

Bayside Adapts: Resiliency Planning



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City of Northampton, MA &
NEMSN Design & Resiliency Teams



1914 resiliency: Filling Port Angeles



community

Finding the right time for ^change



Christchurch Earthquake-2010



Hurricane Katrina-2005

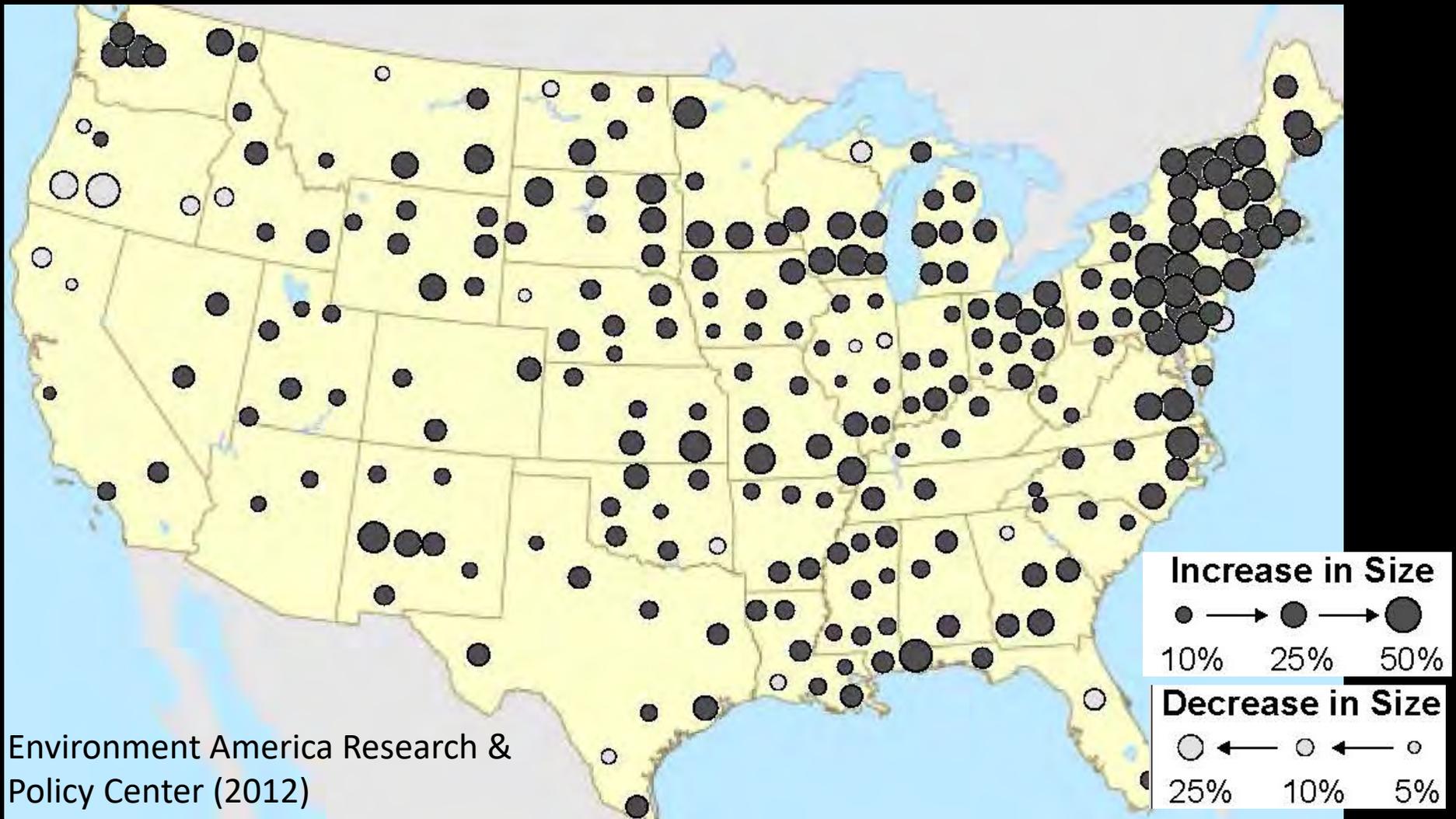


Haiti Earthquake-2010



South Africa-2015 to 2016

Sea Level Rise/Storm Surge/Larger Storms data uncertainties and sensitivity



Cambridge Vulnerability Analysis (comprehensive)

The assets and resources that are ranked as most vulnerable and presenting the greatest risk of disrupting Cambridge will be the focus of the Climate Change Preparedness and Resilience Plan.

