



CITY OF SPRINGFIELD

National Disaster Resilience Competition

Phase II

October 27, 2015



CITY OF SPRINGFIELD

Exhibit A: Executive Summary

ExhibitA_ExecSum_Springfield_MA.pdf

Springfield, Massachusetts, located at the crossroads of New England at the confluence of four rivers, is creating an **Urban Watershed Resilience Zone** (see Attachment E – Resilience Zone) made up of its most economically distressed neighborhoods. With National Disaster Resilience funding and leveraged resources, the City will carry out a portfolio of projects throughout this 6.8 square mile Zone that will: provide flood protection; introduce two clean redundant energy sources; create and enhance business, employment, and job training opportunities; provide safe and healthy housing; and continue to engage residents regarding climate change and environmental stewardship. The Zone’s projects have significant co-benefits, including recreation opportunities, local and regional health benefits, decreased heat island effect, disaster preparedness, and climate change mitigation. The City’s comprehensive approach in a focused target area will support neighborhood revitalization. Springfield is piloting these projects in the region’s lowest-income neighborhoods, with the long-term plan of expanding key interventions city-wide and providing a model for other towns in the Pioneer Valley. In addition, the Urban Watershed Resilience Zone is intended to serve as a model for Springfield’s peer cities - waterfront urban communities in the northeast and mid-Atlantic - to respond to flood and energy interruption risks expected as a result of climate change, as well as to the challenges of urban poverty (see Attachment E – Replicability).

The City and its partners request \$57,843,167 in National Disaster Resilience funds to support this resilience initiative, which will leverage \$82,331,122 in other investments. The proposed projects draw on strategies identified in region’s 2012-2014 HUD-funded Sustainable Communities Regional Planning initiative, and will significantly enhance the long-term commitment that Springfield has already made to climate change adaptation and mitigation through long-term planning, and legislative and policy change.

The impacts of climate change and recognition of the need to find ways to live with water and the changing environment became strikingly apparent for Springfield during the period 2011 through 2013, when the city experienced five presidentially-declared disasters, the most of any municipality in the country during that time period. The most severe was an EF3 tornado—very unusual in New England—which tore a ½ mile wide, 6.2-mile long swath of destruction through the heart of the City’s downtown and residential neighborhoods. Tornado damage to structures, including leaking roofs, was exacerbated by wind and rains of Tropical Storm Irene in August 2011. Another freak storm, the October 2011 record early snowstorm, decimated the City’s tree canopy which was vulnerable because trees were still fully-leafed out. Springfield’s other disasters were a 2011 blizzard and 2013 Superstorm Nemo.

Springfield is located in western Massachusetts and is the fourth largest city in New England, with a population of roughly 150,000, in a metropolitan area of almost 700,000. While the City is unique in experiencing so many disasters in such a short time, it is otherwise a prototypical northeast post-industrial city. Following loss of manufacturing jobs, white flight, foreclosures and housing abandonment, the City’s economic distress has become geographically concentrated in the neighborhoods designated as the Urban Watershed Resilience Zone. These neighborhoods abut the downtown area, are closest to the Connecticut River, have a 41% poverty rate, and are made up predominantly of people of color. The target neighborhoods are home to 10% of the region’s total population but include 32% of all Latinos and 31% of all blacks in the metropolitan area.

Springfield as a whole has a 32% poverty rate, which compares to the statewide Massachusetts rate of 11%. Widespread and deep poverty in the City negatively impacts the tax base, making it difficult for the City to contend with aged infrastructure and vulnerable residents.

The City functions as a gateway city for migrant Puerto Ricans and immigrants and refugees from Central America, Vietnam, Eastern Europe, and African nations. While the City is the employment and economic center for the region, most high paid workers live outside of Springfield, while City residents are more likely to be undereducated, and in low-paying positions or unemployed.

Poverty, unemployment, and high rates of health problems are chronic stressors that make Springfield and its residents extremely vulnerable in the face of disaster. Layered onto these stressors, climate change science indicates that Springfield is likely to experience increased extreme weather events, particularly storms which will include increased duration and volume of rainfall. Increased rain combined with environmental degradation from past disasters makes low-lying distressed neighborhoods subject to localized flooding, and overwhelms the City's combined sewer overflow (CSO) outlets. CSO overflow and stormwater runoff pollutes the Connecticut River, a National Blueway that flows through four states from the Canadian border to the Long Island Sound.

Over the past decade, the City has developed very strong administrative and managerial leadership, as well as built partnerships with community anchors and partners in the region and state. The City has successfully led not only disaster recovery, but also major neighborhood revitalization initiatives, ongoing restoration of Urban Station into a multi-model transportation center, and attraction of major businesses to the City. With its partners, the City has brought about collective impact in areas of community health, access to early childhood education, public safety, and ending chronic and veteran homelessness. City residents are extremely active in the conversation about climate change and environmental justice. Springfield is ready to become a resilient city.



CITY OF SPRINGFIELD

Exhibit B: Threshold Requirements

ExhibitB_Threshold_Springfield_MA.pdf

I. ELIGIBLE APPLICANT

HUD designated the City of Springfield, MA as an eligible applicant to the NDR.

II. ELIGIBLE COUNTY

Springfield is located in Hampden County, MA, which is listed as a most impacted and distressed County in HUD's Appendix A.

III. MOST IMPACTED AND DISTRESSED TARGET AREA(S)

Springfield is located in Hampden County, MA, which is listed as a most impacted and distressed County in HUD's Appendix A.

IV. ELIGIBLE ACTIVITY

The proposed CDBG-NDR activities are all CDBG-eligible activities, with the exception of one activity; an eligibility waiver request is submitted for the ineligible activity. Each eligible activity is listed below by eligibility category.

Public Facilities and Improvements: Tree canopy restoration; tree boxes/green infrastructure; flood control/drainage systems; dam improvements; dam instrumentation; waterway restoration; removal of waterway debris; Van Horn Park expansion (new passive park) and connector trails; new North End bikeway access points; and Riverfront Park enhancements.

