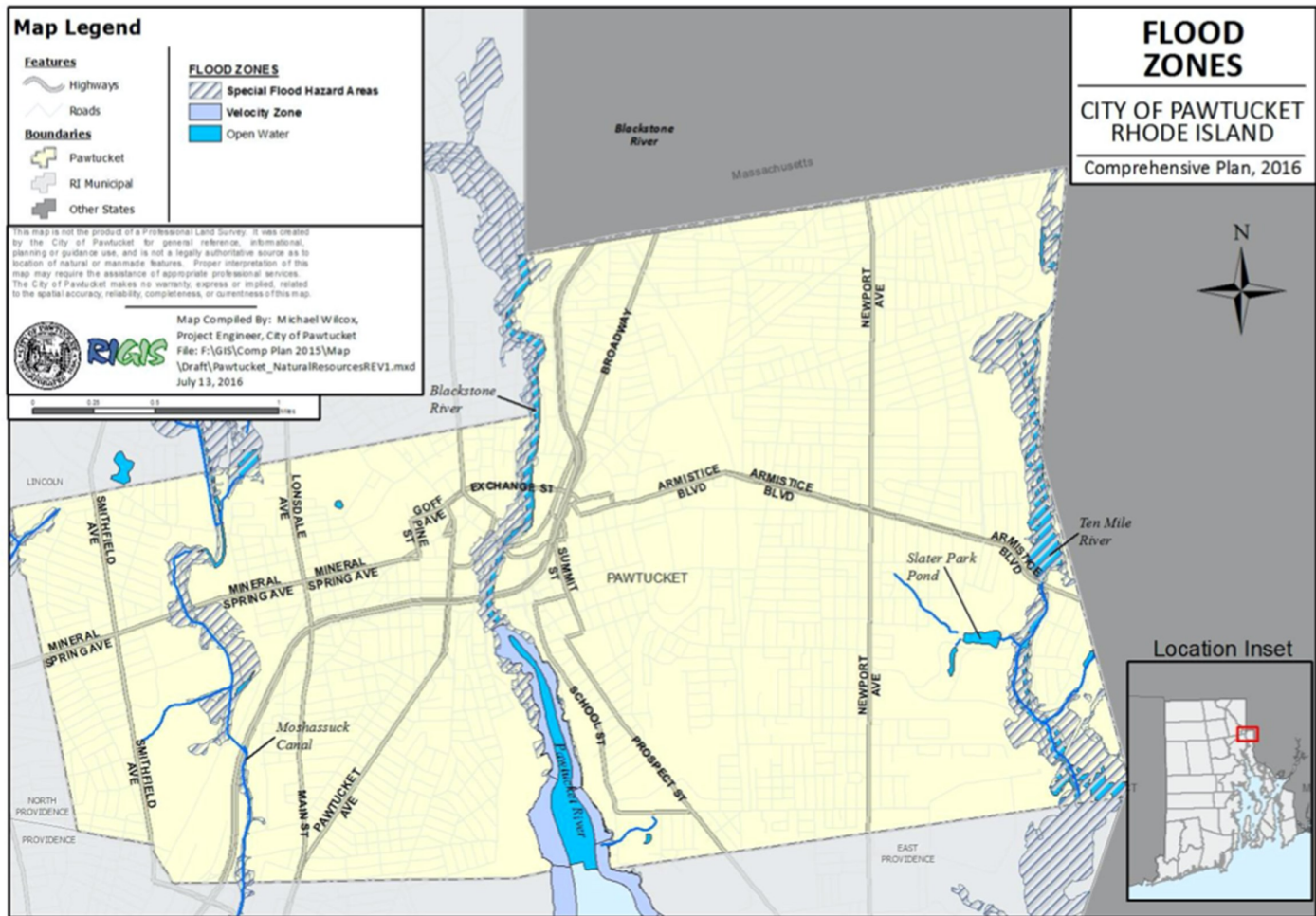
CITY OF CENTRAL FALLS, R.I.