Water

Fresh Pond Reservoir



Stormwater

New St Pump Station
 Separated Stormwater
 CAM 400 (Alewife)
 CAM 004 (Alewife)
 Western Flagg (Charles)
 Lechmere (Charles)
 D46 (Alewife)
 Combined Sewer
 CAM 017 (Charles)
 CAM 001

Roadway

Concord Tpke, Broadway
 Memorial Drive, Land Blvd
 Cambridge St Underpass
 Monsignor O'Brien Hwy
 Alewife Brook Pkwy
 Massachusetts Ave
 Lars Anderson Bridge
 Longfellow Bridge
 Eliot Bridge
 Fresh Pond Pkwy



Transit

Alewife-Davis-Porter Rail Line
 Fitchburg Commuter Rail
 Central-Kendall Rail Line
 Harvard-Central Rail Line
 Lechmere T & Rail Line
 Central Square T Station
 Kendall T Station
 Alewife T Station
 Porter Square Station

Critical Services

Youville Hospital
 Fire Company 2
 Fire Department
 Headquarters



Critical Services

Windsor Street Health Center
 & Public Health Department
 Police Headquarters
 Professional Ambulance
 Services Office

Energy

North Cambridge Substation
 Brookford St Take Station
 Third St. Regulator Station
 MIT Cogeneration Plant
 Putnam Substation
 Prospect Substation



Telecom

City Emergency Com
 Center (Police HQ)
 AT&T Data Hub/300 Bent St
 BBN Data Hub/CO-LOC:
 10-12 Moulton St
 AT&T Office/Long Line
 Switch: 250 Bent St

2070 Scenario
 11.7 inches
 rainfall in
 24 hours



Flood Risk

Depth of flooding (ft)

0-0.5	Lightest blue
0.5-1.0	Light blue
1.0-2.0	Medium blue
2.0-3.0	Dark blue
>3.0	Darkest blue

Fig. 23 **Assets Most at Risk to Flooding**
 (Source: Kleinfelder, November 2015)

Design & Resiliency Teams (DART)

