

Middletown



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Municipal Resilience Program Community Resilience Building Workshop

Summary of Findings September 2020



Town of Middletown

Community Resilience Building Workshop

Executive Summary

With expertise from The Nature Conservancy and the Rhode Island Infrastructure Bank, the Town of Middletown conducted a Community Resilience Building Workshop on September 15, 2020 as part of the state of Rhode Island's Municipal Resilience Program. The half-day exercise was provided to Middletown at no cost after the Town was selected through a competitive application process. Approximately 20 participants comprised of elected officials, appointed officials, municipal staff, and non-profit groups strove to:

1. Define top local natural and climate-related hazards;
2. Identify existing and future strengths and vulnerabilities;
3. Identify and prioritize action for the Town of Middletown;
4. Identify opportunity to collaboratively advance resiliency for Aquidneck Island.

Using their local experience and knowledge, workshop participants defined Middletown's top hazards as hurricanes/high wind events, heavy rain events, and droughts. **The following four focus areas to improve climate-change resiliency emerged:**

1. **Drinking water supply preservation:** wastewater treatment systems and facilities; stormwater management systems; drinking water supply security improvements.
2. **Stormwater systems and management:** stormwater utility program; stormwater management plan; retrofit/ replacement of infrastructure.
3. **Emergency management:** preparedness; communications; sheltering; and continuance of services.
4. **Institutionalization of resilience:** further internalization of resilience within government operations for Middletown and collaboratively across Aquidneck Island.

Middletown is now recognized by the Rhode Island Infrastructure Bank as a "Resilient Rhody Municipality" within the Municipal Resilience Program, which enables the Town to apply for dedicated funding to implement projects in the four focus areas listed above.



Town of Middletown

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 Town of Middletown 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 the spring of 2020, the Town of Middletown 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 Town with a community-driven process to assess current hazard and climate change impacts and to surface projects, plans, and policies for improved resilience. In September 2020, Middletown's 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 Middletown.

The Middletown 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 Town of Middletown;
- Identify opportunities to collaboratively advance actions to increase resilience alongside the other municipalities and organizations on Aquidneck Island.

The Town of Middletown employed a unique “anywhere at any scale”, community-driven process called Community Resilience Building (CRB) (www.CommunityResilienceBuilding.org). The CRB’s tools, various reports, and local maps were integrated into the workshop process to provide both decision-support and visualization around shared issues and priorities across Middletown as well as Aquidneck Island. The Middletown Natural Hazard Mitigation Plan (2019), Comprehensive Plan (2014), 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 Middletown’s 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 Middletown 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 Middletown. The hazards of greatest concern are hurricanes and other high wind events, heavy precipitation events, and drought. The other hazards discussed during the workshop included coastal flooding and inundation (storm surge and sea level rise), and winter storms with associated snow and ice accumulations. These hazards have direct and increasing impacts on Middletown’s residents and resources such as its neighborhoods, natural areas (rivers, wetlands, shorelines, beaches, salt marshes), roads, bridges, tourist attractions and economy, 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

- Hurricanes/High Wind Events
- Heavy Rain Events
- Droughts

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

Infrastructure: Wave Avenue Sewer Pump Station, Paradise Avenue Sewer Pump Station, Sachuest Campground, Mobile Homes/Trailer Parks (Forest Avenue, Mello, Prospect Avenue), Gardiner Pond Dam, Nelson Pond Dam, Easton's Pond North Dam, 99 Structures in 100 year Flood Zone, Nursing Homes and Assisted Living Facilities, Atlantic Beach District (south of Newport Avenue & Aquidneck Avenue), Utility Lines - Evacuation Routes, Shoreline Property.

Ecosystems: Bailey Brook, Maidford River, Sachuest Point, First Beach, Second Beach Wetland Area, Paradise Brook, Easton's Beach, Dunlap-Wheeler Park-CRMC Right-of-Way, Norman Bird Sanctuary, Sandy Point Beach.

Roads, Bridges, and Road Network: Burma Road, First Beach Roads, Berkeley Avenue, Hanging Rock Road, Third Beach Road, Wood Road, Atlantic Beach District Roads, Pell/Newport Bridge, Mount Hope Bridge, Easton's Beach Roads, Memorial Boulevard/Aquidneck Avenue Bridge, Birchwood Road, Champlain Terrace, Forest Avenue, Wave Avenue, Wave Avenue Bridge.

Neighborhoods/Areas: Atlantic Beach District, Coddington Cove, Easton's Point, Sachuest Point, Third Beach.

Vulnerable Populations: Elderly/Senior Citizens, Children, Special Needs and Disabled Residents, Visitors and Tourists, Local Business Owners, Veterans, Low-Income Residents, Working Poor.

**Information from workshop participants augmented via the Middletown NHMP (2019). See Appendix A for full list of mitigation actions from the Middletown NHMP (i.e. Section 4.2 & 4.3 and Table14).*

Current Concerns and Challenges Presented by Hazards

The Town of Middletown has several concerns and faces multiple challenges related to the impacts of natural hazards and climate change. In recent years, Middletown has 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 Nor'easter Nemo (February 2013), 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 Middletown. The winter storm Nemo dropped 19-20" of snow on the Town 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 Middletown to proactively and comprehensively improve resilience.

Middletown's series of extreme weather events highlights the impacts from hazards are diverse: ranging from coastal flooding of critical infrastructure, bridges, roads, and low-lying areas near the coast; inland 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 across Middletown.

The workshop participants were generally in agreement that Middletown is 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 storms coupled with colder weather.



(Credit: fire.middletownri.com)



(Credit:groupon.com)



(Credit: choicehotels.com)

Specific Categories of Concerns and Challenges

As in any community, Middletown is 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 categories - Infrastructure, Societal, and Environmental.

Infrastructure Concerns and Challenges

Roads, Bridges, and Road Networks:

- Low-lying coastal roads and roads in close proximity to riverine systems subjected to erosion and routine flooding from storm surge and stormwater runoff.
- Evacuation options via bridges (i.e. bridges close during storms and high winds).

Development:

- Increased development has resulted in a loss of green space, increased impervious surface, declines in water quality, beach closure, and flooding issues (i.e. basements).

Stormwater Management:

- Out dated stormwater drainage system unable to keep up with current levels of flooding, not to mention future projections for more intense and longer duration storms.

Septic Systems:

- Privately owned and maintained on-site wastewater treatment systems in certain locations subject to flooding from precipitation and groundwater.

Emergency Management and Preparedness:

- Need to update and revisit evacuation routes and consider alternates.
- Communications and assistance not effectively reaching the majority of residents during major events - particularly those with special needs and/or mobility issues such as the elderly.

Housing:

- Direct impacts to structures from storms - flooding coupled with wind.
- Isolation of homes when road network is compromised for extended periods.
- Need broader education about potential for current and future impacts to structures.

Economy:

- Over-reliance on tourism income—particularly in areas subjected to flooding (i.e. Atlantic Beach District).

Specific Categories of Concerns and Challenges (cont'd)

Infrastructure Concerns and Challenges

Wastewater Treatment System:

- Several wastewater pump stations located in various flood zones.

Societal Concerns and Challenges

Vulnerable Populations:

- Implications to local residents and visitors in neighborhoods susceptible to flooding (i.e. Atlantic Beach District) and isolation due to compromised/limited access and egress (i.e. elderly, working poor, disabled individuals, veterans).
- Implications on disproportionately disadvantaged populations (i.e. elderly, working poor, etc.) due winter storms and heat waves.
- Need for more business continuity and recovery planning before major events.
- Limited affordable housing to support localized workforce.

Power:

- Power outages to residential homes and businesses, particularly during the winter months, increasing isolation and risks to key populations in Middletown.

Historic/Cultural Areas:

- Historic and cultural resources and sites located in floodplains.

Environmental Concerns and Challenges

Drinking Water:

- Concerns about long-term viability of drinking water reservoirs.
- Tributaries on Bailey Brook and Maidford River have been impacted by storms and there are issues of flooding and reduced water quality.

Groundwater:

- High groundwater levels in certain areas pose risks to homes placed in lower lying areas.

Beaches:

- Ongoing routine and episodic (Tropical Storm Sandy) erosion and loss of beaches and potential impacts on attraction for visitors and tourists.

Specific Categories of Concerns and Challenges (cont'd)

Environmental Concerns and Challenges

Trees and Forests:

- Increasing impacts to tree health from pests and pathogens resulting in population of dead and damaged, standing trees that pose risks to power lines and increase blockage of roads during emergencies.

Salt Marsh:

- Loss of critical natural infrastructure that protects people and property.

Open Space/Preserves:

- Concerns about impacts to Sachuest Bird Sanctuary.



(Credit: realtor.com)

Current Strengths and Assets

Just as certain locations, assets, and populations in Middletown stand out as particularly vulnerable to the effects of hazards and climate change, other features are notably affirmative assets for Middletown's 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 Middletown. Ongoing collaboration between the Town, business community, faith-based organizations, NGOs, University of Rhode Island, adjoining municipalities, and state-level organizations, among others on priorities identified will help advance comprehensive, cost-effective, community resilience building actions.
- The Town has highly experienced staff with access to resources for most emergency situations. The coordination amongst various departments including leadership, Police, Fire, and EMS was cited as a highly valued community strength despite the ongoing need to maintain volunteers over time.
- Solid emergency management services including good communications system, emergency shelters, heating and cooling facilities, and vehicles able to transport residents to facilities—reflects the Town's strong emphasis on a preparedness culture.
- Town is a participant in the National Flood Insurance Program's Community Rating System.
- All departments across the municipality have a track record of collaboration fostered by routine meetings and exchanges on pertinent practices, projects, and/or policies.
- Understanding across neighborhoods that working together results in better outcomes for Middletown which may be due in part to the fact the communities is situated on an island.
- Strong partnerships and productive track record amongst municipalities and communities on Aquidneck Island on issues of sustainability and comprehensive planning.
- Middletown has an established and committed approach to securing and managing open space.
- Presence and deep involvement of the NGO communities both locally and regionally across Aquidneck Island (i.e. Aquidneck Island Planning Commission).

Current Strengths and Assets (cont'd)

- Numerous public amenities and open spaces that improve residents' quality of life in Middletown.
- Except for the Atlantic Beach area, the topography of Middletown is generally favorable to help minimize the inland extent of coastal flooding, storm surge, and sea level rise.
- Strong regulations and protections in place around watershed areas which are connected to drinking water resources.
- 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.
- Physical location on Aquidneck Island between Portsmouth and Newport provides a greater sense of the island-wide perspective on challenges, successes, and resource needs.
- Town staff effective at securing and managing federal emergency management grant (i.e. post-Sandy) that improved resilience by burying utility lines (Sachuest Point Road), assessing watershed, replacing culverts, and raising a road.

Recommendations to Improve Resilience

A common thread throughout the workshop discussions was the recognition that Middletown needs 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 attention including:

- Infrastructure improvements (i.e. wastewater treatment system and facilities, stormwater management systems, and the security of the drinking water supply);
- Stormwater systems and management (i.e. stormwater utility, management plan, retrofit/replacement priorities);
- Emergency management (i.e. preparedness, communications, sheltering, and continuation of services);
- Further internalization of resilience within government operations for Middletown and collaboratively across Aquidneck Island.

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 Middletown NHMP (2019) are provided in Appendix A for cross reference.

Higher Priority Actions

Capacity Building:

- Establish a Middletown Resilience Committee to help incorporate resilience mandates into the practices and help focus all town councils, boards, and commissions.
- Leverage opportunities to collaborate on a regional based with other municipalities on Aquidneck Island including the U.S. Navy.

Plans/Preparedness/Studies/Outreach:

- Accelerate pace and depth of collaborative partnerships between the municipality and utilities to reduce segmented and fragmented approaches and enhance the resiliency of the current systems including water supply, sewer, electrical infrastructure, broadband, etc.

Higher Priority Actions (cont'd)

Plans/Preparedness/Studies/Outreach:

- Develop a community-wide communications plan with new public relations staff to help increase the education and awareness of the public on the importance of resiliency and enhance the current collaboration between leadership, staff, residents, utilities, businesses, NGOs, and adjoining municipalities and Navy on Aquidneck Island.
- Work to develop a comprehensive strategic plan for improving resilience across Middletown in a way that town council and residents can engage, understand, support, and champion going forward.
- Ensure that plans developed, and actions taken to improve the resilience of Middletown are additive to a cohesive response alongside Portsmouth and Newport as well as the Navy.
- Convene and strategically identify open space parcels for future acquisition that will improve the overall resilience of Middletown and dedicate funding via bonding and other sources of funds to secure priority parcels in lock step with a public awareness campaign regarding resilience and benefits of natural assets.



Policy:

- Reinvigorate previous effort to establish a stormwater utility by updating the 2016 draft plan, detailing the steps to initiating a enterprise fund, clarifying and correcting misconceptions and misunderstandings with leadership and residents through community engagement, and highlighting success stories from other municipalities in New England (i.e. New London, CT).
- Recognize economic value of environmental assets and prioritize their protection through stricter development regulations and capital improvement projects.
- Update building and zoning codes to ensure development and redevelopment projects are in line with climate change projections and continue to reduce water quality/stormwater runoff issues.

Higher Priority Actions (cont'd)

Policy:

- Better align zoning code with future zoning in the Comprehensive Plan to ensure buildout proceeds in appropriate and orderly manner over time.

