COMMON THREADS : RESILIENT PVD

DESIGN AND RESILIENCE TEAM

CITY OF PROVIDENCE

NEMSN/ AIA DART REPORT

FEBRUARY 3, 2016

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SUSTAINPVD

Design and Resiliency Team

A public service program of the American Institute of Architects and the New England Municipal Sustainability Network

Sponsors:
New England Municipal Sustainability Network (NEMSN) and American Institute of Architects (AIA)
Funders:
Urban Sustainability Directors Network (USDN) and American Institute of Architects
Cosponsor:
Boston Society of Architects (BSA): providing exposure and volunteer architects for each team
Cities of Northampton MA (lead), Boston, and Burlington VT: grant applicants and sponsors for USDN funding.
Purpose: Help develop a strategic vision and framework with a focus on any social, environmental and economic issue to make a resilient, stable and healthy community.
Eligibility: Any community in New England and New York's Capital Region.
What is it: Five-person multidisciplinary teams of experts (e.g., from sustainability, climate change, planning, architecture, landscape architecture, engineering, economic development, finance, artists, and other fields, depending on local needs). Team members are from both the public and the private sector in New England and beyond. Each team is custom-built to serve local needs and opportunities.
Process: Afternoon concurrent stakeholder focus groups, an evening town-hall style public workshop, team intense charrette work time and tours, and a final evening community presentation on the team's findings and recommendations.
Cost: There is no cost to communities to participate. Communities must, however, demonstrate the capacity and commitment to convene diverse community leaders and stakeholders for an intensive, collaborative resiliency planning process. Communities also need to provide appropriate venues for two evening public workshops, afternoon concurrent stakeholder meetings and DART working space with access to a copier, internet access and, if possible, a scanner.
Eligible: Any project with a resiliency component or that can benefit from thinking about resiliency is eligible. The focus of each DART will vary depending on community needs and opportunities. Regardless of the issue, a DART will work with community decision-makers and stakeholders during an intensive three day planning process that can be comparable to a planning study that would otherwise cost tens of thousands of dollars.
Questions: Feel free to contact Wayne Feiden, FAICP, with questions at WFeiden@NorthamptonMA.gov.
Precendent- AIA Design Assessment Teams: DARTs build on AIA's five decades of experience fielding over 220 Design Assessment Teams, focusing on a range of challenges. These programs create design, resiliency and sustainability opportunities. They build on three pillars:
1) multidisciplinary team approach,
2) objectivity of the team members, and
3) broad, inclusive public participation and support.
AIA DAT Projects in New England have included: Northampton (two teams, 2005 and 2015), Pittsfield, Portland, South Hadley, Woodbury, and others.

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Executive Summary and Introduction

- Climate Resiliency as lens for all actions
- Incremental and transformative
- Policy and governance structures
- Social and racial equity in resiliency planning
- Community and physical connectivity

Common Threads

The title to this report has two meanings. First, we, as residents of Providence, Rhode Island, or New England, share common threads to address climate change-- and we are stronger as a region when we work together. Second, Providence is an amazing community, woven out of a strong cloth, but that cloth has some threats and is highly vulnerable. The threads needs to be strengthened to make the community strong and resilient.

"Resilience didn't start with this [DART] workshop; It's another chapter in a long tradition of sustainability and exists in the context of Providence community-building"
Curt Spalding, EPA New England Regional Administrator

"Being resilient means that Providence can recover quickly, adapt, and grow no matter what challenges we may face. From rising sea levels to more extreme weather, we must ensure that our city is prepared to face a changing climate."
Jorge Elorza, Mayor, City of Providence

"This is not a report that is going to sit on a shelf somewhere and collect dust. It is going to inform the update of the sustainability plan, which the Mayor will release in the spring."
Leah Bamberger, Sustainability Director, City of Providence

What does climate resilience mean to you?

The Common Threads DART began with community stakeholder focus sessions. Providence stakeholders told use what climate resilience means to them:

- Adaptation is what you do. Resilience is what you are.
- Be ready for sea level rise, hurricanes, storm surge, etc.
- Learn from other cultures and vulnerable populations.
- Focus on both cultural and physical resilience.
- Build community strength from trauma.
- Knowing where we are and where we want to be.
- Understand our systems, designs, and policies.
- ability to bounce back.
- Use natural systems.
- Proactive instead of reactive.
- Responsive and knowledgeable government.

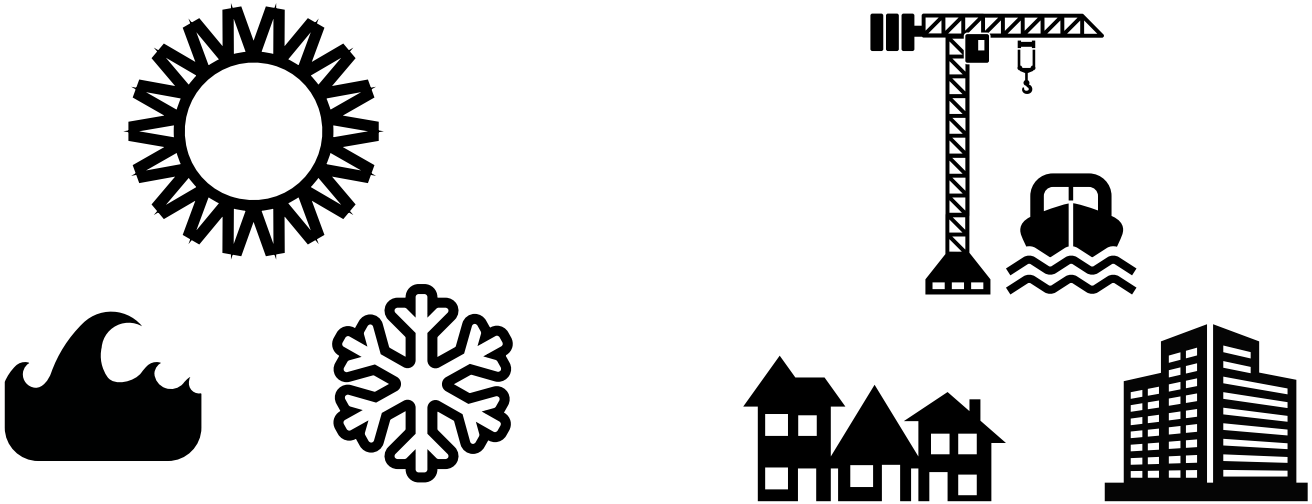
Climate Stress vs. Climate Shock

Impending dangers of climate change
ex. heat, sea level rise, etc.

It is up to the individual to make a difference

Extreme weather events
ex. hurricanes, storm surge, flooding

Preparation must be done to minimize damage



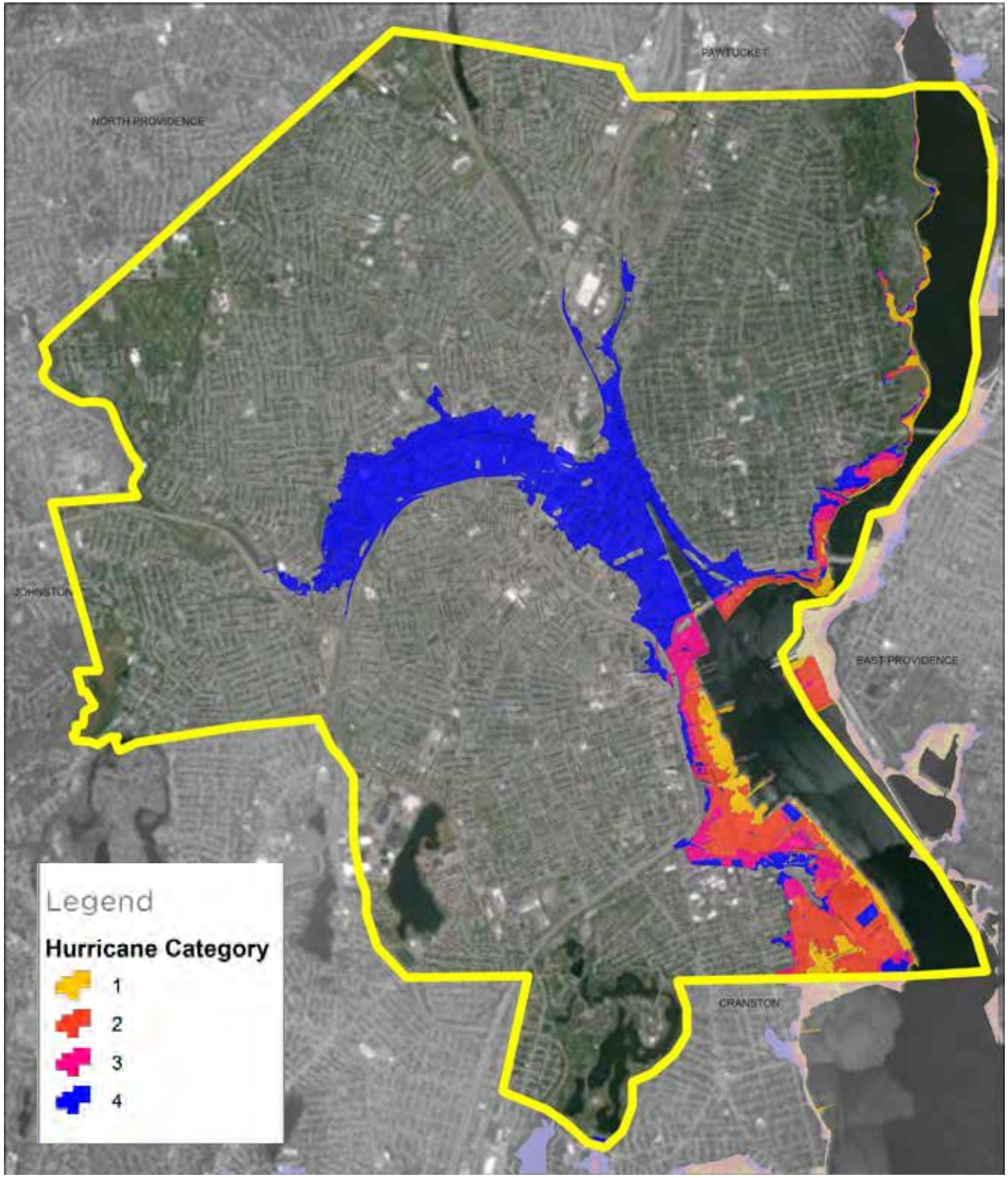
RISK = THREAT X VULNERABILITY

Threat and Vulnerability

Before resiliency tactics can be put into place, it is essential to understand the threat that Providence is up against and to discover to what extent the city is vulnerable. The threat is the thing that is likely to cause damage and in this context lies in the scientific evidence; sea levels are rising and extreme weather events such as hurricanes and resultant flooding have and will continue to become more frequent and more violent. Vulnerability is the susceptibility to the damage brought about by the threat. The extent to which Providence is vulnerable is reliant on how well the city is prepared to prevent, soften, and respond to both these extreme weather events and the issues causing climate change.

Threat

In assessing threat it is important to consider the worst-case scenarios. This map shows the effect of a hurricane on the resulting amount of land flooded in Providence. Showing the damage caused by a category one, two, three, and four hurricane given the conditions today without any sea level rise. The map offers some valuable information. One, during severe storm events the waterfront and ProvPort suffer substantial damage. Two, based on the hurricane barrier the city of Providence as a whole is in much better shape than many other coastal cities around the world. This shows the importance and opportunity for Providence to act now and begin to implement resiliency strategies. By introducing the tactics explored in this report, Providence can become a powerhouse for resiliency, ensuring a safer future for the city and its residents while setting an example for other cities. With this map showing the worst-case scenario, we can imagine the impact of the worst-case scenario: or a category four hurricane, at high tide, with sea level rise.