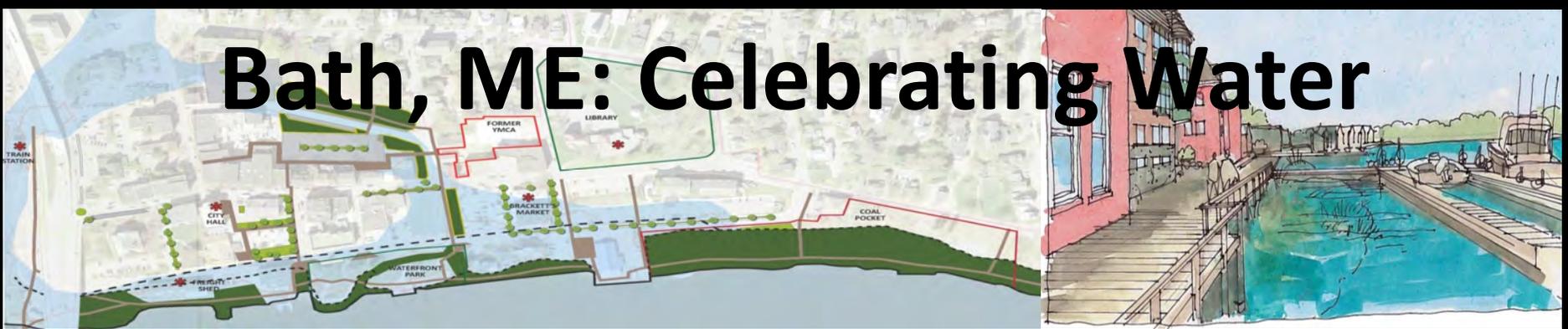




Provincetown Speaks: resiliency=people

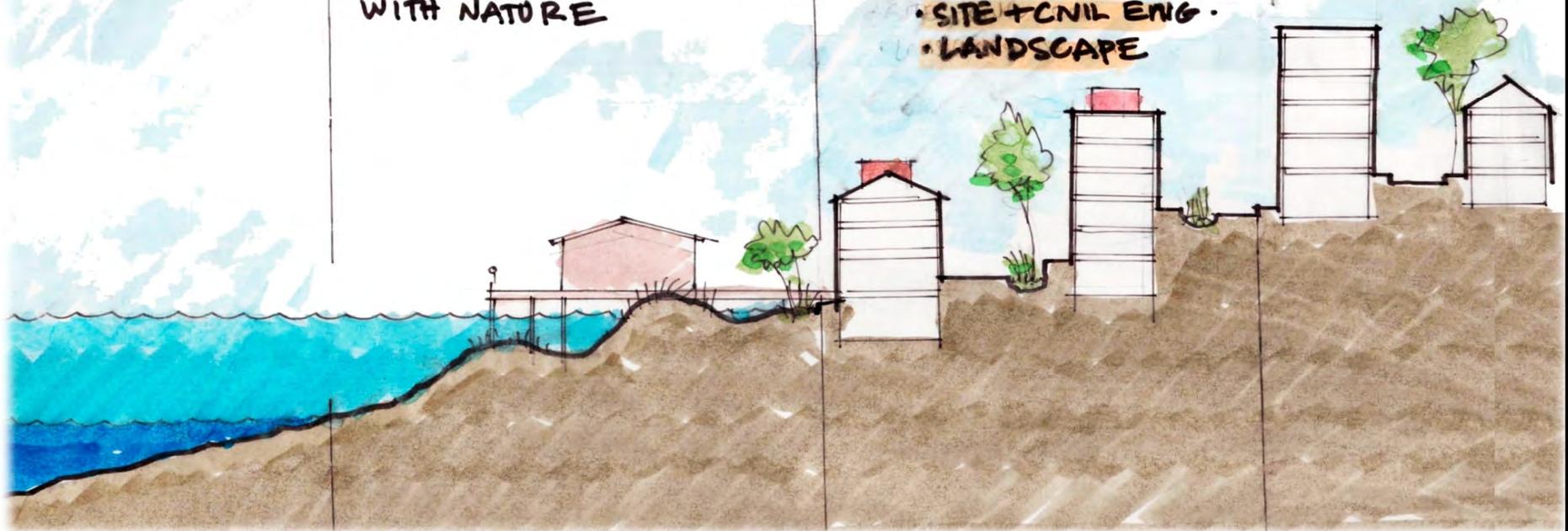
affordable housing
waterfront
multigenerational
transit
less cars
accessible
a place for everyone
piers
MacMillan town square
families
year round
resilient sustainable
wind generators
THANKS: Bill Needelman