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 Middletown, but not as high priority as the preceding list, currently.

Capacity Building:

- Review and modify on an annual basis the Capital Plan to ensure resilience in fully integrated into funded projects and other budgeted expenditures.

Projects:

- Continue to advance the incorporation of resilience into traffic and safety focused projects (i.e. Aquidneck Avenue Sidewalk project) by ensuring increased capacity to convey and retain/store stormwater runoff.
- Ensure that currently funded and future priority stormwater infrastructure upgrades look to build into designs more intense and longer duration precipitation events as the “design storm” as well as integrating green stormwater infrastructure projects and approaches, where feasible.
- Continue to advance the 15 projects currently identified or underway in Baily Brook and other river systems in Town.
- Expand green stormwater infrastructure projects in parking lots and front-yards.
- Review and prioritize resilience-related projects identified in the Maidford and Bailey Brook Watershed Plans per the SNEP Network efforts.

Priority Actions (cont'd)

Projects:

- Seek out opportunities to identify and install in suitable locations nature-based solutions along the shoreline of Middletown to help reduce impacts from storm surge and sea level rise (i.e. Sachuest Point).
- Design and install signage at outdoor recreation areas that communicates the implications of climate change, such as loss of beaches and other natural resources (i.e. erosion of 1' of beach/year), to residents and tourists in hopes of building support for more resiliency action across the Town.
- Implement measures identified and defined in the Impacts on Water and Traffic Study.

Plans/Preparedness/Studies/Outreach:

- Complete the update process for the draft stormwater utility plan (2016).
- Review the overlay zoning for Atlantic Beach District (including elevated buildings) and determine if it can serve as a template for other locations in Middletown and potentially across Aquidneck Island.
- Evaluate the longer-term implications of drought on residential well yields and consider various options such as deeper wells (500') and/or converting to public water supply.
- Continue to promote and advance energy efficiency/renewable measures and other sustainability projects/efforts for municipal facilities, residential homes, and commercial establishments.
- Determine the impact to coastal reservoirs under various storm surge and/or sea level rise scenarios in partnership with University of Rhode Island's Ocean Engineering program.
- Improve the existing forum through which all vested utilities in Middletown and Aquidneck Island share contingency plans and operational approaches in hopes of increasing cooperation between organizations (i.e. National Grid, electric, gas, Newport Water, wastewater treatment facilities, etc.).

Priority Actions (cont'd)

- Conduct feasibility assessment for undergrounding utility lines in high risk areas.
- Strengthen development and redevelopment regulations for structures and building envelopes in flood-prone areas across Middletown.
- 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.
- Continue to monitor the Newport National Golf Course expansion project to ensure impacts to the Maidford River do not occur including water diversion or extraction to the golf course.
- Continue to partner with Aquidneck Land Trust and help increase their efforts to purchase and manage open space critical for watershed resilience and public health via passive recreation.

Policy:

- Seek opportunities to pass and secure a bonding for open space acquisition that is tied to a strategic open space plan designed to maximize resilience for Middletown via natural assets and ecosystems.
- Introduce new and/or strength existing Low Impact Development ordinances across Town.



(Credit: Pinterest)

CRB Workshop Participants: Department/Organization

Town of Middletown - Town Council Representation
Town of Middletown - Office of Town Administrator
Town of Middletown - Planning
Town of Middletown - Economic Development
Town of Middletown - Police
Town of Middletown - Fire
Town of Middletown - Public Works
Town of Middletown - Engineering
Town of Middletown - Planning Board
Town of Middletown - Zoning Board
Town of Middletown - Open Space and Fields Committee
State of Rhode Island - State Representatives
State of Rhode Island - State Senator
Naval Station Newport
Aquidneck Island Planning Commission
Rhode Island Small Business Development Center
Aquidneck Land Trust
Save the Bay
Church Community Housing

Middletown Core Project Team

Rita Lavoie - Principal Planner and GIS Manager

Ron Wolanski - Planner and Director of Economic Development

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)

URI Coastal Resources Center - Teresa Crean (Facilitator)

URI Coastal Resources Center - Pam Rubinoff (Facilitator)

Audubon Society of Rhode Island - Meg Kerr (Facilitator)

Save the Bay - David Prescott (Facilitator)

Scribes - Kim Koriath (RIIB), Isabel Harrington (RIIB), Catherine Campbell (TNC -RIFO)

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Appendix A

Middletown Natural Hazard Mitigation Plan (2019)

4.0 Mitigation Actions

(Section 4.2 & 4.3 - Table 14)

TABLE 14: ACTION PLAN SUMMARY					
Action Plan Number	Vulnerable Areas (in order of priority)	Natural Hazard	Risk Level (based on hazards)	Action Items	
1	Vulnerable Populations • Low-income • Disabled • Elderly • Children	Flooding, hurricane, and severe weather, hazardous materials	High	1.A1. Study the necessity and feasibility of offering buses from low-income neighborhoods to evacuation shelters. If the decision is made to offer this service, then develop an implementation plan 1.A2. Prioritize communicating with individuals who rely on electronic health devices during power outages 1.A3. Increase efforts to encourage the public to be added to RI Department of Health's registry of people with special needs and to sign up for Code Red alerts 1.A4. Evaluate the possibility of expanding the number of emergency shelter beds available during an evacuation event.	
2	Vulnerable Business Districts	Hurricanes, storm-surge flooding	High	2.A1. Develop incentives for property owners with properties in the flood zone to flood proof their structures 2.A2. Offer technical assistance on business continuity plans to local business community	
3	Critical roads	Flooding and erosion	High	3.A1. Increase culvert size, raise roadbeds, clear brooks, add guiderails, and make stormwater and drainage improvements to Town roads	
4	Hazardous Materials Evacuation Zones	Hazardous materials incident	High	4.A1. Formalize input of emergency management staff in DPR application process for applications relating to hazardous materials	
5	Wave Ave. Sewage Pump Station	Flooding, hurricane, and severe weather	High	5.A1. Reduce Inflow and Infiltration at the Wave Avenue Pump Station – COMPLETE 5.A2. Increase Capacity at Wave Avenue Pump Station – COMPLETE 5.A3. Eliminate Illegal Sump Pump Connections to Sanitary Sewer System	
6	Paradise Ave. Sewage Pump Station	Flooding, hurricane, and severe weather	High	6.A1. Reduce Inflow and Infiltration at Paradise Avenue Pump Station	
7	Evacuation Route Intersections	Flooding, hurricane, and severe weather	High	7.A1. Install OptiCom Sensors on Traffic Signals – COMPLETE 7.A2. Acquire Temporary Stop Signs for Use During a Power Outage	

8	Essential Services	Severe weather, hurricanes and wind	High	8.A1. Continue Town Tree-Trimming Program 8.A2. Create a Public Tree Database for the Town's Geographic Information System (GIS) 8.A3. Maintain Safe Roads during Snow and Ice Events 8.A4. Assess Impact of the Privatization of Navy Housing - COMPLETE
9	Maidford River	Flooding & erosion	High	9.A1. Continually Clear Debris from the Maidford River 9.A2. Regulate Development in the Maidford River Watershed
10	Bailey Brook	Flooding & erosion	High	10.A1 Implement Debris Clearing of Bailey Brook 10.A2. Limit Development in the Watershed of Bailey Brook 10.A3. Complete Watershed Analysis and Update Flood Maps as Needed - COMPLETE 10.A4. Extension of Buck Road to Serve as Evacuation Route - COMPLETE
11	Dams and Reservoirs	Flooding and hurricanes	High	11.A1. Work with Dam Owners to Encourage Proper Maintenance
12	Campgrounds and Trailer Parks	Flooding, erosion & wind	High	12.A1. Properly Anchor and Secure Mobile Homes and Recreational Vehicles
13	Recent Development Project Stormwater BMPs	Flooding	High	13.A1. Enforce Property Owners/Homeowners Associations to Maintain Drainage Features
14	Shoreline Property	Erosion, hurricane, and severe weather	High	14.A1. Evaluate which shoreline properties are at significant erosion risk due to coastal surge and wave action during Hurricanes, Tropical Storms, and other Severe Weather 14.A2. Armor the shoreline at Dunlap Wheeler Park.
15	Vegetated Wildlife Areas	Wildfire, Drought	Low	15.A1. Identify any forested or heavy brush areas within the Town's jurisdiction that could create a wildfire hazard including the U.S. Sachuest Point Wildlife Refuge 15.A2. Monitor fire risk areas and implement outside burn restrictions during times of severe drought

4.2 ACTIONS CATEGORIZED BY HAZARD ADDRESSED

All Hazards

- 1.A3 – Increase efforts to encourage the public to be added to RI Department of Health’s registry of people with special needs and to sign up for Code Red alerts.
- 1.A4. Evaluate the possibility of expanding the number of emergency shelter beds available during an evacuation event.
- 8.A4 – Assess Impact of the Privatization of Navy Housing - COMPLETE

Severe Weather: nor’easters, winter storms, thunderstorms, high winds and tornadoes

- 1.A1 – Study the necessity and feasibility of offering buses from low-income neighborhoods to evacuation shelters. If the decision is made to offer this service, then develop an implementation plan
- 1.A2– Prioritize communicating with individuals who rely on electronic health devices during power outages
- 2.A2 – Offer technical assistance on business continuity plans to local business community
- 7.A2 – Acquire Temporary Stop Signs for Use During a Power Outage
- 8.A1 – Continue Town Tree-Trimming Program
- 8.A2 – Create a Public Tree Database for the Town’s Geographic Information System
- 8.A3 – Maintain Safe Roads during Snow and Ice Events
- 12.A1 – Properly Anchor and Secure Mobile Homes and Recreational Vehicles
- 14.A1 – Evaluate which shoreline properties are at significant erosion risk due to coastal surge and wave action during hurricanes, tropical storms, and other severe weather
- 14.A2 – Armor the shoreline at Dunlap Wheeler Park

Hurricanes and Tropical Storms

- 1.A1 – Study the necessity and feasibility of offering buses from low-income neighborhoods to evacuation shelters. If the decision is made to offer this service, then develop an implementation plan
- 1.A2 – Prioritize communicating with individuals who rely on electronic health devices during power outages
- 7.A1 – Install OptiCom Sensors on Traffic Signals – COMPLETE
- 7.A2 – Acquire Temporary Stop Signs for Use During a Power Outage
- 8.A1 – Continue Town Tree-Trimming Program
- 8.A2– Create a Public Tree Database for the Town’s Geographic Information System
- 12.A1 – Properly Anchor and Secure Mobile Homes and Recreational Vehicles
- 14.A1 – Evaluate which shoreline properties are at significant erosion risk due to coastal surge and wave action during hurricanes, tropical storms, and other severe weather
- 14.A2 – Armor the shoreline at Dunlap Wheeler Park
- 2.A2– Offer technical assistance on business continuity plans to local business community

Flooding

- 1.A1– Study the necessity and feasibility of offering buses from low-income neighborhoods to evacuation shelters. If the decision is made to offer this service, then develop an implementation plan

- 2.A1 – Develop incentives for property owners with properties in the flood zone to flood proof their structures
- 3.A1 – Increase culvert size, raise roadbeds, clear brooks, add guiderails, and make stormwater and drainage improvements to Town roads.
- 5.A1 – Reduce Inflow and Infiltration at the Wave Avenue Pump Station
- 5.A2 – Increase Capacity at Wave Avenue Pump Station – COMPLETE
- 5.A3– Eliminate Illegal Sump Pump Connections to Sanitary Sewer System
- 6.A1 – Reduce Inflow and Infiltration at Paradise Avenue Pump Station
- 9.A1 – Continually Clear Debris from the Maidford River
- 9.A2 – Regulate Development in the Maidford River Watershed
- 10.A1 –Implement Debris Clearing of Bailey Brook
- 10.A2 – Limit Development in the Watershed of Bailey Brook
- 10.A3 – Complete Watershed Analysis and Update Flood Maps as Needed - COMPLETE
- 10.A4 – Extension of Buck Road to Serve as Evacuation Route
- 13.A1 – Enforce Property Owners/Homeowners Associations to Maintain Drainage Features

Dam Failure

- 11.A1 – Work with Dam Owners to Encourage Proper Maintenance

Wildfire

- 15.A1 – Identify any forested or heavy brush areas within the Town’s jurisdiction that could create a wildfire hazard including the U.S. Sachuest Point Wildlife Refuge
- 15.A2– Monitor fire risk areas and implement outside burn restrictions during times of severe drought

Drought

- 15.A2– Monitor fire risk areas and implement outside burn restrictions during times of severe drought

Earthquakes

- Due to the low frequency of damage inducing earthquakes, no action specifically addresses this hazard. The Town enforces the State building code.

