Providence

Municipal Resilience Program
Community Resilience Building Process
Summary of Findings
July 2021
City of Providence, Rhode Island
Community Resilience Building Workshop

Summary of Findings

Overview

The need for municipalities, regional planning organizations, corporations, states, and federal agencies to increase resilience to extreme weather events and a changing climate is strikingly evident amongst the communities across the state of Rhode Island. Increasingly frequent events such as Tropical Storm Irene, Super Storm Sandy, and the COVID-19 pandemic which exacerbate existing inequality and systemic issues, reinforced this urgency. The City of Providence has demonstrated a unique commitment, particularly at the community-level, to proactively collaborate on planning and mitigating risks.

The City of Providence, in collaboration with state agencies, community experts, and a variety of stakeholders, has over several decades engaged in numerous studies and plans largely addressing infrastructure vulnerability through hazard mitigation planning. More recently, issues of racial and social inequality have been increasingly brought to the forefront with the release of the City’s Climate Justice Plan in 2019. This type of leadership from communities who are most impacted by the climate crisis is necessary to reinforce the strengths of people, infrastructure, and ecosystems and serve as a model for other communities in Rhode Island, New England, and the Nation.

In the spring of 2021, the City of Providence embarked on certification within the state of Rhode Island’s Municipal Resilience Program (MRP). As part of that certification, the Rhode Island Infrastructure Bank (RIIB) and The Nature Conservancy (TNC) provided the City with a process to assess current hazard and climate change impacts and to surface projects, plans, and policies for improved resilience. In late July 2021, Providence’s Office of Sustainability helped organized a Community Resilience Building Workshop facilitated by TNC in partnership with RIIB. The core directive of this effort was the engagement with and between City and community leaders to define strengths and vulnerabilities, and the development of priority resilience actions for the City of Providence.
Overview (cont’d)
The Providence 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 City;
- Identify opportunities to collaboratively advance actions to increase resilience alongside residents and organizations from across the City; and
- Bring together representatives, including community members, from city climate planning efforts to build on previous work and translate existing plans into additional actions, including identification of funding and resources to support implementation.

The facilitation team employed a unique “anywhere at any scale”, community-driven process called Community Resilience Building (CRB) (www.CommunityResilienceBuilding.org). The CRB’s tools, reports, other relevant planning documents, and local maps were integrated into the workshop process to provide both decision-support and visualization around shared issues and existing priorities across Providence. The City of Providence’s Climate Justice Plan (2019), the Toward a Resilient Providence Plan report (2021), Woonasquatucket Vision Plan (2018), and Resilient Rhode Island Report 2018 were particularly instructive in addition to the Multi-Hazard Mitigation Plan (2019) and Comprehensive Plan (2014, including Providence Tomorrow Neighborhood Plans). 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 Providence’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, speaks to the leadership displayed by the City of Providence on community resilience building that will benefit from the continuous participation of all those concerned over time.

Additional Workshop Context
The City of Providence Workshop participants took an advanced intersectional approach to the workshop and topic of community resilience (reflected most recently in the Climate Justice Plan and Matter of Truth Report). Workshop participants explicitly recognized and discussed that the successes of the city and institutions of Providence have come at a human and environmental cost, particularly from ongoing legacies of settler colonialism of stolen indigenous lands, the exploitation of enslaved people and
Additional Workshop Context (cont’d)

subsequently underpaid immigrant labor. Workshop participants emphasized the variety of issues the City and their residents face, particularly associated with the legacy of industrialization and the creation of a deeply unjust global economic system, are fundamentally rooted in local extractive relationships to the earth, land, resources, and people and thus are inherently intersectional requiring comprehensive and holistic approaches. Climate adaption and resilience building must acknowledge that frontline communities have and do disproportionately bear the burdens of industrialization, consumerism, and global climate change, while also are denied access to health care, education, clean air and water, emergency services, remediation and mitigation benefits, and basic infrastructure and services, etc. The Providence Climate Justice Plan clearly demonstrates that as a result of historical residential segregation and systemic bias in access to quality housing and healthy environments, low-income communities of color (i.e. frontline communities) in Providence suffer the greatest environmental consequences (particularly associated with health); these generally include Indigenous, African-American, Black, Latinx, and Southeast Asian communities. Intersecting identities to consider may also include those who are refugees, immigrants, and/or undocumented, those with criminal records, those who speak languages other than English, disabled people, elderly people, and LGBTQIA+ individuals.

Summary of Findings

Top Hazards and Vulnerable Areas for the Community

Prior to the CRB Workshop, the Providence Core Project Team identified the top hazards for the City. The natural hazards of greatest concern include hurricanes, high winds, severe thunderstorms, severe winter storms including heavy snow, hail, ice, and extreme cold, sea level rise, flooding (riverine, storm surge, and urban; in the future also coastal and flash), and extreme heat events. Exacerbated by climate change, these natural hazards are increasingly frequent and intense, disproportionally affect marginalized and frontline communities, and have direct and compounding impacts on Providence communities, infrastructure, and environment including neighborhoods, waterways, roads, bridges, businesses and commerce, municipal facilities, school systems, civic events, social support services, public health, community relationships, and other critical infrastructure and community assets. Preexisting mitigation planning and workshop participants highlighted several critical hazards including dam inundation/failure, isolation of vulnerable populations in extreme winter conditions, the potential for cascading disasters associated with liquified natural gas (LNG) and liquified petroleum gas (LPG) facilities, mean higher high water levels threatening critical water infrastructure (storm water management, waste water management, and drinking water), and the continued investment in increasingly obsolete fossil fuel infrastructure at the port which endangers proximate frontline communities predominantly of color. Existing sys-
Top Hazards and Vulnerable Areas for the Community (cont’d)
-temic inequalities, including access to affordable housing, safe and good education, clean water and air, and emergency services and relief, are exacerbated not only by accelerating climate change but also by the lack of BIPOC representation in decision making and regulatory bodies. The impact of the current COVID-19 Pandemic was raised several times by workshop participants as a significant hazard and also a compounding hazard exacerbating pre-existing inequalities and vulnerabilities.

