Springfield Community Resilience Building Workshops

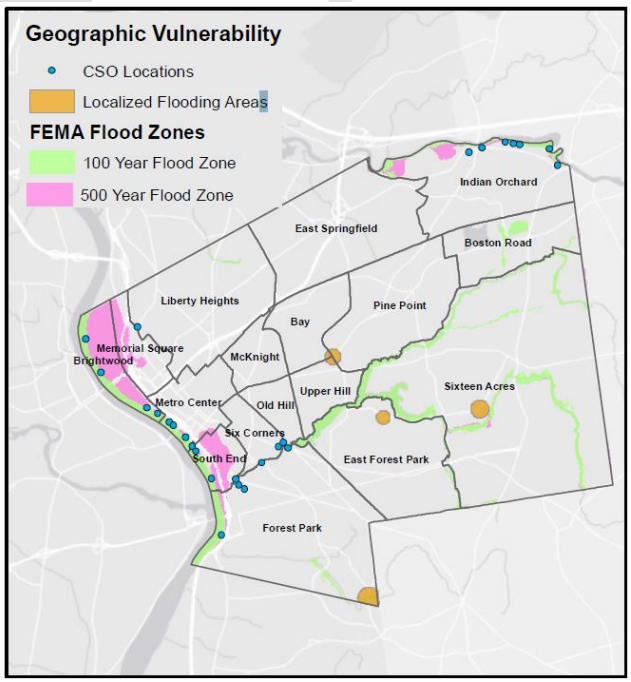
Summary of Findings

Springfield
Community Resilience Building Workshops

Overview:

Clearly, the need for municipalities, regional planning organizations, the state and federal agencies to increase resilience and adapt to extreme weather events and mounting natural hazards is strikingly evident in the City of Springfield which experienced five presidentially-declared weather disasters from 2011-2013, including an EF3 tornado. Recent events such as Tropical Storm Irene, Hurricane Sandy, the October snow storm, and the tornado have reinforced this urgency and compelled leading communities like the City of Springfield to proactively plan and mitigate potential risks through a community driven process. Ultimately, this commendable type of leadership will reduce the exposure of Springfield's citizens, infrastructure and ecosystems and serve as a model for cities and towns across Massachusetts, New England, and the Nation.

Since 2015, the city of Springfield has been collaborating with the Pioneer Valley Planning Commission, Arise for Social Justice, the Public Health Institute of Western Mass, the University of Massachusetts-Amherst, the Commonwealth of Massachusetts, numerous Springfield-based businesses and organizations and the federal government to increase awareness of risks associated with extreme weather and natural and climate-related hazards, working to assess the risks, strengths and vulnerabilities within the City of Springfield.