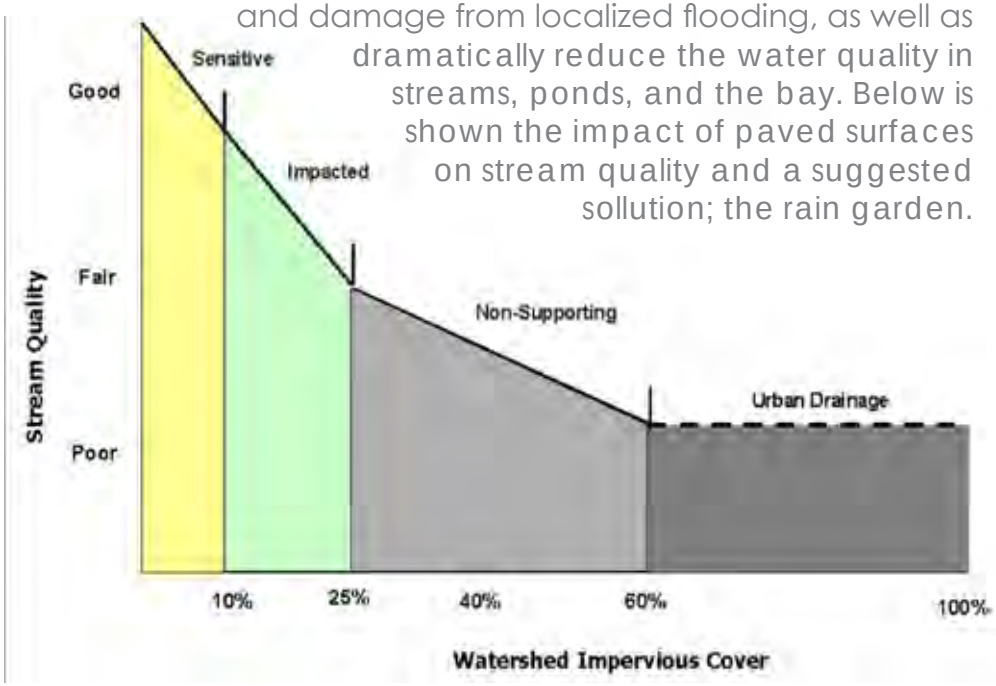
Vulnerability

To the right is a map generated in StormTools showing the vulnerable areas of Providence in the event of a 100 year storm taking into account future sea level rise by 2100. A 100-year storm is one that has a one-in-one hundred (or 1%) chance of occurring in any given year. By using maps like this one, areas of high risk can be identified and if resiliency practices are put into place much of the region in danger can begin to prepare and greatly lessen the blow of a storm of such magnitude.

By accessing and understanding information such as this, resiliency plans can begin to target areas in higher demand of intervention. It is also important to understand the social and physical infrastructure at place in the identified areas as these factors can lead to a cascading effect in damage. Below is an image depicting the damage caused by the Hurricane of 1938, one of the most devistating hurricanes to ever come through New England. Events such as these will occur more frequently as the effects of climate change decreases weather stability.

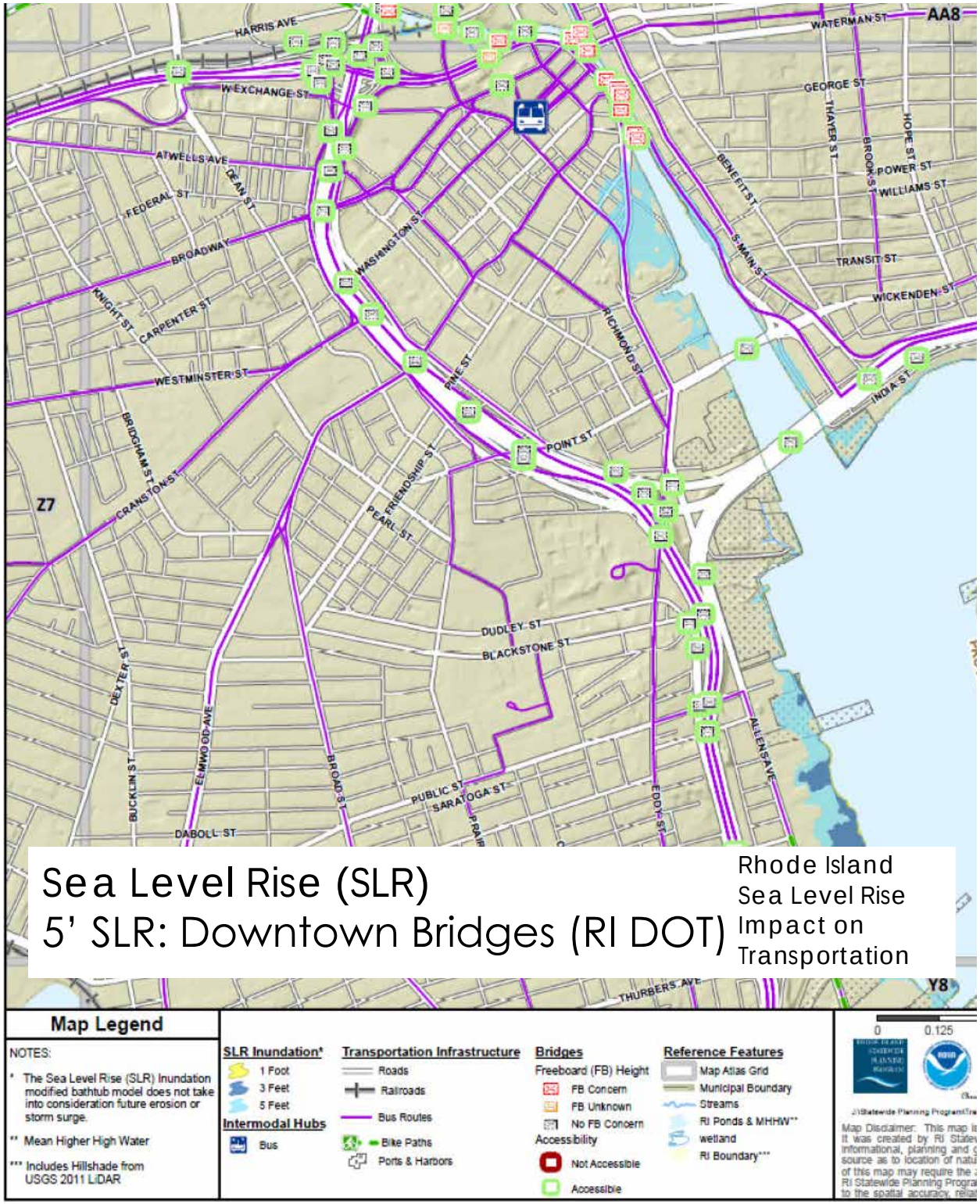
Local Flooding & Water Quality

In addition to flooding risks from major off-shore storm events (previous pages), Providence is highly vulnerable to less severe but far more frequent storm events. The large amount of asphalt and impervious surfaces both increase the livelihood and damage from localized flooding, as well as dramatically reduce the water quality in streams, ponds, and the bay. Below is shown the impact of paved surfaces on stream quality and a suggested sollution; the rain garden.



Vulnerability of Infrastructure

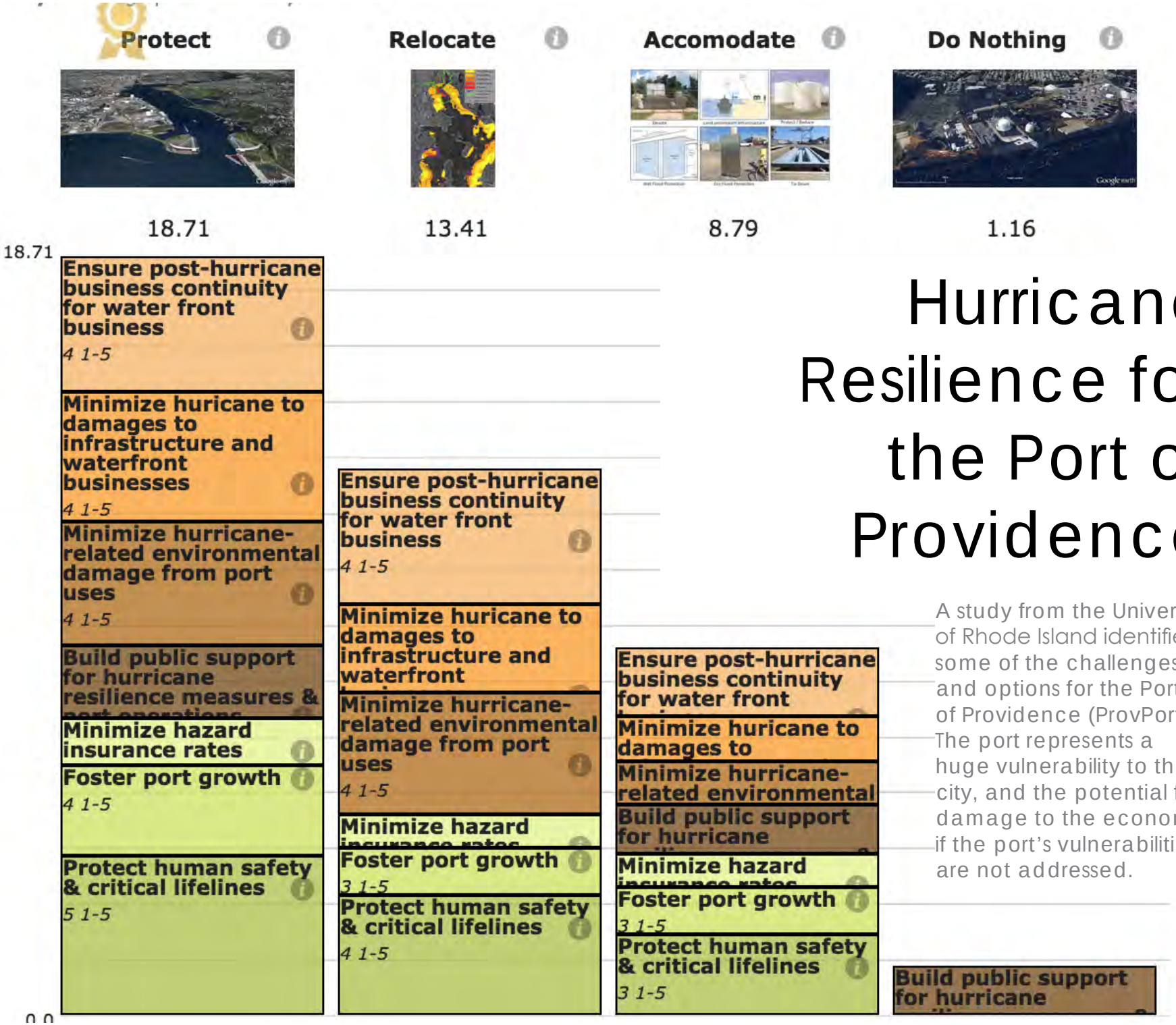
Sea level rise and the hazards of extreme weather events effect much more than just the individual and the home. Damage to roadways, bridges, bikeways, energy, water quality, residences, and businesses can cripple a city and make recovery after a severe storm much more difficult and long lasting. In assessing infrastracture related to transportation in Providence, the results are encouraging. Some areas are in danger but more commonly roads, bridges, and bus routes are located a safe distance from flooding zones when taking into account 5' SLR by the year 2100. The port of Providence on the other hand, is in a vulnerable position.