Top Hazards and Areas of Concern for the Community

Top Natural Hazards
- Hurricanes
- Severe Winter Storms (heavy snow, high winds, extreme cold, etc.)
- Sea Level Rise and Flooding (riverine foremost, as well as urban, and coastal)
- Extreme Heat Events

Areas of Concern in Providence1 - Several categories and locations were identified as being particularly vulnerable by workshop participants including:

Infrastructure2: Fox Point Hurricane Barrier (and lack of barrier protecting South Providence), City Drinking Water Pipes, Critical Facilities Proximate to Port, Dams, LNG and LPG Facilities (Port); Fields Point Wastewater Treatment Facility (including Influence Pump Station at Ernest Street, Preliminary Treatment, Deep Rock Tunnel System, Wet Weather Tanks, Preliminary Clarifiers, Intermediate Pump Station, Secondary Clarifiers, Disinfection System, Gravity Thickeners, Solids Handling, Generators, Chemical Storage, Operations Building, and Maintenance Building), Seekonk Tunnel, Emergency Response Hubs in FEMA Flood Zones, Energy and Utility Infrastructure (Transformers, Generators, Power Lines, Communication Towers), Hospitals, Gas Pipelines, Impervious surfaces, Cunliff Pond Dam (Mashapaug Brook) and Canada Upper Pond Dam (West River Tributary), Fuel Terminals (5/6 of RI’s at the Mouth of the Providence River).
Top Hazards and Areas of Concern for the Community (cont’d)

**Ecosystems/Waterways:** Rivers (Blackstone, Providence, Woonasquatucket, Seekonk, Lower Pawtuxet, Moshassuck, West Rivers), Pawtuxet Watershed, Scituate Watershed Complex, Mashapaug Pond and Brook, Conservation Areas, Coastal Barriers and Buffers, Air Quality (particularly in Port and the I-95 corridor), Nutrient Loading in Rivers and Upper Bay, Contaminated Groundwater and Soils (residential and industrial), Bioswales, Green Space Proximate to Rivers and Urban Parks, Seekonk River Shoreline (Irving and River Roads), York Pond.

**Roads and Road Networks:** Irving Road, River Road, Allens Ave, flooding Downtown Roads, Francis Street South Bridge, Smith Street, Tar Bridge and Manton Ave, I 195 E, 195 East Access Road, Exit 3, Exit 19, Gano Street, Public Street, On Ramp I-195W and E, Henderson Bridge, Eagle Street Bridge, Park Street Bridge, Crawford Street Bridge (South Water Street), Acorn Street Bridge, Steeple Street East Bridge, Point Street Bridge, Park right of way.

**Neighborhood Areas/Districts/Locations:** Olneyville, Manton, Elmhurst, Port, Jewelry District, Riverside, Downtown, Jewelry District, cooling and warming centers, Reservoir Triangle Neighborhood (Alvarez High School; Gorham Silver Manufacturing Site), Hospitals, Schools, Historic properties and buildings, Special Flood Hazard Areas and Repetitive Loss Properties; Fox Point Waterfront, Waterplace Park, India Point Park, Public Street off Seekonk River (used for fishing); Empty Lots and Houses in Olneyville, South Side, and West End.

**Vulnerable Populations:** Vulnerability factors for residents include structural racism and income inequality, disparities in living conditions, age, location, occupation, health, language barriers (via Providence Common Threads 2016). Frontline communities, as defined in the Climate Justice Plan, generally include Indigenous, African-American, Black, Latinx, and Southeast Asian communities across the City of Providence. Intersecting identities to consider may also include those who are refugees, immigrants, and/or undocumented, those with criminal records, those who speak languages other than English, disabled people, elderly people, and LGBTQIA+ individuals.

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1 Information from workshop participants augmented via review of Providence’s Multi Hazard Mitigation Plan (2019), Comprehensive Plan (2014), Climate Justice Plan (2019), etc.

2 See Table 2.7 Critical Facilities Impacted by Hurricane Categories 1-4 (page 34), Table 2.10 Critical Facilities Impacted by FEMA Flood Zones (page 44), and Tables 2.13-2.15 Critical facilities Impacted by Mean Higher High Water Plus Sea Level Rise (0, 1, and 7 feet) (pages 52&53), Multi-Hazard Mitigation Plan 2019.

3 See Tables 2.25-2.28 for Total Vulnerability FEMA Flood Zones Summary, Mean Higher High Water (Plus 1-Foot and 7-Feet Sea Level Rise), and Hurricane Categories 1-4 Inundation Areas (pages 95-100 Multi-Hazard Mitigation Plan, 2019).
Current Concerns & Challenges Presented by Hazards

The City of Providence has several concerns and faces multiple challenges related to the unequal impacts of natural hazards, climate change, and continuous development. Repeatedly throughout the workshop and reflected in existing plans, Providence participants outlined several systemic issues regarding process and decision-making that consistently stymie climate and resiliency action and exhaust community advocates and frontline communities. Participants repeatedly mentioned political inaction associated with short-term perspectives, a lack of climate change and climate justice literacy (particularly regarding structural inequities), and the tendency to iterate planning processes without comprehensive implementation of existing actions (propensity to act only on low-lying fruit). Providence indeed has a wealth of existing plans building on the technical and local expertise of its residents; plans which are intended to be the springboard for project implementation, policy change, and law. While some goals and suggested actions from the Climate Justice Plan have indeed been codified into the City’s original sustainability ordinance, including the creation of the Office of Sustainability and appointment of members from the Environmental Committee and Youth Committee to the Sustainability Commission, City Leadership has in hand the impetus and knowledge from community members to commit to bold implementation of extensive short, mid, and long-term climate action across the City. Participants express that iterative and further community participation is redundant and extractive without action.