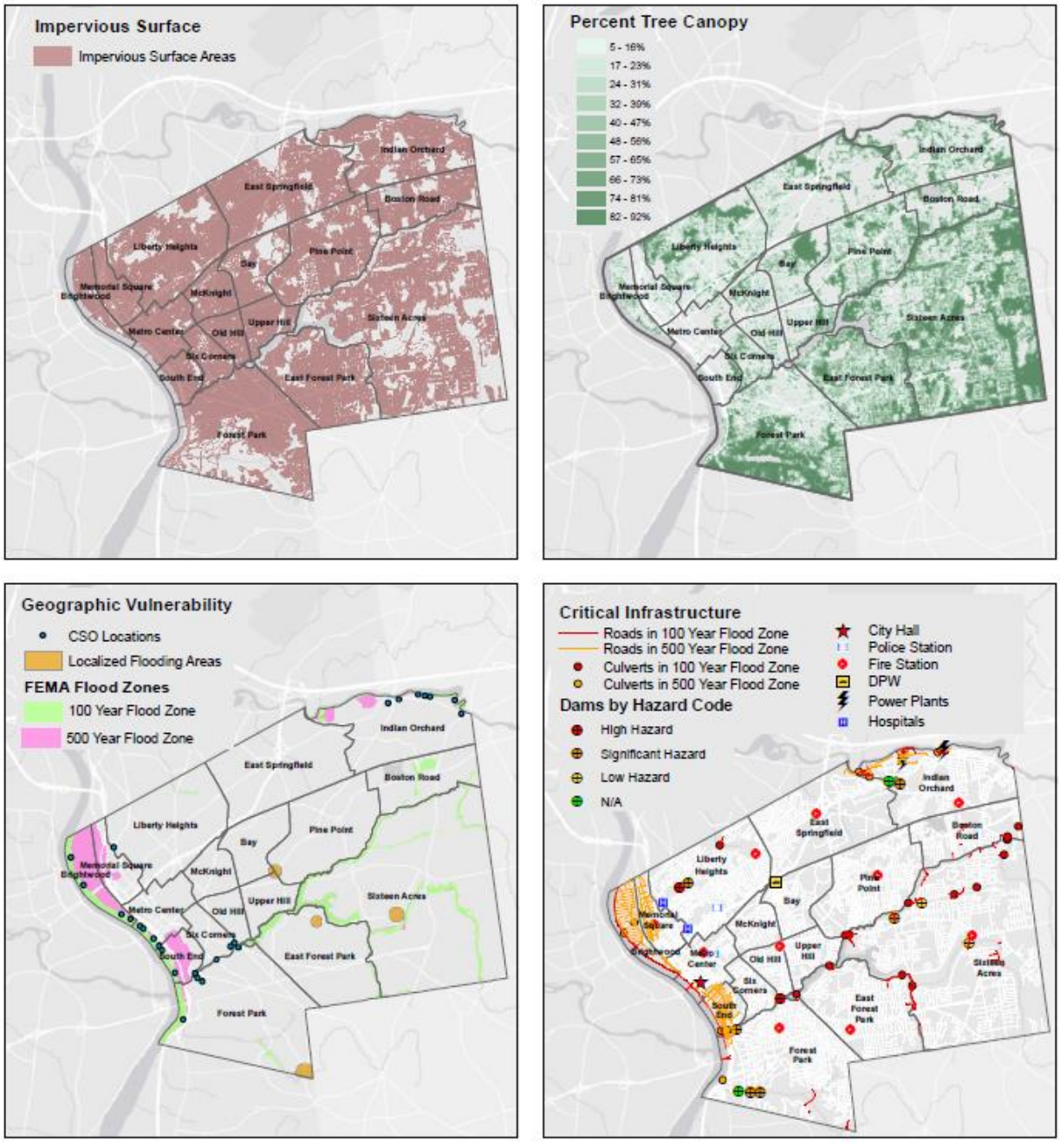
This focus was actualized through collaborative work on the city's FEMA funded Natural Hazards Mitigation plan (which built on the city's ReBuild Springfield plan, commissioned by the Springfield Redevelopment Authority and DevelopSpringfield, and facilitated by Concordia from 2011-2012 after the Tornado), a series of city vulnerability assessments, collaborative work on the city's successful application to the National Disaster Resilience Competition, and the development of the City's **Strong, Healthy & Just: Climate Action & Resilience Plan**. Through years of interactive community-driven presentations, individual interviews, workshops, group meetings, on-line engagement and outreach to build stakeholder willingness and participation followed by a series of community meetings, focus groups, stakeholder interviews, and culminating in a phase one Community Resilience Building (CRB) Workshop in May 2017 followed by phase 2 in April 2018. The core directive of this effort was the engagement with and between community stakeholders in order to facilitate the education, planning and ultimately implementation of priority adaptation actions. To reinforce this directive the Community Resilience Building workshop had several central objectives including:

- Affirm community consensus of extreme weather and local natural and climate-related hazards;
- Identification of existing and future vulnerabilities & strengths;
- Develop and prioritize actions for the City and a broad stakeholder network;

The results of the CRB workshops are summarized in a Risk Matrix (at the end of this document). The Risk Matrix was integrated into the CRB Workshop process to provide both decision-support and risk visualization for the City of Springfield. The report provides an overview of the top hazards, current concerns and challenges, current

strengths, and actions to improve the City of Springfield's resilience to natural and climate-related hazards today and in the future. Much more detail is available in the Complete Risk Matrix, the City's recently completed Strong, Healthy, and Just: Springfield's Climate Action & Resilience Plan and Strategic Action Chart, the City's updated Vulnerability Assessment, the City's 2016 federally approved Hazard Mitigation Plan and on www.resilientspringfield.org.

Geographic Vulnerability & Critical Infrastructure Panel Map- Springfield, MA



Data sources: Info USA Data Services, Massachusetts Office of Geographic Information Systems, Pioneer Valley Planning Commission, U.S. Department of Agriculture Forest Service.

Summary of Findings

Top Hazards for Springfield

During the CRB workshops (and including the events and outreach held as part of the City's recently completed local hazard mitigation planning process, as well as those held as part of the City's coordinated effort to secure $17 million in National Disaster Recovery funds for re-building after the tornado, and the community planning process for the Strong, Healthy & Just: Springfield's Climate Action & Resilience Plan), participants from the community were asked to identify the top hazards for the Greater Springfield region. Inland flooding was identified as the top hazard by the majority of the participants. Extreme weather events in the form of tropical storms, severe wind, snow and ice storms, and extreme heat were also listed universally across most workshop teams. (Box A) According to the participants, these hazards are already having a direct impact on several neighborhoods, natural areas (streams, wetlands, and parks), roads, and other critical facilities within the City of Springfield (Box B).