Bath, ME: Celebrating Water

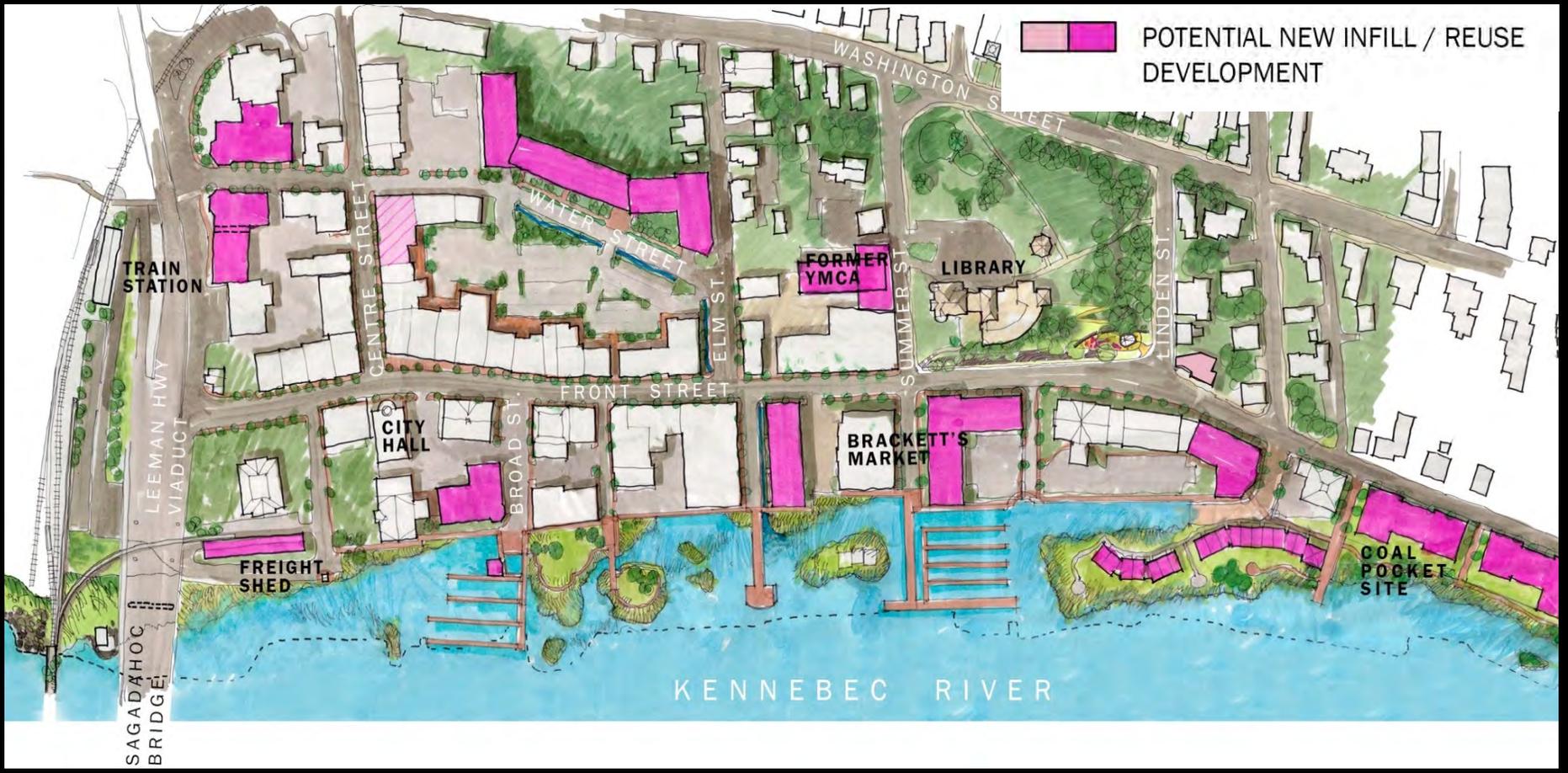


"THE ECOTONE"
HUMAN USE COEXISTS IN
NEW DYNAMIC RELATIONSHIP
WITH NATURE

HUMAN USE DEPENDS ON
ADAPTIVE STRATEGIES:
• ARCHITECTURE
• SITE + CIVIL ENG.
• LANDSCAPE



2014 COASTLINE * FUTURE COASTAL ZONE * FLOOD ZONE * ABOVE FLOOD ZONE



6 Strategies

Connect

Gather

Cool

Absorb

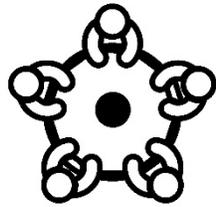
Adapt

Link

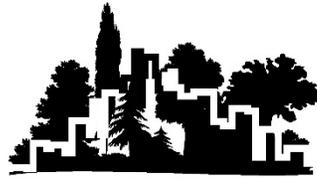