Systemic racism, sexism, and colonialism underlie centuries of decision-making in many municipalities including Providence and continues to have ramifications particularly for frontline communities. Participants consistently returned to mechanisms and structures of decision-making, budget allocation and distribution, project prioritization to highlight both the neglect of BIPOC communities and neighborhoods and the lack of representation in leadership and access to decision-making. The City’s Climate Justice Plan demonstrates how ubiquitous consideration of intersectional climate justice and prioritization of BIPOC and frontline communities more effectively and efficiently improves the resilience and wellbeing of the City of Providence as a whole.
**Current Concerns & Challenges Presented by Hazards (cont’d)**

In recent years, Providence has experienced a series of highly disruptive and damaging extreme weather events including:

- Severe Storms and Flooding - March 2010
- Tropical Storm Irene - August 2011
- Hurricane Sandy - October 2012
- Nor’easter Nemo - February 2013
- Severe Winter Storm/Snowstorm - January; March 2015
- Winter Storm - March 2018
- Winter Storm - November 2020
- 12 riverine flooding events and one flash flood between (2013-2019)

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 Providence to proactively and comprehensively improve their resilience. This series of extreme weather events highlights that the impacts from hazards are diverse: including urban and riverine flooding of critical infrastructure, bridges, roads, and low-lying areas; localized flooding from stormwater runoff during intense storms, and heavy precipitation events; property damage, dam hazards, and frequent utility outages from wind, snow, and ice. Longer periods of elevated heat, particularly in July and August, coupled with increases in humidity raises concerns particularly about vulnerable segments of the population including the elderly, disabled, and/or underserved and disproportionately burdened residents (including frontlines communities). The combination of these issues presents a challenge to preparedness and mitigation priorities and requires comprehensive, yet locally-specific actions across the City of Providence.
Specific Categories of Concerns and Challenges

As in any community, Providence 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 broad categories—Infrastructure, Societal, and Environmental. Categorization into these three broad groups should by no means undermine the intersectional approach to resilience which Providence has exemplified in its community-driven planning and advocacy efforts.

Infrastructure Concerns and Challenges

Transportation Networks:
- Irving and River Roads proximate to Seekonk River flood regularly at high tide events and with seasonal precipitation.
- Waterplace Park floods at high tide events and with seasonal precipitation.
- Roads are vulnerable to hurricanes and tropical storms during which excess precipitation, downed trees, and power lines can isolate community members.
- Sinkholes increasingly a problem from aging infrastructure that fails underground.
- Road infrastructure is vulnerable to heat and summer afternoon storms which are increasingly more intense.
- Highway infrastructure (6/10, I-95) divides the city and communities and brings pollution and congestion to the City.
- Incomplete (lacking bike lanes, safe sidewalks) and unsafe streets and public transportation make certain areas of the City inaccessible without a car.

Utilities and Critical Infrastructure:
- Water supply and sewer facilities are vulnerable to hurricane and tropical storms, sea level rise, and storm surge (e.g. Fields Point Wastewater Treatment Facility).
  - Stormwater drains and culvert overflow cause flooding.
  - Narragansett Bay Commission’s new overflow system does not remove issues of combined sewer overflows; system is not designed to accommodate the volume of water necessary (there are backflow preventers but these do fail),
  - Seekonk Tunnel is not adequate to address combined sewer overflows (inadequate maintenance and undersized).
- Some sewer network dates back to 1840's-1850's, extant in situ pipes were not intended to last more than 50 years, failing long overdue and damage avoidable without proactive remediation.
- City of Providence maintains 600 miles of sewer lines with no funding from residents’ sewer bills to Narragansett Bay Commission (NBC) (those funds go to interceptor management). Sinkholes have appeared as sewer lines degrade.
Specific Categories of Concerns and Challenges

Utilities and Critical Infrastructure:
- Electrical infrastructure is extremely vulnerable to hurricanes and other extreme storm events and high winds including the following:
  - Outages are more frequent with more frequent and intense storms; outages last longer as well (energy infrastructure is old), instead of minutes to an hour, outages in some areas are typically days.
  - Outstanding questions include what determines/influences the distribution of outages and the prioritization of service.
  - Many residents unfamiliar and/or unable to access back-up power generators, which are also not ideal looking towards an energy transition.
  - Clean energy transition and push to electrify will only amplify these vulnerabilities, putting all homes on heat pumps could overburden current electric system so need updates and safeguards designed for near future use (e.g. electrification of Port, microgrids to provide redundancy for downtown, etc.).
  - Hospitals and Health system could be vulnerable to utility failures.
  - Improvements needed in trash pick up (excess trash can lead to rat infestations in neighborhoods).
  - Liquefied natural gas and liquefied petroleum gas facilities at port create risk of cascading explosion/fire.
  - Drinking water vulnerable to climate impacts.
    - Providence Water owns 6000 miles of aging pipes (many lead pipes still carrying drinking water) are not adequately maintained (separate from those managed by the Narragansett Bay Company); no comprehensive plan or budget for maintenance and regular checks.
  - Departments (e.g. Public Works) understaffed and underfunded severely undercuts capacity to make even modest changes or address issues.