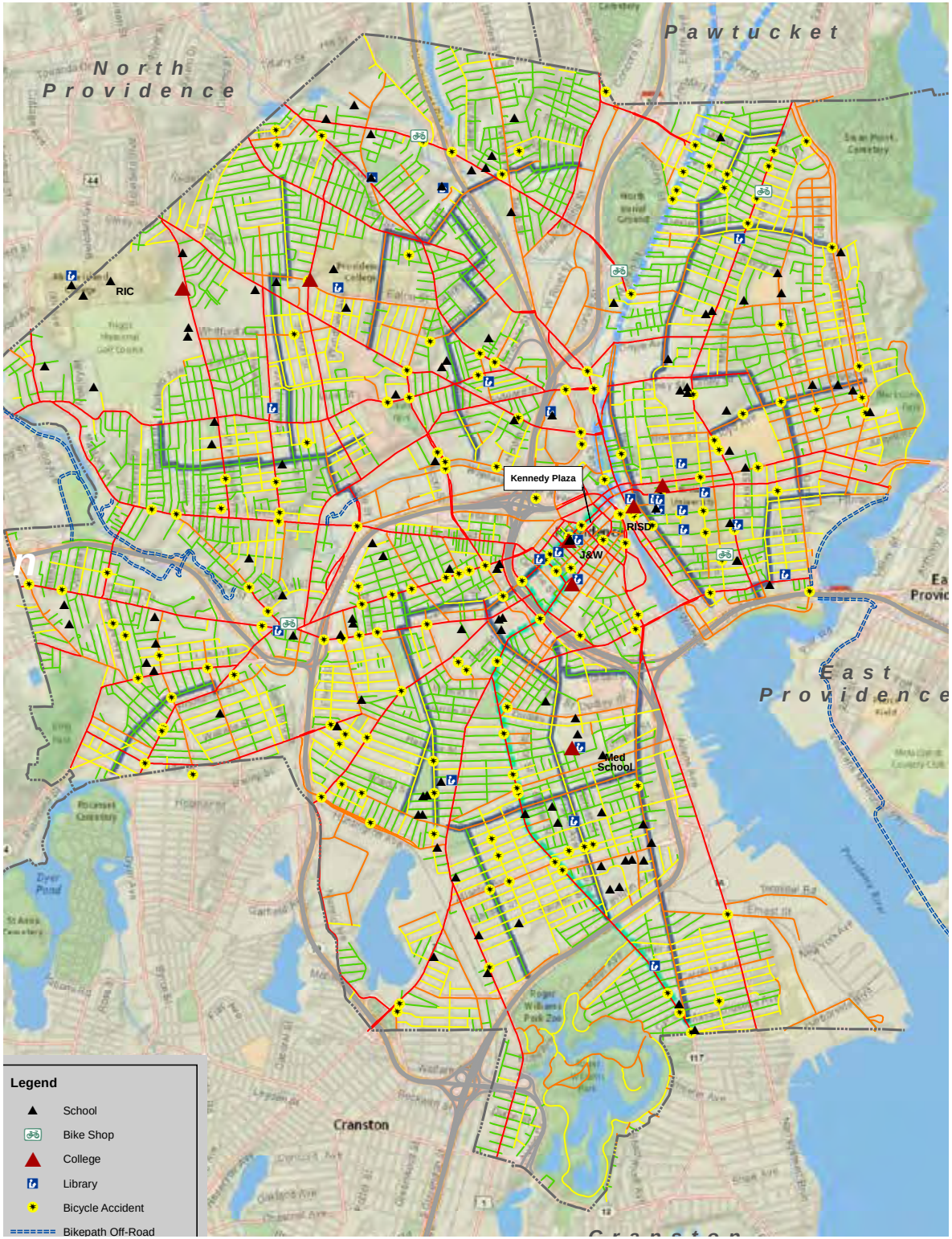


Great work has been done to consider the impacts of and opportunities from climate change for the port. Recomendations from this report are designed to build upon this work and help the City work towards a more comprehensive understanding of its vulnerabilities and steps it can take to address them.

Hurricane Resilience for the Port of Providence

A study from the University of Rhode Island identifies some of the challenges and options for the Port of Providence (ProvPort). The port represents a huge vulnerability to the city, and the potential for damage to the economy if the port's vulnerabilities are not addressed.

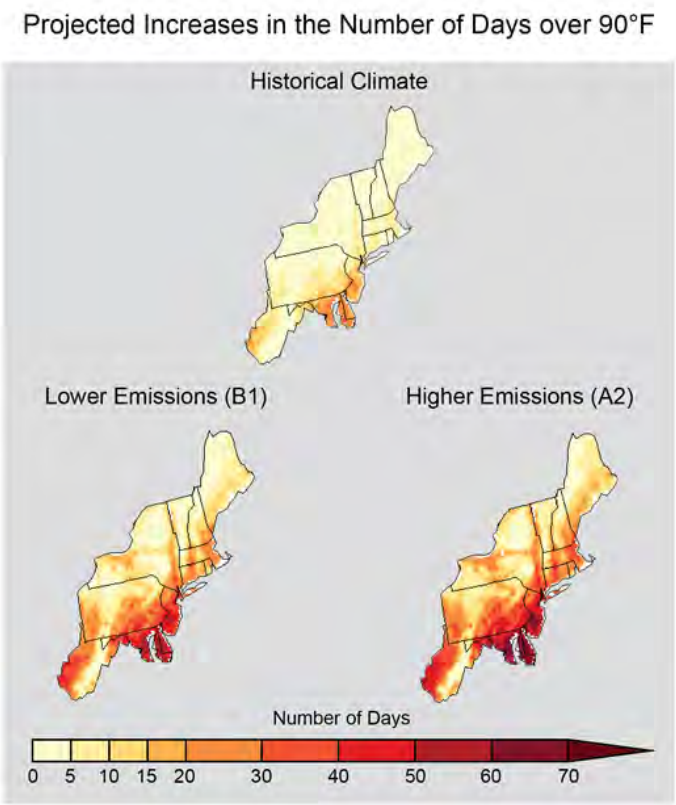




Connections e.g. bicycling

Providence has some strong infrastructure components, be it flood protection, stormwater management, parks, or bicycle and pedestrian infrastructure. Much of this infrastructure, however, is discontinuous--it has gaps that weaken the entire system. The name of this report, Common Threads, is partially to stress the need to reknit the city and fix those gaps.

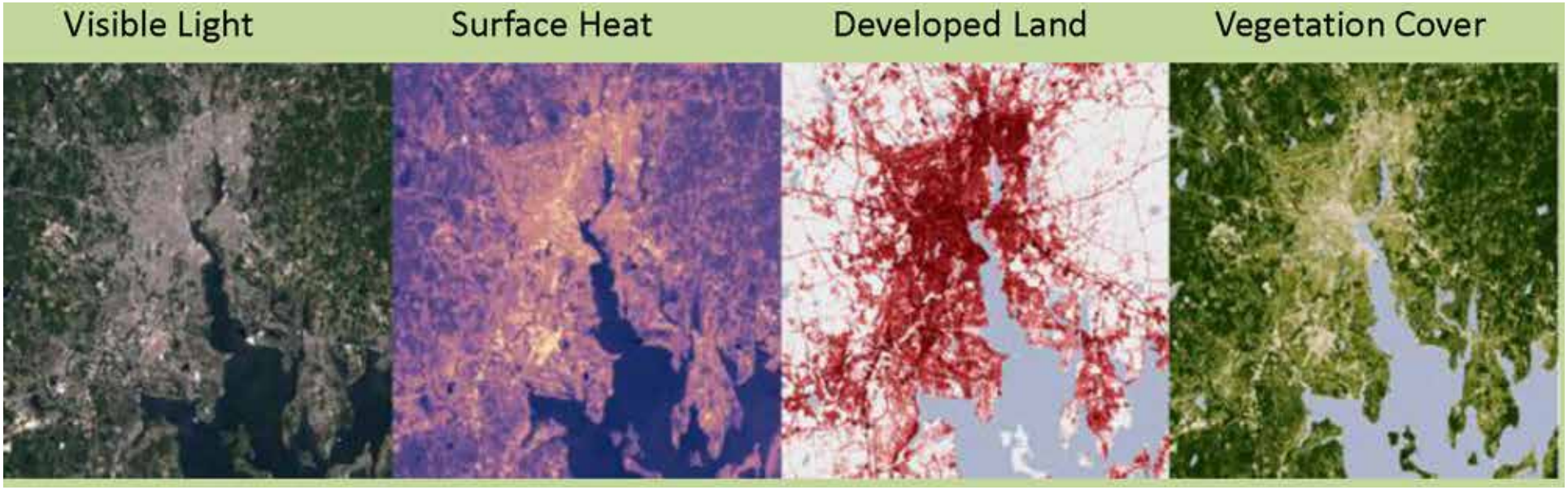
Map courtesy of:
Providence, RI Vanasse Hangen Brustlin



Providence Climate Conditions

Shown below is an assessment of the current conditions of Providence in regards to light pollution, surface heat, density of developed land, and vegetated areas. These images show the massing of development and activity in the heart of the city mostly situated around Providence's waterways. This creates a great deal of impervious surface in these areas and to poor water quality. Similarly, more developed land is sparsely vegitated, leading to poorer air quality. However, Providence does maintain a respectable amount of green cover considering the extent of paved area. Shown to the left is a diagram illustrating the resultant temperature increase if emissions continue as they are now as well as if they increase.

The surface heat in Providence is high, even for an urban area, due to the amounts of asphalt, "heat island effect". This heat island is especially a problem for the most vulnerable populations (very young and elderly) and for low income residents without air conditioning. Climate change will exacerbate such issues, as extreme heat and heat waves become a more common occurence.



Principles for consideration

- Preparing for storms and heat waves is different than preparing for changes in climate norms (sea level rise/high tides; avg. temperature)
- Buildings and capital project design standards should take into account the climate projections for the full life cycle of the asset.
- Envision climate resiliency in 2050 and 2100 and work backwards - incremental approaches will likely not be sufficient, and may prove counter productive.
- Don't put all your eggs in one basket - resiliency requires multi-level approaches to protection and preparedness.

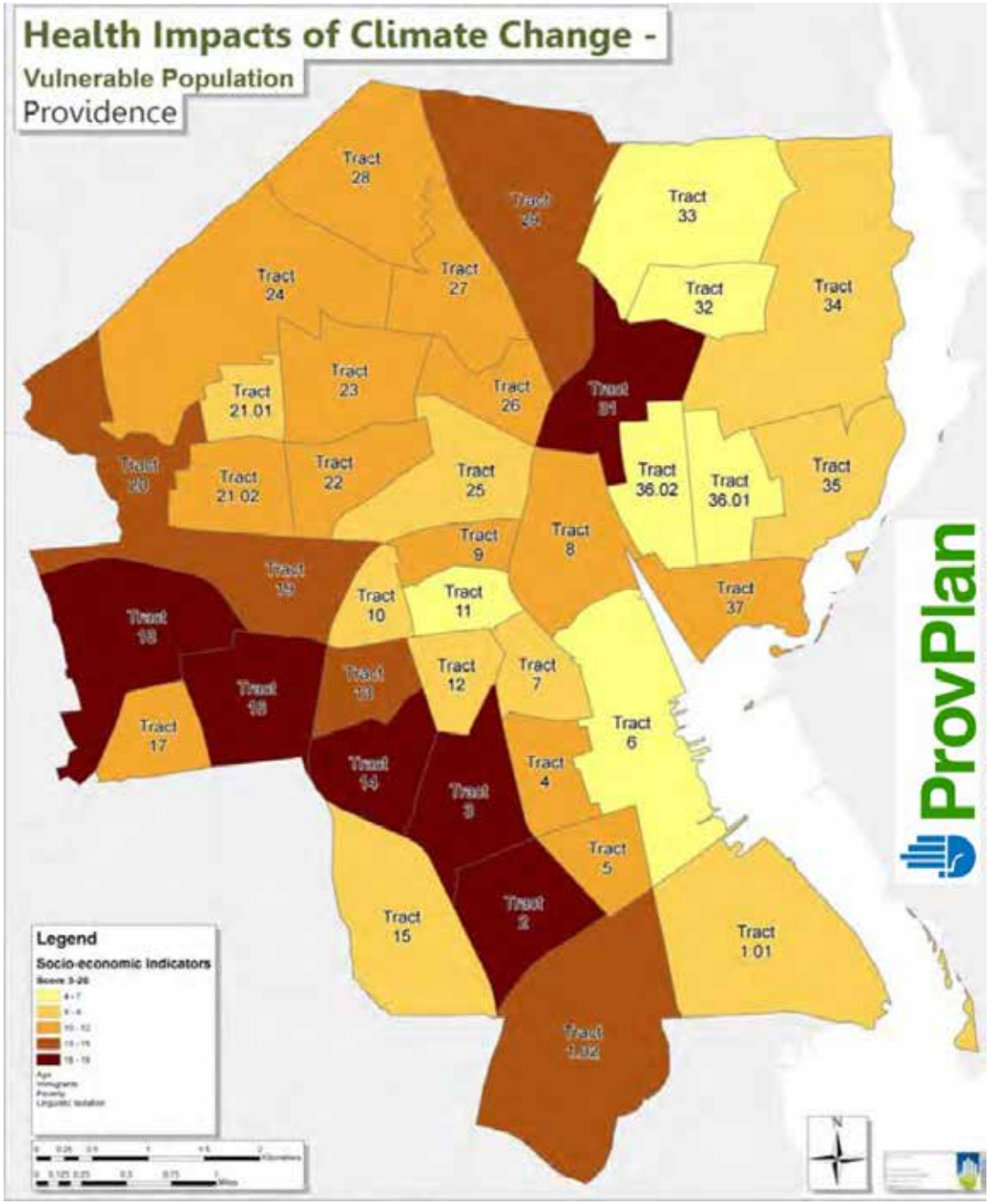
What We Heard

Before starting to draw conclusions, making assessments, and offering ideas for the future; the team first spoke with the people of Providence. We received a great amount of feedback and opinions on what people saw as concerns, strengths, and hopes for the city. We listened, and what we heard was that people were concerned with the long term story that is Providence. The city is experiencing a great point of growth in diversity, creativity, and culture. However, people voiced their concerns about the life cycle of the city's infrastructure and policies. Storm barriers may be an effective fix in the short term scheme but they will break and it is going to be up to the long term planning and newly implemented resiliency tactics to keep Providence moving on the upward swing it is seeing today. It is important to think of the life span of things like roads, bridges, the port, community centers, and neighborhoods and work backwards being sure that we can provide the means to keep these neccessities in place. Issues of social justice were also voiced. Concerns such as: decisions that encourage development are being made without ensuring benefits accure equitably, lower income neighborhoods continuing to decline, disproportionate exposure to toxins in communities of color, not all residents benefitting from growth, and communities of color experiencing high asthma rates.

