

Westerly



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Municipal Resilience Program Community Resilience Building Workshop Summary of Findings September 2019



Town of Westerly

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 Sandy have reinforced this urgency and compelled leading communities like the Town of Westerly 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 2019, the Town of Westerly embarked on certification within the newly established state of Rhode Island's Municipal Resilience Program. As an important step towards certification, Rhode Island Infrastructure Bank (RIIB) and the Nature Conservancy (TNC) provided the Town with a community-focused process to assess current hazard and climate change impacts and to surface projects, plans, and policies for improved resilience. In August 2019, a Westerly core 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 facilitate the assessment of climate vulnerabilities, and the education, planning and ultimately implementation of priority resilience actions for Westerly.

The Westerly Community Resilience Building Workshop's central objectives were to:

- Define top local natural and climate-related hazards of concern;
- Identify existing and future vulnerabilities and strengths;
- Develop prioritized actions for the Town of Westerly;
- Identify opportunities to collaboratively advance actions to increase resilience.

The Town of Westerly employed a unique “anywhere at any scale”, community-driven process known as Community Resilience Building (CRB) (www.CommunityResilienceBuilding.org). The CRB’s Risk Matrix and various reports, data, and maps were integrated into the workshop process to provide both decision-support and visualization around shared values and priorities across Westerly. The Westerly Natural Hazard Mitigation Plan (2018) 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 Westerly’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 Town of Westerly 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

During the CRB Workshop, participants identified the top hazards for the Town of Westerly. The hazard of greatest concern to the participants was major storms including hurricanes, Nor’easters, and winter storms. The other key hazards discussed included precipitation-driven flooding (inland and riverine), coastal flooding and inundation (storm surge and sea level rise), and extreme temperatures or heatwaves. These hazards have direct and increasing impacts on Westerly’s residents and resources such as its neighborhoods, natural areas (rivers, wetlands, coastal ponds, watersheds, parks), farms, roads, bridges, salt marshes, places of employment, tourism, municipal facilities, drinking and wastewater systems, health care facilities, social support service for disproportionately disadvantaged populations, and other critical infrastructure and community assets.

Top Hazards and Areas of Concern for the Community

Top Hazards

- Precipitation-driven Flooding (Inland & Riverine)
- Coastal Flooding/Inundation (Storm Surge & Sea Level Rise)
- Major Storms & Wind (Hurricanes, Nor'easters, Winter (Snow/Ice) Storms)
- Extreme Temperature (Heatwaves, Drought)

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

Infrastructure: Wastewater Treatment Centers (Westerly, Pawcatuck, Stonington), Groundwater Wells, Residential Septic Systems, Stillman Avenue Dam, Potter Hill Dam, Canal Street Substation and Power Lines, Stormwater System, Affordable Housing (north end, Cross Street), Historic/Cultural Sites, Town Beach Pavilion, Animal Shelter, Public Works Station, Residential Units in Floodplain, Nursing Homes (Watch Hill), National Historic Landmarks – Carousel, Emergency Services Radio Network, Marinas, Harbor Anchorages, Food Pantry, Westerly Library, Solar Farms, Transfer Station.

Ecosystems: Chapman Pond, Salt Marshes, Freshwater Wetlands, Aquifer System, Coastal Barrier System, Pawcatuck River, Quonnie Pond, Winnapaug Pond, Little Narragansett Bay, Eelgrass Beds, Trees, Aquaculture Locations, Farms.

Roads, Road Network, Bridges: Route 1 Bridge, Stillman Avenue Bridge, Amtrak Line, Atlantic Avenue, Evacuation Routes, Westerly/Bradford Road, Causeway Street, Weekapaug Road, Winnapaug Road, Hospital Access Routes, Route 78, Bay Street (Watch Hill), Boom Bridge, Cottrell Bridge, Westerly Train Station, Westerly Airport, Dunns Corner, Route 91.

Neighborhoods: Watch Hill, Downtown Westerly, Misquamicut, Bradford, Napatree Point, Weekapaug, Greater North End, Pawcatuck, CT.

Vulnerable Populations: Low Income, Tourists, Renters, Elderly, Business Owners, Mobility Impaired, Dialysis Patients, Seasonal Workers, Homeless, Non-English Speakers, Farmers, Commercial Fishermen, Agricultural & Aquaculture Providers.

*Information from workshop participants augmented with the Westerly NHMP (2018). See Appendix for full list of vulnerable assets and associated mitigation actions from the Westerly NHMP (i.e. Table 5.4).

Current Concerns and Challenges Presented by Hazards

The Town of Westerly has several concerns and faces multiple challenges related to the impacts of natural hazards and climate change. In recent years, Westerly has experienced a series of highly disruptive and damaging weather events including Tropical Storm Irene (August 2011), Tropical 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 extended coastal erosion and power outages across portions of Westerly. 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 climatic change, while motivating communities like Westerly to proactively and comprehensively improve resilience.

This series of extreme weather events highlights that for Westerly the impacts from hazards are diverse; ranging from coastal flooding of roads and low-lying areas near rivers during intense storms and heavy precipitation events to 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, response and mitigation priorities and requires comprehensive yet tailored actions for particular locations and/or areas across Westerly.

The workshop participants were generally in agreement that Westerly is experiencing more intense and frequent storms events and heat waves. The impacts have affected the daily activities of most residents. Additionally, there was a general concern about the challenges of being prepared with contingency plans for worst case scenarios during different times of the year (i.e. major disasters, storms, major hurricanes (Cat-3 or above)) particularly in the fall/winter months due to more intense storms.



(Credit: seewesterly.com)



(Credit: flickr.com)



(Credit: istockphoto.com)

Specific Categories of Concerns and Challenges

As in any community, Westerly is not uniformly vulnerable to hazards and climate change, and certain locations, resources, 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 concerns and challenges across three categories - Infrastructure, Societal, and Environmental.

Infrastructure Concerns and Challenges

Roads, Road Networks, Bridges:

- Low-lying coastal roads and roads in close proximity to riverine systems subjected to erosion and routine flooding from storm surge and stormwater runoff.
- Stormwater management tools and upgrade needs associated with road flooding.
- Critical need for bridge and culvert upgrades/replacements/retrofits.

Wastewater:

- Wastewater Treatment Facilities exposure to flooding.
- Privately owned and maintained on-site wastewater treatment systems subject to flooding in high flood and seasonally high groundwater areas.

Drinking Water:

- Overtopping of wellheads resulting in contamination of source water along with pump house flooding.

Emergency Management and Preparedness:

- Major hurricane creating unmanageable challenges for current response and recovery staff, resources, and facilities within municipality.
- Need for more business continuity and recovery planning for major events.

Housing:

- Majority of seasonal homes in most vulnerable areas (i.e. Misquamicut).
- Isolation of homes when road network is compromised for extended periods.
- Education about potential for current and future impacts to structures.
- Concerns about household contaminants and storm debris post-storm.
- Lack of specific evacuation plans for residents in coastal areas.