Box A: Top Hazards for Greater Springfield Region

#1 Frequency and Severity of Inland Flooding

#2 Hurricanes/Severe Wind-->power outage

#3 Severe Snow/Ice Storms-->power outage

#4 Extreme Heat (moving up on the list of concerns)

Box B: Vulnerable Areas in City of Springfield

Neighborhoods: Brightwood, Memorial Square, Liberty Heights, Metro Center, South End, Old Hill, Upper Hill, Bay, McKnight, Six Corners, Indian Orchard

Dams: Watershops Pond, Van Horne Dam, Connecticut River dikes and flood control system

Roads: Columbus Avenue, Main Street, Mill Street, Riverside Road, Water Street, Viaducts and Bridge Crossings

Facilities: Baystate Medical Center, Springfield Housing Authority residences in Brightwood neighborhood, Grochmal Mobile Home park, Eastman Manufacturing, Sisters of Providence Health Facility on Mill Street, Buckeye Pipeline, CSX Rail line, Transportation, Shelters and Cooling Stations, Nursing Homes, Gas Stations, Low Income Housing, Wastewater Treatment, Brownfields

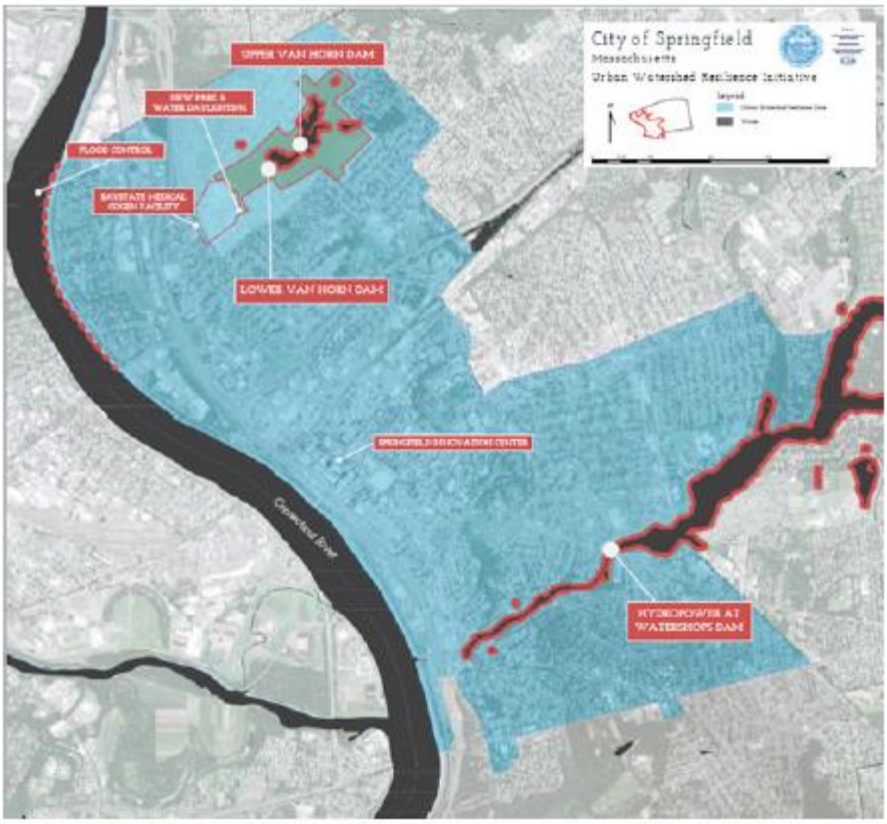


Figure 3. Springfield's Urban Watershed Resilience Zone, from NDRC application.

Current Concerns and Challenges Presented by Hazards

The City of Springfield currently has several concerns and challenges related to the impact of hazards in the community. Many of these were brought to the fore during the recent experiences of a tornado (June, 2011), Tropical Storm Irene (August, 2011) and the October snow storm (2011).

Aged infrastructure and out of date data, combined with the recognition of the need to more aggressively integrate nature based solutions were the key concerns of city officials raised at the May 12 2017 and April 25 2018 Community Resilience Building workshops. City Public Works Director Chris Cignoli stated "We're still using stormwater standards from 1950!" Springfield sits along the Connecticut River and is protected by 12 dams and the CT River dike system. Challenges facing the city are massive, including storm systems, reconstruction and repair of the levee system and flood control drainage systems on and off the CT river, roadway cross sections, street lights, electrical distribution system (limiting expansion of solar), gas lines, and housing stock.

The city has been working pro-actively to replace culverts, and this is an ongoing effort. Springfield has been making good use of zoning and subdivision regulations to prevent/constrain development in sensitive areas and is moving forward with a systematic and deliberate integration of green infrastructure. Loss of power is a concern and the city has invested additional resources in tree management as one of the many lessons learned after the 2011 'year of disasters', when over 100,000 trees were lost, and the need to inventory and plant more trees emerged as a high priority. Associated risks to public health and safety included potential for disease outbreaks due to overflowing and standing sewage, surface and ground water contamination, mold outbreaks in flooded basements, mobilized debris in the streets and clogging storm drains, and the potential for release of toxic materials from brownfields and other storage facilities in flood-prone areas.