The most important way to prepare for climate change is to use climate resilience as a lens for looking at all significant government and non-government actions (e.g., infrastructure and building investments, policies, regulations). How do we consider such actions when thinking about:

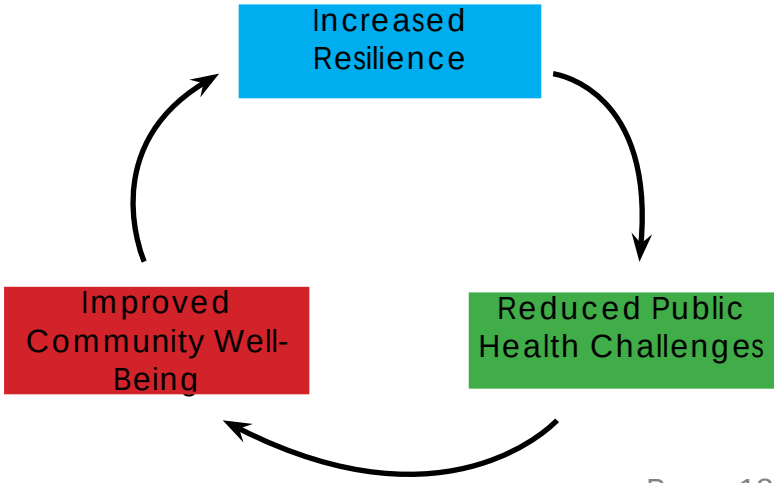
1. The Long View: E.g., does a building or infrastructure design change when thinking about the climate and sea level that will be here during the life of that investment
2. Community and Equity: Who benefits and who is burdened by climate preparedness actions and how do we ensure communities of color and lower income communities are part of the planning process?
3. Common Ground: Find those COMMON THREADS that serve the entire community.

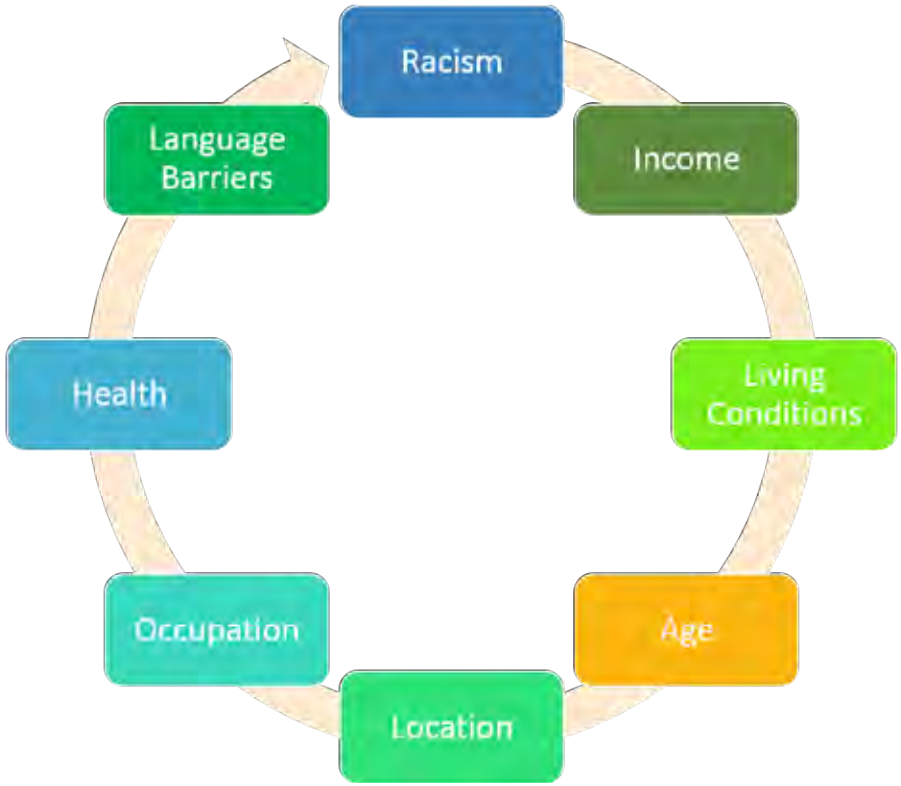
Community & Equity



Vulnerable Communities

In Providence, like in many U.S. cities, the less affluent communities see unfavorable environmental factors. Low-income neighborhoods often suffer from lack of tree canopy, a high percentage of impervious surface, and is in position to be the most directly effected by factors of climate change. One example of these factors of climate more directly effecting low-income communities is the problem of heat waves and temperature fluctuation. In extreme heat, those who can't afford air conditioning will see the greatest health impacts. With resiliency practices, not only the effects of climate change on the city as a whole be addressed, but issues of social equity also be resolved.





adapted from 'Bay Localize Resiliency Toolkit' baylocalize.org/toolkit

"The effects of climate change threaten everyone, but they do not threaten all people equally."

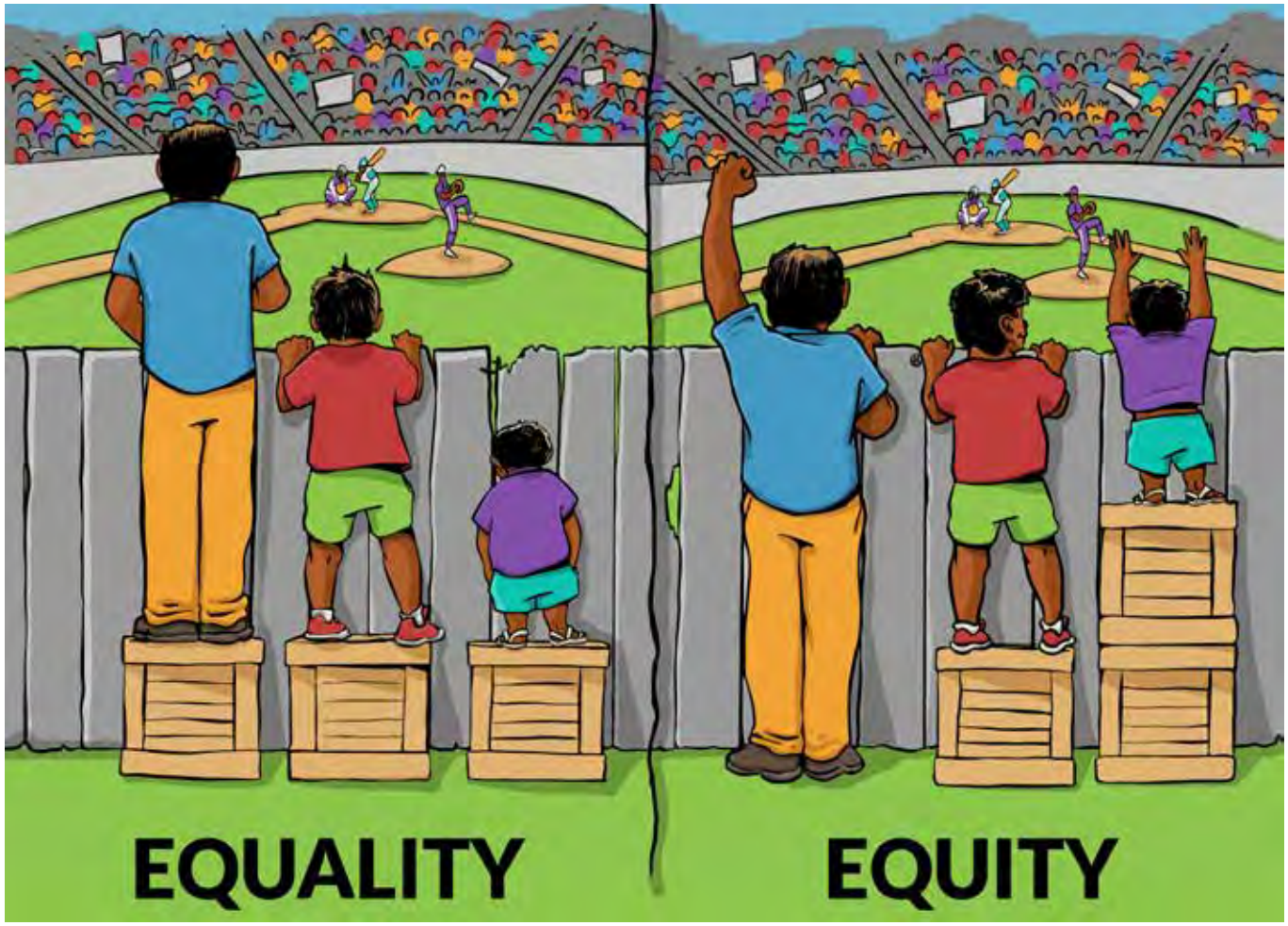
"The climate crisis inflicts the greates suffering on those who have contributed the least to the problem - our poorest and most vulnerable communities."

"The voices of frontline communities, the ones that are most impacted, usually dont make it to the airwaves."

Jacqui Patterson, Director Climate Justice Initiative, NAACP

Major Vulnerability Factors to Climate Change

Among myriad other impacts, the legacy of institutionalized racism and classism has led to a higher prevalence of pre-existing health conditions, poorer building construction, and lower functioning infrastructure conditions in communities of color and lower-income residents. Further these residents have fewer resources to respond to extreme events. Disproportionate access to government decision making processes is a significant contributor to these inequities. Language barriers, lack of time, distrust in government, and poor access have contributed to some voices not being heard as governments have made policy and investment decisions resulting in an inequitable distribution of resources. These disparities result in disproportionate vulnerability to the impacts of climate change, which will exacerbate pre-existing health conditions, tax drainage and other infrastructure, and impact those with poor building conditions such as a lack of insulation, among other impacts.



Equality vs. Equity

Therefore an equitable approach to climate preparedness requires that we take these factors into consideration as we plan and implement climate preparedness actions. If we approach preparedness as if all of us are impacted the same way and deploy solutions "equally", meaning distributing our resources in a way that everyone receives the same, we would continue to perpetuate the existing disparities. We must instead take an equitable approach and prioritize those who are the most climate vulnerable and work at the root causes of disproportionate vulnerability, including enhancing access to decision making. Fostering the resilience in frontline communities and supporting their recovery after extreme events is critical. To enhance equity, climate change preparedness strategies should:

1. Prioritize actions that help communities of color and lower income communities to moderate potential impacts and to cope with the consequences of climate change.
2. Incorporate input and perspectives from members of frontline communities.

GROUNDWORK
CHANGING PLACES
CHANGING LIVES

DARE

ENVIRONMENTAL JUSTICE
LEAGUE OF RHODE ISLAND

Outreach and Involvement

The vibrant diversity of non-profit organizations and programs which are working to enhance Providence for all residents through job training, improving food access, reducing exposure to toxics, planting trees, and engaging youth in the arts is inspiring and strength. These programs offer people of all ages, backgrounds, and interests a chance to enhance their lives and neighborhoods. These programs also help foster neighbor to neighbor connections which are vital in times of stress, such as the aftermath of extreme weather events.

Cultural Assets

Another great social strength of the city of Providence is its richness in culture and arts. A large part of the growth of Providence in recent decades has been the movement towards fostering creativity, expression, and involvement in the arts. Activities like the International Film Festival, Waterfires, and leisure activities like ice skating in the center of the city brings the community together. This strength of Providence demonstrates the creativity and spirit of the city and should be encouraged and expanded upon in coming years.

Recommendations to Promote Social Equity

Resilience Planning

Community-centered planning is essential to achieving equitable climate outcomes.

- Establish a people of color led community Advisory Committee.
- Implement a Race and Social Justice screen.
- Develop an Equitable Engagement Checklist.
- Fund Community members and organizations to lead engagement processes.

Neighborhood Resilience

- Create a Community-Defined vision of resilience.
- Develop Neighborhood-Specific climate vulnerability assessments and resilience plans, include metrics.
- Work at the Nexus of Climate Preparedness & Neighborhood Needs.
- Increase Individual and Community disaster preparedness.
  - Culturally appropriate emergency reparedness outreach.
  - Neighborhood emergency hubs.

Neighbors

Empowered and Connected
Neighbors are More Resilient

- Support Neighborhood Events.
- Enable Community Defined Projects.
  Foster equitable access to and benefit from these programs.
- Expand the Neighborhood Toolkit.