Incorporated 1895
 area 1.27 sq. miles
 population, 2000 18,928

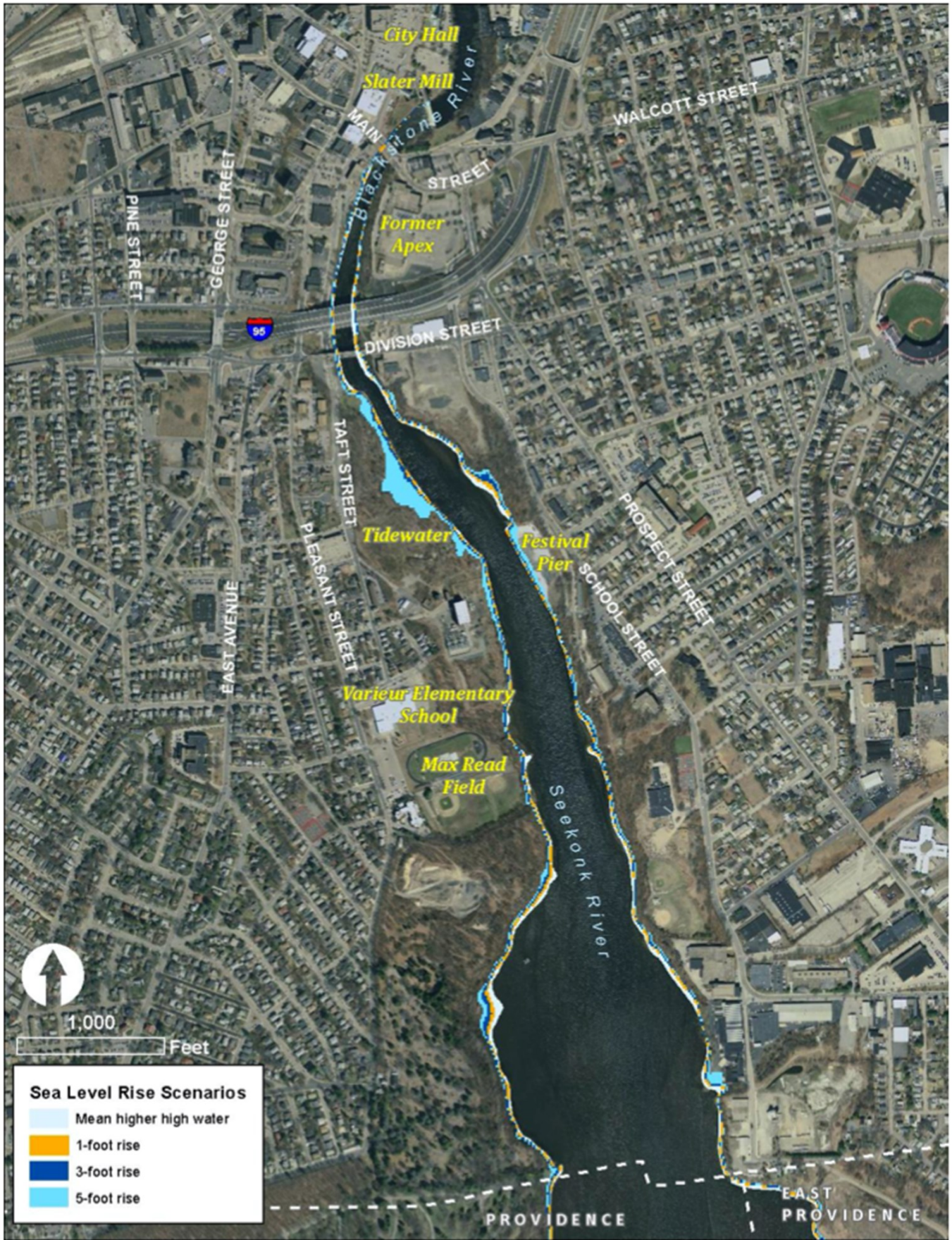
**FUTURE LAND USE PLAN
 2007 - 2012**

- LD Low density residential
 maximum 8 units per acre
- MD Medium density residential
 maximum 8-21 units per acre
- NC Neighborhood commercial
- GC General and Downtown Commercial
- IM Industrial and mill building reuse
- P Parks and open space