Emergency Management and Preparedness:
- The City’s Fox Point Hurricane Barrier can only provide protection per its design (for a Category 3 storm) through 2070 based on current sea level rise projections. The City will be increasingly vulnerable to storm surge damages downtown and along the Woonasquatucket River watershed in the future.
  - The Port, South Providence, and West Providence extends outside the hurricane barrier and are therefore vulnerable to flooding, storm surge, and sea level rise.
  - No current source/plan for back-up power for pumps.
Specific Categories of Concerns and Challenges

Emergency Management and Preparedness:
- The City’s primary emergency shelter and response hub at the Providence Career & Technical High School and has a short term sheltering capacity of 2,800 people. Across the City including American Red Cross Hurricane Shelters, the City has short term capacity for 6,963 people and long term capacity for 3,481 people (NHMP pp. 104).
- Inadequate shelter capacity with existing shelters lacking resilient power supply.
- Frontline communities have not been engaged in emergency management planning and often do not have access to existing emergency management plans and resources.
- City needs a plan to address gaps in direct communication with residents (can’t just “put information out”).
- Emergency response hubs (including transportation) are located in FEMA flood zones (NMHP pp. 44).

Societal Concerns and Challenges:

Vulnerable Populations:
- Frontline communities have not been engaged in emergency management planning and often do not have access to existing emergency management plans and resources.
- Historically marginalized communities bear greater burden of environmental hazards (natural and anthropogenic) (include extreme weather events, urban heat islands, power outages, etc.) and are often underserved in terms of relief and access to public services.
- Vulnerability factors for residents include racism, income, living conditions, age, location, occupation, health, language barriers (via Providence Common Threads 2016).
- Heat stress associated with sustained temperature spikes is serious concern, particularly for low-income BIPOC neighborhoods (less tree cover; more impervious surface which exacerbates issue via heat island affect) and elderly.
- Neighborhoods in low-lying areas including in Olneyville, proximate to the port, and near Woonsaquatucket River are vulnerable to flooding.
- Dense urban areas are much more vulnerable to existing and future threats including:
  - Pandemic (e.g. COVID) and other public health threats.
  - Unequal access to warm and cool spaces (including disparities in access to tree cover), and water.
Specific Categories of Concerns and Challenges

Societal Concerns and Challenges:

Development and Housing:
- Historic buildings near the Providence River are especially vulnerable to flooding.
- Historical and contemporary industrial land use along port is persistent public health issue to proximate communities associated with unremediated parcels, pollution (air; water, soil), etc. This area is furthermore extremely vulnerable to flooding, storm surge, sea level rise – all of which exacerbate these ongoing threats and exposure to hazardous materials.
- Continued use and development of the port, including the proposed expansion to Providence Port terminal to provide rail delivery of propane, are highly contested given existing hazards to public health and wellbeing, and the unsustainability of even current activities given even modest sea level rise scenarios and current climate conditions.
- Business functions of the Port are also extremely vulnerable particularly to storm surge and sea level rise; investment in fossil fuel infrastructure highlighted as unsustainable.
- Proximate highways, traffic, and port activities themselves result in persistent poor air quality.
- Low availability and access to low-income housing.
  - Gentrification and rapidly rising rent prices.
  - Stigma & bias against vouchers particularly from small private landlords is significant hurdle for low-income residents to find housing.
  - Legal barriers to building multi-family units in most of the state including parts of Providence (single family zoning) disproportionately burdens low and working-class residents, immigrant communities, etc.
- Lower housing density on hills which are less susceptible to flooding and sea level rise and house wealthier neighborhoods, while communities of color and low-income communities are disproportionately burdened by current conditions and threatened by future scenarios in low-lying areas.
  - Relocation must consider proximity to resources and future vulnerability.
- Old and limited Housing stock.
  - Lead pipe remediation is prohibitively expensive and currently reliant on individual building owners’ private investment.

Community Services/Capacity Needs:
- Inadequate shelter capacity for unhoused residents; existing shelters lack resilient power supply.
- Some neighborhoods have high densities of transitory residents.
Specific Categories of Concerns and Challenges

Community Services/Capacity Needs:
- Cooling and warming centers need to be supported by regular budget line, made resilient (power supply) and accessible (transportation) on a regular basis and in disaster scenarios.
- City, big institutions, and organizations share common goals but roll out individual plans which can lead to lack of action and policy change:
  - Need for additional funding to execute plans.
  - Lack of shared understanding of diversity, equity, and inclusion.
  - Provide tools/services (language access, compensation, childcare) for full community participation and expertise.
- Overall lack of diversity and representation in decision-making positions (politics, government, school and institutional boards, etc.).
- Mismatch between available community programs and community needs.
- Inconsistent climate literacy, education, and ability to prioritize climate issues.

Environmental Concerns and Challenges:

Watershed, River, and Waterways:
- High density and surface area of impervious coverage is significant hazard to rivers and waterways, as it facilitates high loading of stormwater and thus pollutants into waterways and significantly contributes to flooding severity (inhibits proximate land absorbing overflow).
- Waterway shorelines vulnerable to erosion particularly the Seekonk River shoreline along Irving and River Roads where flooding already occurs at high tide events and with seasonal precipitation.
- Former Gorham Manufacturing Co site groundwater and soil are contaminated with toxic metals, solvents and combustion waste products, this includes Mashapaug Pond cove and adjacent parcels including the site of Alvarez High School. Mashapaug Pond is further polluted due to the high density of impervious surfaces and associated high surface water run-off and industrial discharge from bordering roads and parcels including Adelaide Avenue, Huntington Business Park and Ocean State Job Lot off of Reservoir Avenue.
Current Strengths and Assets

Just as certain locations, assets, and populations in Providence stand out as particularly vulnerable to the effects of hazards and climate change, some features are also notable assets for Providence’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.

Location/Environment:

- Several of the defining features of the City are favorable to bold and relatively expedient comprehensive climate resiliency and mitigation action:
  - Established infrastructure is built out to serve the needs of most of its residents,
  - Much of the City is densely developed and walkable (core developed before dominance of automobiles),
  - Modest/small size of the City is a strength in a number of ways including comprehensive and coherent project scale, accountability, community and stakeholder engagement, etc.,
  - River, waterways, ponds, and coast are major strength, e.g., opportunities for different renewable energy sources (hydro, wind, etc.), and
  - Natural geomorphology has a lot of topographic variety so relatively small area is low-lying elevation (proximate to the river) (thus relatively small area will likely become uninhabitable in future scenarios).
- Open space availability and access.