COMMON THREADS : RESILIENT PVD



Connect



Gather



Cool



Absorb

6 STRATEGIES

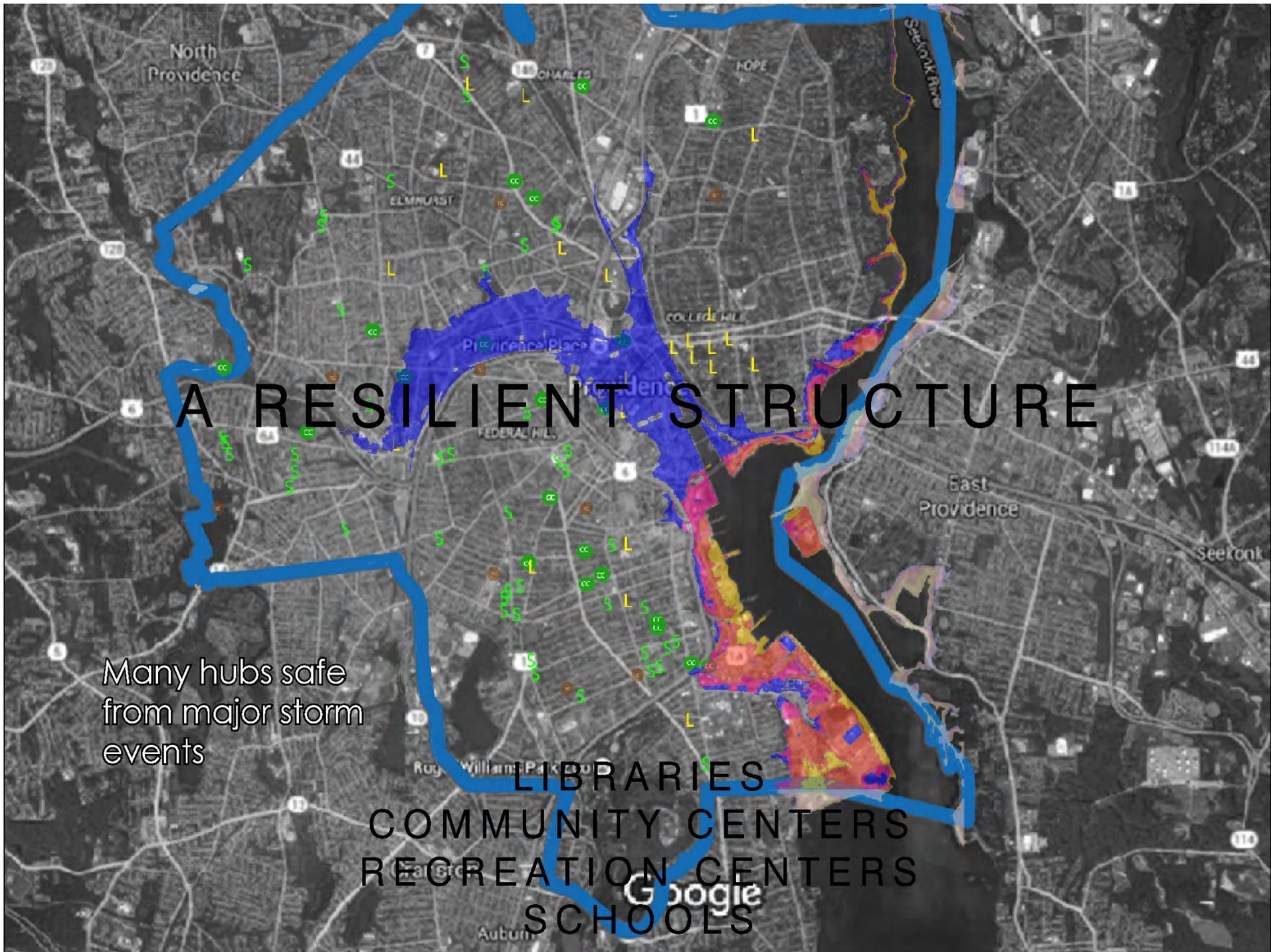


Adapt



Link/Communicate



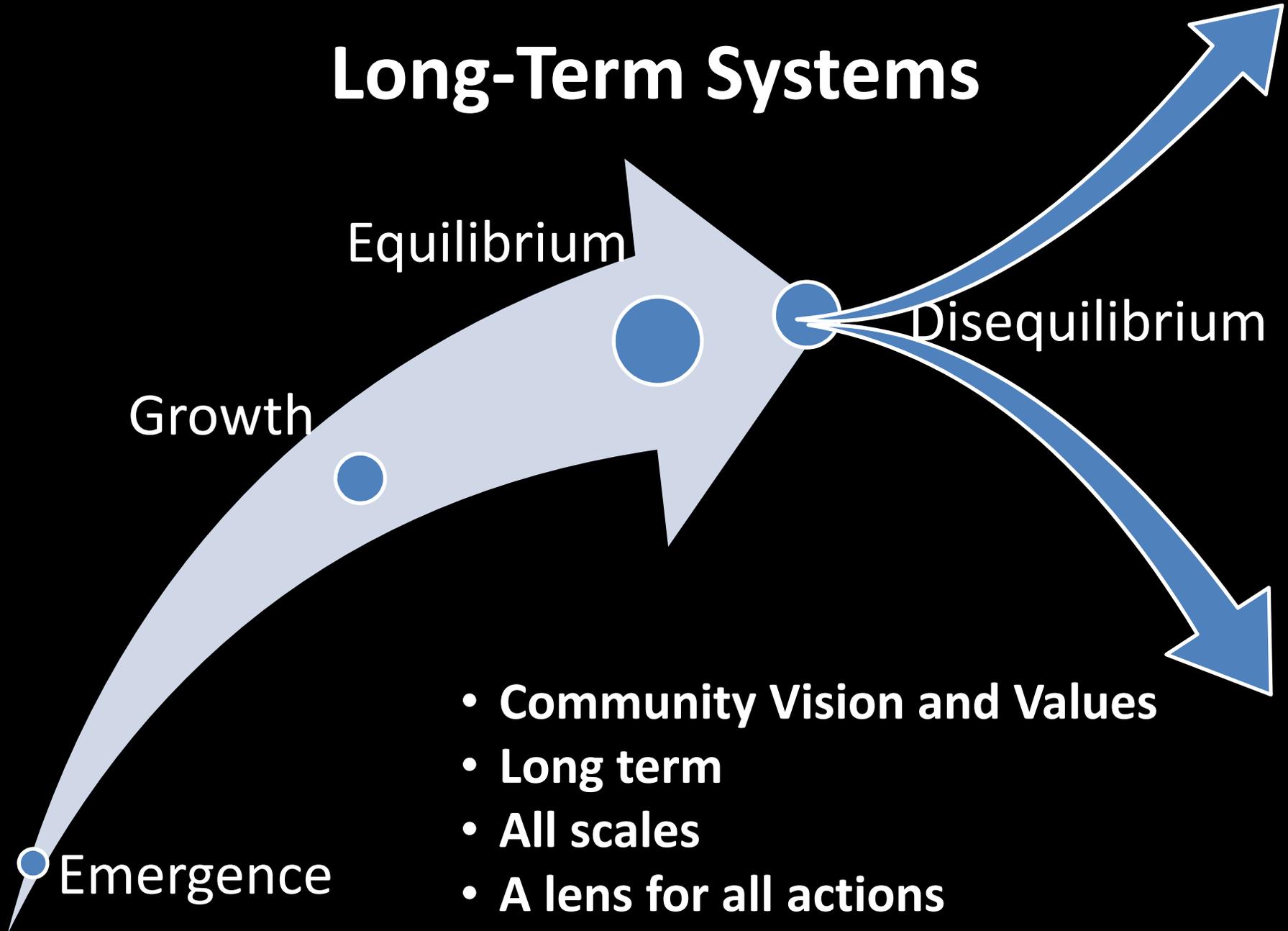


A RESILIENT STRUCTURE

Many hubs safe from major storm events

LIBRARIES
COMMUNITY CENTERS
RECREATION CENTERS
SCHOOLS

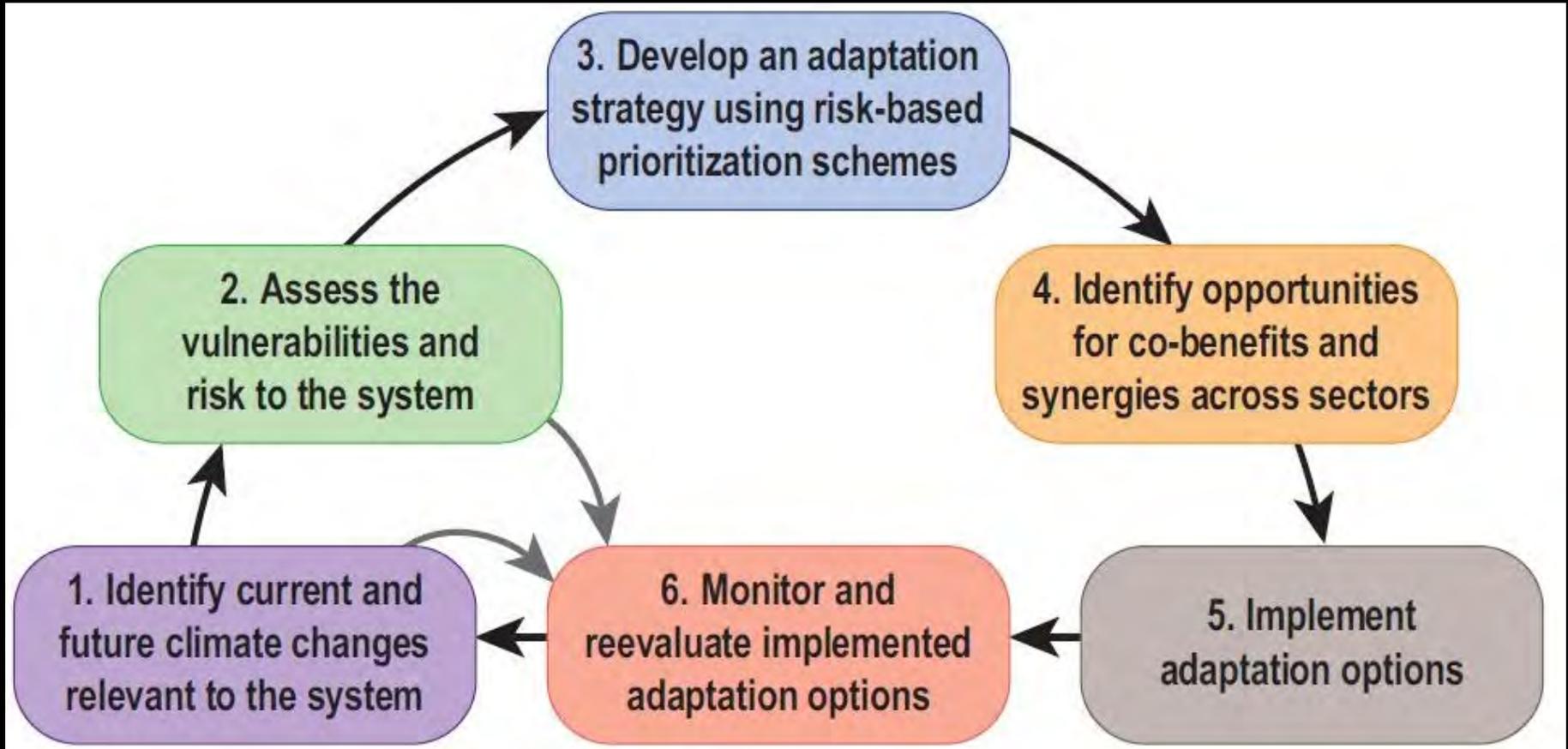
Long-Term Systems



- **Community Vision and Values**
- **Long term**
- **All scales**
- **A lens for all actions**

Credit: USDN

Long-Term Community Sustainability



Source: Galvin Smith, HUD

COASTAL RESILIENCE CENTER

A U.S. Department of Homeland Security Center of Excellence

ADAPTION, meet PLACE MAKING

Physical | Social | Equity | Comprehensive

- Community Vision
- Community conversation
- Take advantage of opportunities
- Integrate
- Think about people
- All scales, simultaneously
- BE CHAMPIONS

1st LEED Gold KFC/Taco Bell
Is this as good as it gets?