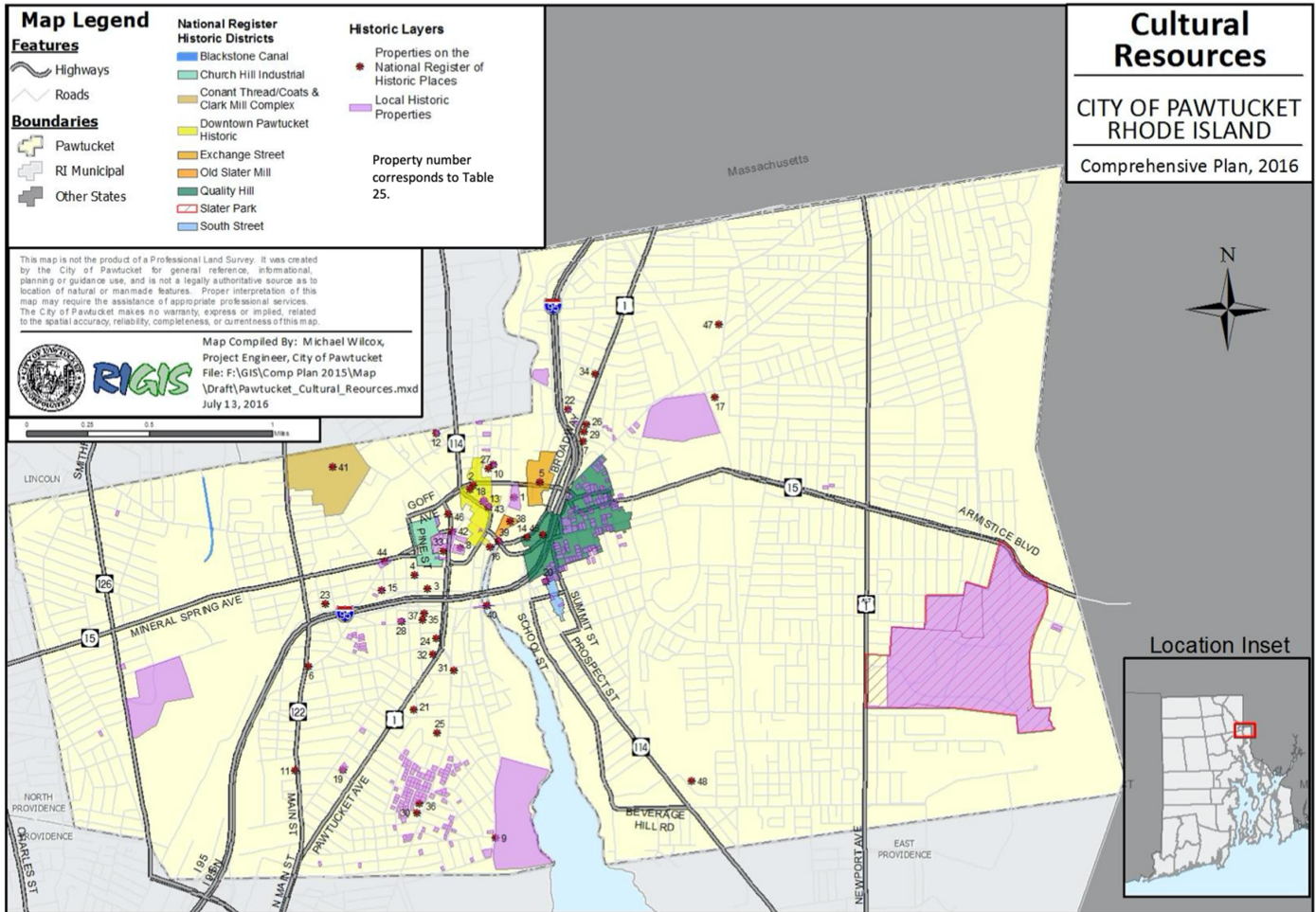


Map 2 Flood Zones

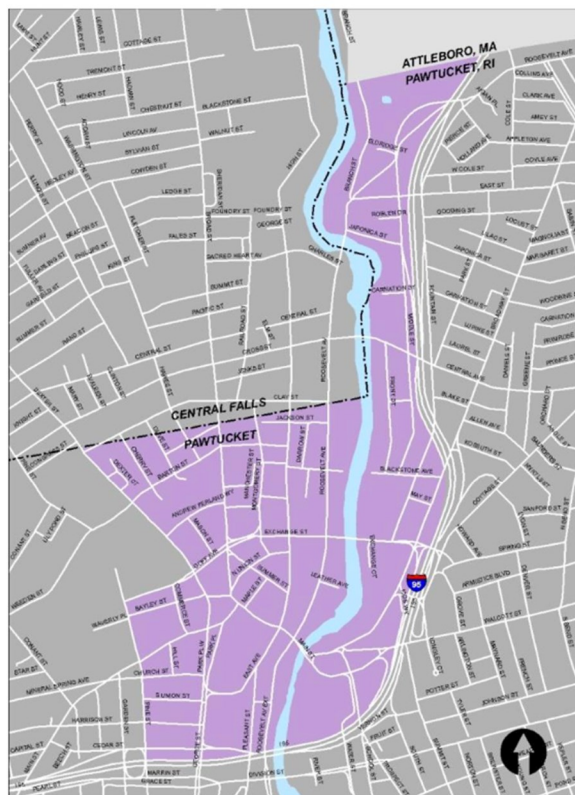


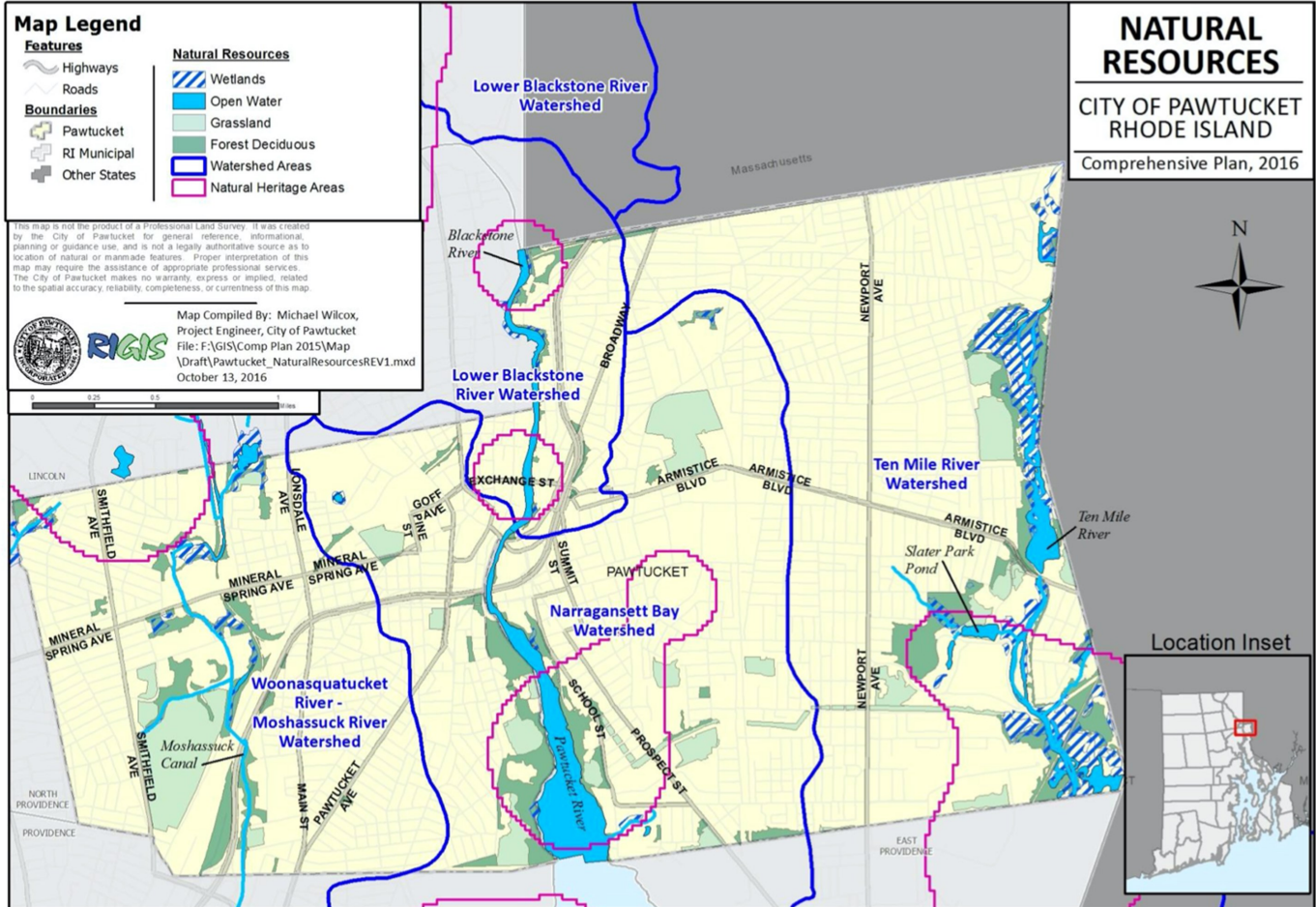
Source: RI Division of Planning and NOAA Coastal Services Center