Economic Development: Springfield Innovation Center, a new-business incubator

Housing Rehabilitation: Housing rehabilitation, lead hazard removal, healthy homes

Public Service: Citizen Science, Green jobs workforce training

Ineligible Activity: Restoration of hydro-electric power generation at the Watershops Pond dam and use of that power to provide electricity to an adjacent elementary school which was constructed to be able to function as an emergency center. If the waiver request is denied, income generated from the sale of electricity will be treated as Program Income.

V. RESILIENCE INCORPORATED

The specific methods by which each proposed activity will increase the City's resilience as well as specific metrics to determine the success of each activity are described in Exhibit E and the benefit-cost analysis included as Attachment F. Springfield has committed to legislative and policy changes that will increase resilience. These actions are detailed in Exhibit G.

VI. NATIONAL OBJECTIVE

Based on assessments of the populations that will directly and indirectly benefit from the City's proposed activities, Springfield will utilize the Benefit to Low-to-Moderate Income Persons National Objective for all proposed activities except for the co-generation facility, Springfield Innovation Center, and Citizen Science Initiative, which will utilize the Urgent Need National Objective.

VII. OVERALL BENEFIT

Based on an analysis of activity service areas and the populations that are reasonably expected to benefit from the activities, the City estimates that 75% of the funds requested will benefit LMI populations. A summary the preliminary LMI benefit analysis and maps detailing the proposed activities and their service areas are included in Attachment E – Service Areas.

VIII. ESTABLISH TIE-BACK

All of the activities included in the City of Springfield's Phase II application have a direct tie back to the five qualified disasters between 1/1/2011 and 12/31/2013: DR-1959 (January 2011 snowstorm), DR-1994 (June 2011 tornado – see Attachment E – Tornado Path), DR-4028 (Aug. 2011 Tropical Storm Irene), DR-4051 (Oct. 2011 severe storm and snowstorm), and DR-4110 (Feb. 2013 severe winter storm, snowstorm and flooding). Exhibit D details the specific impacts sustained in the areas of housing, infrastructure, economic development, and the natural

environment. Specific tie-backs are listed below. See Attachment E – Disaster Impacts for images of the impacts from recent disasters.

Riverfront Park enhancements, North End Riverside Drive enhancements, Van Horn Park expansion and stream daylighting: Tie-back to extensive loss of tree canopy and damage to park infrastructure from DR-1994 and DR-4051.

Clearance of waterway debris/Restored water storage capacity of ponds and streams: Tie-back to filling of ponds and waterways with trees, vegetative debris and, in some case, construction material and other rubbish from DR-1994 and DR-4051.

Public Way Trees—tree planting, stormwater collecting tree boxes: Tie back to extensive loss of tree canopy from DR-1994 and DR-4051.

Restoration/hardening of Van Horn dams: Tie-back to damage to dam from DR-4051.

Restoration/hardening of Watershops Pond dam: Tie-back to direct damage to dam from tornado, DR-1994, and extraordinary amount of storm debris from DR-4051.

Water control and quality monitoring: Tie-back to impacts to water quality and flows from extraordinary amount of storm debris from DR-1994 and DR-4051.

North End Flood Control System/Riverside Road: Tie-back excessive debris and sediment caused by increased flow after storms clogged and damaged system from DR-4051.

Clean redundant energy—hydropower and cogeneration: Tie-back to repeated and extensive power loss during storm events, DR-1994, DR-4028, DR-4051, and DR-4110.

Housing rehabilitation/healthy homes: Tie-back to high level of housing abandonment due to poor condition and low values of damaged properties in distressed neighborhoods; decrease in number of available decent safe and sanitary housing units from DR-1994.

Springfield Innovation Center: Tie-back to small business loss due to DR-1994.

Workforce training: Tie-back to spike in unemployment following tornado, DR-1994.

Citizen Science and Tree Steward programs: Tie-back to extensive tree loss and environmental degradation from DR-1994, DR-4028, DR-4051, and DR-4110.

IX. BENEFIT-COST ANALYSIS

The estimated benefit of the City's proposed project is \$247,906,692 and the estimated cost is \$101,495,258. As a result the benefit-cost ratio is 2.44. See Attachment F for full details on the benefit-cost analysis.

X. CDBR-NDR APPLICANT CERTIFICATIONS

The required certifications are provided in Attachment C.

XI. UNMET RECOVERY NEEDS

Housing: Forty affordable housing units owned by the Springfield Housing Authority (14) and Hill Homes Cooperative (26) were severely damaged by the 2011 tornado (DR- 1994) and were demolished. The unmet need for replacement of the 40 units is \$4,951,145, and the amount of CDBG-DR that the City is able to allocate to these projects is \$1,600,000. No other funding, including FEMA, insurance, SBA, or other sources, is available to address the remaining needs. See the Housing Dropbox Folder for documentation of these needs, including photos of the properties and certifications from property owners.

Infrastructure: Unmet infrastructure needs resulting from the multiple disasters that Springfield sustained (DR-1959, DR-1994, DR-4028, DR-4051, and DR-4110) are the reconstruction of roads damaged by repair vehicles after the storms and repair/replacement of the City's flood control drainage system. The funding gap for these projects is \$6,375,975 and there have been no funds identified to address the gap. See the Infrastructure Dropbox Folder for a description of the damages as well as a stamped engineering certificate from Christopher M.

Cignoli, P.E. certifying damage estimates for repairing unmet needs from the federally qualified disasters.

Environmental Degradation: The funding gap needed to repair environmental damage caused by debris from DR-1959, DR-1994, DR-4028, DR-4051, and DR-4110 in the City of Springfield is \$1,677,000. See the Environmental Degradation Dropbox Folder for sources and uses for these projects as well as supporting documentation that describes the remaining damage due to the storm events impacting the City of Springfield. This includes a *Vegetative Debris Removal Report* (2011) and a summary signed by Christopher M. Cignoli, P.E.



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Exhibit C: Factor 1 - Capacity

ExhibitC_Capacity_Springfield_MA.pdf

I. PAST EXPERIENCE

i. General Administrative Capacity

The City of Springfield has extensive experience in management of federal grants, including Community Development Block Grant (CDBG), HOME Investment Partnerships Program, Neighborhood Stabilization Program (NSP), Continuum of Care Program, and Economic Development Administration (EDA) grants. The City has been successful in applying for and carrying out competitive federal grant programs, including Choice Neighborhoods Initiative (CNI) planning, Byrne Criminal Justice Initiative (BCJI), and Section 3 Coordination and Implementation, as well as being selected to participate in HUD's ConnectHome Initiative.