Specific Categories of Concerns and Challenges (cont'd)

Societal Concerns and Challenges

Vulnerable Populations:

- Implications to local residents, visitors, and tourists in neighborhoods susceptible to flooding and isolation due to compromised/limited access and egress.
- Implications on disproportionately disadvantaged populations (i.e. homeless, elderly, working poor, non-English Speakers) due to flooding, winter storms, and heat waves.
- Emergency communications with elderly populations.

Power:

- Power outages to residential homes and business particularly during the winter months increasing isolation.
- Low income households vulnerability due to power outages.

Environmental Concerns and Challenges

Beaches and Dunes:

- Ongoing routine and episodic (Storm Sandy) erosion and loss of beaches and dunes and potential impacts on attraction for visitors and tourists (i.e. Old Town Beach).

Watersheds and Coastal Ponds:

- Water quality declines in Pawcatuck River, Winnapaug, and Little Narragansett Bay due to direct discharge of stormwater.
- Siltation and erosion of coastal ponds and stormwater runoff impacts to rivers.
- Number of dams that pose risk to community if not removed.
- Increasing development pressure on landscape.

Trees and Forest:

- Increasing impacts to tree health from pests and pathogens resulting in dead and standing trees which pose risk to power lines, people, and property if not managed.
- Lack of tree or forest management plan.

Salt Marsh and Barrier Island:

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

Current Strengths and Assets

Just as certain locations, resources, and populations in Westerly stand out as particularly vulnerable to the effects of hazards and climate change, other features are notable as assets to Westerly's resilience efforts. 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 interventions.

- Clearly, the engaged and responsive leadership exhibited by officials and staff is a significant strength within Westerly. Ongoing collaboration between the Town, business community, faith-based organization, NGOs, adjoining municipalities, County and State-level organizations among others on priorities identified herein will help advance comprehensive, collaborative, community resilience building actions.
- The Town has highly experienced staff with desire to maintain adequate resources for most emergency situations. The coordination amongst various departments including leadership, Police, Fire, and EMS was cited as an ongoing, and highly valued community strength despite the ongoing need to maintain volunteers over time.
- A well-coordinated and connected sheltering system including a school, armory, and senior center and cooling/heating/charging locations (i.e. Library, WARM Center) along with a dedicated emergency pet shelter.
- Rich historic and cultural resources coupled with desirable economic and natural resources serve to attract tourist and seasonal renters.
- Open space and natural resources coupled with riparian corridors and coastal marsh and wetlands including the Wood-Pawcatuck Watershed and Salt Pond Region which provide protection from storm surge, flood water storage, high quality drinking water supply, enhance public amenities for recreation and gathering, and increase ecological function and biodiversity.
- Strong social support network and civic groups via active engagement and participation in municipal by faith-based organizations, community-action NGOs, land trusts, and neighborhood groups, among others.
- Several agricultural and aquaculture enterprises with generally supportive residents that help to increase availability of locally produced food.
- Willingness of local employers and retail businesses to contribute to the common good in times of disaster and major need.

Recommendations to Improve Resilience

A common thread throughout the workshop discussions was the recognition that Westerly needs to be better prepared through longer term, community-based, contingency planning across all areas of concern. This need and additional highlights surfaced and prioritized by the workshop participants are provided below across several sub-categories including capacity building, projects, plans/preparedness/studies/outreach, and policy. Mitigation actions from Westerly NHMP (2018) provided in Appendix.

The workshop participants collectively identified several key priority areas stated here and reflected in the lists of potential actions below:

- Infrastructure improvements to wastewater treatment facilities, stormwater management systems, and the networks of roads and bridges.
- Natural system conservation and water quality for drinking and ecosystem health.
- Emergency preparedness, communications systems, and continuation of services.

Higher Priority

Capacity Building:

- Create a Resilience Committee to strategically plan for and operationalize more economic, social, ecological, and infrastructure resilience across municipality.

Projects:

- Secure funding to make improvements to Westerly wastewater treatment plants including upgrades, installation of berms and flood gate, raising pump stations, providing generators for pumps, and limiting discharge quantities.
- Install berms around municipal water supply wellheads and wastewater treatment facility to limit overtopping by floodwaters.
- Redevelop offline drinking water supply wells and repair existing wells and pipes where needed to improve available distribution network.
- Improve stormwater management system on Atlantic Avenue that incorporates green stormwater infrastructure (i.e. bioswales, filter stripes, etc.).
- Secure funding and remove Potter Hill Dam.

Higher Priority (cont'd)

Projects:

- Increase ability to reduce stormwater inputs to wastewater treatment plants through grey water program.
- Remove Stillman Avenue Dam and combine construction project with needed bridge repairs.
- Improve resilience of Canal Street Substation using flood protection walls or berms along with green stormwater infrastructure to strengthen grid against major events.
- Bolster sea wall and install a one-way drainage tide gate in Watch Hill.
- Dredge Winnapaug and Quonnie Ponds in ecologically responsible manner and use spoils for local salt marsh restoration and beach nourishment projects.
- Upgrade emergency services radio network to digital along with wireless infrastructure upgrades to reduce the impacts of wind-related communication interruptions.
- Continue to monitor the quality and quantity of drinking water available to residents.
- Increase restoration of eelgrass beds to add additional layer of coastal protection and improve the resilience of coastal estuaries.
- Explore with utility options to elevate National Grid transformer.
- Floodproof pump house for drinking water well system.
- Expand the prioritization and installation of green stormwater infrastructure in municipal right-of-ways as a way to help reduce localize flooding and improve water quality in coastal ponds, Pawcatuck River, and Little Narragansett Bay among other wetland assets.
- Continue installing concrete diffuser over stone and capture of stormwater runoff from Atlantic Avenue into drainage easement.
- Accelerate the clean-up of the Bradford Dye Site.



(Credit: Adam Wheelchel/TNC)

Community Resilience Building Workshop Recommendations

Higher Priority (cont'd)

- Remove pavement on Atlantic Avenue and replace with gravel or shell along with the installation of natural infiltration options.
- Maintain dune system at Old Town Beach.
- Maintain culverts on Route 91 and Pound Road near Chapman Pond and install beaver exclusion devices.
- Install rain garden demonstration project at Senior Center and involve volunteers in the installation and maintenance of the system over time as an outreach effort via the Senior Center.

Plans/Preparedness/Studies/Outreach:

- Improve use and awareness of evacuation routes across municipality via educational outreach, better mapping of alternative routes and closures, enhanced understanding of flood impacts, and installation of early warning systems.
- Maintain and protect working waterfronts that build on the lessons learned in Point Judith.
- Explore opportunities to use clean dredge spoils for salt marsh elevation and restoration (i.e. broad-cast spraying).
- Ensure translations services are provided for non-English speakers at main municipal facilities and shelters.
- Implement a water efficiency program across Westerly to minimize residential and commercial use during summer months.
- Examine the feasibility of expanding existing sewer system to all parts of municipality including those low-lying areas subjected to high groundwater and flooding.
- Explore options to expand burying of powerlines in critical corridors vulnerable to impacts from high wind and ice hazards.
- Assess the long-term cost and benefits of road elevation on Atlantic Avenue versus progressive “undevelopment” or abandonment to a pedestrian only road or path.