Community Conversation



A.P.E. Gallery, 126 Main Street, Northampton

**Plan Health
Designing Healthy Communities**

**Sunday, December 4th ~
Saturday, December 10th**

Special Events

2:00PM Sunday Dec.4
Event Opens

5:30PM Monday Dec.5
Conway School of Design:
Reception and lecture

5:30PM Tuesday Dec.6
Smith College Landscape Studies
and Engineering students:
Reception and discussion
of parklets

5:30PM Wednesday Dec.7
Umass Landscape Architecture and
Regional Planning:
Reception and discussion

5:30PM Thursday Dec.8
City of Northampton: Reception
and Planning Board Meeting

5:30PM, Friday Dec.9
Western Mass American Institute
of Architects: Reception



Built Environment

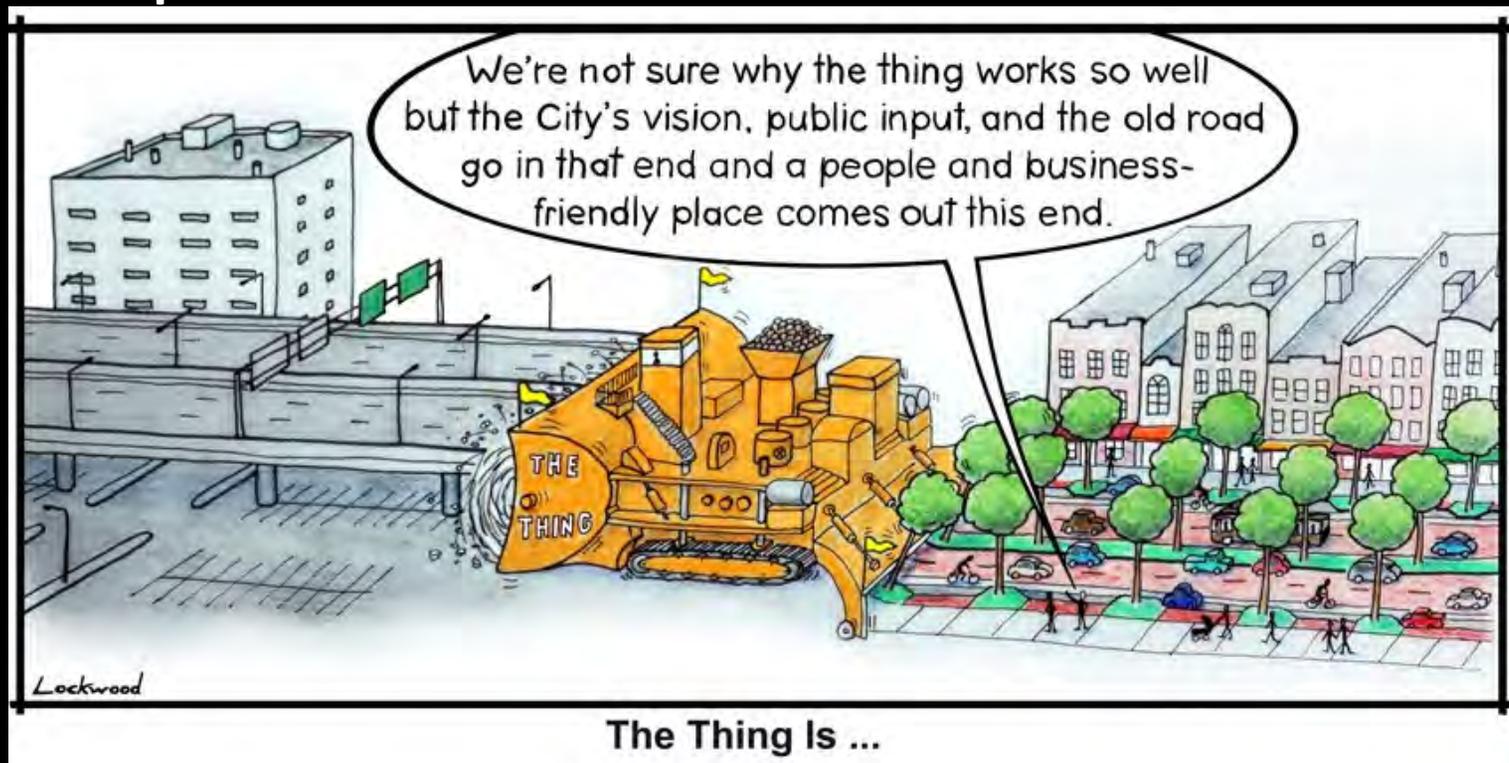
- Hazard Mitigation- NO build in 500 year flood
- Facilities, Vulnerabilities, Response
- Overlap: ADAPTION & PLACE MAKING



small lot  BIG IDEAS
a design competition

Transportation

- Walkable communities and land-use
- Green Streets
- Complete Streets for ALL modes



Equity & Empowerment

- Social Networks & Social Capital
- Cooling and heating shelters
- Environmental justice