The most significant demonstration of the City's capacity to undertake the proposed NDR program is the City's recent and ongoing experience carrying out recovery and rebuilding following the devastating 2011 tornado. Springfield planned and is implementing \$21.8 million in CDBG-DR projects, which are coordinated with \$33 million in school building development and repair due to the disaster, and \$60 million in rebuilding and alternate projects funded with Federal Emergency Management Agency (FEMA) public assistance.

Springfield has managed its recovery through an inter-departmental team led by the City's Chief Development Officer, closely coordinated with the City's Chief Financial Officer and City Solicitor. Due to rapid funding availability and strong design and construction management, the City's first rebuilding projects were extensive repairs to the Dryden Elementary School, completed in 2013, and construction of the state-of-art environmentally-sustainable Brookings Elementary School, completed in early 2015.

Springfield's award of \$21.8 million CDBG-DR funds was made in 2013. The City quickly established its Office of Disaster Recovery and Compliance ("DR Office") and hired the office's

director, financial analyst, and DR program manager. Program set up included creation of the *CDBG-DR Policies & Procedures Manual*, which describes the City's financial policies, internal controls and procurement policies, and which emphasizes mitigation of fraud, abuse, and mismanagement related to accounting, procurement, and accountability.

The DR Program includes thirteen activities. For each of the programs carried out by a subrecipient, the DR Office created program policies and procedures, conducted a procurement process in accordance with federal and state law, selected the most qualified partners, and entered into subrecipient agreements or contracts with those entities. As subrecipients and vendors carry out the activities, the DR Office monitors the work through review of subrecipient policies and procedures, contract compliance, on-site monitoring visits, careful review of submitted invoices and backup, and tracking of project timelines and outcomes.

The DR Office carries out the homeowner repair program directly. For this program, the DR Office set up policies and procedures, created a program application and application process, and marketed the program to homeowners in eligible neighborhoods.

Some DR projects are carried out by other City departments and vendor contractors hired by those departments. The Department of Public Works (DPW) is undertaking road realignment projects, the Parks Department has overseen park restoration, and the Office of Management and Budget has purchased two school buildings. For these projects, the DR Office reviews and maintains records of bid, contract, invoicing and outcomes.

Springfield's CDBG-DR work and funding draw-downs are planned to take place in phases. While it has programmed the full grant, the City has committed only the first \$13 million in Partial Action Plan A. At 22 months into implementation of Action Plan A, the City has spent over \$8 million, and has submitted an extension request for the remainder. The City expects to complete

spending for Action Plan A in 2019 and plans to submit Partial Action Plan B in early 2016 to guide the next major series of investments.

To date, the City has completed the following activities: design and engineering for two major road realignment/road construction projects; initiated all land takings/easements needed for the road projects; rehabilitated a large City park; acquired land and constructed 2 energy-efficient homes (with 3 more underway); demolished 19 distressed buildings; started programs and identified eligible beneficiaries that include 7 homeowners needing repairs and 5 businesses in need of loans; initiated two job training programs that have already trained 40 individuals; and purchased two schools. These projects have proceeded alongside two key FEMA-funded projects: development of a new South End Community Center, which broke ground in fall 2015, and development of a new Senior Center, which will break ground in spring 2016.

The City's DR management experience is augmented by its experience in leading long-term multi-player neighborhood redevelopment efforts. The South End Revitalization Initiative, begun in 2008 and still ongoing, incorporates a total public and private investment of over \$100 million and involves the coordination of private development, contractors, funders, sub-recipients, community stakeholders, and other government agencies in revitalization of this economically distressed neighborhood. The City has carried out numerous components of the initial plan created by the South End Revitalization Coalition, funded by a \$6.6 million city bond and numerous federal, state, and private grants. Completed improvements include environmental cleanup, infrastructure redevelopment, demolition of blight, urban renewal takings, park expansion and redevelopment, and development of single family homes. The City's efforts have been coordinated with private development, including the \$80 million rehabilitation of 23 historic multi-family residential buildings and completed construction of a new hotel. CDBG-DR projects are part of

this initiative, including road realignment and demolition of distressed buildings. The FEMA-funded South End Community Center, currently under construction, will be the centerpiece for this revitalized neighborhood. Neighborhood engagement in the ongoing South End work has been enhanced with the City's 2011 receipt of a Choice Neighborhoods Planning Initiative (CNI) grant and 2013 receipt of a Byrne Criminal Justice Initiative (BCJI) grant for this neighborhood. The ongoing BCJI work has been yielding significant improvements in neighborhood public safety. Very low-income South End residents have become employed as a result of the CDBG-DR job training program and the BCJI *Promotores* program, which hires residents for neighborhood outreach and organizing.

ii. Technical Capacity

The City of Springfield and the involved agencies that have worked to develop this application each possess extensive technical capacity.

The Springfield region, in a bi-state initiative with Hartford, Connecticut, received a 2011 HUD Sustainable Communities Regional Planning grant which supported the planning initiative that resulted in the 2014 *Our Next Future: An Action Plan for Building a Smart, Sustainable and Resilient Pioneer Valley*. The plan, developed by the City's NDR partner the Pioneer Valley Planning Commission (PVPC), assesses the region's risks, vulnerabilities and opportunities, and provides strategies to increase food security, expand housing choices, move toward a carbon neutral future, protect greenways and blueways, promote clean water, offer alternative transportation options, and revitalize community centers. The initiative included the *Climate Action and Clean Energy Plan*, which analyzes effects of climate change in the region and the resulting vulnerabilities. As part of planning for NDR, Springfield also consulted with the Northeast Climate Science Center (NECSC) at the University of Massachusetts. NECSC is part of

a federal network of eight Climate Science Centers created to provide scientific information, tools, and techniques that can use to anticipate, monitor, and adapt to climate change. Further, Springfield engaged PVPC to assess and report on the social impacts of the past disaster and assess the social risks the City faces in future disasters.