Because of the city's success with the National Disaster Resilience funding, the city is implementing many key resilience projects, including upgrading the newly re-built Brookings school in the historically African-American Mason Square

neighborhoods: Old Hill, Six Corners, Bay, McKnight and Upper Hill as a neighborhood based emergency shelter, supporting the Combined Heat and Power (CHP) project at Baystate which will yield 30 days of back-up power in the event of extended power outages, and other initiatives detailed below.

Vulnerabilities in the city are complicated due to the diversity of the City's demographics: the significant number of economically disadvantaged residents who do not have access to a vehicle and are dependent on the PVTA whose funding is being cut, who live in poorly insulated homes necessitating higher spending on energy, and who may not be proficient English speakers. Actionable news updates and instructions originating from city officials and emergency managers and delivered by trusted messengers (technology plus process) were identified as key to ensure preparedness and proactive responses by an informed and aware citizenry. But lack of confidence in city government has also emerged as a key vulnerability. After the tornado, residents of color reported feeling like majority white neighborhoods were better protected by police and received faster assistance from DPW than their predominantly African American and Hispanic neighborhoods/blocks. In addition, the city's dubious distinction (documented in a 2013 University of Michigan study) as the most segregated in the nation in terms of white and Hispanic separation, and 22nd in terms of black and white segregation and 57th in terms of white and Asian segregation, was lifted up as a serious vulnerability. Segregation results in disparate access to opportunity, leaving residents of color less able to 'bounce back' after a disaster.

Current Strengths and Assets within Springfield

The City of Springfield views its recent experiences with increasingly extreme weather patterns and hazard events as ongoing issues to be addressed boldly and with urgency. Actions that the City has already initiated are focused on several key areas of preparedness:

Existing Assets/Initiatives-strengths

- Re-developed the tornado-destroyed Brookings School into an emergency shelter with back-up power;
- Assisted Baystate Hospital with NDR funding to develop Combined Heat & Power facility with long-term back-up power in the event of prolonged power outage;
- Mayor formed City Disaster Resilient Department Head working team and was one of only 13 entities across the country successful in securing $17 million in NDR funds;
- Very effective use of zoning and subdivision regulations to prevent development in hazard areas;
- Robust existing plans with numerous recommendations, that, when implemented, will dramatically reduce the City's vulnerability;
- On-going dialogue between federal, regional, municipal and neighborhood levels on response and preparedness;
- Strong social services network: community-based organizations, faith-based community, sheltering facilities, and hospitals;
- Broad network of education resources that can assist with public awareness and outreach: public library network, universities and colleges, and schools;
- Rich natural resources, recreational areas, and green infrastructure that provide buffering, water storage and protective capacity to the City;
- Commitment to Green Infrastructure by the City DPW, including securing funds from EOEEA to launch development of a Green Streets/Green Infrastructure Guidebook for the city;
- City has been very active in PVPC led Ct River Clean-up Committee and CT River Stormwater Committee and has been working cooperatively with PVPC, MA DEP, and neighboring cities and the federal government to secure funds to separate city combined sewer outfalls;
- City is committing NDR funds to work with economically disadvantaged residents and landlords who own properties where poor people live, to make sure these homes are as healthy and as resilient as possible;
- City has robust 311 service and many residents use NextDoor app for communication.

Top Recommendations to Improve Springfield's Resilience to Hazards

The responses from the Workshop's participants regarding recommended actions to reduce exposure to natural hazards fell into four categories: Building Resilient Infrastructure; Managing the Urban Forest, Back-up Power, and Building Human Resilience. Pervasive throughout the discussion was the need to proactively manage the risk posed by these hazards as well as the need to comprehensively assess the return on actions within an economic, societal, and ecological context. Because Springfield ran their CRB workshops over a 12 month period, the top recommendation is already underway, that if working to develop a Springfield-specific Green Streets/Green Infrastructure Guide for city and private development work in the city. While Springfield was not certified as an MVP community, the city was given credit for their work on the CRB workshop held in 2017, enabling the city to allocate a portion of their MVP planning grant toward the Green Infrastructure Design guide.

STRATEGIES to Build Resilient Infrastructure

1. Develop a Springfield-specific Green Infrastructure (GI) policy and design manual, which should include:
    - Standards by location & city-wide
    - Set of criteria to assist developers and the City in determining what type of infrastructure system is appropriate for a given location and project type. This set of criteria should set GI as the standard, requiring developers to prove they have completed a thorough site analysis and alternatives assessment regarding infrastructure systems design.
    - Neighborhood-specific content, designed to educate Springfield's 17 neighborhood groups at the concept-level.
2. Highlight projects already in the city to help build the case and educate neighborhood residents and developers alike. Monitor public and private installations.
3. Set up "pop up green infrastructure" demonstrations along public roadways, in public plazas and parks, in public and commercial parking lots, and in other highly trafficked and/or highly impervious sites.