Community Resilience Building Workshop Recommendations

Higher Priority (cont'd)

- Assess level of “food deserts” and look to continue free/reduced lunch program, summer meals, and ways to support local agricultural operations via distribution to people in need across the municipality.
- Prioritize future salt marsh advancement zones for land acquisition to ensure existing marshes have room to expand as sea levels rise.
- Enhance communications with and carefully considering the ramifications and liability for people that refuse to evacuate before a major disaster.
- Consider incorporating resiliency into school facilities via new bond and construction projects that should include “green” building methods and materials.
- Look to secure option to utilize parking for shuttle from airport to beaches as well as staging options to facilitate emergency responses.
- Conduct additional outreach and education for local business community to enable faster recovery and continuity before and after major events.
- Comprehensively and directly discuss as a community coastal buyout options and more restrictive uses on high risk areas in coastal barrier island system and areas directly exposed to the Atlantic Ocean.
- Increase awareness of available emergency sheltering facilities for all displaced residents.
- Development of Harbor Management Plan and follow-up with enforcement of plan.
- Identify the structures, especially of historic significance, within the 100-year flood zones in collaboration with state agencies including Watch Hill and Napatree which are both in the National Register of Historic Places.
- Verify what evacuation routes are in place and that they are in fact navigable during various extreme weather events. Create a PSA Campaign to escalate awareness about preparedness, evacuation routes, and emergency protocols.



(Credit: Adam Whelchel/TNC)

Community Resilience Building Workshop Recommendations

Higher Priority (cont'd)

- Develop Best Management Practices guide for all beach and coastal access point and work with community-based groups (i.e. Napatree Point Conservancy, etc.) to implement.
- Continue to advocate for state bond funding during election year for open space protection and commercial recreation (OSCR) particularly for parcels that increase the overall resilience of the municipality.
- Seek to develop a better process to determine the effectiveness and extend needed for mosquito spraying.
- Publicize the opportunities to volunteer including the citizens emergency response team and develop ways to match interest and skills with options.
- Continue to seek way to improve the water quality (i.e. stormwater runoff reduction) and navigability (i.e. dam removal) of the Pawcatuck River as well as Little Narragansett Bay.
- Develop priority map for preservation of natural areas that are not currently protected and will enhance resilience across municipality.
- Gather and/or conduct systematic studies of bridges and culverts across municipality, establish a 5-year infrastructure plan, and prioritize 4-5 immediate upgrades that are integrated into capital improvement budgets.
- Increase awareness and outreach amongst residents and seasonal renters of stormwater management and green stormwater infrastructure options to minimize road and property flooding.
- Need to conduct comprehensive study of where road raising is critical to maintain municipal functions and quality of life for residents.
- Identify high impact areas for conversion of stormwater system to more natural or green stormwater infrastructure systems and drainage easements with integrated best management practices for maintenance and installation.
- Increase coordination amongst the dozen or more conservation-orientated organization to elevate opportunities for open space protection and conservation efforts that increase resilience across municipality.

Community Resilience Building Workshop Recommendations

Higher Priority (cont'd)

Policy:

- Seek to address implications of seasonal denitrification flaws in privately-owned septic systems.
- Increase maintenance requirements on privately-owned septic systems to reduce poor management and failures.
- Implement zoning district for conservation as well as agricultural lands.
- Continue to rewrite and establish aquifer protection regulations that take into account future growth and the implications of climate change (i.e. drought, heat-waves, etc.).
- Advance the establishment of wastewater management district in coastal areas with onsite wastewater treatment systems where pumping and inspections are required.

Community Resilience Building Workshop Recommendations

Moderate Priority

Capacity Building:

- Create a Human Services Department.
- Look to establish a network of neighborhood emergency coordinators to assist with local neighbor-helping-neighbor efforts and in person communications.
- Continue to recruit diverse volunteers for the Fire Department.

Projects:

- Look to improve stormwater management system by increasing storage, maintenance, and management which should include a more wholistic, upstream consideration of opportunity to reduce and retain runoff.
- Continue to seek ways to minimize impacts of beaver dams at Westerly & Bradford Road.
- Establish mobile food pantries and provisioning options for people in need after major events.
- Ensure that medical facilities have back-up power for clients during times of crisis.
- Improve the mapping of all culverts across municipality using new DOT tool.
- Convert drinking water well pumps from fossil fuels to alternative fuel source.
- More enforcement of stormwater management efforts and improved culvert clearing in Bradford area.
- Improve the drainage at intersection of Route 78 and Route 1.
- Conduct mechanical, electrical, and capital improvement studies to identify and prioritize improvements to wastewater treatment facility, water mains, and pipes.
- Conduct improvement to Bridge and associated culverts before 2026.



(Credit: Adam Whelchel/TNC)

Community Resilience Building Workshop Recommendations

Moderate Priority (cont'd)

- Prioritize and repair roads to reduce impacts from flooding on Atlantic Avenue, Bradford Avenue, Bradford Road, and Dunns Corner.
- Complete mapping of stormwater infrastructure and evaluate maintenance and replacement/retrofit needs.
- Remove river bed obstruction in the Pawcatuck River at Stillman Avenue.
- Relocate School Department Bus Garage filling station based on previous study recommendation due to potential impacts to aquifer.
- Establish cooling centers in locations that will best serve low income and senior populations.
- Look to ensure communications systems such as Reverse 911 are not limited to cell phones.
- Continue to conduct tree trimming and removal operations along transportation corridors.
- Send postcards reminding home owners to pump out septic systems every 5 years.
- Support routine and sustainable warming center for homeless population.
- Ensure Johnny Cake center remains funded.
- Plant more street tree to improve aesthetics, reduce heat, and improve air quality.
- Install residential rain garden demonstration project with disconnected downspout to help educate residents and landlords along with a tour for projects.

Plans/Preparedness/Studies/Outreach:

- Continue and potentially expand educational outreach to community members on proper practices to reduce pollutants associated with stormwater runoff (ex. Save the Bay).
- Look to reduce or eliminate car traffic in Watch Hill via establishment of a public transportation shuttle.
- Investigate a homeowner user fee or taxing district to pay for sewer expansion to coastal areas.

Community Resilience Building Workshop Recommendations

Moderate Priority (cont'd)

- Look to increase the number of community response and help centers for heating, cooling, and charging.
- Consider options to make the food pantry more resilient and able to serve the needs of vulnerable populations on a routine basis as well as after major events including establishing satellite distribution points and having an MOU with the senior center.
- For Little Narragansett Bay, establish the conservation protocol and vision for ecological resilience in partnership with state agencies.
- Increase emergency response and recovery coordination amongst community facilities and services.
- Conduct watershed-wide evaluation for all watersheds in Westerly to better understand, identify, and prioritize opportunities for impervious cover reduction using green infrastructure.
- Continue to conduct education of residents on emergency protocols.
- Identify options to use open space recreation sites for flood and stormwater storage (i.e. Gingerella Sports Complex, Rotary Park, etc.).
- Revisit available engineering studies regarding culvert impairments and replacement/retrofit needs across municipality.
- Develop Pawcatuck River Greenway that would accelerate improvement to water quality standards, expand studies and testing of the entire river and bay, and establish added layers of protection for the resource.
- Establish an evacuation plan for the Warm Center.
- To help minimize the impacts of flooding to residential units in floodplains, upgrade failing culverts, execute longer-term zoning changes, install bioswales and/or other green stormwater infrastructure, and institute other LID practices.