The City worked closely in preparation of its NDR proposal with GZA GeoEnvironmental, Inc. (GZA), a private engineering firm that specializes in geotechnical, environmental, water, ecological, and construction management. GZA completed NDR-related feasibility assessments and design of needed dam repairs and upgrades, along with working with the City to design critical flood control and habitat restoration projects.

The City consulted with the Springfield Water and Sewer Commission (SWSC) regarding assessment of flood risk and strategies to lessen this risk, and will work with SWSC throughout implementation of flood control strategies. Both SWSC and the Connecticut River Watershed Council are providing expertise regarding combined sewer overflows (CSOs) and water quality. The City's partner PVPC, along with the Conway School of Landscape Design, are providing technical expertise regarding green infrastructure.

The City has price agreements with a number of engineering and design firms that it contracts with for technical expertise to undertake specific projects. As part of its CDBG-DR program, the City's Department of Public Works (DPW) contracted with three engineering firms to undertake three separate roadway design and engineering projects. The engineering firms are established well-regarded national and regional firms: Fuss & O'Neill, Inc., Weston & Sampson, Inc., and Benesch & Company. The advantage of these existing competitively-bid price agreements is that they enable the City to quickly move forward with multiple complex projects simultaneously. DPW and the City's Department of Parks, Facilities and Recreational

Management also have engineers on staff, enabling the City to appropriately oversee infrastructure and facilities work that is contracted out and also to value engineer projects.

The City generally procures construction vendors for individual projects. Springfield's Chief Procurement Officer and her staff oversee all City procurements, and ensure that they are completed in compliance with federal and state law. The City's Director of Disaster Recovery is also a Certified Public Procurement Official. The City's Law Department oversees contracting with selected vendors.

The two ongoing CDBG-DR road projects and a recent South End project require property takings and easements. In order to obtain the expertise needed to comply with the Uniform Relocation Act, the City procured the services of Steve Mollica, a nationally recognized relocation assistance specialist, with more than 20 years' experience that includes overseeing the Massachusetts Bureau of Relocation and authoring the current Massachusetts relocation regulations.

The City operates housing development and rehabilitation programs out of its Office of Housing, which has successfully managed \$4.76 million in NSP development from 2009 through 2015, and currently operates a Homeowner Emergency Repair Program and a heating system replacement program. The DR Office currently operates a tornado home repair program.

The City's NDR partner, Partners for a Healthier Community (PHC), offers extensive expertise related to healthy homes. PHC is working this year under a grant from the Green and Healthy Homes Initiative (GHHI) to conduct a feasibility study regarding the creation of a Social Impact Bond to support healthy homes interventions.

iii. Community Engagement and Inclusiveness

Springfield conducts extensive ongoing community engagement and outreach. To guide tornado rebuilding, the City undertook a broad and inclusive planning process which engaged over 3000 residents in community meetings. The City obtains extensive input into its Consolidated Plan through the use of online surveys—for the 2015 Consolidated Plan, the City received almost 2000 survey responses.

For the City’s most recent Hazard Mitigation Plan update, the City conducted thirteen community meetings with civic associations, neighborhood associations, and business associations in locations across Springfield. During these discussions, community members were informed of critical hazard mitigation needs in their neighborhoods and citywide, and provided the opportunity to submit suggestions and identify community needs.

Throughout its neighborhood revitalization planning process in the South End neighborhood, where median annual household income is \$19,060 (2013 ACS 5-year) and almost 20% of the population is Spanish-speaking and speaks English “less than very well”, the City used varied means to engage residents in planning. The efforts undertaken include: a door-to-door survey which achieved a 70% response rate; door-knocking and Spanish-English flyers to invite people to meetings; provision of child-care, Puerto Rican food, and simultaneous translation at meetings; and community celebrations with input “stations.” These successful strategies used are being highlighted in a “Promising Practices” report being produced by HUD about Springfield’s work with the federally-funded Choice Neighborhoods and BCJI initiatives.

For its work in climate change and NDR planning, the City engaged PVPC to undertake community outreach.. PVPC conducted focus groups and community meetings in the areas being targeted for the implementation of the City’s proposed activities in order to work with residents to design the community’s approach to resilience. PVPC also engaged community-based advocacy

groups that organize City residents and undertake environmental justice work, including Arise for Social Justice and the Springfield Climate Justice Coalition.

PVPC's planning over three and half years to create [*Our Next Future: An Action Plan for Building a Smart, Sustainable and Resilient Pioneer Valley*](#) increased the degree of collaboration among regional partners, which it had already built through its regularly-updated [*Plan for Progress*](#), the region's economic development strategy, as well as the Pioneer Valley [*Regional Transportation Plan*](#). Springfield is an active participant in development and implementation of these regional plans. Other key regional collaborative efforts include the multi-community collaborative effort to address outdated combined sewer overflows and the Western Massachusetts Network to End Homelessness. In planning its NDR proposal, PVPC and the City collaborated to hold meetings with neighboring communities and relevant state agencies.

Springfield's post-tornado/October snowstorm tree canopy restoration efforts have been a cross-disciplinary collaboration which has relied upon partnership among stakeholders. The City and its NDR partner ReGreen Springfield have collaborated with businesses, community organizations, educational partners, and government agencies to promote the reforestation of Springfield, improve growing conditions for trees, and engage new allies in tree care and monitoring, education, and citizen science.

II. MANAGEMENT STRUCTURE

i. Description

Springfield will use its Development Services Division ("Development Services") to manage the NDR Program. Development Services is led by the City's Chief Development Officer (CDO), who reports directly to the Mayor. The CDO, Kevin Kennedy, has been in the position since 2011; prior to joining the city, Mr. Kennedy served for over 25 years as Chief Economic

Development Aide to U.S. Representative Richard E. Neal. Development Services includes the departments of Disaster Recovery & Compliance, Community Development, Housing, Neighborhoods, Code Enforcement, and Economic Development and Planning. Development Services will provide the leadership, planning, project and financial management, reporting and coordination for the NDR initiative. Development Services will partner with the other City divisions critical to implementation of this program: Office of Management and Budget, Public Works, Procurement, Capital Assets Construction, Law, and Parks and Buildings Management.