Youth Involvement

Health & Well-Being

Resilience to Everyday Stresses Helps
Prepare us for Big Events

- Improve housing and food security.
- Reduce the burden of pollution on communities of color and lower income communities.
- Advocate to the utility for increased weatherization support for lower income houses.

Resilient Economy - For All

Economically stable neighborhoods and residents are better able to prepare for and recover from extreme events.

- Support development that brings benefits for all.
- Implement anti-displacement strategies.
- Expand job training & opportunities to support local residents in accessing jobs which result from preparedness investments

Common Ground

What is Resilience?

Resilience

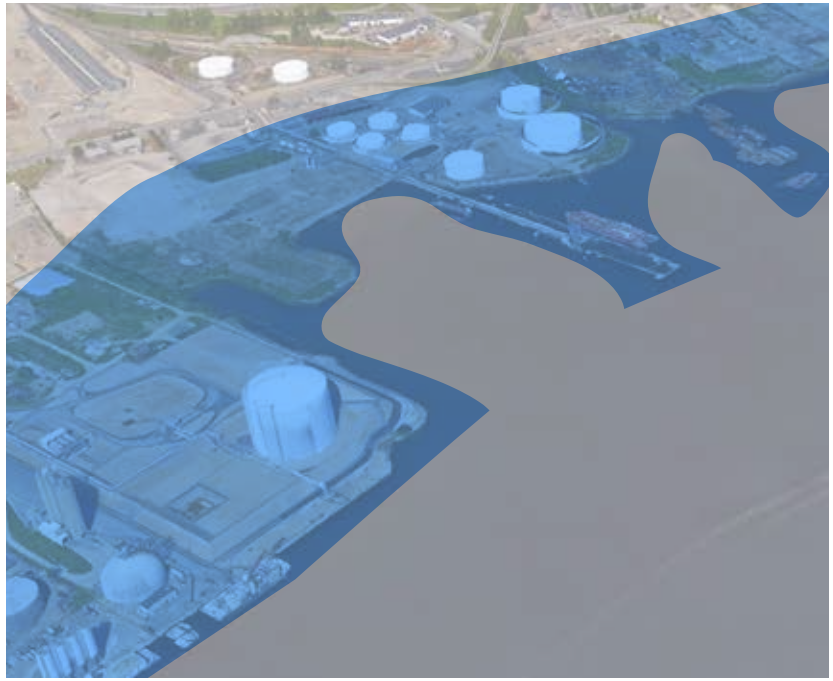
Resilience can be seen as the ability of the physical environment to respond to forces; we as the people can equip the physical environment to respond to forces in a positive way. Therefore, the questions we need to ask are: is the physical environment increasing the quality of life? Is the physical environment aiding natural systems? We can implement green infrastructure that not only aids in the combat of climate change but also increases the quality of life for neighborhoods, communities, and all of Providence.

FREQUENCY	NOW	2050		2100	
	A Water Level*	B Projected Sea Level Rise	C = A + B Water Level	D Projected Sea Level Rise	E = A+D Water Level
100 Yr Storm Tide	12'	1'	13'	5'	17'
Annually	4'	1'	5'	5'	9'

100 YEAR STORM BECOMES AN ANNUAL EVENT

Vulnerabilities

The vulnerable areas of Providence's future are clear and climate change is the common denominator in these issues. As shown above, by the year 2100 a 100 year storm will become an annual event. This is to say that what is now a storm that has a 1% chance of happening in any given year may be a storm that in 2100 has a 50% or 100% chance of happening in any given year. It is only through resiliency planning now that Providence can ensure its safety. The other vulnerabilites in Providence heighten the effects of climate change. The high percentage of paved impervious surface makes flooding a more likely and extreme occurence. The lack of functioning bike paths leads to a greater reliance on automobiles and higher vehicular emissions. The port of Providence sits in the 100 year flood plain which puts the city's energy supply in jeopardy and would cause greater damage to surrounding neighborhoods in the case of a flood. Pollution creates a scenario where groundwater quality is in constant risk.



Vulnerabilities

PROVIDENCE IS A MOSAIC

...BUT IT'S DISCONNECTED

Vehicular Disconnect

The main vehicular arteries cutting into the center of the city create a disconnection between neighborhoods in Providence.

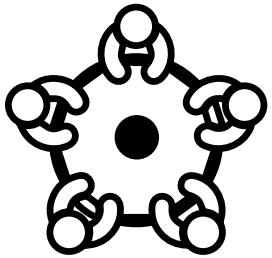
Bicycle Disconnect

The few bike paths that do exist in Providence lack connection and a universal connecting hub. Bicycles do not emit carbon, repair easily, and can be relied on when cars can not. Bicycles are an essential piece of the resiliency puzzle but they are not the singular solution.

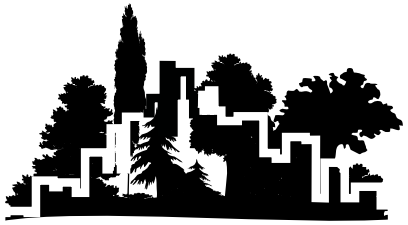
CONNECTING PROVIDENCE

COMMUNITY TOOLKIT
making a "HUB"

Connect



Gather

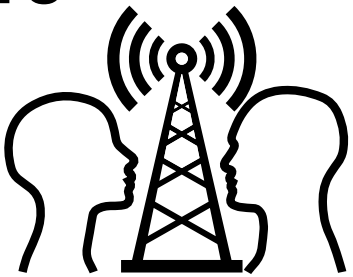


Cool

6 STRATEGIES

Absorb

Adapt



Link/Communicate

Community Toolkit Strategies

Connect - Create connections between community hubs that can be traversed on foot or by bike. During an extreme weather event vehicular transportation might be hindered or impossible.

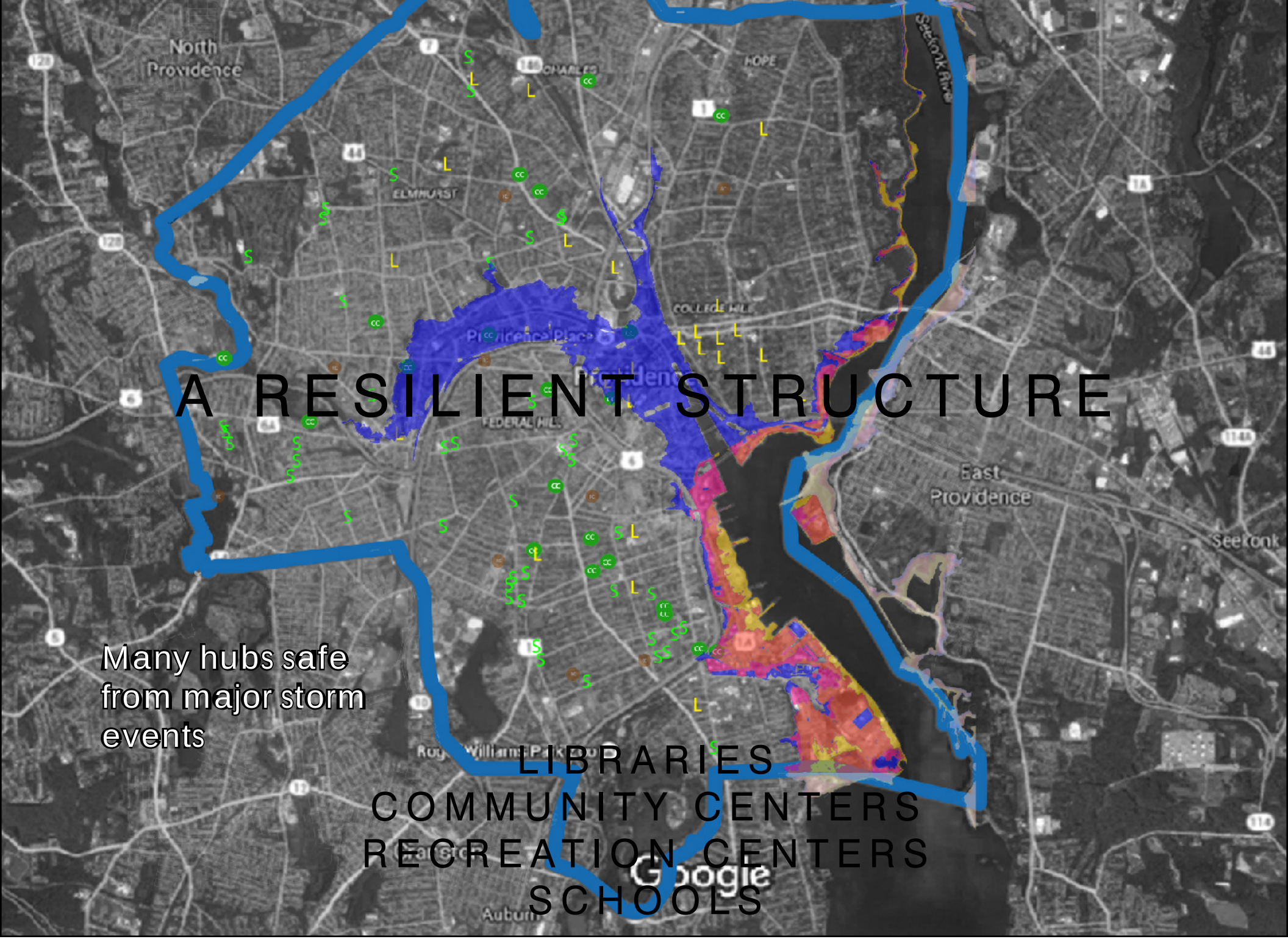
Gather - Create places for people to gather for use year round that are also sufficiently equipped to house people in the event of an extreme weather event. This allows people to be located in a familiar place for safety.

Cool - Combat the heat island effect. During a major storm air conditioning capabilities might be lost. Retrofit existing buildings with techniques that will cool them naturally. Think of children and elderly citizens who the heat effects more drastically.

Absorb - Capture stormwater in more frequent, smaller amounts and let it infiltrate through pervious materials. This will allow pollutants to the be pulled out of the water and increase the health of ground water.

Adapt - Equip citizens of Providence with the tool kit that is neccessary to adapt and prepare for climate change.

Link - Give people the means to communicate before and during major storms. Equip community centers with means of communication to other community centers in case of failure of usual communication lines.



A RESILIENT STRUCTURE

Many hubs safe from major storm events

LIBRARIES
COMMUNITY CENTERS
RECREATION CENTERS
SCHOOLS

WORTH SAVING

Libraries

Providence's library system create places for people of each neighborhood to gather, learn, and build community. These libraries are home to events which cater to people of all interests, welcoming a diverse group of visitors. With these libraries already in place, they can easily become a part of a larger system of community hubs that work to build connections between people year round but also can serve as safe havens during severe storm events. The people of Providence have already showed their dedication and appreciation for these institutions. The Knight Memorial Library, in particular, is a great asset to the city. When the city's libraries were facing shut down due to budget cuts, the community stepped in to save the entire system. Providence now has 'community' libraries (their own non-profits) and their one public library downtown.

“NOTHING IS KNOCKING THIS DOWN”

- GEORGE LINDSEY

Recreation Centers

Another set of institutions with a strong pressence for communities in Providence are recreation centers. These centers foster dozens of activities that bring people together, promote healthy habits, and offer opportunities for fitness and sport. Currently, these rec centers have great community support. Growth of opportunities for the facilities, resiliency retrofitting, and increased staff and activities can build off of an already prospering community hub. The team spoke with the caretaker of the Davey Lopes Recreation Complex. He assured us of the integrity of the building and organiztion stating “nothing is knocking this down” in regards to both physical strength and community support.