Community Character:

- High community involvement, unique level of civic engagement, shared value, and willingness to work together, capacity to create change, concerted effort to center voices of frontline communities of color in resilience efforts such as The Climate Justice Plan which has resulted in real partnerships between government and residents.
- Locally owned and community-owned businesses predominate, less large corporate control, results in a more tight-knit community and resources remaining local.
- Abundant local community organizations, neighborhood business groups, grassroots organizations, NGOs, etc., with deep roots still active; could leverage this strength better by encouraging collaboration on these issues.
- Strong youth leadership and advocacy including but not limited to: Youth in Action working on the Urban Forest Master Plan, Providence Youth Student Movement (PrYSM), Environmental Community Organizers (ECO) Youth, etc.
Current Strengths and Assets (cont’d)

Community Character:
- Universities, colleges, and hospitals (RISD, Brown, URI, Providence College, Johnson & Wales, Lifespan, etc.) not only boost economy but serve as regular flow of wide-ranging skillsets, expertise, perspectives, etc. (could leverage more intentionally and formally).
- 80+ different languages spoken, many different cultures; voices sought out and now working on representation at decision-making levels and action.
- City provides resources for non-English speakers.
- Love and patronage of the arts brings people together, breaks down barriers, and creates shared recognition of the arts, different voices, and perspectives (mentions included: RISD, support for URI theater program, Trinity, urban murals, large variety of live entertainment and local events including several free series and programs).
- Emphasis on highly adaptive economic shifts in the past (e.g., shift from industrial to creative economy).
- Generally, community and stakeholder buy-in for climate change adaptation efforts; many individuals well-aware of resources and willing to advocate, some businesses also willing to support.

Government & Personnel/Capacity:
- High level of environmental stewardship cuts across other sociopolitical identities, share a value (although not always definitions) of environmentalism throughout the City and State.
- Established procedures for hazard response across federal, state, and other community partners including an annual group meeting on flooding and sea level rise to make sure procedures are up-to-date and exercised.
- The City has a rigorous planning and update process, with robust conversation on these and related issues; now working on pushing for action.
- Providence partners with the Rhode Island League of Cities and Towns on numerous initiatives.
Current Strengths and Assets (cont’d)

Existing Infrastructure & Ongoing Projects:

- Fox Point Hurricane barrier.
- The City’s primary emergency shelter and response hub at the Providence Career & Technical High School with a sheltering capacity of 6,963 people, as well as other schools, libraries, and community centers well situated to continue to be outside of the flood zones.
- Woonasquatucket 2018 Vision Plan and flood resiliency project with engaged frontline community members.
- Urban farming and gardening across the City.
- Investments in renewable energy include Solarize campaign, investments in microgrids, pilot battery projects, and ongoing planning focused distribution and implementation.
- Ongoing efforts Just Providence Framework, Racial and Environmental Justice Committee, Energy Democracy Community Leaders Program, interviews with frontline community members of color (CJP pp 20), etc. to address systemic gaps not only in protection from environmental and health hazards, but also in access to the decision-making process to have a healthy environment in which to live, learn, and work.

(Credit: wikipedia.org)
**Recommendations to Improve Resilience**

A common theme among workshop participants was the need to continue community-based planning efforts focused on developing adaptation measures which not only reduce Providence’s vulnerabilities as a whole but also prioritizes communities of color, low-income communities, and frontline communities. To that end, the workshop participants identified several overarching themes and priority issues requiring immediate and comprehensive attention including heat island effect mitigation, riverine, urban, and coastal flood mitigation and stormwater management, resilient low-income housing, major utility infrastructure changes, and reimagined decision-making, funding, and resiliency workflows and hubs. In direct response, the workshop participants developed the top priority actions and other actions presented below.

**Overarching Themes:**

Several overarching topics emerged throughout the workshop which require further articulation and attention. Foremost, is the need for a bold resilience strategy in Providence that prioritizes long-term climate infrastructure, policy, and practice, much of which must be coordinated with other municipalities, the state, public, private, nonprofit, and regional entities. As mentioned above, despite substantial initiatives and plans with numerous benefits and actions outlined in detail, comprehensive and large-scale implementation is still needed along with a new umbrella agency (city or state) be designated to address resilience on multiple-time scale as a primary and overarching focus (Toward a Resilient Providence, 2021). Results to date are significant as noted by workshop participants alongside the often mentioned need for a comprehensive long-term resilience infrastructure plan to reduce reactionary and underfunded responses. Several top priority actions and an action section on decision-making and governance below suggest steps to address this in concert with existing recommendations.

The port of Providence served as a key focus of discussion as a hotspot of past, present, and future climate issues as its very function as a transportation hub for fossil fuels is intimately tied to “business as usual” scenario in clear opposition to clean energy adoption, community health improvements, and climate change mitigation at the city, state, and regional levels. Existing hazards to proximate communities include contaminated air, soil, and water, with high risk of concentrated spills, exposure to hazardous materials, high risk and density of combustible material, heat island effect and flooding exacerbated by lack of tree canopy and green spaces, etc.
Recommendations to Improve Resilience

Proximate communities are mostly low-income communities of color who thus disproportionately bear the burden of regional fossil fuel distribution⁴ while also are the least likely to have access to emergency services, remediation and mitigation benefits, basic infrastructure and services. The scale of remediation and transformation needed, as well as economic and physical vulnerability continue to rise rapidly with observed and projected climate change. Participants identified the Port as a priority location for several of the actions suggested below, including trash and hazardous material management and remediation, target for reduction of traffic associated with transportation to improve air quality (and relieve severe public health effects), impervious surface removal paired with tree canopy expansion and/or nature-based coastline remediation to mitigate flooding and the urban heat affect, etc.