The Development Service's Director of Finance and Administration, Cathy Buono, will be responsible for financial management of the grant, including fiscal oversight, and receipt and dispersal of funds. Ms. Buono has 26 years' experience in municipal finance, including 19 years' experience managing federal grants. Ms. Buono will oversee and approve information for program set up and accomplishments into DRGR. Springfield uses the MUNIS Financial Management System to track all grant awards, obligations, unobligated balances, assets, liabilities, expenditures, and program income.

NDR project management will be overseen by the Office of Disaster Recovery and Compliance. This office is led by the Director, Tina Quagliato, who has 11 years municipal management experience, and also includes a fiscal analyst and a program manager. To administer the NDR Program, the Department will hire four new staff: a Senior Program Manager for NDR, a Program Manager for NDR, an NDR Compliance Officer/Section 3 Coordinator, and a Construction Manager.

The Disaster Recovery Director will be responsible for overall NDR project management, including regular inter-departmental project management meetings and supervision of the NDR

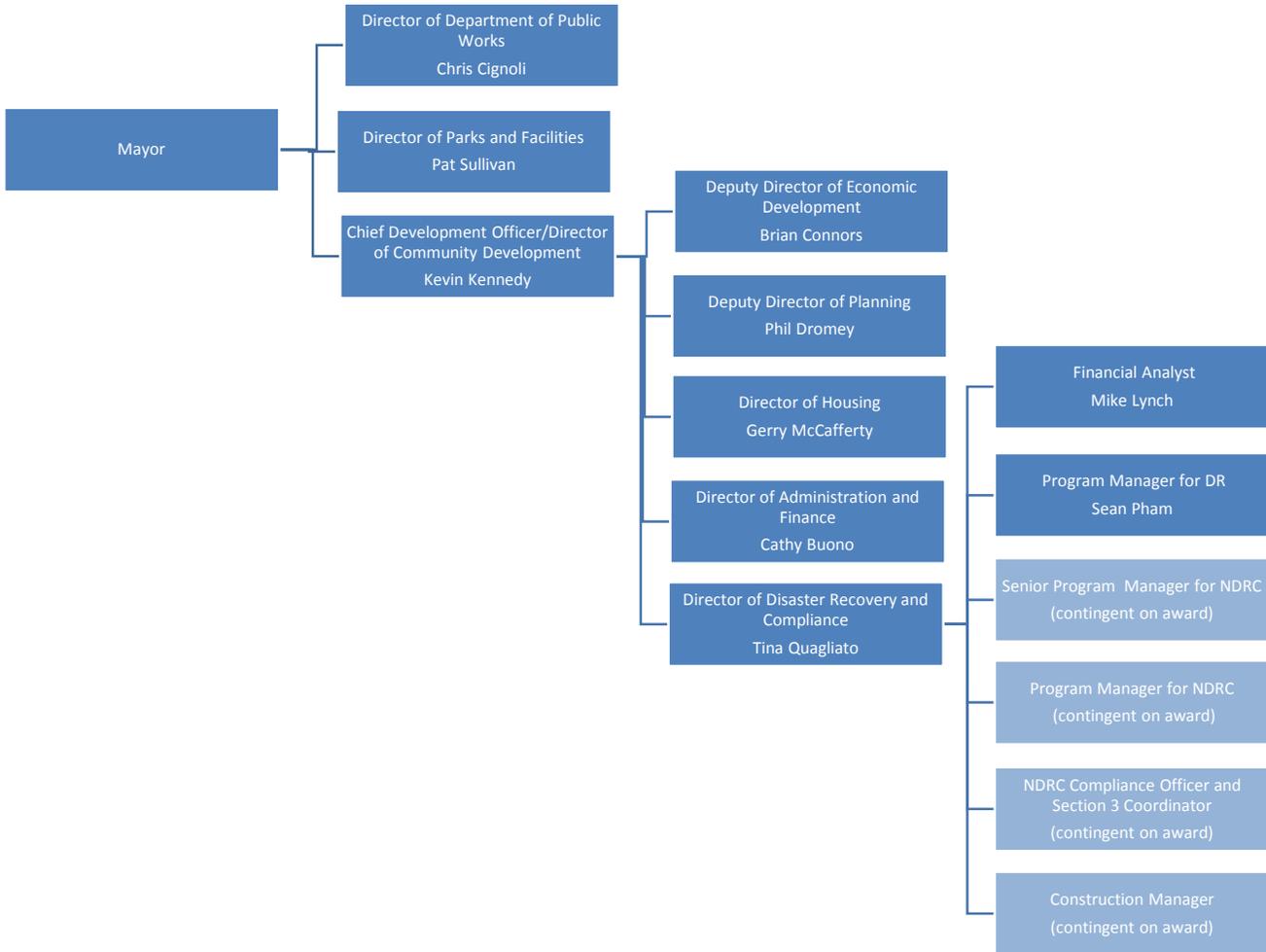
staff. The DR Director currently holds weekly staff meetings with internal and external City staff to track progress toward project goals, and will continue this practice with NDR projects.

The NDR Compliance Officer/Section 3 Coordinator, collaborating with other DR department staff, will create policies and procedures for all NDR programs, will perform ongoing compliance reviews of all ongoing programs, and will oversee the Section 3 program. The Senior Program Manager for NDR will be responsible for: procurement of all subrecipients (in coordination with the Office of Procurement); contracting with other City divisions, Partners, and subrecipients (in coordination with the Law Department); regular monitoring of all projects and subrecipient activity, and activity close-out.

Throughout the project life-cycle, the NDR Program Manager and the Financial Analyst will be responsible for receiving and tracking project status reports and invoices for each contract. The Program Manager will submit set up and close out forms for the DRGR System related to each contract to the Compliance Officer and the Sr. Program Manager. The (existing) DR Program Manager will be responsible for Environmental Review of all projects prior to project implementation, and will be responsible for all tasks necessary to submit each Request for Release of Funds to HUD and document that approval has been received prior to initiation of any choice-limiting activities.

Throughout its management of NDR, the City expects that there will be issues in which it will need technical or compliance capacity beyond what can be met with its own staff. As the City has done in administration of the CDBG-DR program, the City expects to use consultants to provide expertise on particular questions or complicated issues that arise.