IMPROVING INFRASTRUCTURE

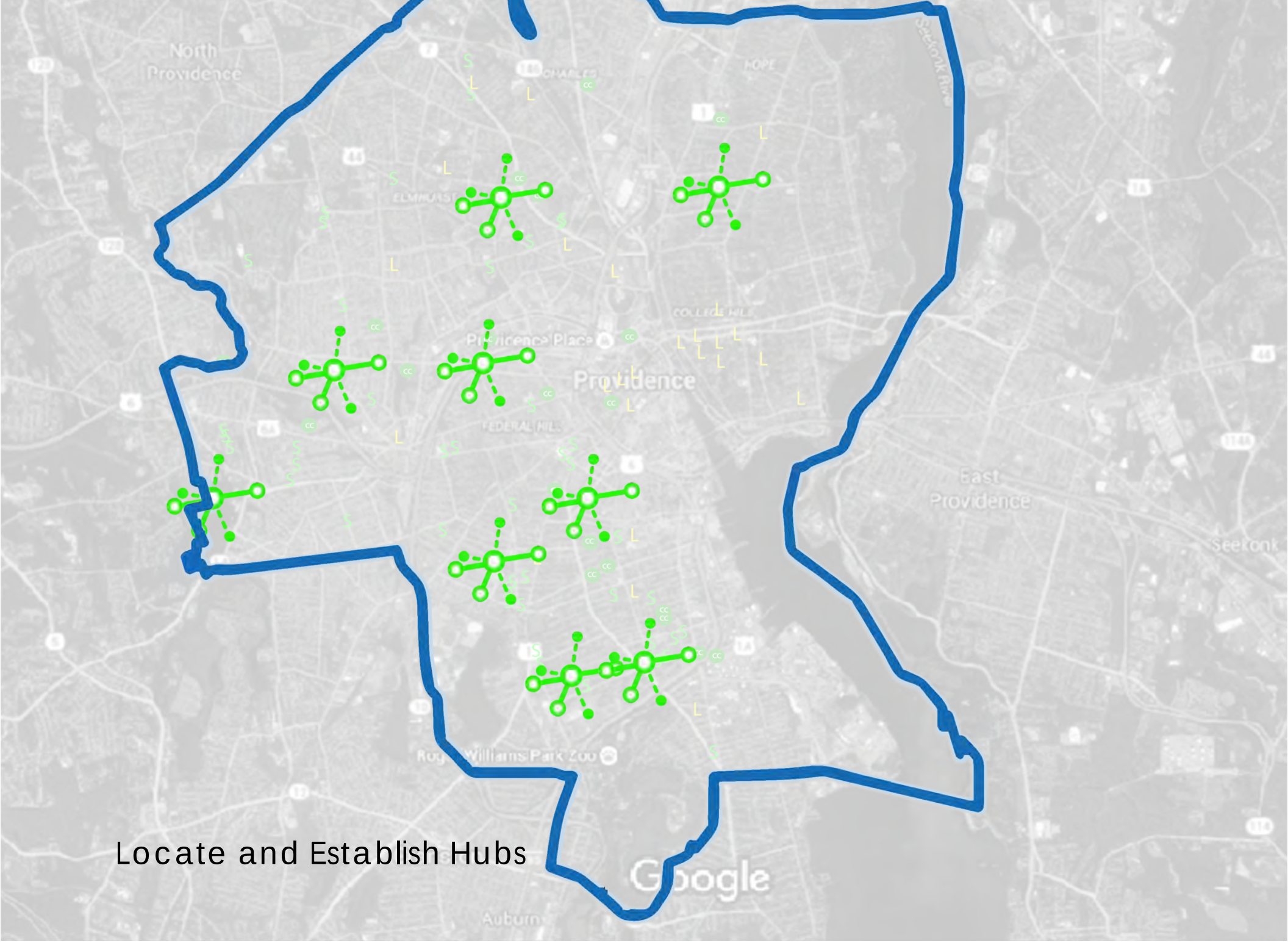
Minor Adjustments

In a more immediate context , improvements can be made to existing buildings and infrastructure. Using Davey Lopes as a place of opportunity, these are some easy changes and techniques. The coloration of both the roof and external walls could be painted a lighter more white color; this combats the heat island effect. Water captured on the roof, brought down to ground level, and either infilitrate or be used to water garden plants. Urban gardens could be used for produce and food. Windows could be retrofitted to promote thermal efficiency.

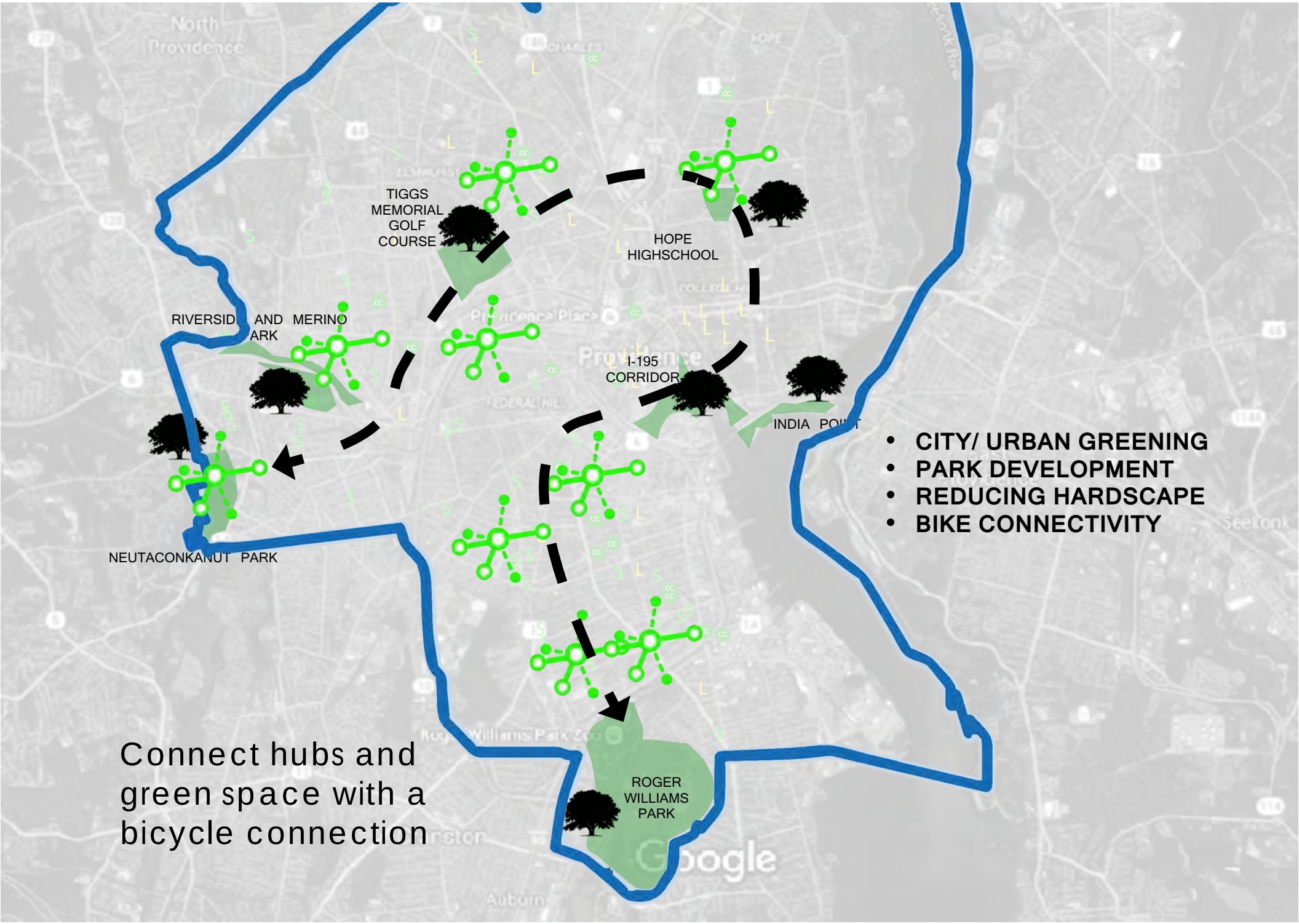
3 days

Crisis Plan

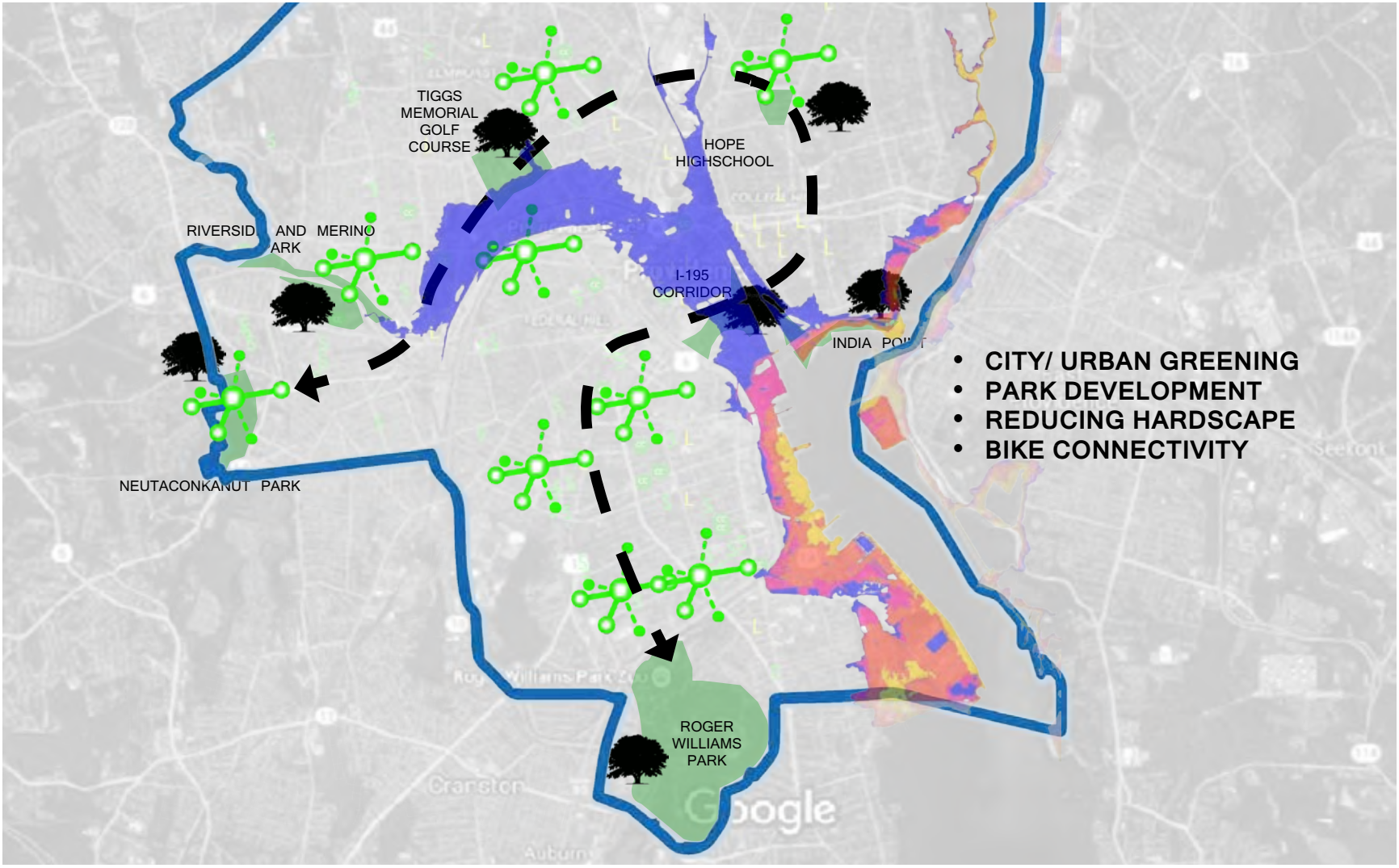
If properly equipped, these rec centers can become safe havens during severe storms. With a bit more intervention and retrofitting, these buildings could sustain neighbors in need for up to three days. Roof water could be captured, filtered, and stored for drinking. Solar panels could capture energy to charge batteries which could operate neccessities. A fail proof form of communication would need to be installed to contact other safe havens until the weather is sorted out. Food produced by the garden coupled with a supply of beverages and other food could supply enough food to keep the group nourished for a minimum of three days.



Locate and Establish Hubs



- **CITY/ URBAN GREENING**
- **PARK DEVELOPMENT**
- **REDUCING HARDSCAPE**
- **BIKE CONNECTIVITY**



Connectivity

Centers in Providence are fairly well dispersed throughout the different neighborhoods and, for the most part, are outside the potential flood zones. Using these recreation centers as community resilience hubs, a system of green spaces and hubs can be established in the city. Connectivity can be enhanced by improving bicycle connections from Roger Williams Park, through the Jewerly District, across the East Side, and then west again all the way to Neutaconkanut Park. This connection means that in the case that cars are rendered useless due a severe storm, transportation between hubs may still be possible by bike or on foot. This could become a connecting green corridor through the city. Located along the path are many vacant lots and parking lots that could be repurposed into smaller parks, community gardens or other assets to the green corridor.

SCALE

City Wide

Regional Stormwater
Code
Mass Transit
Port Strategic Hazard Mitigation

Neighborhood

Ecodistric Planning
Community Hubs
Community Empowerment

Buildings/Sites

Passive Heating/Cooling Strategies
Flood Proofing Strategies
Stormwater Disconnection

Scale

Resilience happens at all scales. Each step and leap between scalesv requires different levels of commitment, different amounts of time, and different amounts of resources. Thus far, resilience has beeen discussed in the form of disaster preparedness such as retrofitting existing infrastructure. This is on the individual scale and can be done in one day. However, neighborhood resiliency plans and equity within communities takes time and constant involvement. Moving forward, the city wide and long term scale of resiliency will be addressed.