STRATEGIES to Manage the Urban Forest

1. Identify and secure funding for a city-wide survey of trees.
2. Identify and secure sustainable funding sources for annual tree planting.
3. Identify and secure sustainable funding sources for tree care and maintenance of public trees.
4. Focus planting efforts in neighborhoods with the greatest risk of urban heat island (UHI) effect and the lowest rate of tree canopy cover.
5. By 2022, plant 5,600 trees on public property and by 2060 achieve 100% stocking levels and have planted an additional 55,000 trees on public property.
6. By 2022, plant 300 trees per neighborhood on private property for a total of 5,400 trees across Springfield's 18 neighborhoods.
7. Secure funding and develop an incentive program for planting trees on private properties.
8. Implement a city-wide green infrastructure policy, as identified in Strategy 1 of the Building Resilient Infrastructure goal.

Additional work to do:

9. Enhance opportunities of forestry-related job and skills trainings for Springfield's youth and residents and collaborations with area academic institutions
10. Increase public education efforts pertaining the value and importance of trees, shrubs, and fruit producing vegetation regarding:
    - Food access and security
    - Mental and community health co-benefits
    - Urban ecosystem services

STRATEGIES to Build Human Resilience

1. City will work deliberately to restore faith in city government, especially with respect to explaining what the city is doing to be resilient and to protect residents from the effects of disasters, including communicating with residents on resilience initiatives and providing details to residents on how they can reduce their own vulnerability and enhance their individual, family and neighborhood strength.
2. City work to address perceived cultural insensitivity and work to develop cultural competence and understand diversity as a strength and not a weakness.
3. Work to improve access to transportation for residents who do not have access to an automobile, to assure mobility in the event of prolonged power outages and the need to evacuate, including ongoing advocacy for increased funding for the Pioneer Valley Transit Authority and East/West rail, as well as programs to encourage employers to offer subsidies for bus passes and ValleyBike Share membership and ongoing aggressive participation in the MassDOT Complete Streets funding program.
4. Establish a program, spearheaded by utilities, to provide super energy efficient air conditioners to homeowners and renters who do not have access, contingent upon completion of Mass Save HEA and full implementation of recommended energy efficiency home improvements to maximum $2,000 incentive.
5. City, SHJ Implementation team, businesses, and anchor institutions create a program to provide low or no cost (as needed) property insurance coverage to all vulnerable homeowners and renters.
6. Assess the feasibility of adopting a building requirement for air conditioning in all new developments and as part of any major rehabilitation work over a certain size (excluding single family homes).

STRATEGIES to Develop Back-up Power

Create a Springfield micro-grid working group to advance this initiative. Members should agree to implement the following detailed action plan:

- Meet with Eversource and ISO New England to understand grid connection and other issues.
- Research how other cities are implementing micro-grids, and conduct site visits and conference calls to exchange ideas. Possible site visits include the Codman Square CDC project in Dorchester and the fuel-cell micro-grid in Woodbridge CT.
- Research funding opportunities from Massachusetts Clean Energy Center, Department of Energy Resources, and other sources. Apply for feasibility study grants.
- Investigate battery storage for micro-grid and emergency back-up power, especially for nursing homes and grocery stores in vulnerable neighborhoods.
- Engage UMASS researchers as appropriate.
- Engage the largest property owners and energy users, such as MassMutual, Baystate Hospital, MGM, Picknelly, Mass Visitors & Convention Bureau, and the Greater Springfield Chamber.
- Focus on Downtown/Metro Center and integrate EV car charging stations
- Conduct research to understand the level of retro-fitting necessary in existing buildings in order to connect to micro-grid.
- Assess the feasibility of a regulatory option requiring new developments to be 'micro-grid ready'.
- Oversee feasibility study.
- Launch project by 2019 for completion in 2020.

The City of Springfield continues to work to advance implementation of these recommendations. Additional detail is available at www.resilientspringfield.org

Workshop Participants: City Departments, Organizations and Other Entities

All City of Springfield Departments
Pioneer Valley Planning Commission
DevelopSpringfield
Springfield Partners for Community Action
Columbia Gas
Eversource
Regional Employment Board of Hampden County
Springfield Technical Community College
American International College
Baystate Hospital
Springfield City Council
LiveWell Springfield
ReGreen Springfield
Co-op Power
Center for Eco-Technology
City Neighborhood Councils
Public Health Institute of Western MA
Arise for Social Justice
University of Massachusetts Amherst LARP/Design Engagement

Note: Additional groups were represented during portions of the workshops; those listed above participated in one or both full workshop sessions and/or stakeholder sessions