Hazardous Materials

- 1.A1 – Study the necessity and feasibility of offering buses from low-income neighborhoods to evacuation shelters. If the decision is made to offer this service, then develop an implementation plan
- 4.A1– Formalize input of emergency management staff in DPR application process for applications relating to hazardous materials in order to mitigate the impact of incidents

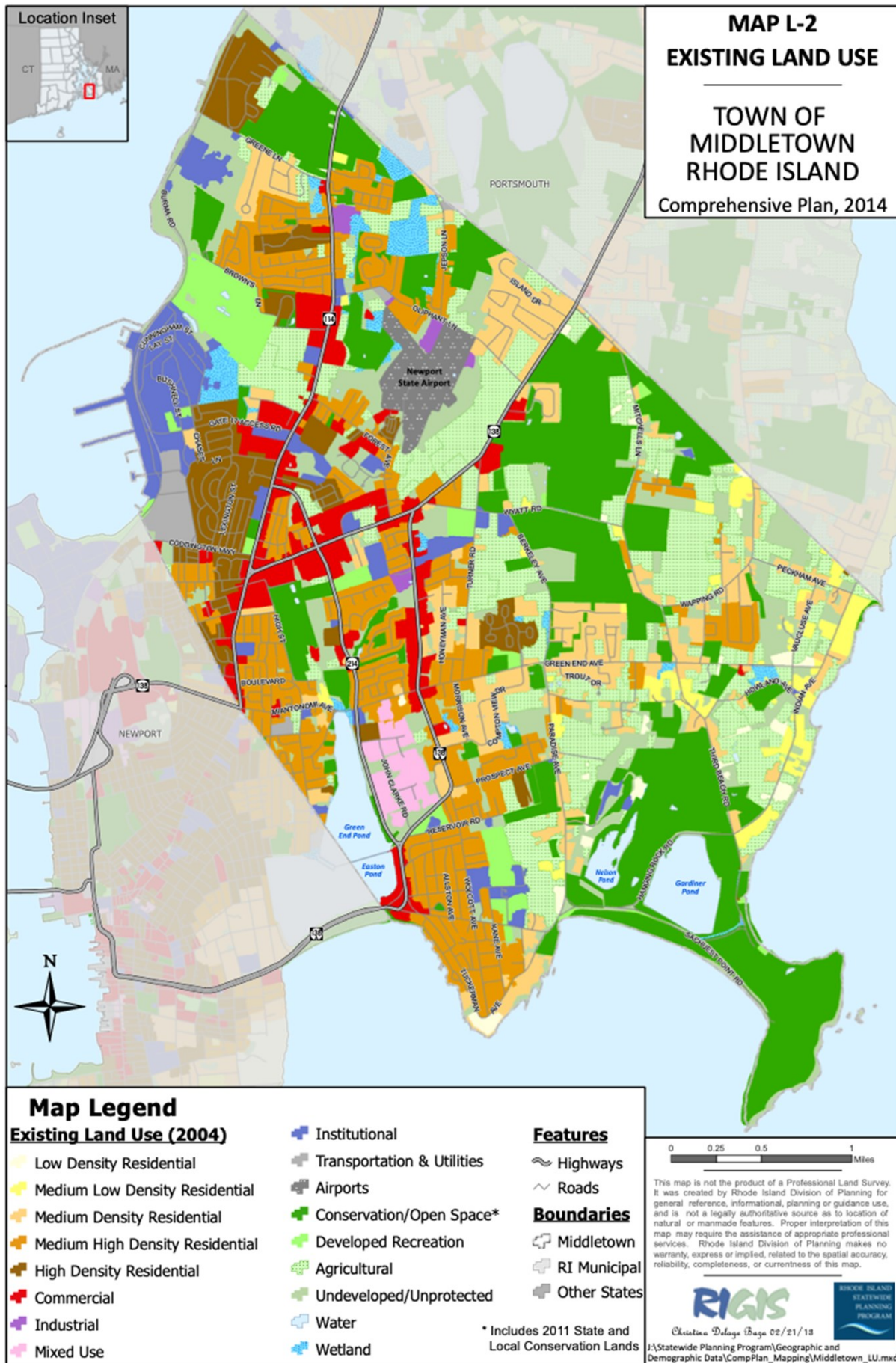
Terrorist Events

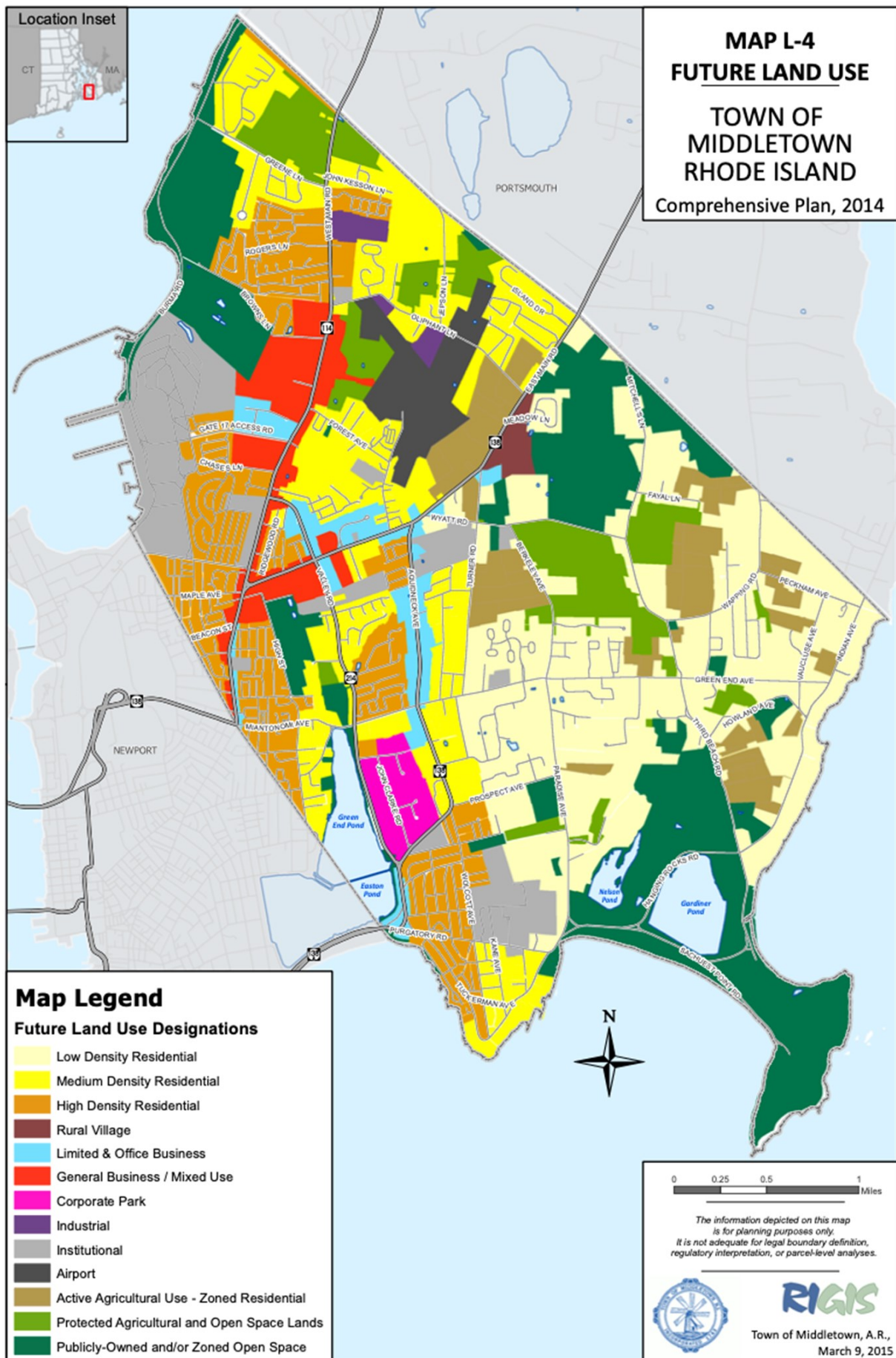
- No action specifically addresses vulnerability to terrorist events, though emergency management staff have various programs and procedures to prepare for and respond to some terrorist events as noted in the vulnerability assessment.