(Credit: Adam Wheelche/TNC)

Community Resilience Building Workshop Recommendations

Moderate Priority (cont'd)

- Conduct comprehensive assessment of engineering studies of road elevation options to reduce flooding issues with a particular focus on Atlantic Avenue, Causeway Street, Weekapaug Road, and Winnapaug Road.
- Encourage residents, renters, and tourists in the Bradford area to evacuate in advance of events that would cut off areas.
- Develop Forest Management Plan for municipality.
- Look to encourage and support more land and resources for agricultural and aquacultural uses.
- Identify location and ownership of historic assets that may be lost as well as historic assets that may be movable during extreme weather events.
- Follow CRMC guidelines and SAMP to conserve natural beach barrier.
- Convene stakeholders associated with salt ponds for visioning exercise to determine the future of this resource given climate change.
- Development of the Urban Coastal Greenway Program along the Pawcatuck River (i.e. pilot program used by future Cinder Restaurant) and greening of Main Street.
- Encourage community gardening through additional education and availability of plots on municipal lands.
- Look to reduce reliance on natural gas and fossil fuels and educate public on choices and alternative energy resource options and look at state options with OER.
- Work with Utility to increase the rate of power line hardening in areas experiencing high winds along critical distribution corridors.
- Accelerate voluntary buyouts of severe and repetitive loss properties.
- Improve communications and outreach with residents with septic systems based on examples from Charlestown.
- Conduct educational program in schools to reduce water consumption and increase efficient use of water in the home.
- Look to expand the reach and scope of educational facilities to attract and develop desirable work force (i.e. Westerly Education Center).

Community Resilience Building Workshop Recommendations

Moderate Priority (cont'd)

- Look to expand the Coastal Barrier Resource System (COBRA) zone along coastline in areas that should not be developed or redeveloped due to high level of risk and exposure.
- Identify organization to serve as conduit for resiliency education for business to help minimize interruption and increase continuity.
- Discuss ways to preserve and sustain the historic downtowns (e.g. Watch Hill, etc.) in balance with maintaining the natural resources and beauty that drives the economy.
- Develop forest health and management plans with funding currently available through conservation districts.
- Continue to conduct outreach and education for residents and seasonal renters of the importance of nature infrastructure to reduce impacts of climate change and proper chemical use on lawns, and water use limitations.
- Examine the impacts of the unlined transfer station on proximate natural water features (i.e. Chapman Pond).
- Develop comprehensive air quality maintenance plan to inform potential actions such as extraction ordinances.
- Comprehensively consider the implications of coastal flooding and sea level rise in the Misquamicut community including options such as infrastructure relocation, shuttles from common parking areas, less permanent and portable structures, and restrictions in tourist/rental seasons.

Policy:

- Strengthen affordable housing regulations including altering density requirements and location opportunities.
- Continue to increase integration of affordable housing in comprehensive plan and zoning structure.

Community Resilience Building Workshop Recommendations

Moderate Priority (cont'd)

- Enhance LID regulations and improve enforcement in proximity to freshwater resources in municipality (i.e. Chapman Pond).
- Create restrictive areas or zones for rebuilding after storm events that are integrated into locally-tailored recovery plans.
- Explore incentives for mobile business models and approaches to enable safe relocation during major events.
- Look to enhance protection and enforcement of regulations on Sandy Point including a “no wake zone” and improve communications to boaters.
- Amend and update the Aquifer Protection Overlay District to ensure consideration of climate change (i.e. extended drought and heatwaves) are built into the protection of this resource.
- Consider ordinance to limit types and quantities of pesticide use across municipality.

Lower Priority

Capacity Building:

- Foster greater collaboration between Westerly and Pawcatuck wastewater treatment plants.

Projects:

- Continue to monitor and seek to stabilize Town Beach Pavilion over time.
- Relocate the National Historic Landmark Carousel to higher ground.
- Continue to prune and remove limbs and trees where needed to ensure continuity of power during and after major events.



(Credit: Adam Whelchel/TNC)

Community Resilience Building Workshop Recommendations

Lower Priority (cont'd)

- Assess and inspect the condition and potential deterioration of existing bridges including the use of sensors or monitoring devices.
- Purchase more land for protection of aquifer.
- Install generator at Library and Park.
- Ensure all schools have emergency generators.
- Address flooding on road entering DPW complex.
- Incorporate emergency generator to the Senior Center renovations to increase options for temporary sheltering.

Plans/Preparedness/Studies/Outreach:

- Strengthen dialogue with Amtrak to conceptually explore opportunities for inter-modal connectivity across municipality and region to help with seasonal congestion and increase mobility of residents.
- Consider dredging ponds nearby Atlantic Avenue to reduce overall flooding during major events.
- Educate residents and tourists about risks of flooding on roadways and the need to avoid standing water (i.e. Atlantic Avenue).
- Protect, celebrate, and strengthen historic areas, Watch Hill, and downtown area.
- Secure and review state flyover imagery to locate wetlands of importance and sensitive environmental areas that may have been impacted as well as more accurately and routinely track changes in land use and land cover.
- Look to better manage wildlife across municipality.
- Continue to ensure the Hospital is fully functional and ready via table top exercises and that that the access routes are maintained and clear of debris.
- Strengthen and educate residents about economic drivers such as water quality for the community.
- Explore longer-term option for greater resiliency and access at Town's Animal Shelter.

Community Resilience Building Workshop Recommendations

Lower Priority (cont'd)

- Seek to enhance long-term viability of barrier beaches through natural formation/erosion, replenishment when and where needed, limitations on development, and restoration of sea grass beds.
- Encourage management to develop evacuation plan for Avondale nursing home.
- Develop an emergency action plan for marinas and anchorages that would include protocols for moving boats away from marinas when storming to reduce risk from flooding and major events.
- Improve understanding of bridge closure protocol and weight limits of various bridges that would preclude the use by emergency management vehicles.
- Establish inventory of all sea walls across coast in municipality and identify appropriate locations for living shorelines or non-structural approaches to increase stabilization and reduce erosion.
- Amplify the Wild and Scenic designation of Pawcatuck River.
- Clarify appropriate locations for aquaculture in coastal waters of municipality, currently and in the future given climate change.
- Identify alternative heating sources for residences and businesses in municipality.
- Seek out or create grant opportunities to elevate homes owned in low income neighborhoods.
- Explore the potential use of floating docks in Marinas to help reduce the impacts of storm surge.
- Support literacy and bi-lingual education through volunteer activities.
- Need to diversify demographic in municipality to include young professionals and young families by increasing apartments and affordable housing options along with attracting and retaining employers that pay competitive living wages.
- Develop plan for temporary operations and debris pickup along with providing containers for use during flood clean-up.

Policy:

- Explore improvements to land disturbance ordinance.