Workshops Project Team: Organization and Principal Contact

City of Springfield - Tina Quagliato, Director of Disaster Recovery
Chris Cignoli - Director Department of Public Works
Patrick Sullivan - Director Buildings, Parks and Recreation
Bob Hassett - Emergency Management Director
Shayvonne Plummer - Office of Planning and Economic Development
Geraldine McCafferty - Director Department of Housing

Certified CRB Provider: Pioneer Valley Planning Commission– Catherine Ratté (Project Lead)

Acknowledgement:

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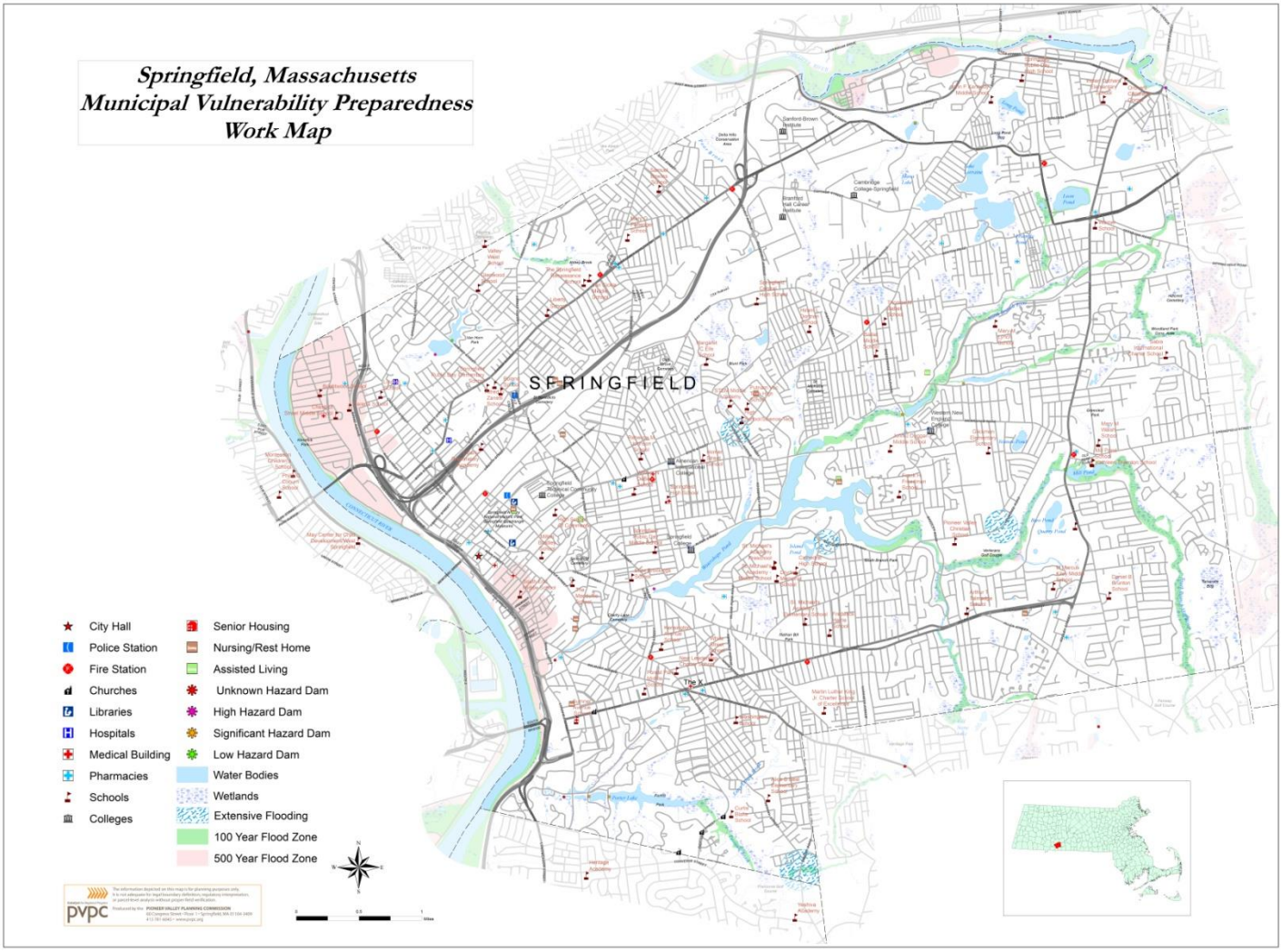
Springfield, Massachusetts
Municipal Vulnerability Preparedness
Work Map
SPRINGFIELD
City Hall
Police Station
Fire Station
Churches
Libraries
Hospitals
Medical Building
Pharmacies
Schools
Colleges
Senior Housing
Nursing/Rest Home
Assisted Living
Unknown Hazard Dam
High Hazard Dam
Significant Hazard Dam
Low Hazard Dam
Water Bodies
Wetlands
Extensive Flooding
100 Year Flood Zone
500 Year Flood Zone
pvpc