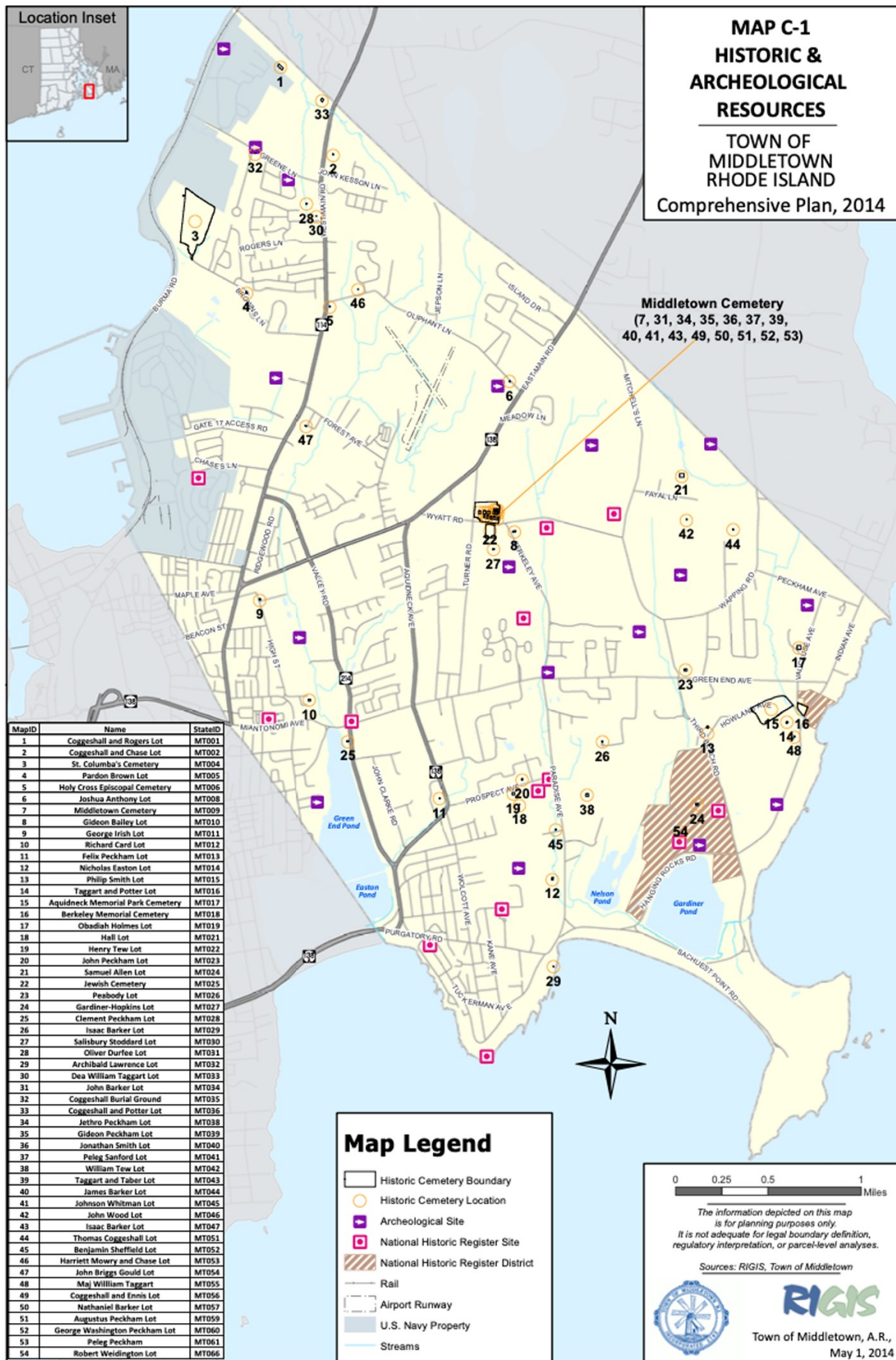
Appendix B

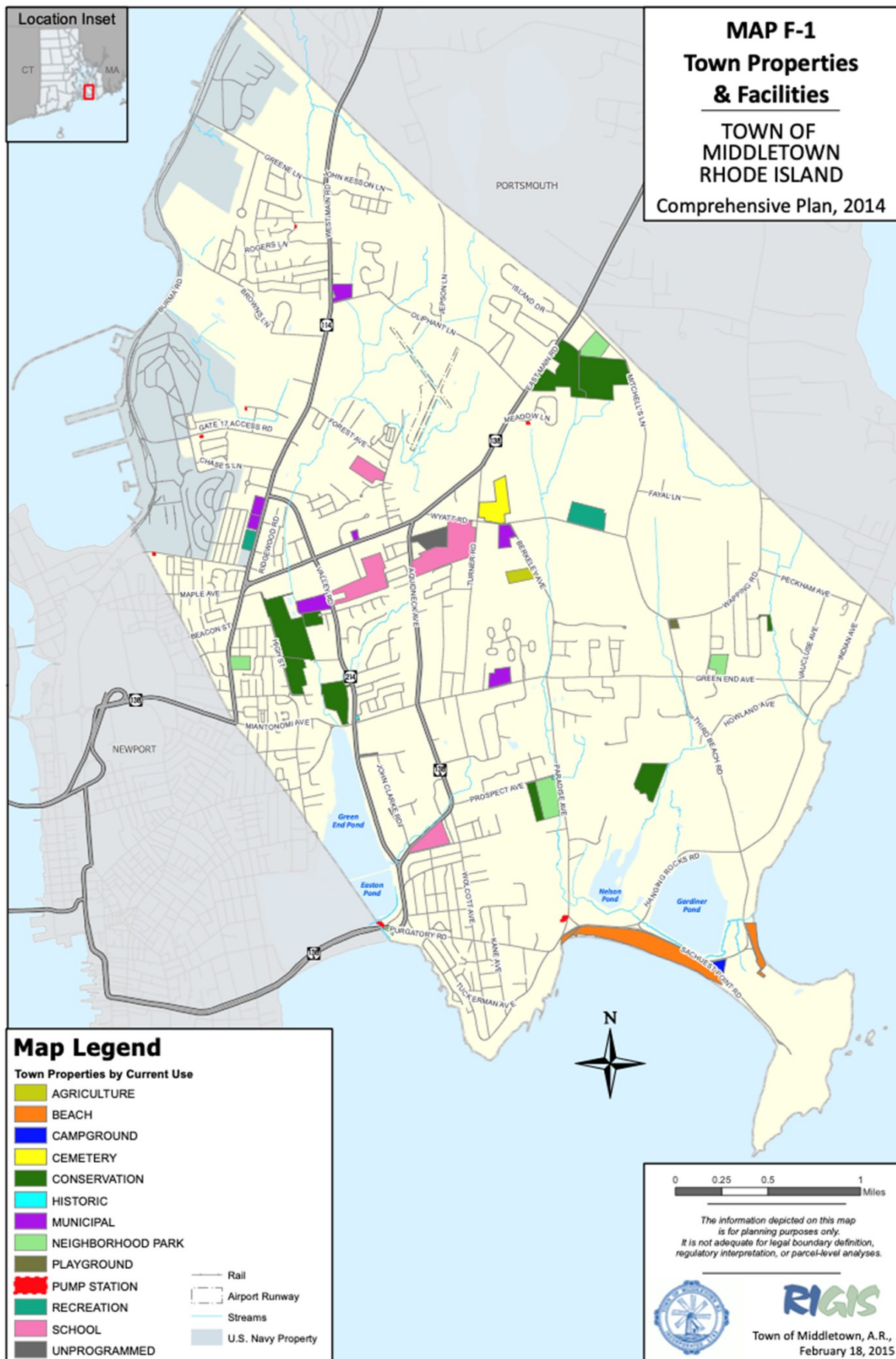
Middletown Map Resource Packet* Used During Workshop

***Gathered from Local Hazard Mitigation Plan (2019) & Comprehensive Plan (2014)**

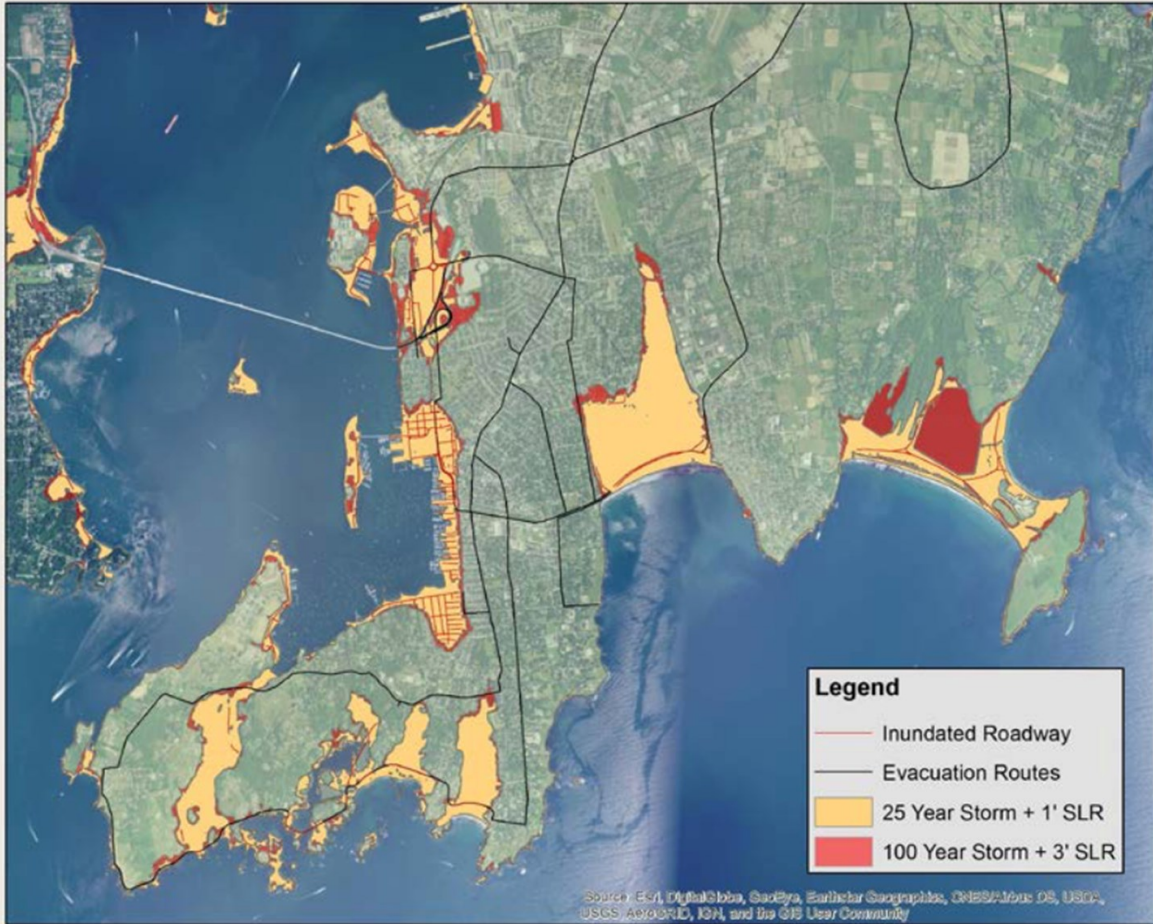








COASTAL INUNDATION IMPACTS: SOUTHERN AQUIDNECK ISLAND



Maps courtesy of the Rhode Island Environmental Data Center

MILES OF COASTAL EVACUATION ROUTES EXPOSED

LOCATION	TOTAL MILES OF EVACUATION ROUTES	25-YEAR STORM +1' SEA LEVEL RISE	100-YEAR STORM +3' SEA LEVEL RISE
Middletown	2.7	0.01	0.01
Newport	2.6	1.3	1.4
Portsmouth	3.8	1.0	1.12
Island-wide	9.1	2.3	2.5

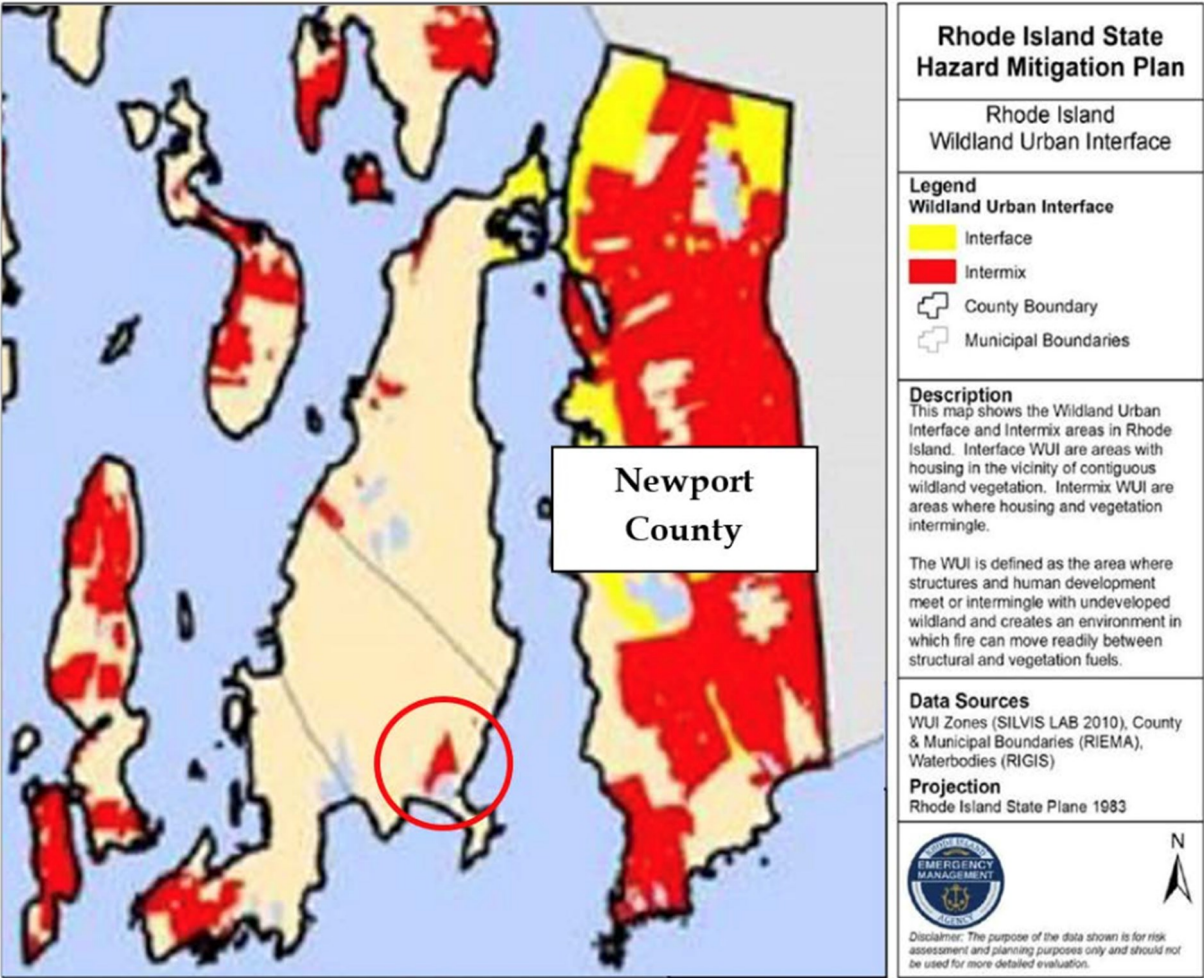
This graph shows the total miles of evacuation routes on Aquidneck Island, and how many miles of those routes would be exposed to flooding in the event of a 25-year storm with 1 foot of sea level rise, and in a 100-year storm with 3 feet of sea level rise.

MILES OF ROAD EXPOSED ON AQUIDNECK ISLAND

LOCATION	3' SEA LEVEL RISE	100-YEAR STORM +3' SEA LEVEL RISE
Middletown	0.60	6
Newport	2.17	33
Portsmouth	1.62	30
Island-wide	4.39	69

This graph shows the total miles of road that would be exposed to flooding on Aquidneck Island with 3 feet of sea level rise and during a 100-year storm with 3 feet of sea level rise.

FIGURE 10: WILDFIRE - AREAS OF CONCERN



RI Hazard Mitigation Plan 2017

Parcels Impacted by Flood Zones - Appendix D



Town of Middletown

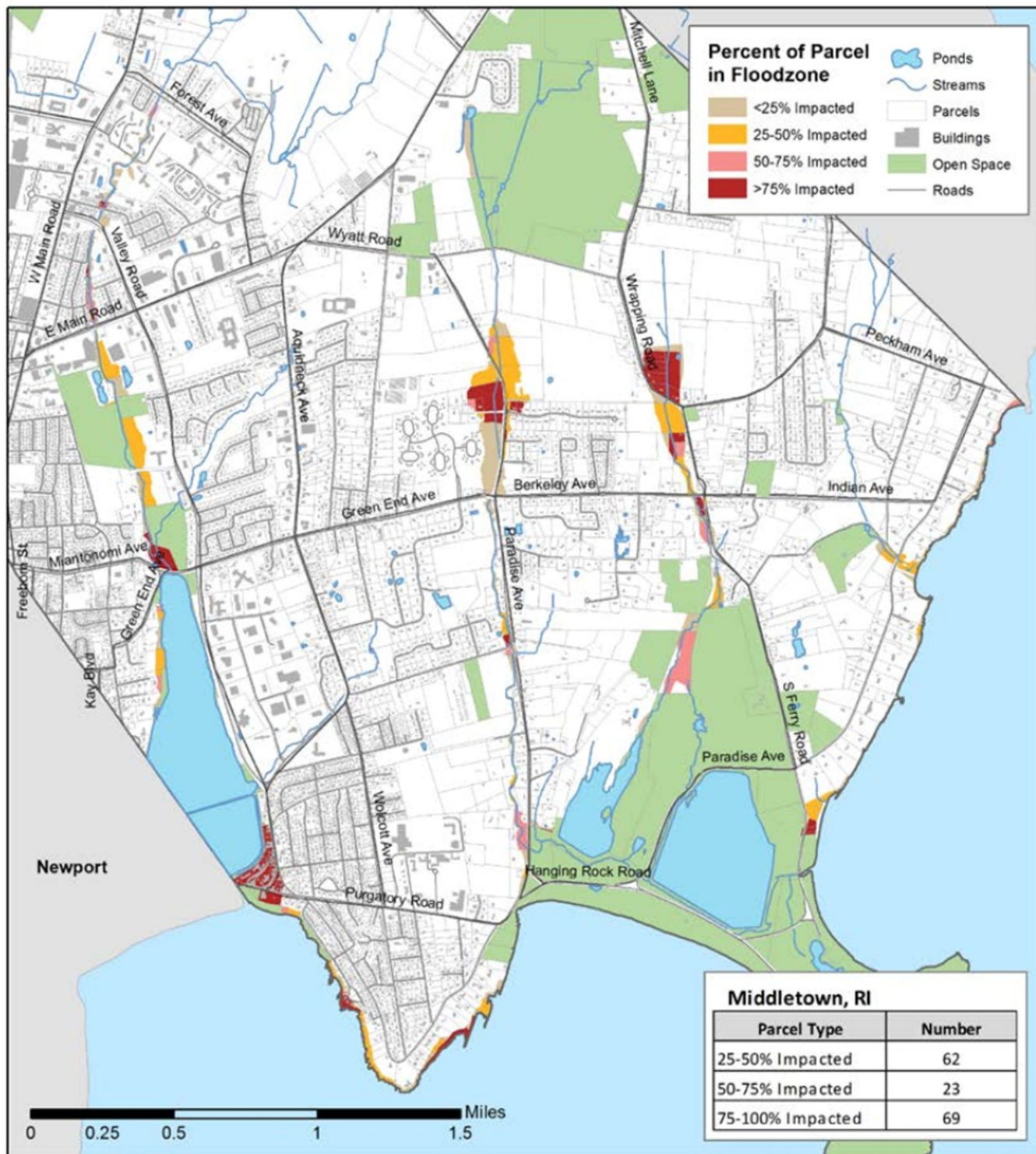
Parcels Impacted by Flood Zone

The information on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation or parcel-level analysis.