CRB Workshop Participants: Department/Organization

Town of Westerly - Town Council
Town of Westerly - Department of Public Works
Town of Westerly - Emergency Management
Town of Westerly - Engineering Department
Town of Westerly - Department of Development Services
Town of Westerly - Recreation Department
Town of Westerly - Finance Department
Town of Westerly - Information Technology
Town of Westerly - Economic Development Commission
Town of Westerly - Planning Board
Town of Westerly - Zoning Board
Town of Westerly - Conservation Commission
Weekapaug Fire District
Westerly Ambulance
Westerly Police
Southern Rhode Island Conservation District
Wild and Scenic River Stewardship Council for Wood-Pawcatuck River Watershed
The Westerly Land Trust
Watch Hill Yacht Club
Cherenzia & Associates
Johnycake Center
The Nature Conservancy
Westerly Pawcatuck Downtown Business Association
Ocean Community Chamber of Commerce
Save the Bay
Pare Engineering
Commercial Fisherman
Watch Hill Conservancy
WPWC
Greater North End Community Development, Inc.
Wood Pawcatuck Watershed Association
Rhode Island Department of Transportation

Westerly Core Team

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Workshop Facilitation Team

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The Nature Conservancy - Drew Goldsman (Facilitator)

The Nature Conservancy - Kristie Giannetto (Facilitator)

Scribes - Sydney Usatine (RIIB), Kyle Lemoine (SRICD), Stephanie Joy LaSota (Independent), Jacob Peterson (SRICD)

Recommended Citation

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Acknowledgements

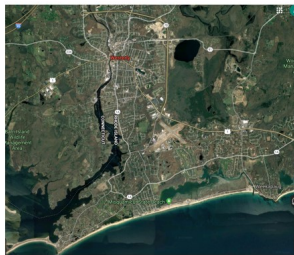
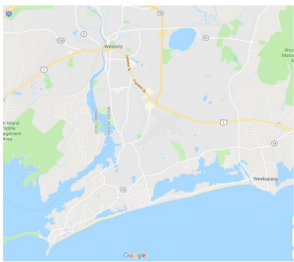
Special thanks to the Town's leadership, staff, and community members for their willingness to embrace the process in hopes of a more resilient future for Westerly. Thank you to the Town of Westerly for providing a space for the workshop. Thank you to Rhode Island Infrastructure Bank for providing refreshments and food. Finally, thanks to the scribes that recorded the workshop dialogue.

This workshop was made possible in part through the generous contribution of the facilitation team members who skillfully conducted the Westerly Community Resilience

Appendix

Base Map

WESTERLY BASE MAP



Westerly MRP Community Resilience Building Workshop - 22 August 2019





Appendix

Westerly Natural Hazard Mitigation Plan (2018) Vulnerable Assets & Mitigation Actions Table (Table 5.4)

Table 5.4 Town of Westerly – Natural Hazard Mitigation Plan Matrix

PROJECTS WHAT IS AT RISK	TYPE OF MITIGATION				IMPLEMENTATION				
	Local Plans & Regulations	Structure and Infrastructure Projects	Natural Systems Protection	Education and Awareness	Priority	Timeframe	Responsible Person / Agency	Financing Options	Estimated Cost of Mitigation
1 Repetitive Loss Structures	Continue to enforce building codes for substantial improvement in a flood zone.	Acquisition and Elevation Program.	Purchase property adjacent to the Atlantic Ocean to increase open space; reduce debris and repetitive losses.	Continue to develop public outreach to inform and educate the public about acquisition and elevation.	High	Near-term	Development Services Department	FEMA Grant/Town Operating Budget/Property Owner	Average cost per home elevation: \$160,000
2 Misquamicut Drainage Project – Phase II	Incorporate ISDS management policy into drainage project.	Mitigate adverse drainage and flooding impacts from roadways in vicinity of Atlantic Avenue.	Replenish dunes, plant vegetation, remove impervious surfaces such as paved parking lots.		High	Medium-term	Engineering, DPW	State & federal grants, municipal bonds.	\$1,000,000
3 Main Street Drainage		Improve drainage on Main Street from the Bridge restaurant to Beach Street.			High	Medium-term	Engineering, DPW	FEMA Grant/Town Operating Budget	\$500,000
4 Water distribution infrastructure & well fields		Upgrade aging water lines. Construct a berm to protect White Rock #1 and #2 well fields from flooding.			High	Medium-term	Water & Sewer Department	Grants & local capital improvement program, , NRCS , ACOE Feasibility study in progress	\$1,250,000 within 5- years
5 Drainage Improvements Pierce & Ann Streets	Conduct engineering study to map the drainage system.				High	Near-term	Engineering, DPW	RIDEM grant, Capital budget, CDBG-DR application pending	\$50,000 within 2 years
6 North End Neighborhood Housing in flood zone				Promote flood resiliency by encouraging higher flood protection standards for residents.	High	Near-term	Local EMA and Neighborhood Association	CDBG, RIHMFC	\$3,000 within 2 years
7 Critical roads subject to flooding	Create a Memorandum of Agreement with the State of Rhode Island to make mitigation improvements on State owned roadways.	Improve roadway drainage & elevate above flood zone where appropriate and cost effective. Replace aging water lines where applicable when trenches are open. Upgrade fire hydrants. Direct overhead utilities underground where possible. Enlarge culverts, provide open drainage swales, and increase underground stormwater pipe storage.	Use Experimental Erosion and sediment control BMP's.	Educate residents of danger of moving water and flooding.	High	Near-term	RIDOT, Westerly DPW	State & federal grants, municipal bonds.	\$10,000,000 5+ years
8 Dam Management			Continue to monitor dams in need of repair, reconstruction, or removal.		High	Near-term	Development Services Department	Site specific	\$13,000 within 3 years
9 Downtown areas subject to Pawcatuck River flooding.	Conduct map study to upgrade culverts & drainage			Increase awareness of flood insurance. Provide FEMA retrofitting literature.	High	Near-term	Development Services Department	Property owners, DPW ACOE Feasibility study in progress	\$3,000 within 2 years