⁴see Climate Justice Plan pp 13-23 for a more detailed look at how climate pollution, particularly carbon pollution, disproportionately harms low-income communities of color, particularly children, in Providence.
**Recommendations to Improve Resilience**

**Priority Actions**

- Dedicate funding for infrastructure resilience (shift funding strategy from only defensive to preventative), including via adapting the capital improvement plan process (and other budget approaches) to include long-term planning, community participation, as well as dedicated funding\(^6\) for resilience actions that are responsive to community needs.

- Conduct a climate resilience assessment for infrastructure to inform workflow for city capital projects and investments and create mechanisms which mandate community resilience and climate justice considerations.
  - Design comprehensive and collaborative resilience approach (10-year action plan) which distributes workflow across city and institutions.

- Implement citywide urban heat island reduction strategies including tree management and greening, cooling centers among other strategies.
  - Establish local minimum landscape requirements based on proximate canopy coverage; expand tree canopy and tree management to mitigate heat island affect.

- Establish and finance comprehensive flood mitigation program which includes water quality remediation, stormwater management, improving recreational access, depaving and greening low-lying, flood risk areas (particularly those along waterways), and overall maintenance of green and grey systems.

- Work with landlords (large and particularly small) to provide safe and affordable housing for all\(^7\):
  - Address bias against low-income tenants through education about housing vouchers (section 8 and RI housing vouchers), vouchers provide guaranteed payment (particularly relevant given COVID challenges for landlords).
  - Work with community development agencies to run mandatory landlord education courses.

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\(^6\) Resilient Rhody, Chapter 6 Action item: Develop, publish, and maintain a comprehensive list of climate resilience funding opportunities to increase awareness of federal, state, and local sources (2018, pp85).

\(^7\) Resilient Rhody 2018, Chapter 5 action: Expand the Rhode Island Low Income Home Assistance Program (LIHEAP) to include cooling assistance for eligible low-income residents (e.g., air conditioning units, help w/ summer utility bills, emergency assistance to avoid shut-offs) & incentivize retrofits & weatherization for home & business property owners (pp 85).
Priority Actions (cont’d)

- COVID relief support to landlords could be tied to training and addressing code issues (lead pipe mitigation, cooling and heating, weatherization).
- Provide incentive program (via grants, bank funding, forgiveness loans) for landlords with mandatory requirements to bring houses up to code and weatherize (heating and cooling) without rent increases (maintain low-income priority).
- Implement rental registration standards for landlords.
- Create new pathways for civic engagement and increased political power for historically marginalized communities including through adult education programs and support for community leadership.
- Establish community resilience and emergency hubs (e.g. Seattle model/Climate Justice Plan) to provide essential resources and amplify local preparedness and response (essentially finances neighborhood networks with seed funding and grant support):
  - Create neighborhood level community teams who will serve as “first responders” to hazards (trained, resourced, known).
  - Community Resilience Hubs scale well to municipal level and serve as a conduit for providing supplies, preparedness planning and emergency kits, and communications for neighborhoods.
  - Function as water access points: water bubblers, bathrooms, showers, hydrants or other infrastructure for emergency situations as well.
  - Centralize information, educational resources, science communications, etc..
    - Supported by dedicated-staff and focused on urban core to produce real-time data and technical support.
Priority Actions (cont’d)

- Establish and fund the work of Green Justice Zones led by community priorities and impacts.
  - Function as EJ Review Commission in high vulnerability areas with regulatory decision-making power that would use standardized review process (like the CRMC) to review proposed development projects, zoning changes, and future land-use plans prior to permitting.
- Develop and implement a comprehensive plan for the Port of Providence that is in line with City’s resilience planning efforts.
- Create a comprehensive Grid Modernization (Electrification) Vision and Action Plan which emphasizes increased reliability, sustainability, equity, and includes:
  - Reliance on Renewable Energy,
  - EV charging infrastructure and the integration of EVs into emergency response (see below),
  - Battery storage,
  - Solar carports,
  - Net Zero Neighborhoods,
  - Port Transformation.
- Incorporate resulting resilience actions from this workshop into Comprehensive Plan and prioritize development of robust resiliency section. This could include adding a section on urban heat island effect including policy that regulates impervious surfaces quantity and distribution as well as blacktop/asphalt lot color (alternatives to black to ameliorate heat absorption and radiation).
- Increase coordination by building staff capacity (including compensation to participating community members) of short, medium, and long-term projects and programs that center on collaboration between city agencies, local organizations, NBC, Providence Water, and other public bodies.
Priority Actions (cont’d)

- Codify Climate Justice Plan including:
  - Adopt Climate Justice Plan and recommendations within the Comprehensive Plan; examine Comprehensive Plan to fully integrate environmental justice.
  - Examine and amend regulatory documents, policies, and department/agency practices in consideration of Climate Justice Plan and Environmental Justice:
    - Examine current zoning policies including exclusionary practices (restrictions on multi-family housing, housing density in hill-top neighborhoods, etc.), low-impact development, and regarding renewable energy infrastructure siting.
    - Appoint representatives from the Racial and Environmental Justice Committee to relevant City Commissions.
  - Comprehensive review of Fox Point Hurricane Barrier.
    - Evaluate design longevity and priorities for future design changes (before additional investment).
      - Identify gaps and vulnerabilities of design given sea level rise and storm surge scenarios,
      - Evaluate potential to extend barrier or pursue alternative resiliency measures to areas vulnerable to sea level rise, flooding, and power failures, including Downtown and the Jewelry District to Port.
    - Identify alternatives.
    - Provide redundancy for pumps at hurricane barrier (power and infrastructure).
  - Implement the following as priorities in the transportation sector towards reducing emissions and improving air quality:
    - The potential to bury or cap I-95.
    - Support for ongoing creation of urban trail network (75 miles, easy access) including to complete the remaining 2/3s.
    - Increase and electrify bus network.
Other Actions

Decision-Making:

- Examine how structural racism has structured decision-making processes including workflow, timelines, and participation; establish mechanisms to combat these practices including stipended participatory community roles, expand staffing, training, and representation, etc.