A chart displaying the organizational structure to be employed by the City for this program is included below (see Attachment E – Organizational Structure for additional details).



Springfield will partner with Baystate Health, DevelopSpringfield, the Pioneer Valley Planning Commission, the Hampden County Regional Employment Board, Tech Foundry, ReGreen Springfield, and Partners for a Healthier Community. The Springfield Water and Sewer Commission is providing critical supporting commitments.

Baystate Health will develop, own and operate the cogeneration facility at Baystate Medical Center, and will donate 10 acres of undeveloped land to the City to be developed into parkland. Baystate Health is made up of six hospitals, 80 medical groups and its own health insurance plan, Health New England. The system is overseen by a 23-member Board of Trustees

and President and CEO Dr. Mark A. Keroack. Baystate Health completed a \$296 million new “Hospital of the Future” facility in 2012, developed the TechSpring Innovation Center in 2014, and purchased Noble Hospital, in Westfield, Massachusetts, in 2015. Development of the cogeneration facility is being led by Sean M. Gouvin, Director Facilities Planning & Engineering. Mr. Gouvin oversees planning, design, maintenance, and construction for approximately 4 million square feet of facility space, including BayState Health’s six hospitals.

DevelopSpringfield is developing the Springfield Innovation Center. DevelopSpringfield is a nonprofit, 501(c)(3) corporation with the mission to advance development and redevelopment projects, to stimulate and support economic growth, and to expedite the revitalization process within the City of Springfield. The organization is led by a board of directors which includes representatives from the City, state, and local business community, and its Executive Director is Jay Minkarah, who has over 25 years’ experience in planning and economic development, including serving as Economic Development Director for the City of Nashua, NH and Community Development Director for the Town of Merrimack NH.

The *Pioneer Valley Planning Commission* (PVPC) will support the NDR Program by providing ongoing assistance with community engagement, undertaking community-involved climate change planning and providing ongoing data collection and analysis. PVPC is also consulting with the City on its Complete Streets program and providing technical assistance regarding bio retention tree boxes. PVPC, a quasi-governmental regional planning agency, is the primary agency responsible for increasing communication, cooperation, and coordination among all levels of government as well as the private business and civic sectors for the benefit of the Pioneer Valley region and its residents' quality of life.

The ***Regional Employment Board of Hampden County*** (REB) will provide job training. Established by Federal and State legislation, the REB is a business-led, non-profit corporation that engages its members from business, education, labor and community-based agencies to set public policies that will build a better workforce. The REB has an annual budget of \$12.3 million in state and federal funding. It is governed by a 44-member Board of Directors, and its Executive Director is David Cruise, who has been with the organization for 9 years.

Tech Foundry will operate the Information Technology job training program. Tech Foundry is a nonprofit organization that teaches technical and workplace skills that tech companies want in an entry-level employee. The organization seeks to transform the economic landscape of the Pioneer Valley by creating a highly trained IT workforce that draws national companies to the region. It graduated its first class of 23 yearlong students in June 2015.

The nonprofit organization ***ReGreen Springfield*** will operate tree planting, tree care, education, and volunteer opportunities to City residents. The mission of ReGreen Springfield is to promote the reforestation of Springfield, improve growing conditions for trees, and engage new allies in tree care and monitoring, education, and citizen science. ReGreen Springfield's experience includes partnership with the City to operate a \$0.5 million program to help restore Springfield's urban forest canopy by strategically planting 1,140 trees on over 450 private properties in locations that will lead to reduced energy use. This project was awarded the Massachusetts Municipal Association's 2014 Kenneth E. Pickard Municipal Innovation Award.

Partners for a Healthier Community (PHC) is leading Springfield's Healthy Homes Initiative. PHC is a nonprofit organization committed to improving the public's health by fostering innovation, leveraging resources, and building partnerships across sectors, including government agencies, communities, the health care delivery system, media, and academia. The agency is led

by a 21-member Board of Directors and its Executive Director, Jessica Collins, who holds a master's degree and over 15 years' experience in the public health field. The work of the organization is carried out by eight staff and contracted consultants.

The **Springfield Water and Sewer Commission** (SWSC) is coordinating with the City to enhance flood control systems. SWSC's is governed by a three-member Board of the Commissioners, appointed by the Mayor of Springfield and approved by the City Council, and responsible for establishing policies and procedures for efficient water and sewer operations. Operations are carried out by 240 employees under the Executive Director, Katherine Pederson. Construction projects are managed by Chief Engineer Robert Stoops who has over 25 years design and construction experience, and has overseen capital projects at the SWSC for 13 years.

The City is confident that its experienced partners are committed to supporting it throughout the duration of any projects or programs implemented with CDBG-NDR funding. However, in the event that a partner does drop out, the City will issue a Request for Proposals to identify a qualified entity to fill any resulting gaps in expertise.

ii. References for City of Springfield

1. Robert D. Shumeyko, HUD Region 1 Director of Community Planning and Development, Thomas P. O'Neill Jr. Federal Building, 10 Causeway St., Boston, MA 02222, (617) 994-8376, Robert.DShumeyko@hud.gov.
2. Melissa Cryan, Grants Manager, Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs, 100 Cambridge Street, 9th Floor, Boston, MA 02114, (617)626-1171, Melissa.cryan@state.ma.us.