Data: Town of Middletown, RIGIS

Author: K.P. Date: 10/17/2018

1





Town of Middletown

Parcels Impacted by Flood Zone

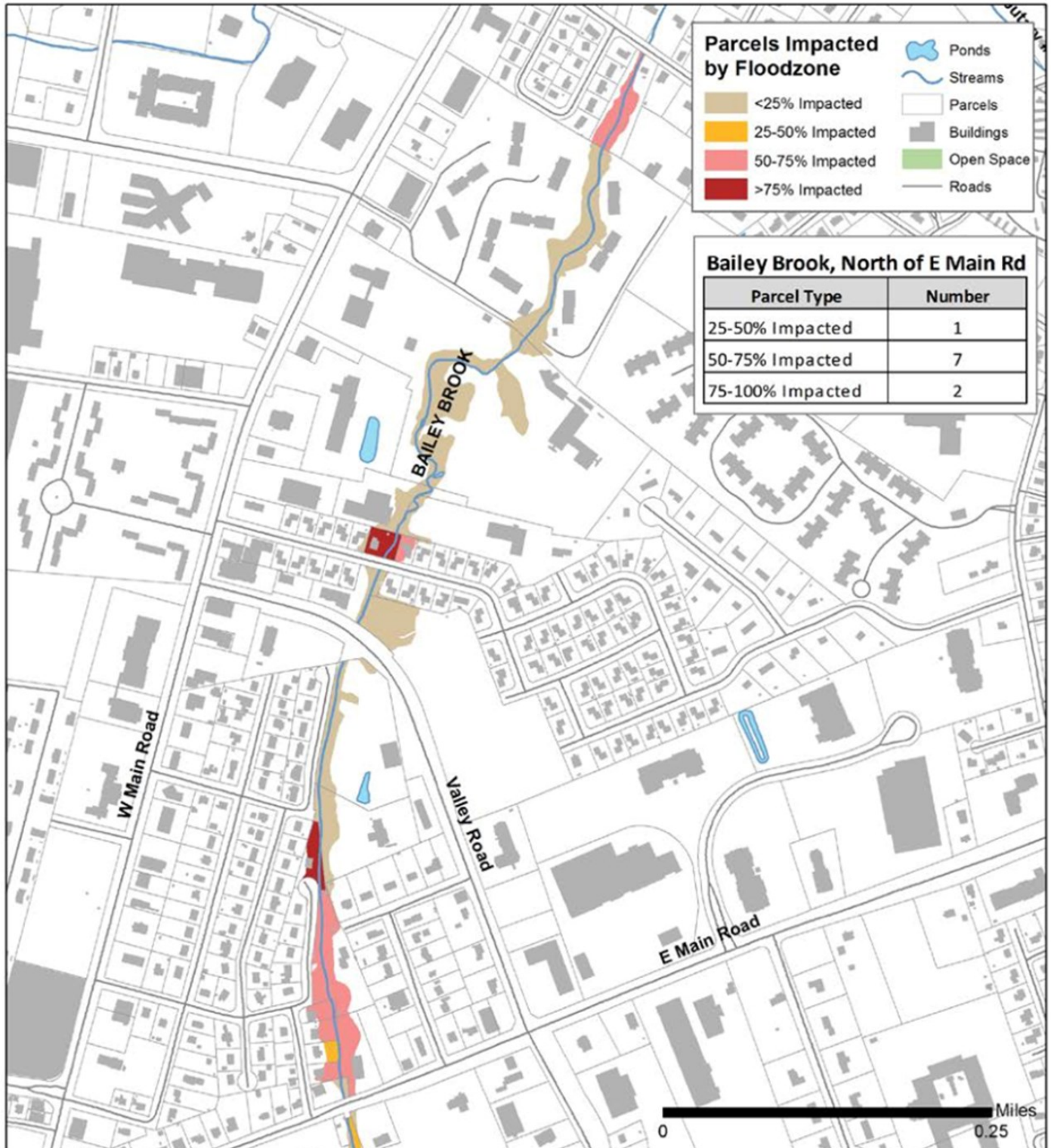
The information on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation or parcel-level analysis.

Data: Town of Middletown, RIGIS

Author: K.P. Date: 11/2/2018

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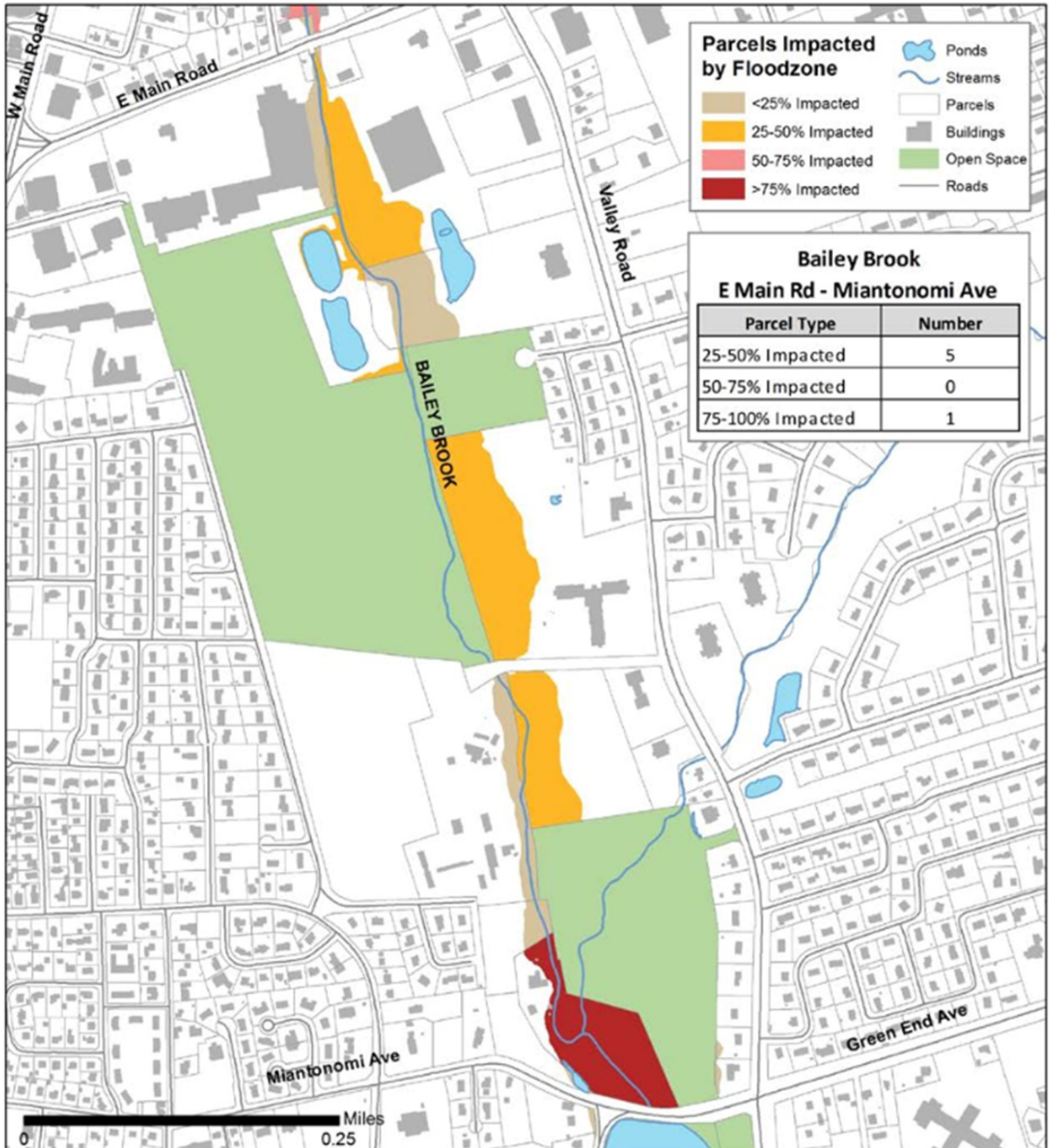
Town of Middletown

Pacels Impacted by Flood Zone

The information on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation or parcel-level analysis.

Data: Town of Middletown, RIGIS
Author: K.P. Date: 11/2/2018

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Town of Middletown

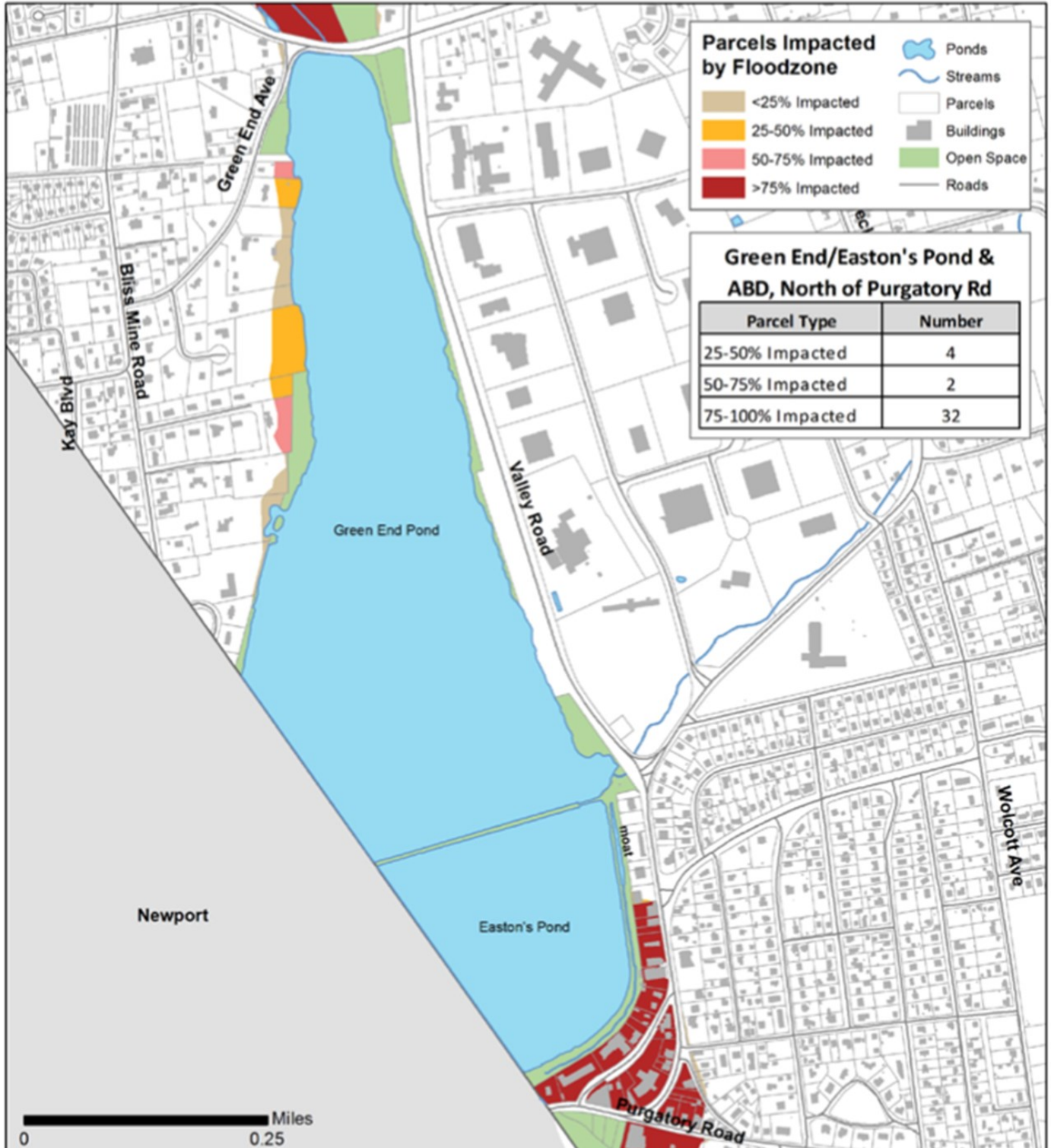
Parcels Impacted by Flood Zone

The information on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation or parcel-level analysis.