Health & Climate Change

Health Outcome	Direction & magnitude of change in health outcome	Severity of health impact	Populations that are vulnerable	Prediction
Heat related hospitalizations and death	↑	***	Elderly Children Low-income without air conditioning Homeless Outdoor workers People w/ chronic conditions	Rates per 100,000 of heat related hospitalization in a region that Northampton may be like in the future are similar – about 7 per 100,000 people per year.
Heat related deaths and hospitalizations are related to the increase in number of days of extreme heat. A large increase in extreme heat days in Massachusetts is predicted, however few people in Northampton are currently hospitalized for heat-stress illness. Heat stress will increase but it is difficult to predict how much; comparisons to North Carolina show an equal amount.				
Asthma hospitalizations and death	↑	***	Families in older homes Children Elderly People of color	No prediction possible
Asthma hospitalizations are related to extreme heat days and ground level ozone concentrations, as well as a variety of non-climate change related factors such as housing quality. There will be more extreme heat days, however exceedances of national standards of ground level ozone in Massachusetts has been on the decline, thus we predict only a small increase in asthma hospitalizations and deaths.				
Seasonal Allergy Prevalence	↑↑	*	Children Elderly Low income	No data available in comparison geography
The increase in days of extreme heat, extension of the warmer season, and decrease in the colder season will result in an increase in seasonal allergies. There will likely be a moderate increase in people affected by seasonal allergies and incidence of symptoms, however this is not a severe health impact.				
Cardiovascular Disease hospitalizations and death	↑	***	Elderly Low income	No prediction possible
CVD is exacerbated by extreme heat and poor air quality. Predicted increases in extreme heat days are large, but there has been an ongoing decline in myocardial infarction over the last decade in Massachusetts. While there may not be a large increase in number of CVD events due to climate change, the possibility of death from such events is high.				
Lyme Disease			Outdoor workers	Approximately 13

Prevalence	↑↑	**	People who exercise outside People living in the woods	more cases per year.
The extension of the warmer season and decrease of the colder season will result in more exposure to ticks as well as less tick die off, thus more Lyme disease. The consequences of having Lyme disease can be extensive, with it lasting for the rest of one's life and holding the potential to severely decrease one's quality of life.				
Eastern Equine Encephalitis	↑	***	Outdoor workers People who hike outside People living in the woods	No prediction possible
The extension of the warmer season and decrease of the colder season will result in more exposure to mosquitos. While the incidence of EEE is currently very low, there will likely be an increase. EEE is fatal in one-third to one-half of cases, so the severity is high.				
West Nile Virus	↑	**	Outdoor workers People who hike outside People living in the woods	No prediction possible
The extension of the warmer season and decrease of the colder season will result in more exposure to mosquitos. Incidence of WNV is not large and only 20% of those infected have symptoms, thus the lower severity rating.				
Water-borne diseases	~	**	Recreational water users	No prediction possible
Sea level will rise and there will be an increase in precipitation in Massachusetts. However, there is little evidence about incidence of water-borne illness in the rivers, lakes, and ponds surrounding Northampton.				
Injury and displacement from flooding	↑	**	Low income Elderly	No prediction possible
There is significantly more precipitation projected in the Northeast United States, and the Northampton Hazard Mitigation Plan cites risk of flood as one a high risk. While risk of death is low, there is potential for injury as well as difficulty in evacuating, loss of home, and displacement.				



Natural Systems

- Green infrastructure
- Parks and recreation for all
- Food access
- Wetlands and buffers

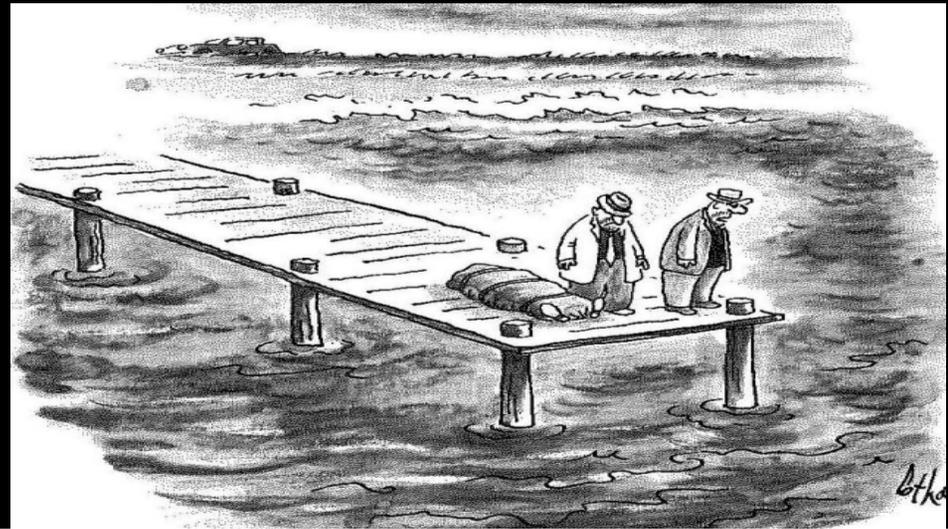


Climate & Energy

- Energy conservation:- reduce demand
- Micro-grid for storm survivability
- Passive survivability
- Climate-change ready street trees
- Stormwater flow



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"I've been dumping bodies here for years, and it seems to me that the sea level is rising."

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