- Allocate sustained funding to provide *upfront* cost coverage (not reimbursement) for weatherization, renewable energy, back-up power generation, and lead abatement for homeowners and incentive programs for landlords to make all residences more resilient.

  - Community-wide electrification must include not only electric transportation but electric heat, municipal capacity to charge, store, and distribute electricity, and an equitable, accessible, and resilient grid system.

- Establish a long-term community resilience project and program financing strategy (e.g., percentage of annual budget).

- Develop mechanisms for funds to be directly given to neighborhoods (potential via climate resiliency hubs for community gardens, public green cultivation spaces, urban farms, etc.).

  - Leverage electoral pressure, evaluate, and capitalize on resource landscape.

Development and Housing:

- Update zoning to allow for multifamily housing in more zones across the City and eliminate exclusions that limit housing supply (particularly low-income housing).

- Update and implement Sustainable Housing Plan (Road Map Rhode Island; Anti-Displacement and Comprehensive Housing Strategy).

- Review and amend zoning density limits taking topography and resilience into consideration.

  - Increase housing density on hills.

  - Identify less vulnerable areas for growth and relocation.

- Olneyville, South Side, and West End neighborhoods have an underutilization of empty lots and houses that could be used to house people.
Other Actions (cont’d)

- Improve access to clean, safe waterfront and clean air to all residents:
  - Fishing on piers highly valued by communities but often overlooked/not facilitated by development,
- City Planning Commission should adopt the Climate Justice goals in the Providence Comprehensive Plan and review and amend zoning policies accordingly.

Flooding Mitigation:

- Address vulnerability along waterway shorelines to erosion particularly the Seekonk River shoreline along Irving and River Roads where flooding already occurs at high tide events and with seasonal precipitation.
- Establish flood zones along rivers where flooding can be controlled:
  - Remove impervious surfaces, and restore green space adjacent to banks (reduces flood risk by soaking up overflow).
  - Take down old buildings, relocate proximate businesses and residents at risk for repetitive flooding.
- Create bioswales to divert street run-off and incorporate such practices into remediation of grey (antiquated) infrastructure when removing impervious surfaces (e.g., adapt York Pond to precipitation increase).

Infrastructure:

- Establish and enact comprehensive plan for City-wide lead pipe remediation and regularize maintenance.
  - Ensure top priority is public schools.
  - Create mechanisms to alleviate cost burden in low-income areas and ensure landlord compliance.
- Identify and implement high-risk areas for “greening-up” and “de-paving” to create recreational green space and water access, mitigate heat island effect, and mitigate flooding especially for BIPOC neighborhoods including Elmhurst, Olneyville, and Manton, Riverside at Seekonk, etc.
Other Actions (cont’d)

- Improve access to clean, safe waterfront and clean air to all residents:
- Increase capacity for tree management.
- Increase staffing for grant writing and management to fund maintenance of green and grey storm water infrastructure.
- Facilitate community use of popular fishing locations off Public Street on the Seekonk River including parking, benches, trash management, fishing access (fishing pier or safe fishing location).
- Proactive, large-scale grid modernization which complements renewable energy development.
- Transform EVs from a liability to an asset for grid: accommodate and integrate EVs into utility infrastructure and emergency/utility failure response (alternative to gas powered generators).
- Grid modernization, policy, and vehicle to grid technology to allow EVs to feed into grid to support homes during grid failure.
  - Ensure distribution facilitates access in underserved and vulnerable areas.
- Advocate at the PUC to limit socialized cost by expanding time of use incentives (and/or limiting peak usage to alleviate power demand) and including them in grid modernization docket and policy.
- Develop a plan to rapidly expand EV charging stations (planning must consider how distribution and access is not only inclusive to, but prioritizes, BIPOC and frontline communities.
Other Actions (cont’d)

Community Resilience:

- Regular and disaster aid to dense urban areas focused on access to water and warming and cooling centers (including transportation) need to be written into budgets and included in timeline/emergency response procedures.
- Support existing programs which include the distribution of water to community libraries, organizations like Crossroads.
- Microgrids co-located with cooling and heating centers.
- Lift-up, resource, and empower cultures and immigrant communities who have been here for generations.
- Center indigenous communities and practice to inform government practice and protocol.
- Comprehensive resiliency program for residents of low-lying areas and coast.
  - Respect deep roots of low-income communities of color would require formal collaboration and buy-in to prioritize maintaining integrity of community (relocation of resources, maintenance of access to critical community locations and hubs, etc.).
  - Explore alternatives to relocation.
- Adopt measures to address air quality and public health from Climate Justice Plan, prioritizing comprehensive measures to address conditions creating and exacerbating increased levels of asthma in children living in the urban core including:
  - Remediation of lead pipes in schools and residences.
  - Examine decision-making, siting, permitting, and provisions supplied to residents regarding extensive construction in urban core (proximate to ongoing high traffic volume, industrial activities, etc.) e.g., Olneyville construction dust and debris.
  - Ensure access to quality health care.
- Implement workforce development programs which build skills around emergency economy of adaptation, mitigation, and innovation, including pathways for those with jobs that are being phased out.
- Incorporate resulting resilience actions from CRB workshop into future updates of Comprehensive Plan and Hazard Mitigation Plan for Providence.
Other Actions (cont’d)

Community Engagement, Education, and Communication:

- Adapt Capital Improvement Planning process to include resilience as a priority and community participatory budgeting.
- Increase adult education programs to prepare and support community candidates for local decision-making positions (to increase BIPOC city representation) and in the form of workforce training.
- Require DEIJ community participation process training for city leadership and politicians; require city, agencies, departments, commissions, etc. to provide compensation, language access tools, childcare, and accountability to community members.
- K-12 climate change and climate justice education including curriculum support, experiential learning opportunities and financing, environmental career and technical skill programs, field trips, speaker and mentorship programs centering BIPOC and frontline community experts (with compensation for participation).
- Investment in K-12 school infrastructure (priority public schools) including:
  - Mitigate low air quality exposure.
  - Remediate water infrastructure (including cost mitigation for lead pipes).