PROJECTS WHAT IS AT RISK	TYPE OF MITIGATION			IMPLEMENTATION					
	Local Plans & Regulations	Structure and Infrastructure Projects	Natural Systems Protection	Education and Awareness	Priority	Timeframe	Responsible Person / Agency	Financing Options	Estimated Cost of Mitigation
10 Textile mills, Dye Plants & Hazardous Materials Handlers		Retrofit sites to provide containment during flooding. Relocate business away from watercourses. Land acquisition.			High	Medium-term	Development Services Department	Property owners ACOE Feasibility study in progress	\$100,000,000 5+ years
11 Babcock Cove & Mastuxet Brook at Watch Hill Road		Improve roadway drainage & elevate if cost effective. Cleanup TMDL's in Mastuxet Brook and in vicinity of Airport Road.	Maintain wetlands for floodwater storage.	Educate residents of danger of moving water.	High	Near-term	RIDOT & DPW (RIDEM & CRMC permit approvals)	RIDOT & FHWA	\$500,000 within 3 years
12 Breachways/Seawalls/Jetties/Causeways in Avondale, River banks on Canal Street		Build seawalls on Pawcatuck River to protect manufacturing district and low lying residential property, and Bay Street to protect retail district.	Improve submergent vegetative cover. Dredge Weekapaug Breachway to improve pond flushing.		High	Long-term	Development Services Department	State & federal grants, town operating budget	\$2,000,000 within 5 years
13 Private septic systems (OWTS units) in flood prone areas				Encourage owners to inspect, repair, pump out, upgrade, or replace systems.	Medium	Near-term	Homeowners and DPW	Homeowner responsibility	\$2,000 within 3 years
14 Stormwater Retention & Detention Ponds.	Incorporate into subdivision design & development plan applications to review maintenance schedule during application process, improve design standards for landscaping, and incorporate into zoning & subdivision regulations.	Improve detention at Argyle Drive, Westerly Middle School, Springbrook School, Linnate, Davenport, Walton Streets & Yankee Drive Trolley Lane, Brandywine Establish residential ponds. Clean & maintain existing ponds.	Remove exotic invasive plants. Plant native plants.	Educate homeowners to establish residential retention ponds and trench drains in steep driveways to capture runoff.	High	Medium-term	DPW	Capital budget, Private-sector developers of subdivisions & commercial projects.	\$100,000 within 5 years
15 Boom Bridge Road Bridge		Inspect, repair, reinforce, rebuild. Increase clearance beneath bridge. Improved flood passage.			High	Long-term	DPW	Town of North Stonington, Conn DOT, RIDOT & FHWA	\$2,500,000 within 4 years
16 Sanitary sewer lines/ Pumping Stations/ WWTP		Protect components of WWTF, New Canal Pump Station, and Old Canal Pump Station from flooding.		Ensure staff awareness of Emergency Operations Plan.	High	Near-term	Police, Water & Sewer Department	Grants & local capital improvement program	\$500,000 within 5 years
17 Homes & buildings subject to wildfire		Remove damaged trees, clear underbrush & conduct controlled burning.		Provide fire safety information to property owners.	Medium	Near-term	Fire Districts, Conservation Commission	Homeowner responsibility	\$100,000/ event

Appendix

Resources and Maps Used During Workshop



**Westerly
Rhode Island
Zoning Map**
Effective November 16, 1998
As Amended Through
September 28, 2015

- Legend**
- RR-40 Rural Residential 60
 - LDR-43 Low Density Residential 43
 - LDR-40 Low Density Residential 40
 - MDR-30 Medium Density Residential 30
 - MDR-20 Medium Density Residential 20
 - HDR-15 High Density Residential 15
 - HDR-10 High Density Residential 10
 - HDR-6 High Density Residential 6
 - P-10 Professional Office
 - NB Neighborhood Business
 - DC-1 Downtown Center 1
 - DC-2 Downtown Center 2
 - GC General Commercial
 - HC Highway Commercial
 - MC Marine Commercial
 - SC-G Shore Commercial - General
 - SC-MH Shore Commercial - Watch Hill
 - ORAT Office Research, Assembly and Technology
 - LI Light Industrial
 - GI General Industrial
 - CR Commercial Recreational
 - OSR Open Space and Recreation
 - PUD Planned Unit Development

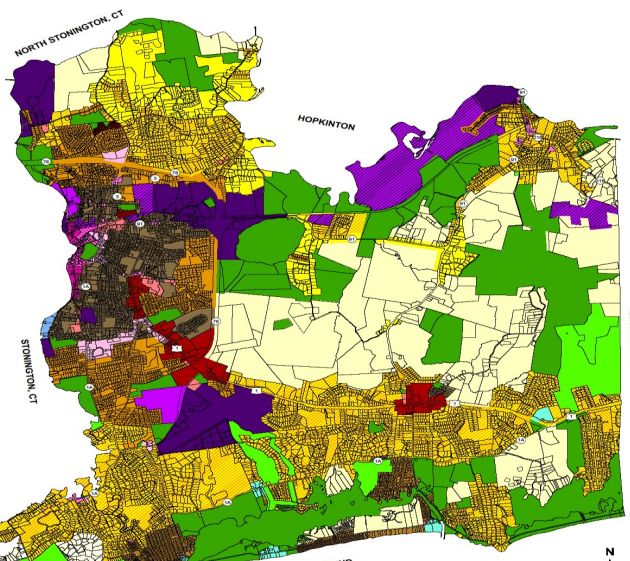
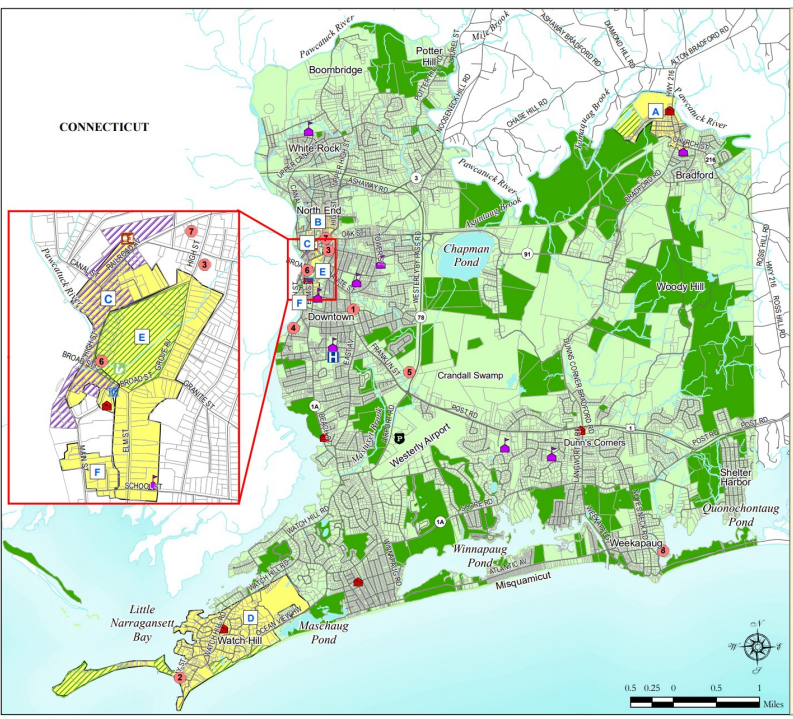


Table of Zoning Map Amendments

Ch. No.	Adoption Date	Change
1240	10-28-1998	From M-1 to R-4
1271	9-13-1999	From P-15 to HC
1300	5-15-2000	From CR to LDR-43 From NSB to LI From HDR-15 to P-15
1338	3-26-2001	From DC-2 to GC
1281	11-20-2003	From MDR-20 to MDR-30 From RR-50 to CR
1411	6-10-2002	From MDR-30 to SC-43
1422	10-28-2002	From RR-50 and OSR to LI
1455	6-9-2003	From HDR-15 to P-15
1462	8-25-2003	From MDR and CR to HC and ORAT
1463	8-25-2003	From MDR-20 and ORAT to HC
1460	4-26-2004	From MDR-30 to CR
1535	5-9-2005	From P-15 and OSR to HDR-15
1543	6-13-2005	From P-15 to HDR-6
1547	8-6-2005	From HC to GC
1634	4-7-2008	Parcel I. From MDR-30 to P-15; Parcel II. From MDR-30 to P-15; Parcel III. From MDR-30 to MDR-20
1674	5-11-2009	Parcel I. From OSR and MDR-30 to HDR-15; Parcel II. From MDR-30, OSR and NB to GC
1676	5-11-2009	From RR-50 to MDR-30
1693	11-23-2009	From P-15 to EC-1 (with restrictions)
1714	5-10-2010	From MDR-30 to MDR-20
1829	9-22-2014	From HC to GC
1846	9-28-2015	From ORAT to GC

Notes
This map is prepared from the best available data. Property boundaries are shown for information only and are not guaranteed. The information on this map is for general planning purposes only and is not intended for legal interpretation. The information on this map is for general planning purposes only and is not intended for legal interpretation. The information on this map is for general planning purposes only and is not intended for legal interpretation.