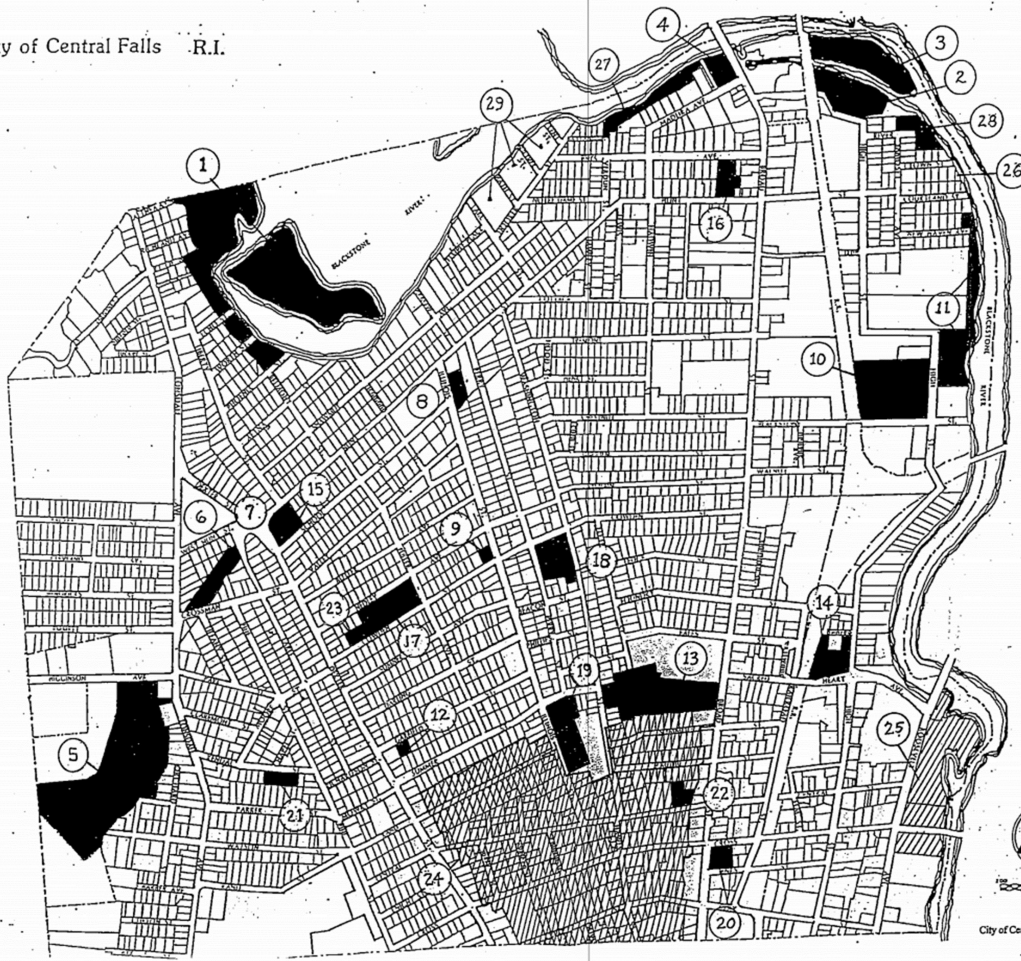
Figure 1. Sea Level Rise Scenarios



Map 6. Historic and Cultural Resources



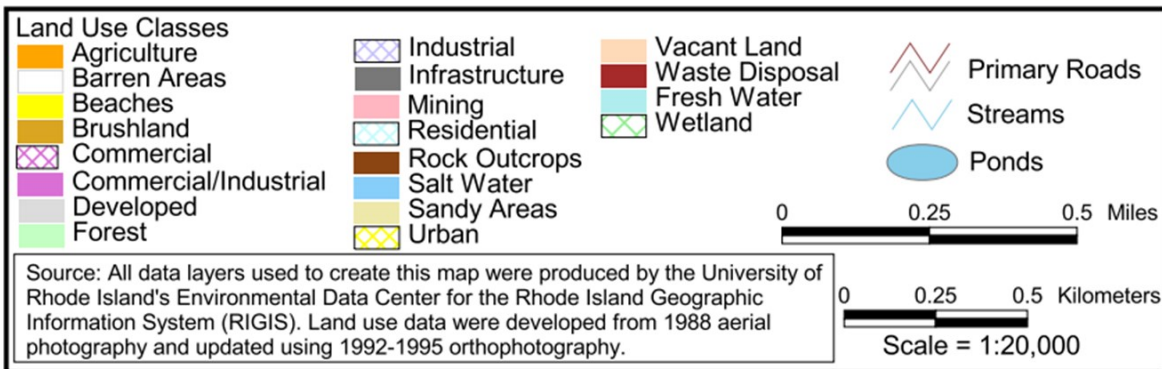
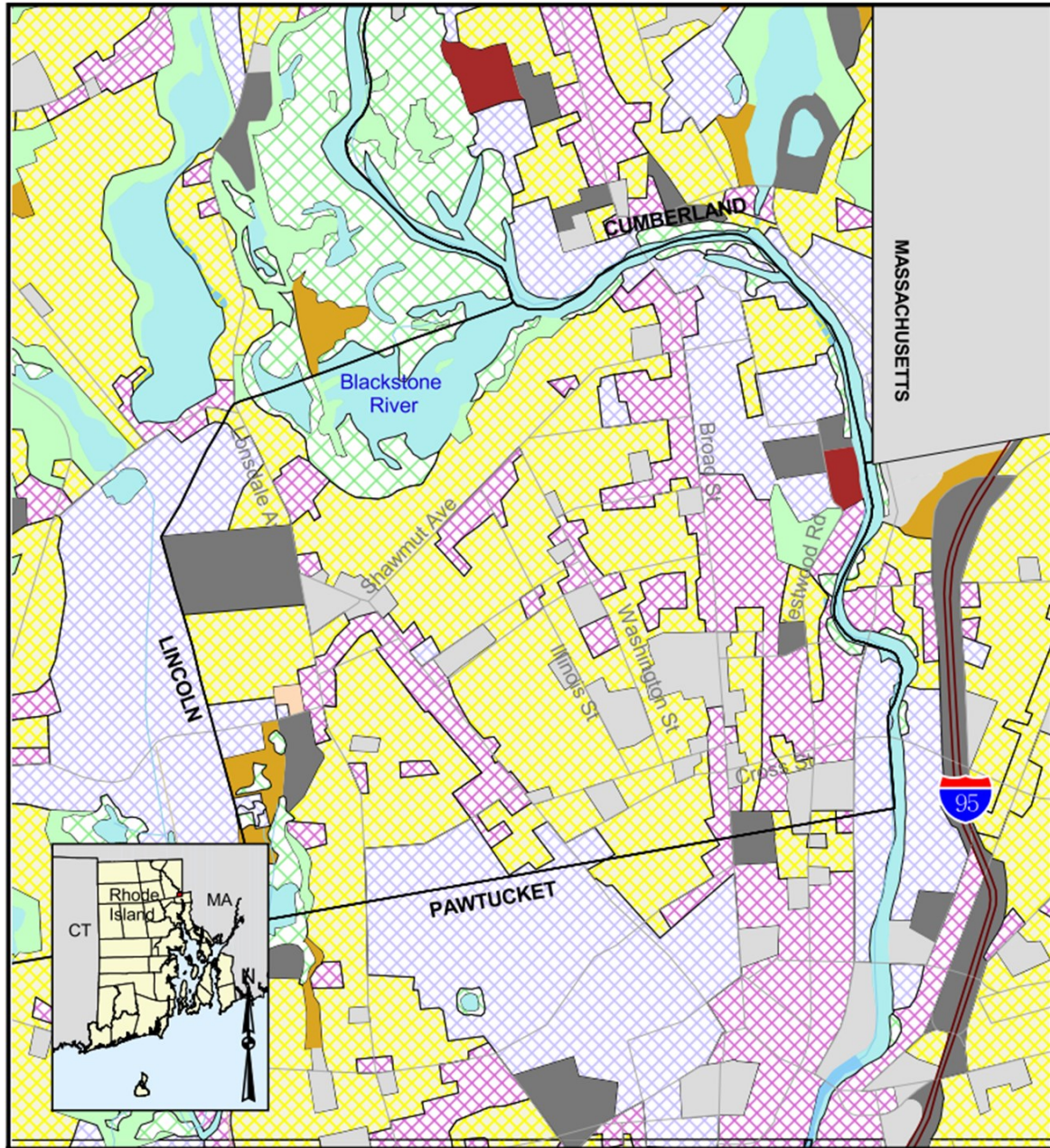