Emergency Planning and Preparedness:

- Arrange transportation to shelters and cooling/heating places in the case of extreme weather and disaster conditions particularly for vulnerable resident (unhoused, elderly, and disabled residents, frontline communities, low-income communities, BIPOC communities, etc.).
- Engage frontline communities in emergency management planning and ensure access to existing emergency management plans and resources. Address gaps in communication via:
  - Neighborhood to individual level conversations and trust building;
  - Comprehensive plan featuring layered approach for mass communications and notification procedures and processes;
  - Address digital divide and tailored approach for vulnerable populations at large focused at the neighborhood level coupled to increases in public access to data.
## CRB Workshop Participants: Department/Organization

City of Providence - Operations  
City of Providence - Park Department  
City of Providence - Public Works Department  
City of Providence - Office of Sustainability  
City of Providence - Department of Planning and Development  
City of Providence - Emergency Management Agency  
City of Providence - Commissioners Office of Public Safety  
City of Providence - Sustainability Commission  
Providence Street Coalition  
African American Police Advisory Subgroup  
Community Member/Resident  
West Elmwood Housing Development Corporation  
Woonasquatucket River Watershed Council  
Kinfolk Benefit Trust  
The Nature Conservancy  
WaterFire  
Rhode Island Environmental Education Association  
Johnson & Wales University  
Providence Resilience Partnership  
Impact RI  
Roots 2Empower  
Southside Community Land Trust  
Brown University  
Providence Youth Student Movement  
OASIS International African Center
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The Nature Conservancy - Adam Whelchel (Lead Facilitator)
The Nature Conservancy - Sue AnderBois (Lead Coordinator/Small Group Facilitator)
The Nature Conservancy - Samantha Lash (IT Management/Scribe)
The Nature Conservancy - Drew Goldsman (Small Group Facilitator)
URI Coastal Resource Center - Pam Rubinoff (Small Group Facilitator)
The Nature Conservancy - Sheila Dormody (Small Group Facilitator)
Rhode Island Infrastructure Bank - Kim Korioth (Scribe/MRP Program Support)
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Appendix A

Providence
Map Resource Packet*
Used During
Workshop

Figure 2.2 Hurricane Evacuation Zones

Source: https://www.arcgis.com/home/item.html?id=d825bad3549a4577a36ace44c845837c
Figure P-1. Port Area Exposed to 100-Year Storm Event (STORMTOOLS).
Figure IE-5. Open Spaces at Risk of Flooding. Given current sea level rise and storm projections, the already limited amount of open space may continue to shrink due to more frequent and intense flooding events.
**ES-4. Small Business Exposed to Moderate and Severe Coastal and Riverine Flooding.** Small businesses are economic drivers for communities, create local jobs, and increase the tax base.

Downtown and the Woonasquatucket River area are especially at risk to both Nor’easter type storms and severe storms.
Figure IE-2. Sea Level Rise Affects Roads and Bridges in Low-Lying Areas Particularly Downtown and to a Lesser Degree in the Woonasquatucket River Corridor.
Figure 5

Environmental Justice Screening Map: Frontline Communities

Demographic Data
(National Percentiles)
- Data not available
- Less than 50 percentile
- 50-60 percentile
- 60-70 percentile
- 70-80 percentile
- 80-90 percentile
- 90-95 percentile
- 95-100 percentile

Figure 5: Source: EPA's Environmental Justice Screening and Mapping Tool (EJSCREEN). Version 2018.
Figure HW-1. Frontline Neighborhoods are Disproportionally Impacted by Changing Climate (City of Providence).
Figure HW-2. Urban Tree Canopy Affects the Impacts Caused by Extreme Temperatures. Less tree canopy (lighter green shading) results in increased urban heat affects at extreme temperatures (RIDOH).
Figure 6: The map on the left is the general prevalence of where children with asthma live – on the east side of Providence 0 - 5.3% of children in Medicaid have asthma while in most of the rest of Providence it’s over 8.5% and as high as 10.7% - 24.5%. The map on the right shows the rate of asthma emergency department visits within those children in Medicaid who have asthma, which is as high as 10.7% - 20.4% in many parts of South Providence, Washington Park, West End, and the North End.

Figure 7

Kindergarten-Aged Children Who Have Had Elevated Blood Levels in Providence, 2014

% BLL 5+
- 5%-11%
- 12%-16%
- 17%-20%
- 21%-25%
- 26%-32%

Statewide average = 12.4%
Source: Rhode Island Department of Health Lead Elimination Surveillance System, Rhode Island GIS
Note: The population includes the total number of children eligible to enter school in fall 2014 (born between 9/1/08 and 8/30/09) with at least one confirmed lead test. Elevated blood lead levels are defined as at least one confirmed test of 5 micrograms/deciliter or higher in the child’s lifetime.
Figure HW-3. Neighborhood Vulnerability to Combined Heat and Flood Hazards in Providence.

The dark blue shaded regions of the map are FEMA flood zones, with the light blue identifying neighborhoods vulnerable to the impacts of flooding. Pink shaded regions are in the top 25% of the Heat Vulnerability Index (HVI). Purple areas are most vulnerable to combined heat and flood impacts, falling within the top 25% of the HVI as well as the FEMA flood zones. When vulnerability maps are overlaid with redlining maps, a relationship between redlined areas and low-income areas with high heat and flood vulnerability can be seen (Groundwork RI, 2020).