Data: Town of Middletown, RIGIS

Author: K.P. Date: 11/2/2018

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Town of Middletown

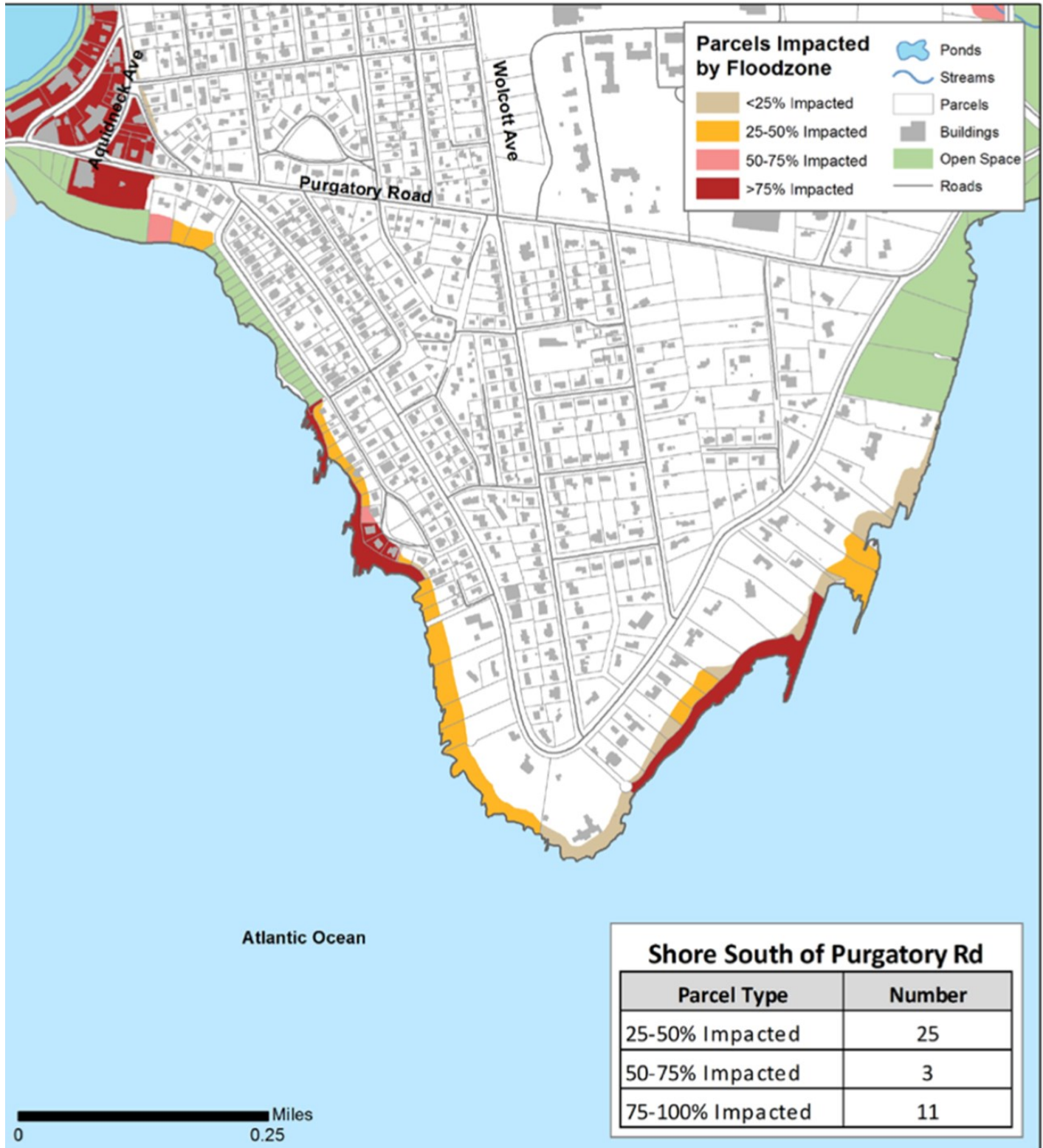
Parcels Impacted by Flood Zone

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Data: Town of Middletown, RIGIS
Author: K.P. Date: 11/2/2018

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Town of Middletown

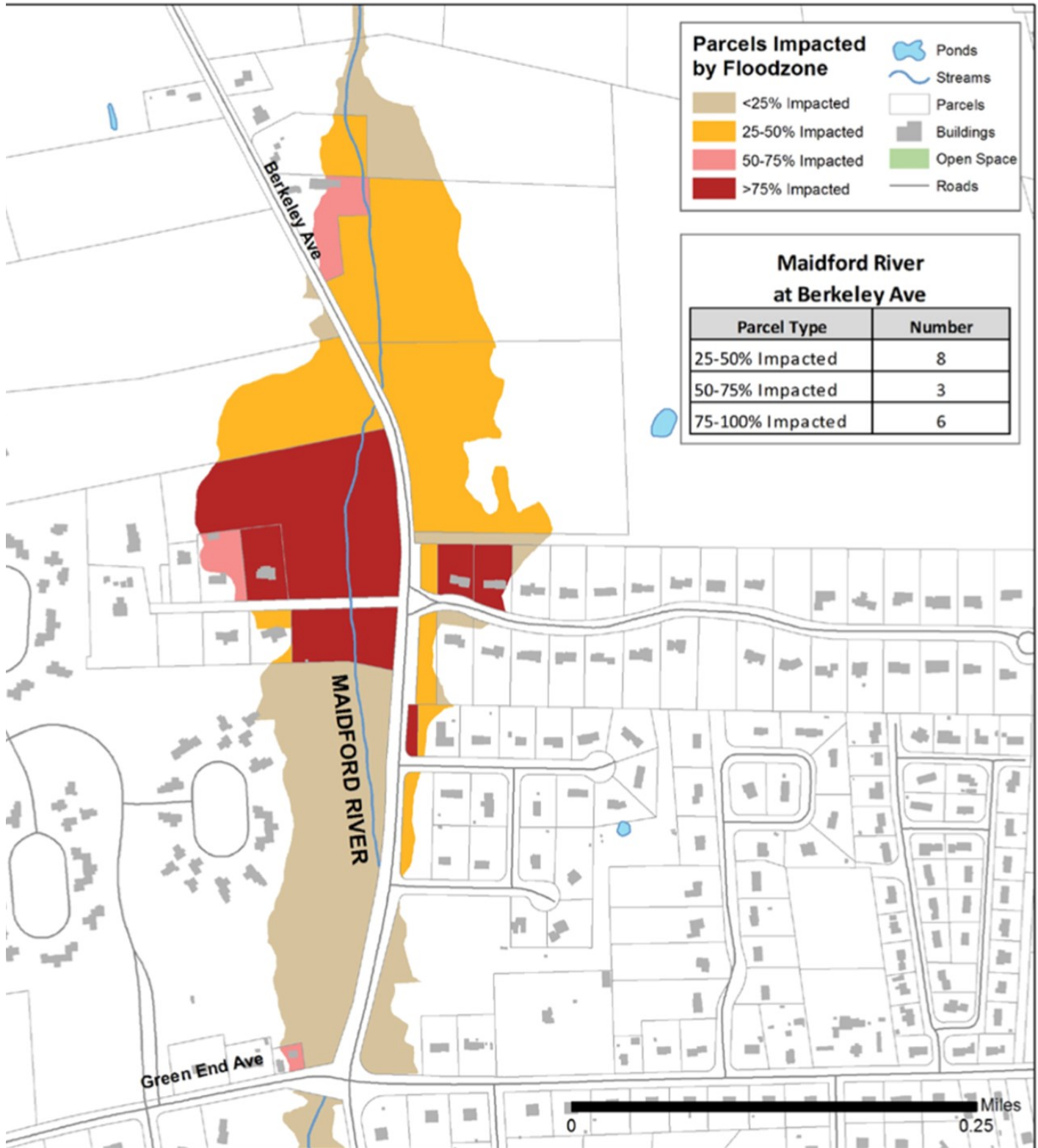
Parcels Impacted by Flood Zone

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Data: Town of Middletown, RIGIS

Author: K.P. Date: 11/2/2018

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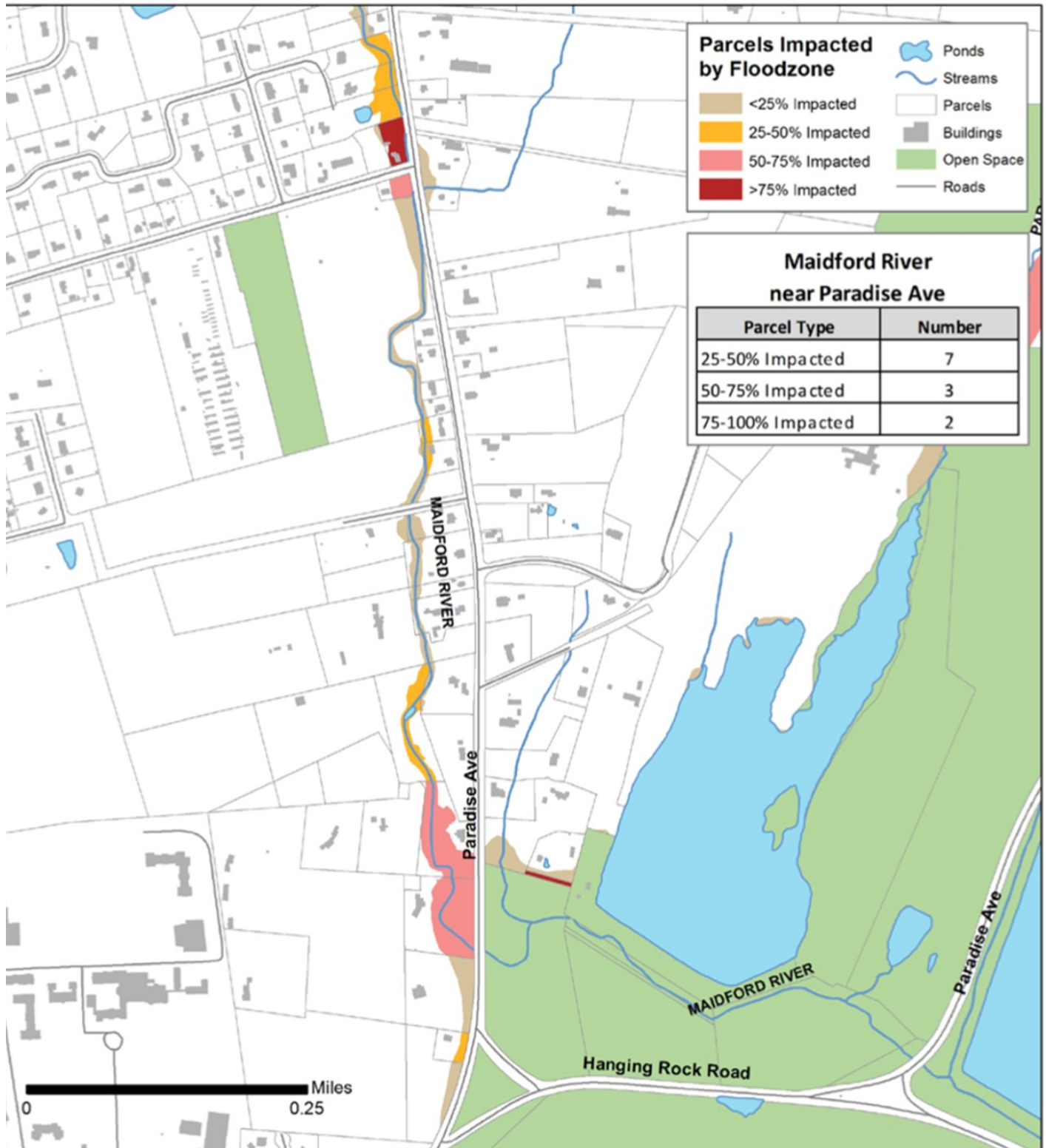
Town of Middletown

Parcels Impacted by Flood Zone

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Data: Town of Middletown, RIGIS
Author: K.P. Date: 11/2/2018