OPEN SPACE PLAN 1998

- State Jurisdiction**
 - 1. Valley Marshes
- Local Jurisdiction**
 - 2. River Island Community Park
 - 3. River Island Nature Trail
 - 4. Central Falls Riverfront Commons and Landing Docks
 - 5. Higginson Avenue Community Sports Complex
 - 6. Crossman Street Playground
 - 7. Quinn Square
 - 8. Illinois Street Playground
 - 9. Cowden Street Basketball Court
 - 10. Macomber Stadium
 - 11. Pierce Park/Saul Tarlow Field
 - 12. Garfield Street Tot Lot
 - 13. Jenks Park
 - 14. Sacred Heart Playground
- School Department**
 - 15. Ella Risk Elementary School
 - 16. Margaret I. Robertson School
 - 17. Veterans Memorial School
 - 18. Dr. Earl F. Calcutt School
 - 19. Central Falls Junior/Senior High School
 - 20. Alan Shawn Feinstein School
 - 21. Harold G. Hunt School
- Private Jurisdiction**
 - 22. Adams Library and Lysander Flagg Museum
 - 23. Central Falls YMCA Community Center
- Historical Areas**
 - 24. South Central Falls Historical District
 - 25. Central Falls Historic Mill District
- Proposed Actions**
 - 26. Blackstone River Bikeway
 - 27. Blackstone River Pedestrian Trail
 - 28. Re-use of City Owned Land
 - 29. Long Range Acquisition

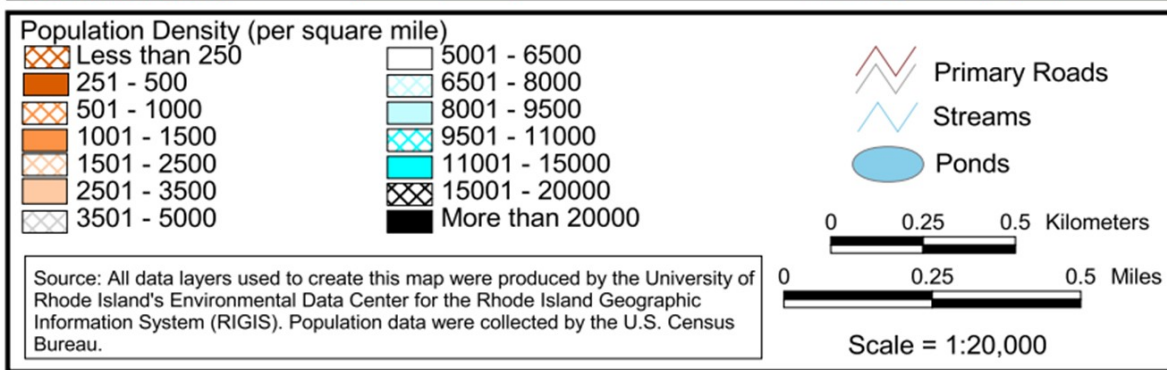
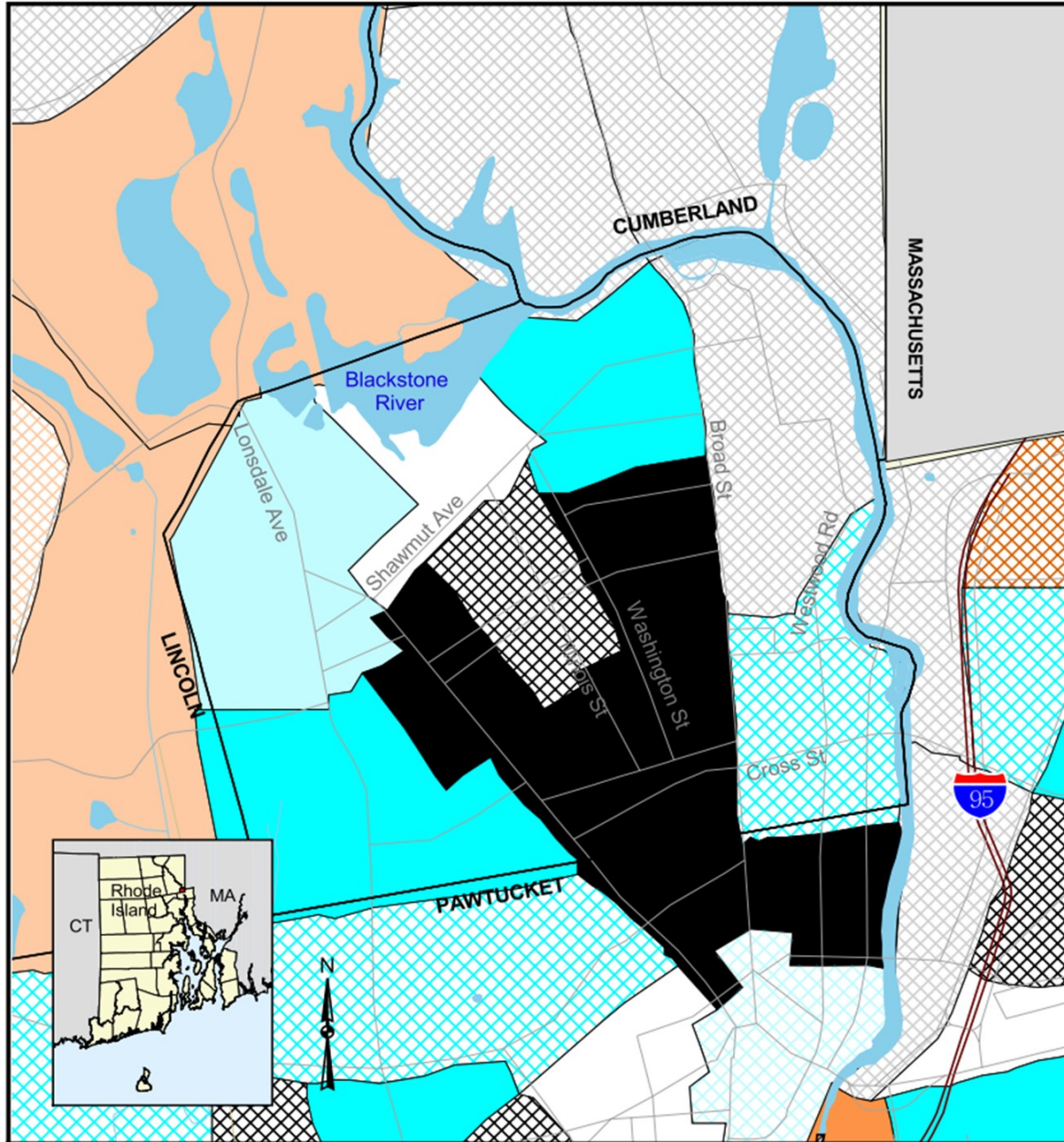
1995 Land Use in Central Falls, Rhode Island