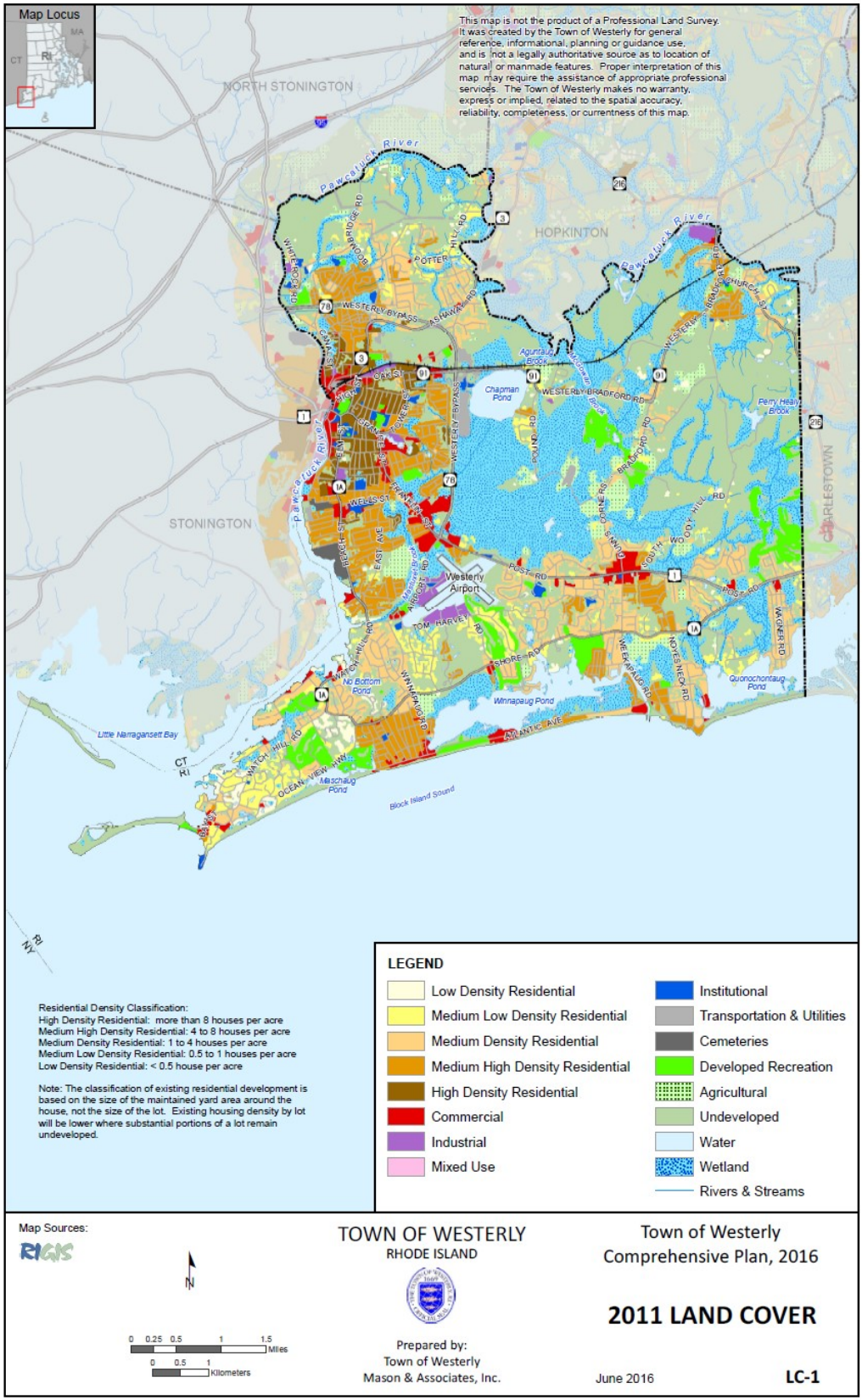
- Legend**
- Railroad Station
 - Library and Wilcox Park
 - Westerly Police
 - Fire Stations
 - Westerly Town Hall
 - Westerly Hospital
 - Elementary and Secondary Schools
 - Conservation Land
 - Conservation Land within Historic Districts
- National Register of Historic Places**
1. Babcock Smith House
 2. Flying Horse Carousel
 3. Former Immaculate Conception Church
 4. Lewis-Card-Perry House
 5. Nursery Site - RI 273
 6. United States Post Office
 7. Westerly Armory
 8. Weekapaug Inn
- Historic Districts**
- A. Bradford Village
 - B. North End
 - C. Downtown
 - D. Watch Hill
 - E. Wilcox Park
 - F. Main Street
- Westerly Arts and Entertainment District
 - Town Boundary
 - Ponds
 - Streams
 - Roads

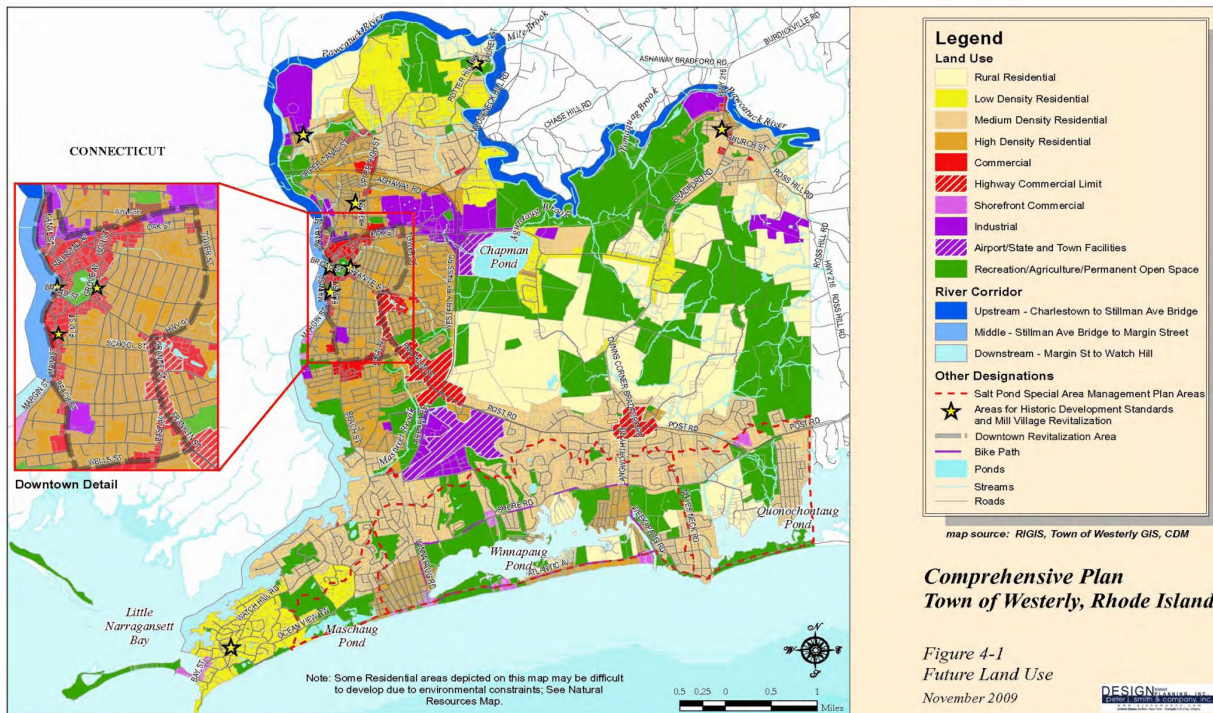
source: RIGIS, Town of Westerly GIS, Camp Dresser & McKee Inc. (CDM), National Register of Historic Places