7





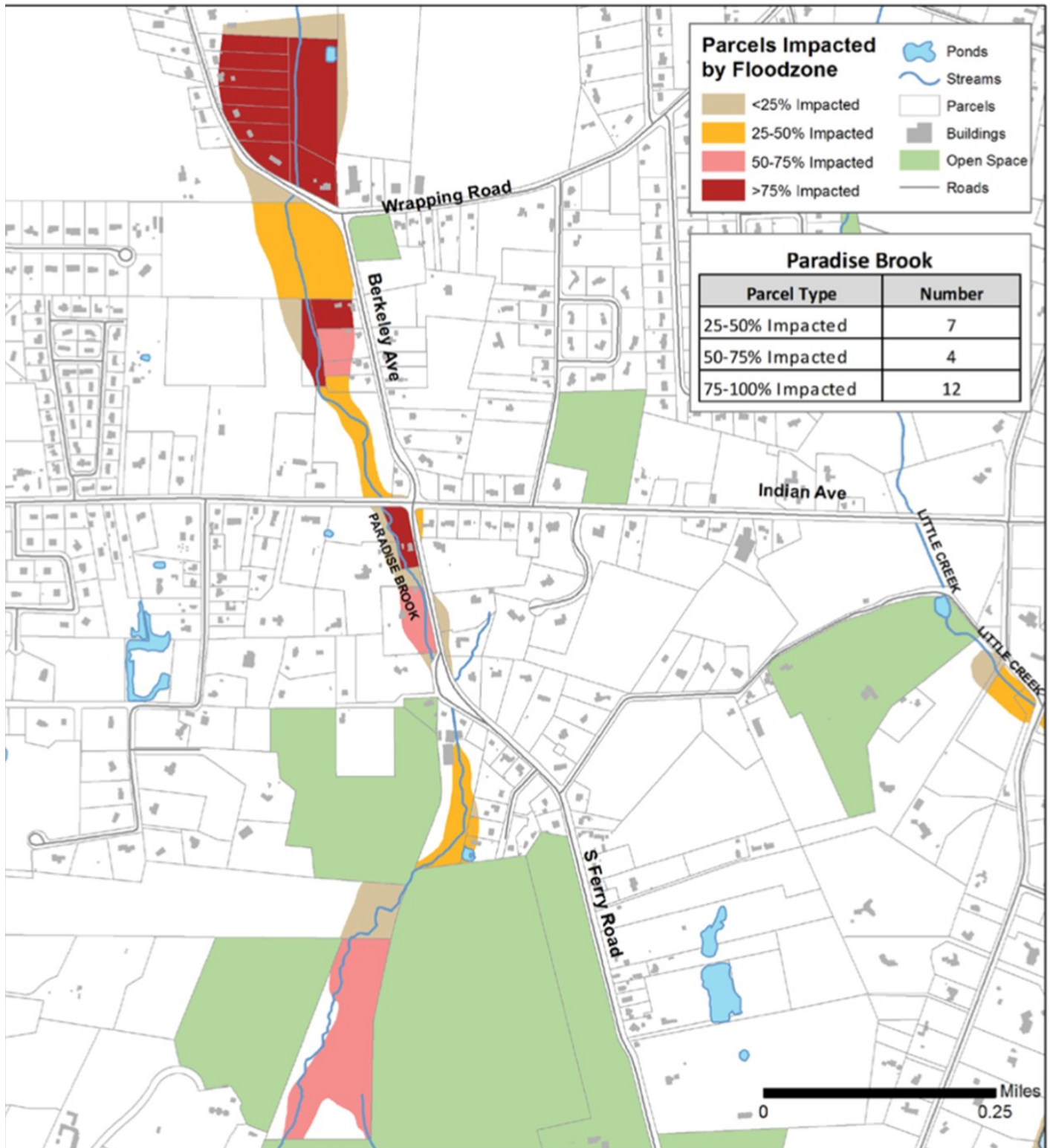
Town of Middletown

Parcels Impacted by Flood Zone

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Data: Town of Middletown, RIGIS
Author: K.P. Date: 11/2/2018

8





Town of Middletown

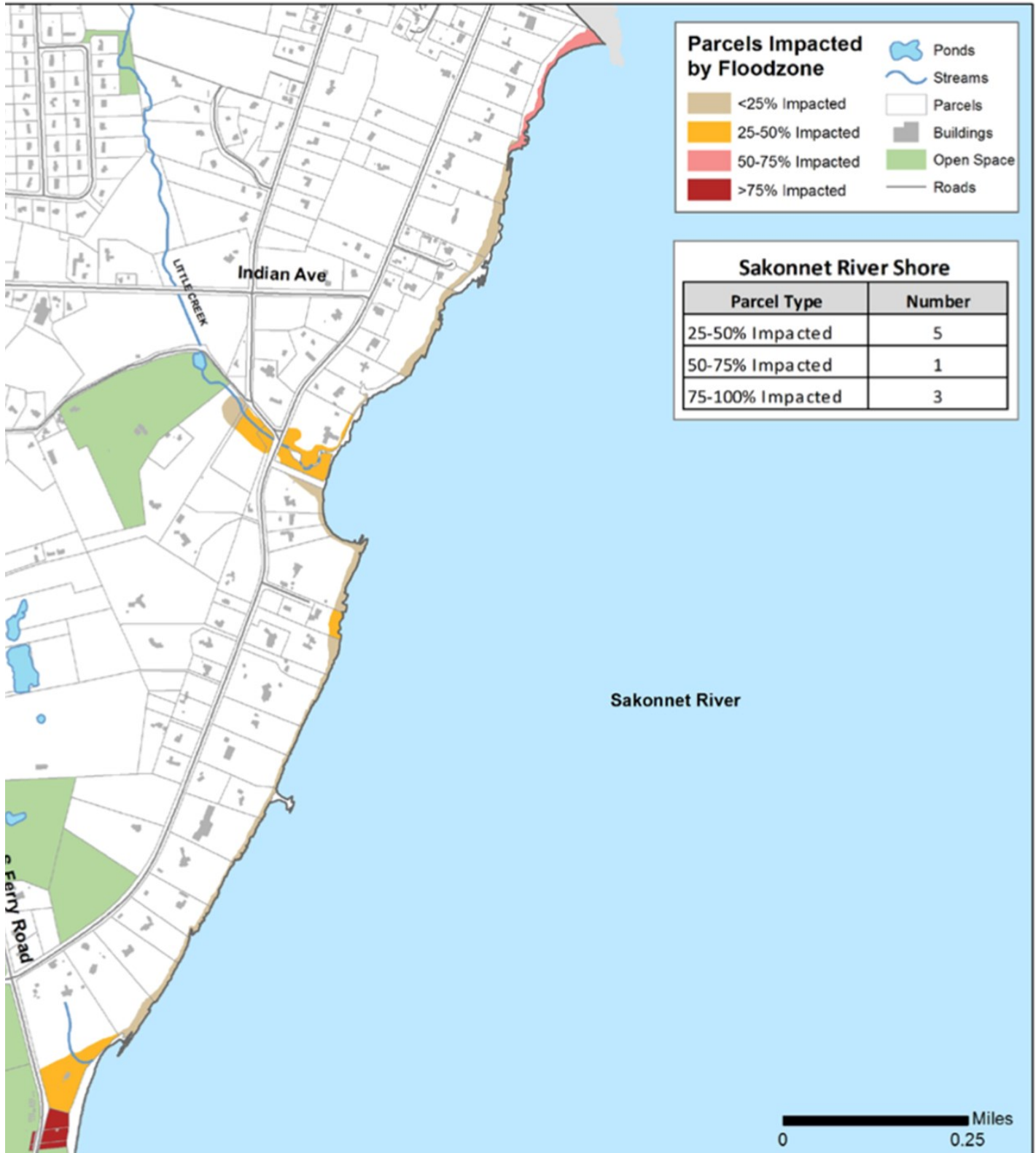
Parcels Impacted by Flood Zone

The information on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation or parcel-level analysis.

Data: Town of Middletown, RIGIS

Author: K.P. Date: 11/2/2018

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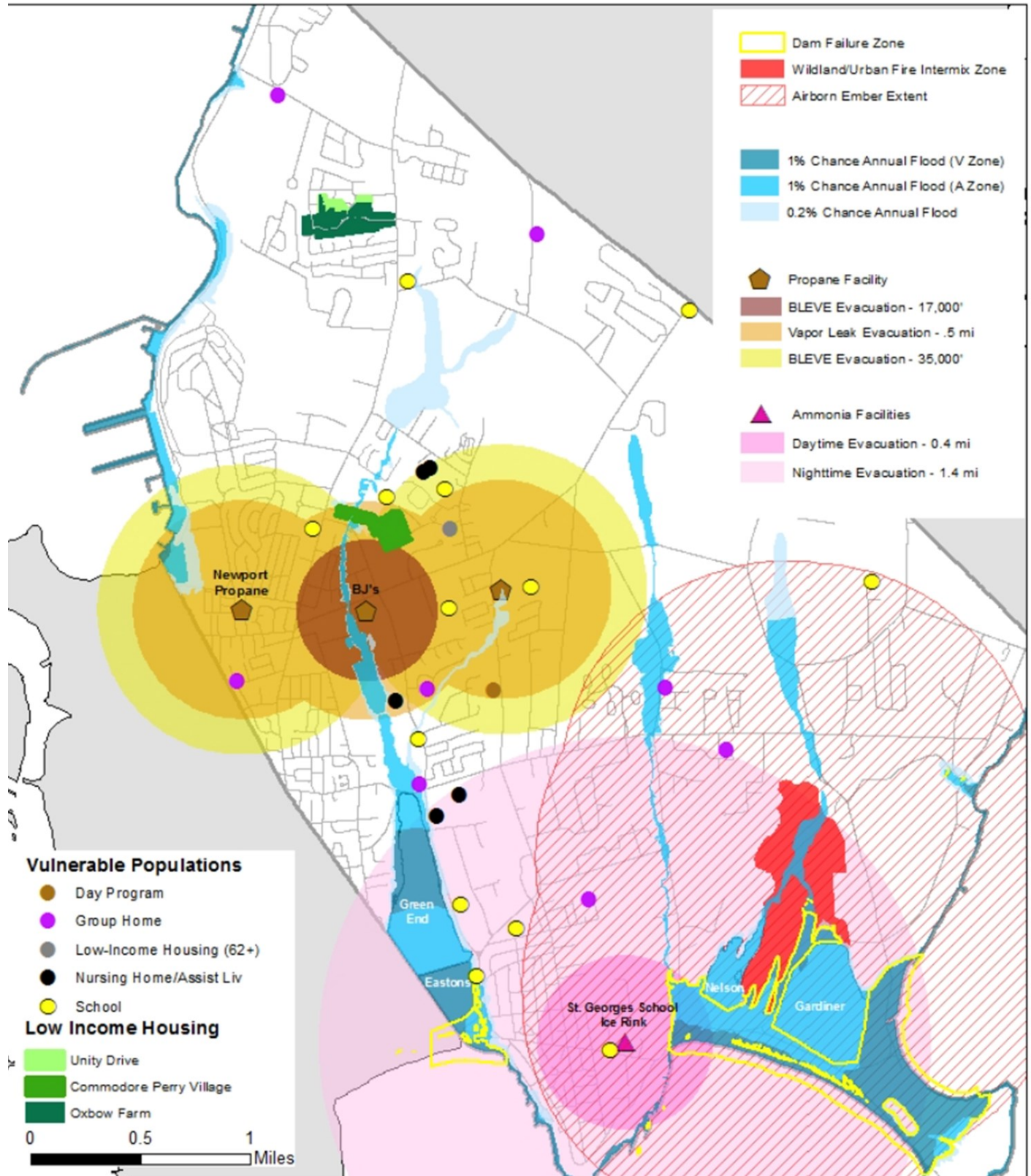


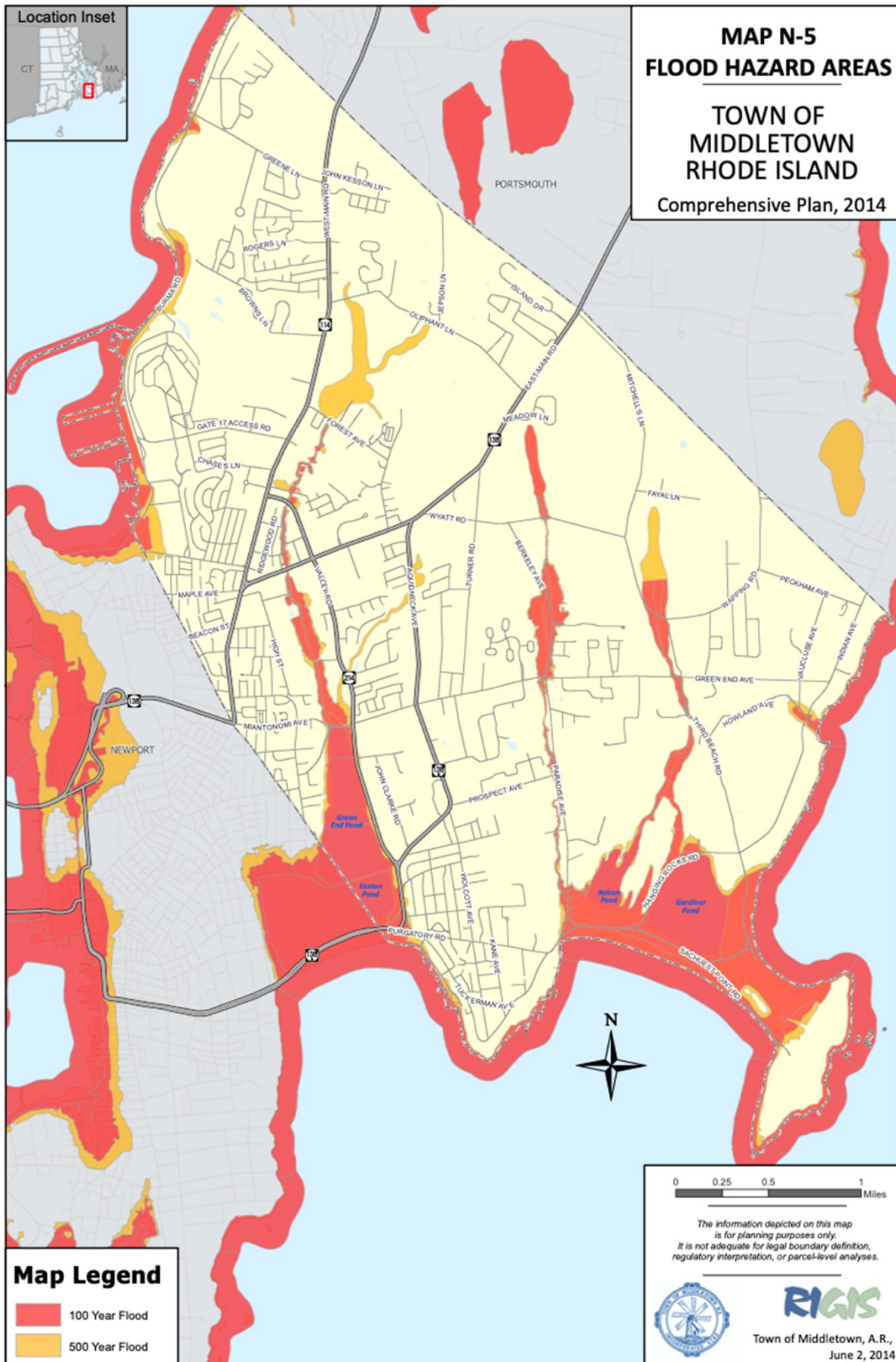


Town of Middletown

Hazard Areas

The information on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation or parcel-level analysis.
Data: Town of Middletown, RIGIS, Statewide Planning
Author: K.P., R.L. Date: 5/23/2019