Long View

What are the long term goals?

- Have a Framework
  - Existing Frameworks
  - Providence Comprehensive Plan
  - Focused & Integrated Vulnerability Assessments
- Using Existing Building and Development Regulations
  - Zoning
  - Building Code
  - Design Standards
- Geographic Focus Areas
  - Resiliency Districts
  - Port of Providence
- Tactical Focus Areas
  - Training the PVD design/engineering community
  - Tactics for Existing Buildings
  - City Government Leading by Example
  - Partnering with Long Term Owners
  - Collaborating Regionally - Sharing Globally
  - Exploring Financing and Incentive Options

FORTIFIED HOME

COMPACT of MAYORS

CRAFT

CLIMATE RISK AND ADAPTATION FRAMEWORK AND TAXONOMY

Utilize exitsting frameworks for promoting & assessing progress

- Climate Risk and Adaptation Framework and Taxonomy (CRAFT)-
  - Developed for compact of Mayor's reporting and measuring progress on city climate resiliency
- Fit Climate Resiliency into the broader context/ goal of city resiliency
  - City Resiliece Framework and City Resilience Index
- Promote and incentivize the Resiliency Pilot Credits for LEED
- Promote Insurance Institute for business & Home Safety's FORTIFIED Home Program
  - Currently being promoted in RI by CRMC - first state in north Atlantic region

Climate Resiliency as core principal to Providence Comprensive Plan

PROVIDENCE TOMORROW
our city ■ our neighborhoods ■ our future

- Sustainable Development Evaluation tool
  - expand to include climate resiliency emphasis
  -Use both public and private developments
- Using CRAFT as a measurment tool for comprehensive Plan implementation
  - City Resilience Framework and City Resilience Index

Focused Asset and System Integrated Climate Vulnerability Assessments

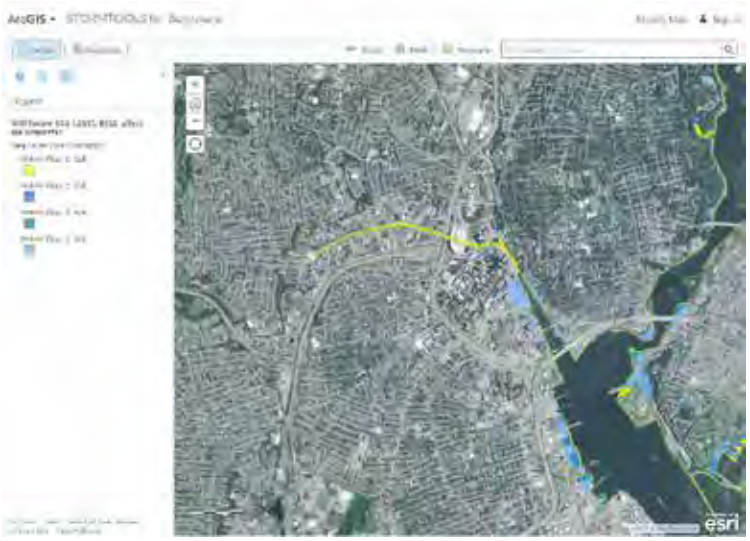
- RI Hospital and health care system
- Transportation
- Stormwater
- Power
- IT & Communications
- Food
- Vulnerability (Sensitivity & Adaptive Capacity) and Risk (Probability & Consequence)
- Equity and Environmental Justice Lens
- Multivariate Risk and Vulnerability Assessment

Zoning Reccomendations

- Coastal Resource Management Council
  - Move towards requiring climate/sea level scenario analysis as part of future permitting

- StormTools
  - Incorporate sea level rise and storm surge models into zoning
  - Using FEMA flood maps is not appropriate in a changing climate
  - Incentivize density and height as groundfloor uses need to evolve to wet uses over time

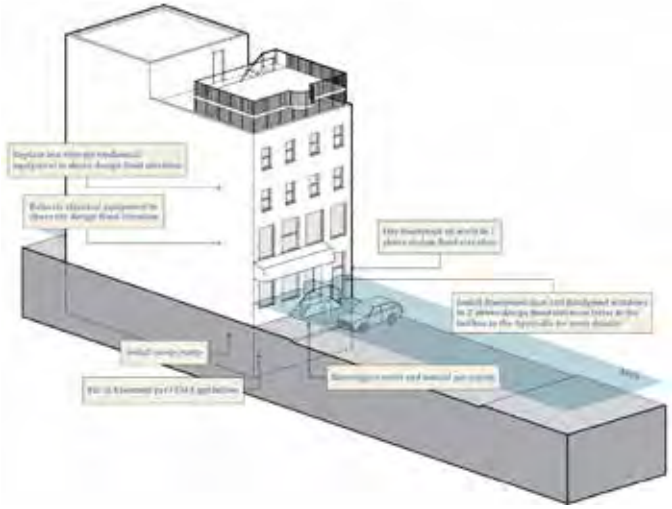
- Adapt NYC's 2013 Flood Resilience Zoning Amendment
  - Consider incorporating climate change preparedness into Zoning Variance and City Plan Commission Reviews

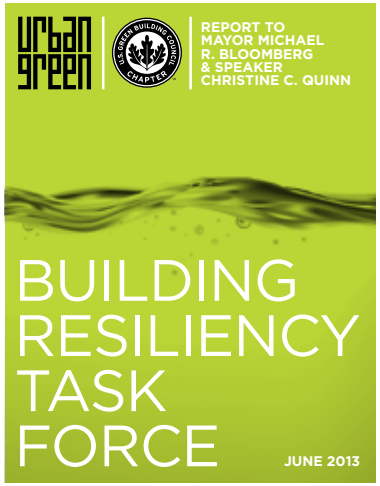


Building Code

- Build on RI'd national leadership in code adoption (including IGCC) by advocating for amendments focused on Climate Resiliency

- Consider different standards for new construction and renovation





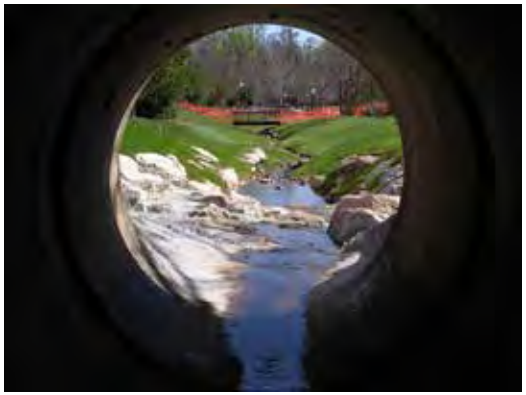
Infrastructure resiliency design standards

- Based on climate projections and vulnerability assessments completed so far:
  - Adopt infrastructure design standards that tie to the full expect life on the infrastructure
  - standards for new and existing asset renovations can be different
- At city level, DPW engagement is critical
  - Peer exchanges with other cities
- Key for new Stormwater Utility
  - Fee structure - incentivize on-site percolation; incorporate equity

Resiliency Districts

- Providence could designate Resiliency Districts focused as innovation/best practice for climate resiliency and adopt distinct standards and incentives for those areas
  - 195 Corridor parcels
  - Olneyville
  - Port of Providence
- Competitive advantage in marketing
  - Waterfront Toronto

WATERFRONToronto



Port of Providence

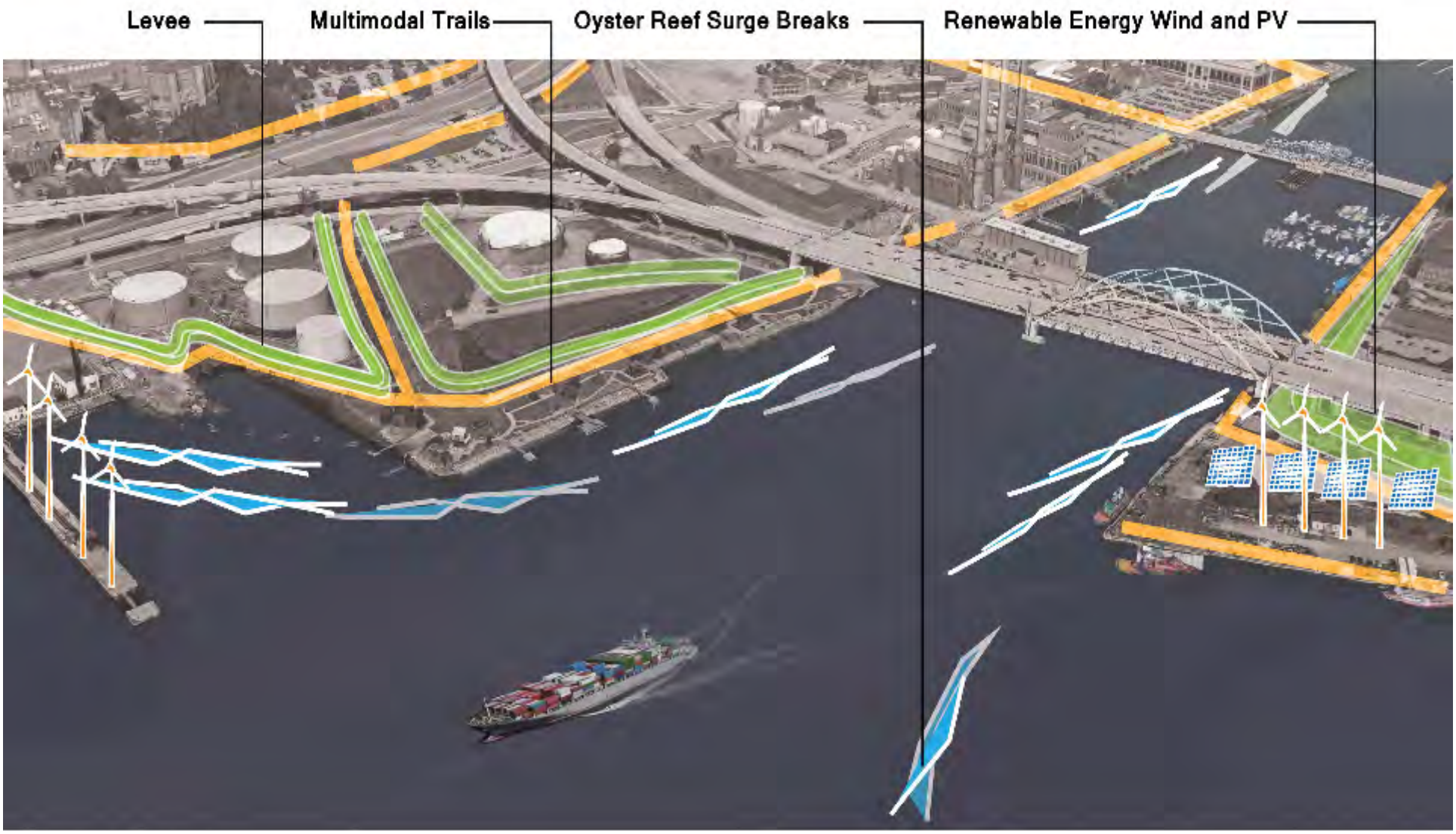
How does Port of Providence become the most climate resilient port on the East Coast?