Community Resilience Building Risk Matrix **www.CommunityResilienceBuilding.com**

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

H-M-L priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability **S** = Strength

Features	Location	Ownership	V or S	Extreme Heat <==> Strategic Actions Cut	Inland Flooding <==> Across All the	Winter Storms <==> Hazards	High Winds (power outage etc) <==>	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Majority of City's Storm Systems > 75 yearsold. Resiliency requires completed replacements or redundancy of systems. Current roadway cross section do not accommodate additional placement of redundant utilities	City-wide	City	V	**Continue to develop & implement Green Infrastructure/Green Streets Guide & Policy Regulation**	Advance Green Infrastructure/Green Streets Policy/Regulation	Keep securing grants and bonds from Feds and State and private sector	MS4 permit reqs	H	S O
Aged Electrical Distribution System (is limiting expansion of solar in city) & aged/aging gas lines	City-wide	City/Utilities	V	Accelerate city's transition to clean, safe, sustainable energy--via Community Choice aggregation, PACE and Solarize	Move utilities underground--where it makes sense	Explore/advance micro-grid and distributed generation	Baystate CHP	H M	S O L
Aged infrastructure--water and sewer lines, pipes, roads, sidewalks, streetlights etc	City-wide	City	V	Explore cement v asphalt and porous pavement where possible	Advance Streetlight working group	Continue to apply for Complete Streets funding	Update Building performance requirements for extreme heat, more flooding and high winds--? Toward net Zero req	H	S, O
Low tax base	City-wide	City	V					M	O
Combined sewers	N. End, Metro Ctr, S. End	City	V	Continue collaborative work with CT River Clean Up committee				H	O
Housing and other Building abandonment	Tornado area & city-wide	Private	V	Code Enforcement	Conduct a comprehensive assessment of the status of all vacant,	Improve inspections and compliance	Incentivize re-development	M	O L
Necessary re-construction of roads	Riverside	City	V	Keep securing Ch90 and CS funds so when streets are upgraded they are "Complete" and GREEN	Green Streets Guide and Policy Impl	Advocate & Secure TRAILS funding for in-city transportation, esp Highland Rail Trail		M	O
Necessary re-construction and repair of levee system and flood control drainage system on and off CT River	N End	City	V	Continue to work with federal and state govt for stable				H	O
Baystate Health Co-Gen	N End	Private w/ city, state, fed govt	S					H	S
Aging Housing stock	City-wide	Private	V	Educate renters on tenant rights	Promote MassSave and Ener-G-Save			M	O
High rates of impervious surface: 34% most in region	City-wide	City	V	Implement GI	Plant Trees			M	O
Brookings School hydro-power @ Watershops Pond	Old Hill	City	S					M	S L
Upper and Lower Van Horn Reservoir Dams with planned real-time monitoring	Liberty Heights	City	V-S					H	S
North End Drainage System and Flood pump repair and hardening	N End	City	V					H	S
North End Cycle Track and Riverfront Bikeway/Walkway Access	N End	City	S					H	S
Revitalized Union Station	Metro Ctr	City/State/Fed	S						
ValleyBike Share and new Pedestrian Way-finding	Metro Ctr	City/State/Fed/private	S						
Springfield active participant in Pioneer Valley EV Charging Station plan--and MGM has committed to significant #	Metro Ctr	City/State/Fed/private	S	Implement recommendations				L	O
DevelopSpringfield works in City to revitalize/restore troubled buildings	City-wide	Private/City	S						
High Hazard Dams	City-wide	City	V	Work w/ Office Dam Safety and MEMA, FEMA to maintain, remove				M	O
Features	**Location**	**Ownership**	**V or S**						
Societal									
Poverty: Median household income Spfld-$31,356 v MA $65,339; Poverty rate Spfld 33.3% v MA 11.9%; S. End-63.6% & 5 other neighborhoods >40% [2012 data] & Poverty for Older Residents: 13.7% Spfld v. 9.3% MA; S. End-58.5%, McKnight-27.1%	City-wide, resilience dist	City	V	Increase small business incentives, w/ focus on env sustainable business dev	Support and expand REB Job training			M	O
Segregation=disparate access to opportunity for residents of color, resulting in areas of concentrated poverty and therefore reduced ability to 'bounce back'	N End, Metro Ctr	City, Private	V	Expand BID to include Union Station area	Increase cultural competence/address segregation directly, via education, festivals and re-distribution of assets	Promote mixed-income housing devs in all neighborhoods		M	S
Unemployment: 10.95% v MA 6.72%	NE, SE, Mason Sq	City, Private	V	Increase small business incentives, w/ focus on env sustainable business dev	Expand internship opportunities for Springfield youth	Hire un/under-employed residents for city initiatives when possible, and require businesses to do as feasible		H	O