Rhode Island Habitat Restoration Portal Map Series - December 2001



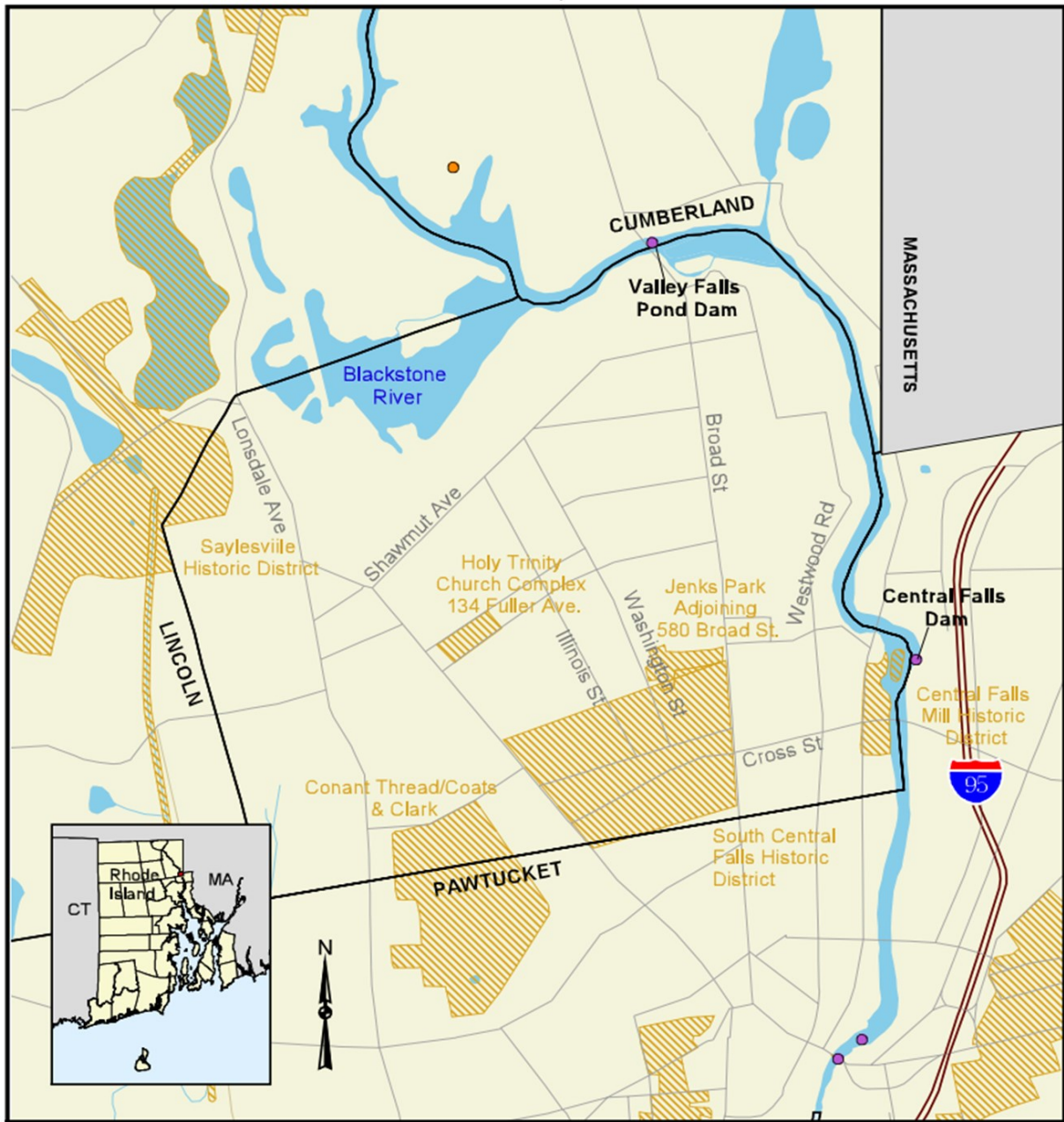
1990 Population Distribution in Central Falls, Rhode Island



Rhode Island Habitat Restoration Portal Map Series - December 2001



Restoration Sites and Historic Districts in Central Falls, Rhode Island



Restoration Type

- Artificial Reef
- Salt Marsh
- Seagrass (Eelgrass)
- Anadromous Fish Habitat
- Grassland
- Riverine Floodplain
- Shellfish/Water Quality
- ▨ Historic Districts