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Exhibit D: Factor 2 - Need/Extent of the Problem

ExhibitD_Need_Springfield_MA.pdf

I. UNMET RECOVERY NEED AND TARGET GEOGRAPHY

i. Identify Specific Target Geography

Springfield is located in Hampden County, Massachusetts, which is designated as a most-impacted and distressed area in the NDR competition. Within Hampden County, Springfield is targeting a defined geographic portion of the City that it has designated as the **Urban Watershed Resilience Zone**, made up of all or portions of Springfield's disaster-impacted and most economically distressed eight neighborhoods: Brightwood, Memorial Square, lower Liberty Heights, Metro Center, South End, Six Corners, Old Hill, and a portion of Forest Park (see Attachment E – Resilience Zone). The following census tracts/blocks comprise the Urban Water Resilience Zone: 8004.001, 8004.002, 8005.001, 8005.002, 8006, 8007, 8008, 8009, 8011.01, 8011.02, 8012, 8017, 8018, 8019.01, 8019.02, 8020, 8021.001, 8021.002, 8021.004, 8022, and 8023.

ii. Narrative Description of Needs

Springfield was struck by five presidentially-declared disasters between January 1, 2011 and December 31, 2013, more than any city in the country. The most destructive was the June 2011 tornado (DR-1994) that traveled on the ground a total of 37 miles and caused \$140 million in damages. The tornado ripped a ¼-mile-wide, 6.2-mile-long swath of destruction through Springfield, destroying homes, businesses, infrastructure, and trees. In August 2011, rains from Tropical Storm Irene (DR-4028) infiltrated buildings still damaged from the tornado, exacerbating housing problems by causing extensive water damage and mold. Water damage on top of tornado wind damage increased the cost of property repair, which was already overwhelming for low-income homeowners, and mold caused more people to be displaced.

The October 2011 record early snowstorm (DR-4051) dumped over two feet snow on trees that were still in leaf, adding extra weight, with the ground still soft from a preceding warm, rainy period. This storm resulted in extensive damage to the City's tree canopy, property and infrastructure damage from downed trees and limbs, and extended power outages. The storm caused \$30 million in damages in Springfield (*CDBG – DR Partial Action Plan A*). Thousands were without power for a week or more; because the weather was already cold and heating systems needed power to run, more residents were displaced or struggled in very cold homes. Springfield residents, infrastructure, homes and natural habitat were also harmed by a January 2011 blizzard (DR-1959) and by the 2013 Superstorm Nemo (DR-4110).

Springfield still includes significant unmet disaster recovery needs from these five storms in the areas of housing, infrastructure, economic revitalization and environmental degradation. While there are continuing needs city-wide, the City has focused this application on the unmet recovery needs of the 6.8 square mile area it has designated as the Urban Watershed Resilience Zone. In addition to lingering disaster recovery needs, the Zone also has substantial revitalization and resilience needs.

Each of the disasters was regional in nature and caused damage throughout the Pioneer Valley and beyond. The event that was the most concentrated in Springfield was the 2011 tornado, but even that was a regional disaster, as the storm traveled along the ground for 37 miles. Four years after the tornado, the areas with the most lingering housing and infrastructure damages are the very-low-income Springfield core neighborhoods, but the tree damage is regional, which increases the impact of the devastation. Tropical Storm Irene caused far more extensive damage in other western Massachusetts river communities, where rivers overflowed their banks.

Housing

In the City of Springfield, the tornado caused condemnation of 615 Springfield residential units, and the City's Office of Housing has tracked outcomes of these properties. While most homeowner damage has been repaired or replaced through insurance, Small Business Association loans, bank loans, homeowner savings, and donated resources, the tornado had long-term impact on rental units. Of the damaged or destroyed residential rental units, 170 have not been rebuilt, including 60 units of public and subsidized housing. 97% of the rental units that have not been replaced were located in the Urban Waterfront Resilience Zone. Among the units not rebuilt, 45 were in 1-4 unit buildings, and 89% of these were in the low-income Old Hill, Six Corners, and South End neighborhoods. These neighborhoods have 47 tornado-caused vacant lots, the majority of which are now covered with overgrowth and used for illegal dumping. Twelve of the properties are in tax title due to owner non-payment of taxes. While more than 300 renter households were made homeless by the tornado, tracking of these households indicates that all have been rehoused.

The existing housing conditions in Springfield's Urban Watershed Resilience Zone make it particularly vulnerable to vacancy and abandonment in the face of disaster-caused housing damage. The neighborhoods are made up predominately of rental housing, with an estimated 70% of the rental housing stock in 1-4 unit buildings. Springfield's housing stock is aged, and the City's housing market is weak, contributing to poor quality housing which is subject to deferred maintenance. In the distressed core neighborhoods, most were built prior to 1940 and many are in need of repair. In addition to being more susceptible to water or wind damage, aged homes may present additional hazards once damaged, including production of debris containing lead paint and asbestos. Following the tornado, the City learned through interactions with property owners that many of the Zone properties are un- or under-insured.

Infrastructure

The tornado and October snowstorm damaged Springfield's infrastructure, including two critical dams, flood control drainage systems, roads, and the utility grid. In the target Zone, the tornado destroyed an elementary school and a community center, as well as damaging eight parks and conservation areas.

Unmet recovery needs in the Zone include repair of storm damage to both the mechanical Watershops Pond Dam and the earthen Van Horn Dams, which control water flow in tributary waterways that run into the Connecticut River. Each of these dams is classified by the state of Massachusetts as a High Hazard Potential because they are places where failure will likely cause loss of life and serious damage to homes, industrial or commercial facilities, hospitals, important public utilities, main highways or railroads ([*PVPC Climate Change and Green Energy Plan 2014*](#)). In addition, each has been inspected and characterized as in poor condition. The tributary waterways affected, which are expected to carry more water as a result of increased precipitation, run through and below heavily developed areas of the City, including downtown and underneath Baystate Medical Center, the region's largest hospital and only Level I Trauma Center (see Attachment E – Flood Risk).

The City's unmet infrastructure recovery needs include repairs addressing storm damage caused by the tornado, Tropical Storm Irene and the October snowstorm to the Riverside Drive flood control drainage systems in the City's North End. These systems, along with a levee, protect the very low-income Brightwood neighborhood from flooding from the Connecticut River, just below where the Chicopee River empties into the Connecticut. The existence of the levee in this area prevents the area from being a flood hazard risk area subject to the requirement for flood insurance. The Riverside Drive flood control damage systems are an integrated part of the levee, and damage to them puts additional stress on the levee.

The neighborhoods that are most at risk from flooding are racially/ethnically areas of concentrated poverty, which are particularly vulnerable when floods disconnect residents from evacuation routes, food access, and safety options (*PVPC Climate Action and Green Energy Plan* 2014). Flooding or extreme weather conditions have the potential to negatively affect the health of a large number of at-risk Springfield residents as it is estimated that 21% of asthma cases can be attributable to mold and moisture exposure in housing and buildings (Mudarri & Fisk 2007). In addition, the North End is home to Baystate Medical Center, the region's only Level I Trauma Center. The hospital would be unable to continue operation following a dam failure, which would leave all of Western Massachusetts without access to a Level 1 Trauma Center.