- How does the Port stay functionally viable in 2050?: 2100?
  - What does it look like? How does progress also address neighborhood concerns?
- What is the right organizational structure for effectively addressing climate challenges?
  - Need for comprehensive assessments of risk/vulnberability; future design/construction regulations, capital investments, strategy decisions
- ProvPort operating license expires in 2036 - opportunity to think about the right organizational structure going forward
- Implement resiliency requirements in infrastructure and capital planning

PROVPORT

New England's premier deep water multimodal facility for international trade and domestic distribution

Resilient Port

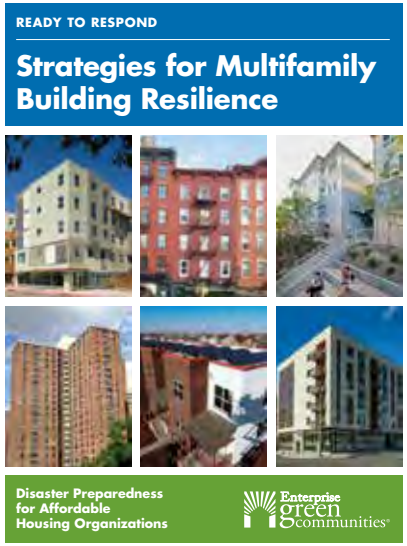


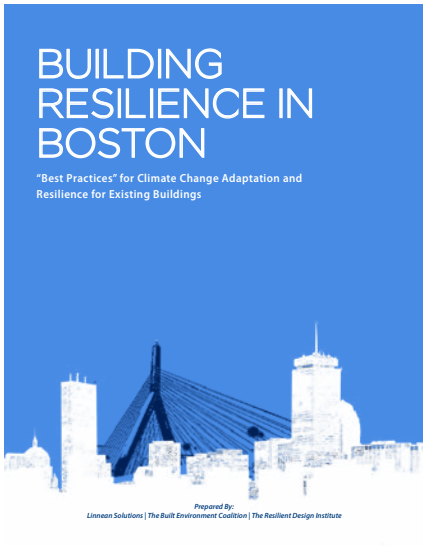
Training the RI Design/ Engineering Community

- An informed Providence design and engineering community is a critical factor to improving building resilience
- Permanent and temporary solutions

Recommendations for Existing Buildings

- Preparing existing buildings is a larger challenge; especially historic structures
- Providence can build off the work in other cities to identify strategies for existing buildings





City Can Lead by Example

- Set municipal asset standards that lead by example

  - Identify city government assets and service vulnerabilities
  -Develop and launch strategies for risk reduction

Rhode Island Hospital
Lifespan. Delivering health with care.™

PROVIDENCE COLLEGE

Hasbro Children's Hospital
The Pediatric Division of Rhode Island Hospital
A Lifespan Partner

RISD

Partner with long term owners

- Identify and partner with real estate owners that are long term stakeholders and have long term visions

  -Medical Institutions

  -Higher education

  -Major real estate owners

RHODE ISLAND COLLEGE 1854

JOHNSON & WALES UNIVERSITY

BROWN

Partnering Regionally - Sharing Globally

- Climate change impacts don't respect municipal boundaries - need to coordinate regionally
  - Convene regional mayors, planning authorities, and infrastructure owners to coordinate assessments and strategies for resiliency

- Partner with other cities globally with similar characteristics and facing similar risks

Exploring financing options

There are a number of available programs and instruments that can be applied to climate resiliency, adaptation, and infrastructure improvements:

- Start with spending existing funding streams with resiliency in mind
  - Distinct Improvement Financing (DIF) and Business Improvement Districts (BIDs)
  - Density Bonuses
  - RI Green Infrastructure Bank
  - RI office of Energy Resources
  - Army Corps of Engineers
  - Natural Hazard Mitigation Plans
  - PACE + R
  - Green Bonds
  - EPA Brownfields funding
  - HUD

cities worldwide facing with similar risk

RI INFRASTRUCTURE BANK

The Team

Wayne Feiden, FAICP
Director of Planning and Sustainability, Northampton, MA
Tracy Morgenstern
Climate Protection Program Manager, Seattle
Rishi Nandi, AIA, LEED AP NCARB
Associate, Payette, Boston
Richard Roark, RLA, ASLA, LEED AP BD+C
Partner, Olin, Philadelphia
Brian Swett
Director, Cities and Sustainable Real Estate, Arup, Boston
Joel Mills (Project Staff)
Senior Director of Communities by Design, AIA, Washington DC
Erin Simmons (Project Staff)
Senior Director of Design Assistance, AIA, Washington DC
Dylan Zingg (Report Layout)
University of Massachusetts Amherst Student of Landscape Architecture

Wayne Feiden, FAICP
Wayne Feiden is Director of Planning and Sustainability for Northampton, MA and a part-time Lecturer of Practice at the University of Massachusetts. He led Northampton to earn the nation's first 5-STAR Community rating for sustainability and the highest "Commonwealth Capital" score, the former Massachusetts scoring of municipal sustainability efforts, as well as "Bicycle-Friendly," "Pedestrian-Friendly", "APA Great Streets," and "National Historic Trust Distinctive Communities" designations. In this role, he has helped address transportation, amenities, land use and other aspects of downtown revitalization. Wayne's areas of interest include downtown and urban revitalization, multi-modal transportation, open space preservation, sustainability and resiliency, and assessing sustainability. Wayne has also led or served on 25 design assessment teams as well as other assessment efforts from Vermont to Haiti. He has authored American Planning Association PAS Reports on Local Agency Planning Management (in press), Assessing Sustainability, Planning Issues of Onsite and Decentralized Wastewater, and Performance Guarantees. Wayne's German Marshall Fund fellowship (Northern Ireland, England and Denmark), Fulbright Specialist fellowships (South Africa and New Zealand), and Eisenhower Fellowship (Hungary) all focused on urban revitalization and sustainability. Wayne is a fellow of the American Institute of Certified Planners. His other awards include honorary member of Western Mass AIA, professional planner and advocacy planner awards from APA-MA, and American Trails Advocacy Award.

Tracy Morgenstern
Tracy is the Climate Protection Program Manager for the Seattle Office of Sustainability and Environment (OSE). She leads Seattle's efforts to achieve carbon neutrality by 2050, and is responsible for ensuring Seattle continues to develop innovative solutions to climate change. Tracy's work also focuses on climate resilience, developing policies and strategies to foster equitable climate preparedness. Tracy was the principal author of the Seattle Climate Action Plan. She previously led development of the City's Urban Forest Management Plan and the Seattle Climate Partnership, which supported businesses in understanding and reducing their climate impact. Tracy has a Bachelor of Philosophy degree in Interdisciplinary Studies with a focus on Environmental Policy.

Richard Roark, RLA, ASLA, LEED® AP BD+C

Richard Roark's work spans a range of scales and typologies, focused on expanding the civic capacity of the landscape. Projects such as the Presidential Sustainability Initiative: Rebuild by Design, the new U.S. Embassy in London; Dilworth Plaza in Philadelphia, Pennsylvania; exemplify a practice focused on sustainable, economical and well crafted public design. His work in sustainability has focused on the reinvestment in neglected neighborhoods and urban landscapes notably the award winning Living Cities project Patchwork Philadelphia and Meeting Green. He has also recently completed a vision plan for the Philadelphia city branch abandoned rail line; a plan to reconnect many neighborhoods and cultural institutions to Fairmount Park along the historic elevated Reading Viaduct and City Branch rail lines. Richard has been recognized as an active participant in public design advocacy and as an outstanding volunteer of the Philadelphia Community Design Collaborative (CDC).

Rishi Nandi AIA, LEED AP NCARB

Rishi is an Associate at the Boston-based firm Payette. At Payette Rishi has worked on a diverse set of projects that not only required forward looking energy saving architecture, but progressive site strategies focused on the restoration of native habitat and effective storm water management. These projects include the LEED Gold Harvard Fogg Art Museum (in partnership with Renzo Piano Building Workshop); the MIT Physics and Department of Materials and Science and Infrastructure (PDSI) project; and currently the projected LEED Gold Northeastern University Interdisciplinary Sciences and Engineering Complex (ISEC). Rishi is an active community member working towards the practical application of renewables with a long view on the necessary investments needed to make more resilient communities. His work focuses on helping enable smaller communities making sustainable and resilient improvements in the face of smaller tax bases and available funding. He has participated as in the City of Salem's Renewable Energy Task Force where he helped recommend renewable energy applications per a MASS DOER negotiated community benefits agreement. Additionally he was an active participant in the review of the City's Resiliency report and recommendations. He has also participated as a member of regional master planning efforts with the MAPC. Rishi has presented both his professional and community work at a number of conferences such as ABX Boston and I2SL. Additionally, Rishi was a founding member of Common Boston; a yearly event focused on increasing communication and interaction between Boston's neighborhoods. He has taught and sat on panels at both Wentworth College and Northeastern University and has worked with a Construction Industry group focused on the execution of complex Design Assist oriented work. Rishi earned his professional degree from Syracuse University.

Brian Swett

Brian Swett currently serves as Director, Cities and Sustainable Real Estate at Arup. In this role, Brian is spearheading the work of Arup in the Americas to integrate its advisory services in strategy development, planning, finance, operations and economics with its key strengths in design, engineering and implementation services, delivered in the city context. Prior to joining Arup, Brian served as Chief of Environment, Energy and Open Space for the City of Boston. Encompassing more than 400 employees and a $40 million annual budget, Brian led a variety of major policy and program initiatives; launched Greenovate Boston and Climate Ready Boston; and led the update to the City's Climate Action Plan, released in January 2015. Under his leadership, Boston was recognized by the American Council for an Energy-Efficient Economy (ACEEE) as the #1 city in the country for energy efficiency policies and programs in their 2013 and 2015 biennial rankings. Previously, Brian was a development project manager and sustainability lead with Boston Properties where he advised and oversaw LEED and sustainability related initiatives throughout the Boston region and across the company. Brian demonstrates his personal enthusiasm to sustainability issues as an advisory board member for the Urban Land Institute (ULI) Center for Sustainability and a board member for the Boston Green Academy.

Project Staff

Joel Mills AIA, Director, Center for Communities by Design

Joel Mills is Director of the American Institute for Architects' Center for Communities by Design. The Center is a leading provider of pro bono technical assistance and participatory planning for community sustainability. Its processes have been modeled successfully in the United States and across Europe. The Center has been the recipient of a numerous awards recognizing its impact. In 2010, the Center was named Organization of the Year by the International Association for Public Participation (IAP2) for its impact on communities and contributions to the field. In 2013, the Center received a Power of A Award from the Center for Association Leadership, and a Facilitation Impact Award, given by the International Association of Facilitators. Joel's 20-year career has been focused on strengthening civic capacity and civic institutions around the world. This work has helped millions of people participate in democratic processes, visioning efforts, and community planning initiatives. In the United States, Joel has worked with over 100 communities, leading participatory initiatives and collaborative processes that have facilitated community generated strategies on a host of issues.

Erin Simmons AIA, Design Asistance

Erin Simmons is the Director of Design Assistance at the Center for Communities by design at the American Institute of Architects in Washington, DC. Her primary role at the AIA is to provide process expertise, facilitation and support for the Center's sustainable Design Assistance Team (SDAT) and Regional and Urban Design Assistance Team (R/ UDAT) programs. In this capacity, she works with AIA components, members, partner organizations and community members to provide technical design assistance to communities across the country. Through its design assistance programs, the AIA has worked in 200 communities across 47 states. In 2010, the Center was named Organization of the Year by the International Association for Public Participation (IAP2) for its impact on communities and contributions to the field. Erin is a leading practitioner of the design assistance process. Her portfolio includes work in over 70 communities across the United States. A frequent lecturer on the subject of creating livable communities and sustainability, Erin contributed to the recent publication "Assessing Sustainability: A guide for Local Governments". Prior to joining the AIA, Erin worked as historic preservationist and architectural historian for an environmental and engineering firm in Georgia, where she practiced preservation planning, created historic district design guidelines and zoning ordinances, conducted historic resource surveys, and wrote property nominations for the National Register of Historic Places. She holds a Bachelor of Arts degree in History from Florida StateUniversity and a Master's degree in Historic Preservation from the University of Georgia.

Dylan Zingg, BSLA

Dylan is a soon to be graduate of landscape architecture from the University of Massachusetts Amherst. With a concentration in the landscape he is in constant exploration for knowledge and experience crossing over the boundaries that seperate the various modes of design. Experience in architecture, urban design, furniture design, and graphic design has given him a unique set of skills to be applied to design at all scales. Recognized for his ability to represent ideas graphically, he was chosen by Wayne Feiden to compile the final report for 'Common Threads' the Providence, RI DART. Dylan worked closely with the DART members during their time in Providence, helping them find ways of expressing their findings and assessments graphically in a way that is clear, concise, and can be referenced by the people of Providence for years to come as they reach for resilient practices.

Special Thanks to:

- Over 110 residents who participated in the DART
- Mayor Jorge Elorza, Senator Whitehouse, EPA Regional Administrator Curt Spalding
- Leah Bamberger, Providence Sustainability Director
- Coordinators and support: Kelly Taylor, Cesar Teo, Ania Szemiot, and Alex Wilson
- Volunteers: Louis Epstein, Eric Kretsch, Lauren Watka, Emily Williams, Emma Gleeman, Katie Denman, Tathya, and Julia Foote
- People's Power & Light for making this a green event

COMMON THREADS : RESILIENT PVD

DESIGN AND RESILIENCE TEAM

CITY OF PROVIDENCE

NEMSN/ AIA DART REPORT

FEBRUARY 3, 2016

MAYOR JORGE ELORZA
DIRECTOR OF SUSTAINABILITY : LEAH BAMBERGER

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PROVIDENCE, RI

SUSTAINPVD