0 0.25 0.5 Kilometers
0 0.25 0.5 Miles
Scale = 1:20,000

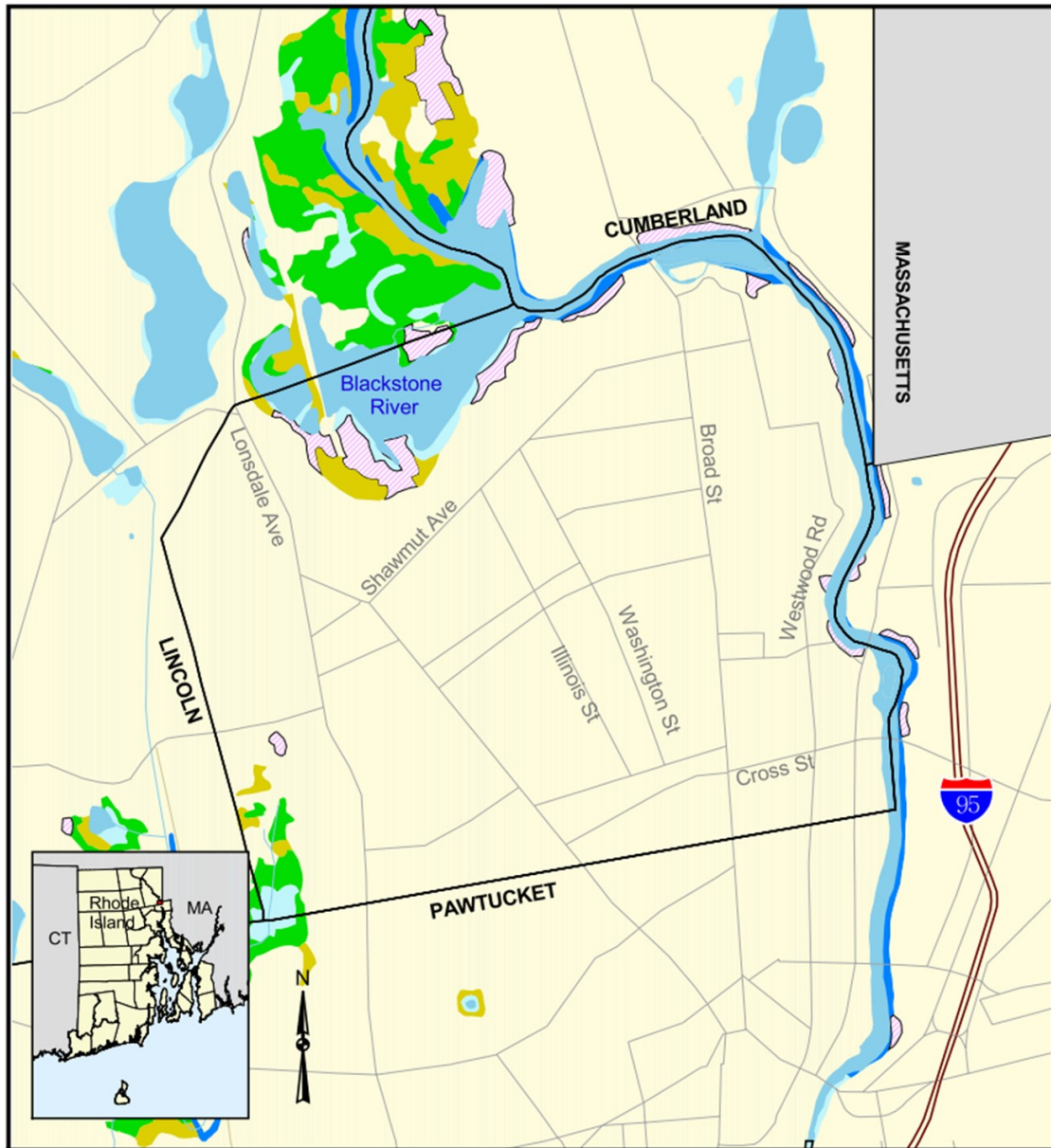
- ▬ Primary Roads
- ▬ Streams
- Ponds

Source: All data layers used to create this map were produced by the University of Rhode Island's Environmental Data Center for the Rhode Island Geographic Information System (RIGIS).

Rhode Island Habitat Restoration Portal Map Series - December 2001



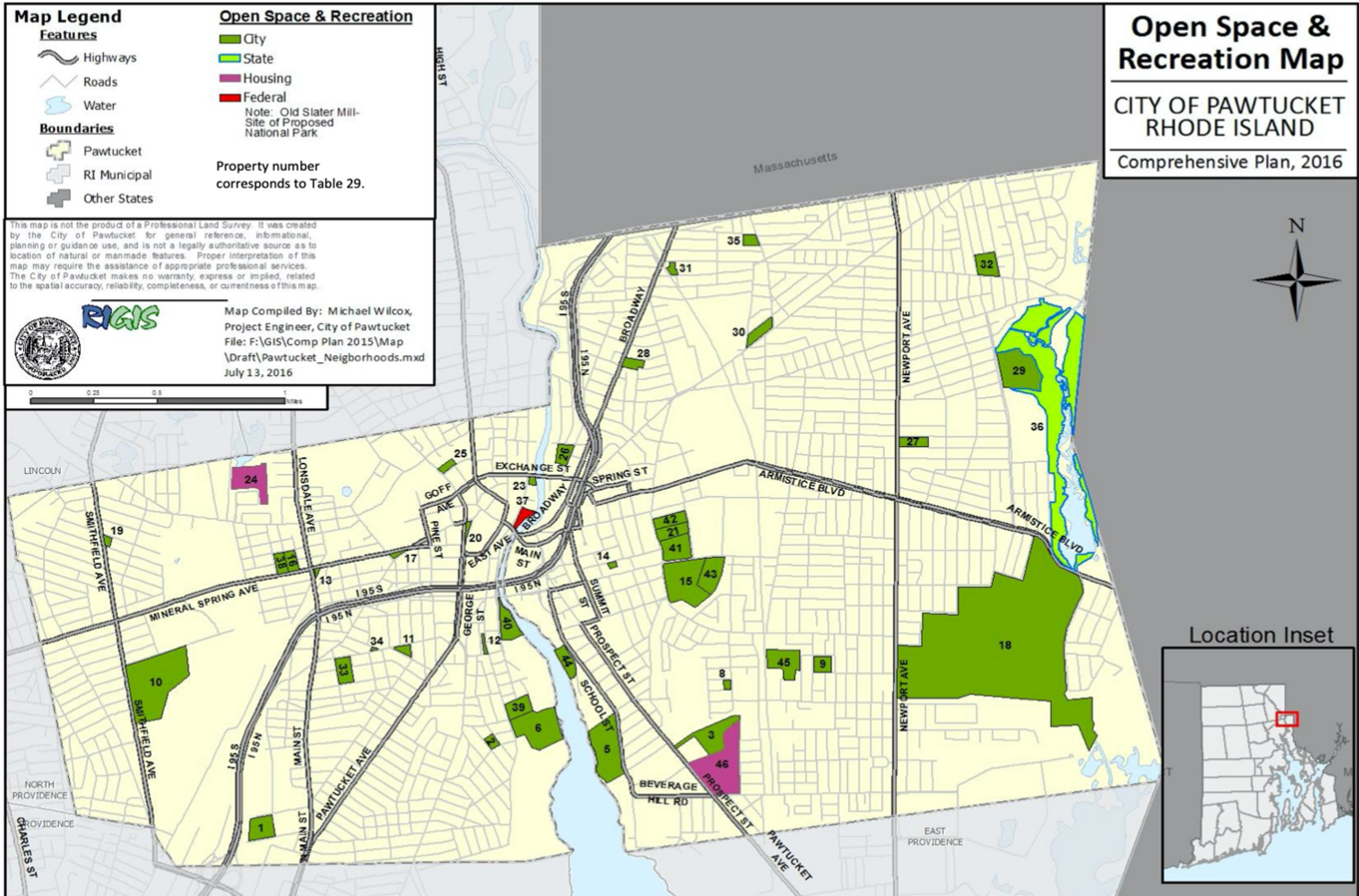
Wetland Distribution in Central Falls, Rhode Island (1988)