Town of Middletown

Eastons North Pond Dam Failure: Flooding Extent

The information on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation or parcel-level analysis. Data: Town of Middletown, RIGIS Author: K.P. Date: 11/22/2019

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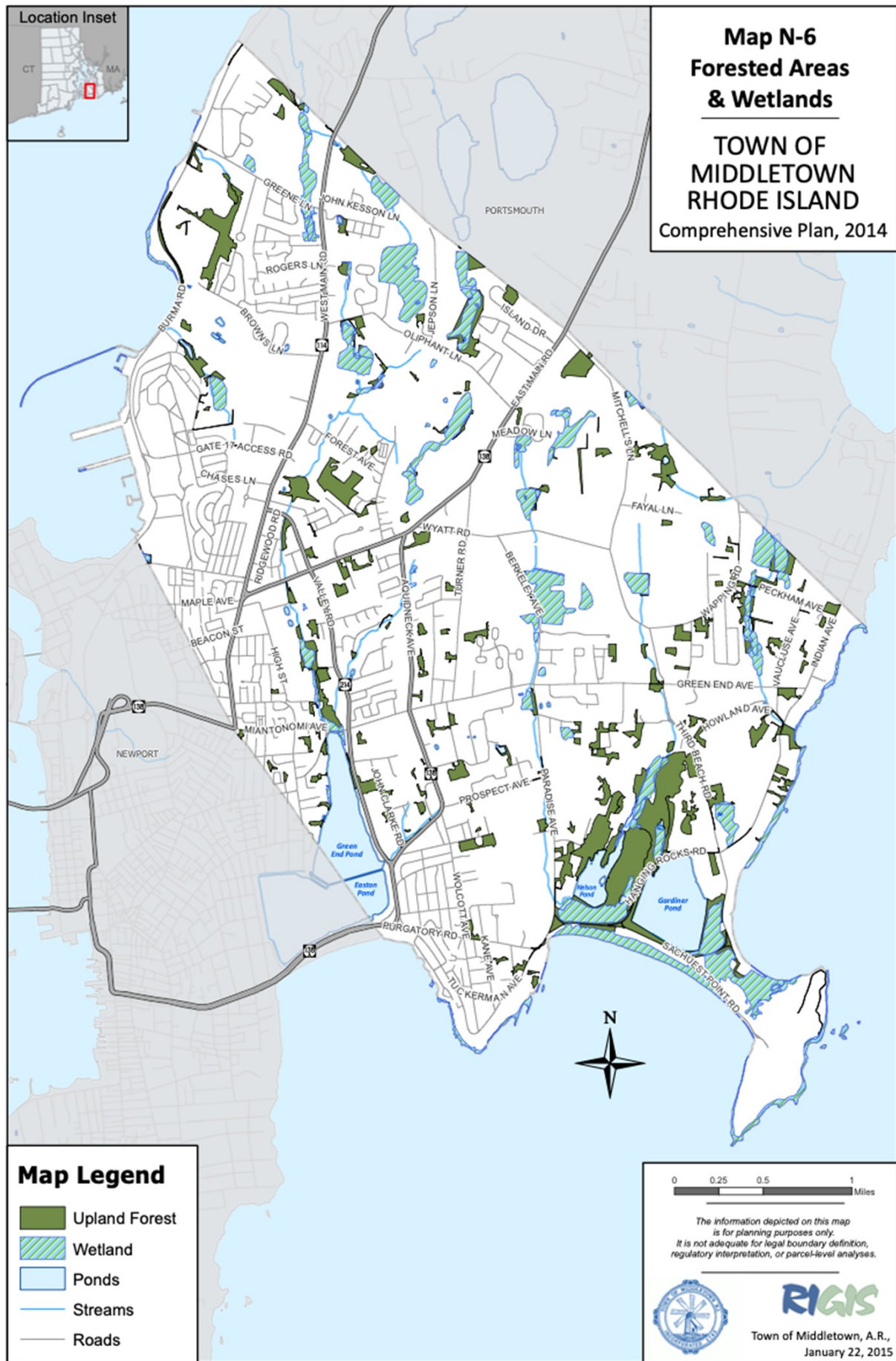
Town of Middletown

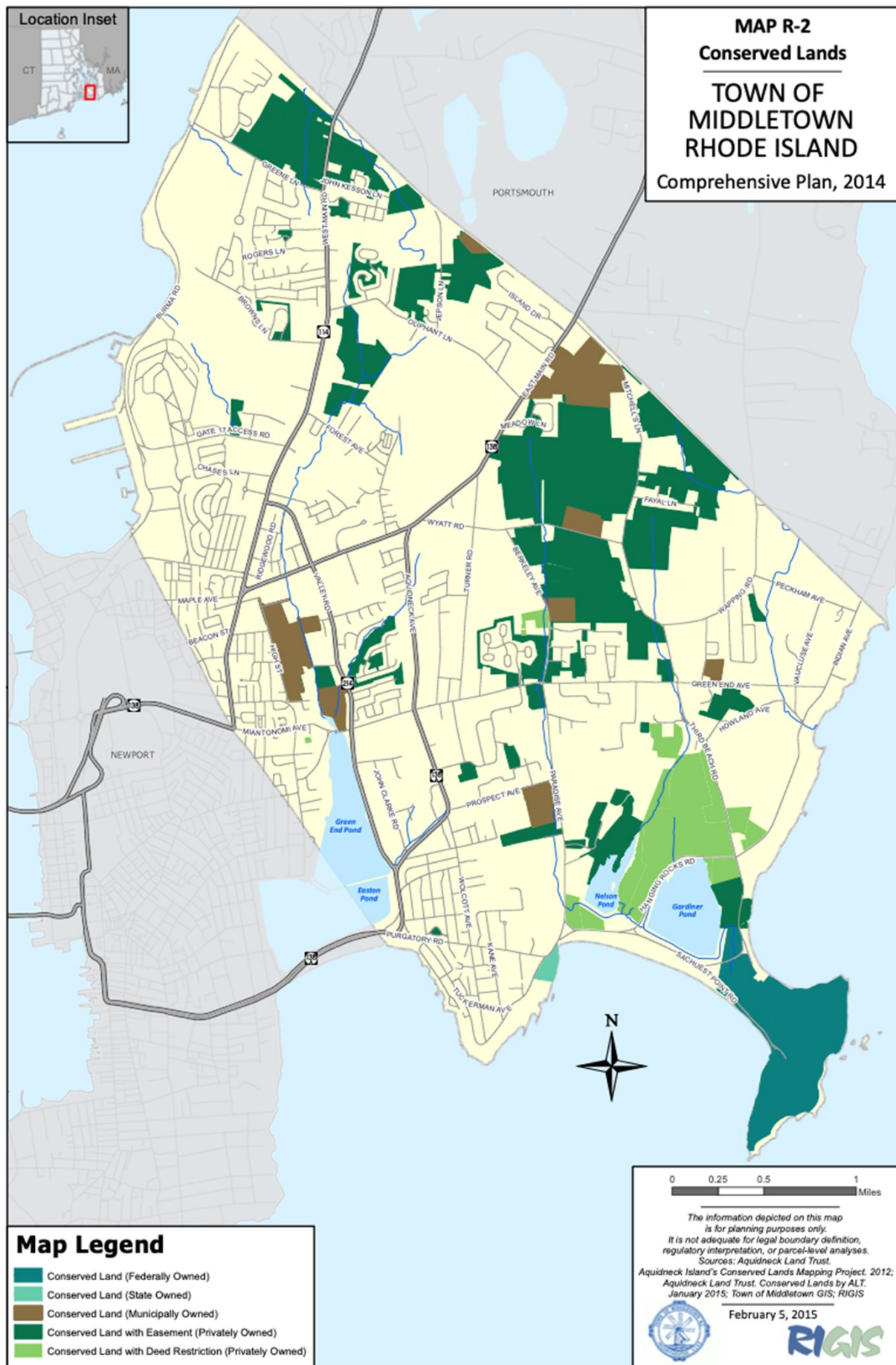
Gardiner Dam Failure: Flooding Extent



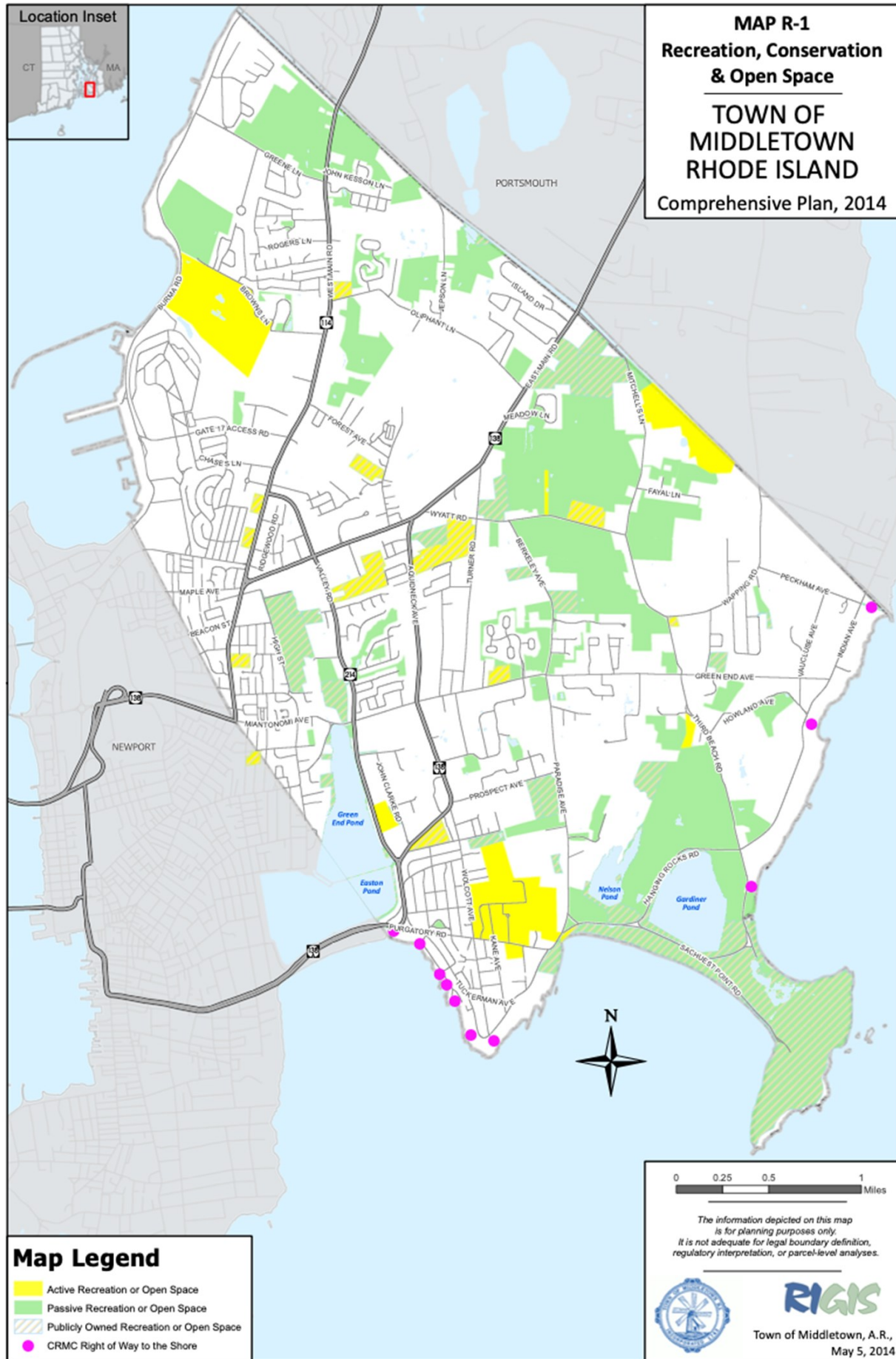
The information on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation or parcel-level analysis. Data: Town of Middletown, RIGIS Author: K.P. Date: 11/22/2019











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