**Comprehensive Plan
Town of Westerly, Rhode Island**

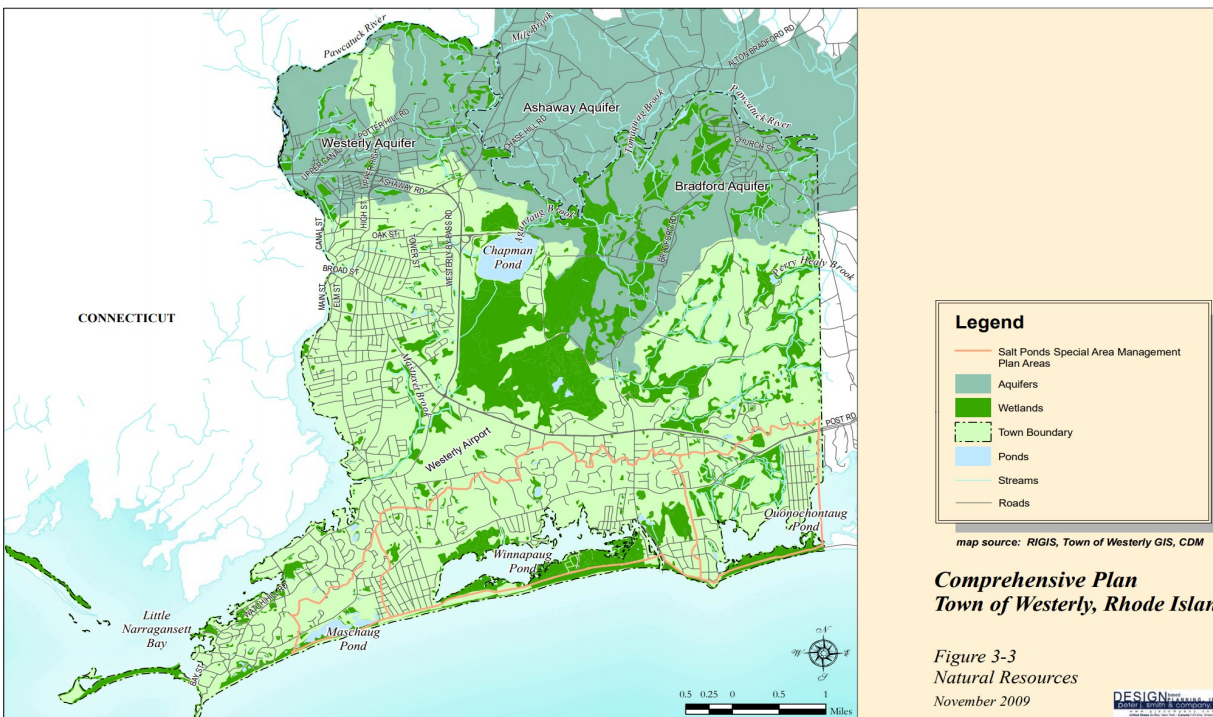
Figure 2-1
Special Character Areas
November 2009

This map is intended as an illustrative guide and may be suitable for general planning purposes; however, it is not adequate for legal boundary or regulatory interpretation.

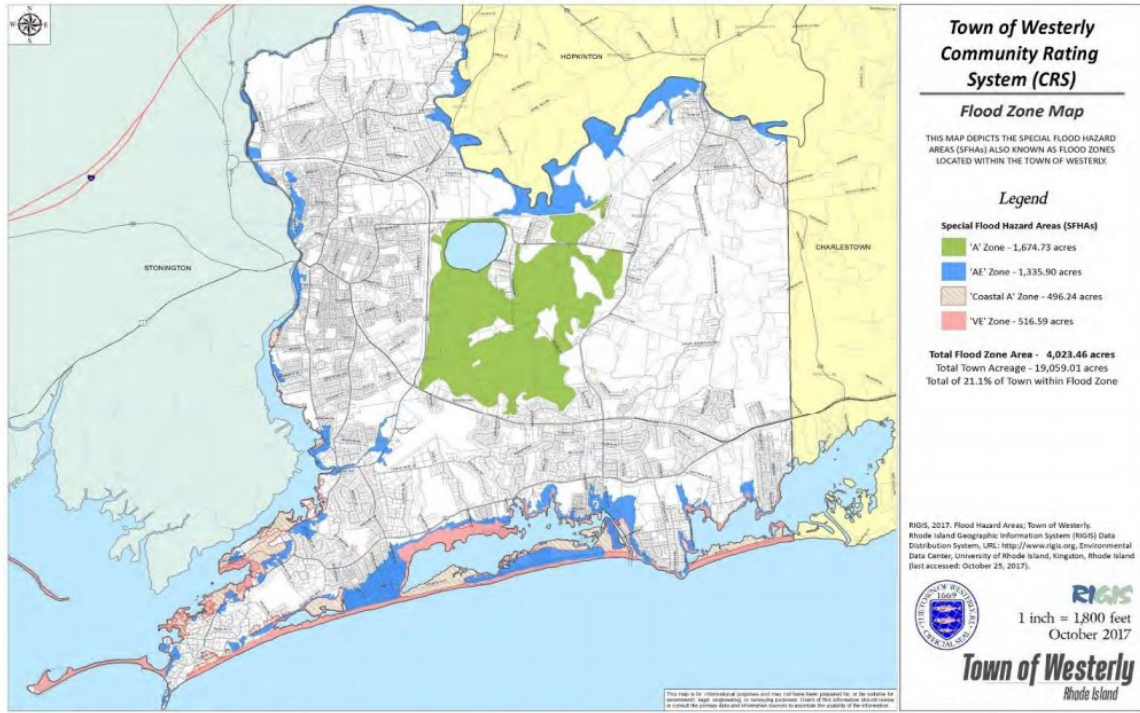




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