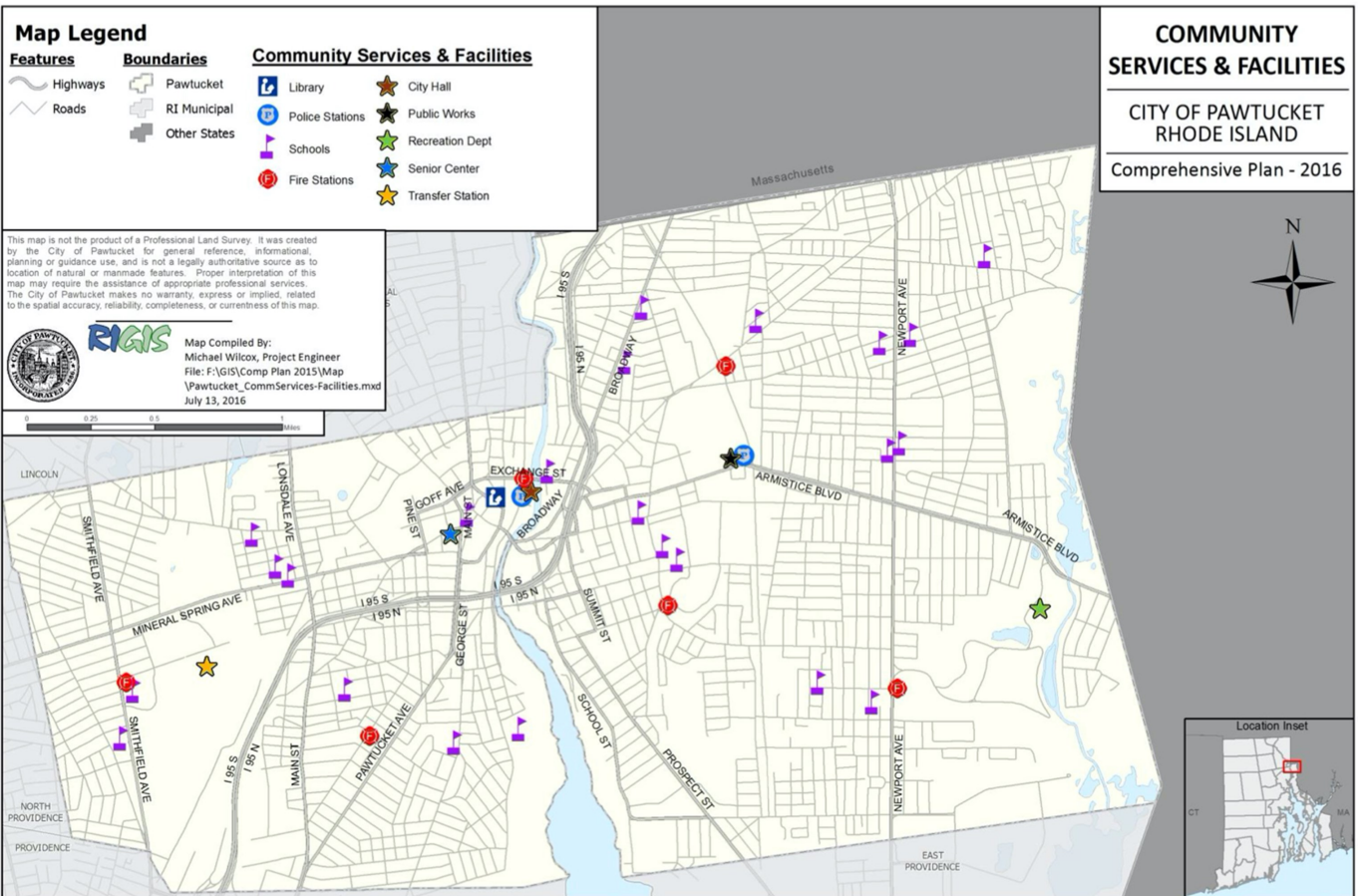
Wetland Types		
Emergent Fen	Deciduous Forested Wetland	Primary Roads Streams Ponds Scale = 1:20,000
Emergent Marsh	Marine/Est. Unconsolidated	
Estuarine Emergent	Open Water	
Estuarine Scrub-Shrub	Riverine Nontidal	
Coniferous Forested	Riverine Tidal	
Dead Forested Wetland	Scrub-Shrub Wetland	
	Upland	
Source: All data layers used to create this map were produced by the University of Rhode Island's Environmental Data Center for the Rhode Island Geographic Information System (RIGIS). Wetland data were developed from 1988 aerial photography.		

Rhode Island Habitat Restoration Portal Map Series - December 2001





Map 8. Recreation Resources



Map 9. Community Services and Facilities

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