Lack of access to a vehicle combined with lack of State support for PVTA and other RTAs--cuts in funding	City-wide	City, Private	V	Continue to advocate & support increased funding for RTAs, esp PVTA and accelerate transition to E-buses	Advocate for East-West Rail	Educate vulnerable residents about evacuation plans BEFORE need to evacuate		H	O
Low home-ownership: 47.5% v. MA 62.2% & Subsidized Housing 16.2% v. 9.1% MA	City-wide, resilience dist	City	V					M	O
High energy costs	City-wide	City, Private	V	Accelerate city's transition to clean, safe, sustainable energy--via Community Choice aggregation, PACE and Solarize	Promote MassSave and Ener-G-Save			L	O
Low rates- pre-natal care, birth weight and high infant mortality	City-wide	City	V	Continue DHHS programs and support ACOs in city				H	O
Very high asthma rates (10.9% MA students v 17.2% Spfld students)	City-wide	City	V	Monitor air quality and keep working to improve it--expand Healthy Homes initiative and plant more trees	Support Pioneer Valley Asthma Coalition			H	O
Low student stability rate (86.8% v MA 95.6%)	City-wide	City	V	Connect schools with families and Neighborhood Councils	Work to diversify school staff so more representation of			H	O
High rates of Obesity (35.7% v MA 22.7%)	City-wide	City	V	Continue Mass in Motion, 1422, LiveWell Springfield,				H	O
Small businesses lost after Tornado	Resilience dist	City, Private	V						
Healthy Homes Initiative	Resilience	City	S	Expand					
Springfield Innovation Center-14 new small businesses	Mtr Ctr		S	Expand					
REB Job Training	City-wide	City, Private	S	Expand					
Tech Foundry Information Technology job training	Mtr Ctr	City, Private	S	Expand					
Lack of confidence in government by residents, esp Police	City-wide	City, Private	V	Improve communication w/ residents esp. on Resilience work planned & underway-target vulnerable residents	Modernize city's mechanisms of communicating w/ residents-Facebook pages, web-site, 311,	Educate residents on what government does--civics	Keep expanding C3 policing across the city	H	O
Vector borne diseases	City-wide	City, Private	V	Crack down on illegal dumping	Educate to stop voluntary transfer,	Join Mosquito control district		M	L O
Heating & Cooling Centers and commitment to improve communication from DHHS	City-wide	City	S						
Academic Institutions--yield local interns	City-wide	Private	S						
City government has higher % of outside funding supporting basic municipal operations than any other city--legacy of 2008 Finance Control Board take over? Or maybe success negotiating with MGM?	City-wide	City, Private	V	Consider Stormwater Utility and innovative financing mechanisms				L	L
City Council recently re-activated Green Committee	City-wide	City	S						
High #s of non-native English speakers	City-wide	City	V					L	O
Existing Structure of Neighborhood Councils	City-wide	City	S	Some are stronger than others-need Training and Capacity Building and better support from City				M	S
Features	**Location**	**Ownership**	**V or S**						
Environmental									
Increase in flooding dues to predicted increased duration and volume of rainfall	Resilience dist	City, Private	V	GI/GS work and implementation	Assess and upsize culverts over time	Plant trees		H	L O
More extreme heat	City-wide	City, Private	V	Expand small parks and assure access to splash parks in all neighborhoods, esp targeted resilience area with	Investigate viability of community pools	Plant trees	Improve access to AC in low income/senior housing	H	L O
Environmental degradation from past disasters--loss of tree canopy (100,000 trees lost in tornado) and erosion, debris and sedimentation, habitat loss	Resilience dist	City, Private	V	More stable funding for Forestry, including survey and implementation of existing				H	L O
ReGreen Springfield is planting trees and educating Citizen Scientists	Tornado area, city	City	S						
Green Streets/Green Infrastructure Guidebook under Development with work on Regulation/Policy pending	City-wide	City, Private	S	CONTINUE				H	S
Planned daylighting of water at Van Horne Park	Liberty Heights	City	S					H	S
Commitment in NDR proposal to increase green space and reduce impervious surfaces-Riverfront Park & Riverside Drive bike path	Mtr Ctr	City	S					M	S
Brownfields-contaminated soil	City-wide	City, Private	V	Explore Green Remediation techniques	Consider for solar arrays		Work with DEP, EPA and others for funding to	M	L O
Invasive Species and pests	City-wide	City, Private	V	Educate to stop voluntary transfer, growth--remove tires from lots/yards, etc	Join Mosquito control district			M	L O
Well-protected, cared for and ample water supply	City-wide	Private	S				Maintain	H	O
Pending drought	City-wide	All	V	Review zoning and other regualtions to assure relevance and applicability given climate change impacts--esp increased heat, flooding, drought and power outages	Conserve water and educate on water conservation			L	L