In addition to unmet recovery needs, the City has underlying infrastructure resilience needs. Like many older cities, Springfield has a combined sewer system, where sewage and stormwater are carried through the same pipes to a treatment facility. During heavy rain events, the system is overwhelmed and untreated sewage mixed with stormwater runoff is discharged directly into the Connecticut River at combined sewer overflows (CSOs). This has significant health consequences, as indicated by the issuance of health safety alerts to advise that people avoid contact with the water for 48 hours. In addition, the ongoing pollution causes the Connecticut River quality to be classified as "impaired." In 2013, Springfield's 19 overflow pipes discharged a total of 434 times and the estimated volume of untreated CSO discharge was 423 million gallons. In 2014, the approximate CSO discharge was 362 million gallons. The CSO problem has significant negative impact for both City residents and all communities downstream from Springfield.

While both the City and the Springfield Water and Sewer Commission are determined to address the CSO problem, progress is incremental due to very high cost. The Springfield Water and Sewer Commission is bound by a United States Environmental Protection Agency (USEPA)

Administrative Consent Order to address the problems with CSOs. To date the Water and Sewer Commission has maintained compliance with the USEPA requirements by undertaking CSO abatement projects throughout the City. A \$7 million project along the Mill River was completed in 2004, between 2010 and 2012 a \$22 million separation project was conducted on CSO 007 and 049, and a project on CSO 008 costing \$23 million was completed this year. The Water and Sewer Commission's next projects address the main interceptor sewer line, York Street pumping station, and CT river crossing, with an estimated cost of \$78 million. After the Commission completes the CSO projects underway, there will still remain approximately \$160 million in further CSO abatement projects on the Connecticut River.

Most of Springfield is served by above-ground electrical service, which is at risk and frequently interrupted by winter storms and high winds. Both the tornado and the October snowstorm left thousands of residents and businesses without power for a week or more.

Economic Revitalization

The 2011 tornado caused widespread damage to the Springfield business community. Eighty-seven businesses were impacted in the immediate aftermath of the tornado because of damage to the buildings, power loss, inability for employees to get to work, and supply and stock delivery challenges. Businesses lost revenue as they were unable to open while roads were cleared, power restored, and repairs were made. A number of businesses had more significant long term effects, including major property damage, loss of equipment, intellectual property, and, in a handful of cases, loss of entire buildings. Lack of resources and uninsured losses forced some impacted businesses to relocate and some to go out of business. Within the Zone, 71 businesses were impacted, and 10 of those either closed permanently or left Springfield.

The City's unemployment rate increased from 12.7 the month before the tornado to 13.4 in the month after the tornado, a spike that lasted about four months. Unemployment is an ongoing struggle in Springfield, where the unemployment rate is usually about 4-6 percentage points above the national rate.

Environmental Degradation

Springfield's unmet recovery needs include environmental degradation from the multiple disasters, including loss of thousands of trees, buildup of excessive vegetative debris in ponds and waterways, extensive erosion, and damage to culverts.

The 2011 storms destroyed an estimated 100,000 trees citywide. Environmental science research indicates that trees serve as critical green infrastructure contributing to rainfall interception; in urban settings a single tree can intercept up to 1,600 gallons of water per year (*North East Community Tree Guide, 2007*). According to this research, Springfield's extensive overall tree loss now contributes an estimated 40 million gallons of additional storm water runoff annually. While this analysis includes the tree impact city-wide, the impact from the total tree damage affects the target Zone, because stormwater from the whole City flows through the Zone to the Connecticut River.

The loss of trees contributes to flood risk in the Zone neighborhoods, which are at low elevation on the Connecticut River, and crossed by tributaries that flow to the River. The Zone neighborhoods are heavily built up, including residential areas with small lots and limited vegetation. In addition, according to the [*Pioneer Valley Green Infrastructure Plan*](#), Springfield has 34% directly connected impervious surfaces, the most in the Pioneer Valley region. These factors combine to decrease opportunity for water infiltration to ground, further exacerbated by the loss of trees that would intercept rainfall.

Springfield struggles with high levels of outdoor air pollution with most years experiencing some exceedances for ozone and fine particulate matter (PM_{2.5}) based on data from the EPA Air Quality Index (EPA Air Data). Springfield's existing tree canopy annually intercepts 73 tons of particulate matter and 186 tons of ground-level Ozone, and removes 11.8 tons of sulfur dioxide and over 18.7 tons of nitrogen dioxide (*i-Tree Canopy Report*, Aug. 2014). The loss of trees significantly impacts air quality.

Debris from the thousands of trees downed in the storms has caused additional environmental degradation, particularly in ponds and waterways. At Watershops Pond, there is both extensive vegetative debris and construction debris from buildings destroyed by the tornado. Van Horn Reservoir contains excessive vegetative debris. The debris in the ponds and waterways impede water collection and flow, which puts surrounding residential and commercial uses at risk of overflow and flooding. In addition to debris, the waters have been increasingly with sedimentation following the 2011 storms, due to increased runoff. There has already been an increase in localized flooding from rain storms since 2011 and the problem is expected to worsen as rainstorms become more concentrated. In the event of heavy rain, the loss of water storage capacity at the Van Horn and Watershops Pond increase the risk of catastrophic flooding.

Due to debris "dams" that formed along streams following the 2011-2013 severe weather events, as well as the significantly increased stormflow out of our existing culverts, significant structural degradation has occurred. The unaddressed environmental degradation in Springfield increases risk of flooding from future storms, as heavier rainfall is not intercepted and flows through now-undersized banks and culverts. In addition, increased pollution from storm runoff flows into tributaries and the Connecticut River.

II. RESILIENCE NEEDS WITHIN RECOVERY NEEDS

i. Value of unmet resilience needs embedded within recovery needs

The resilience values embedded in this application are protection against flooding, capacity to operate critical services in the event of a disaster, preservation of housing stock from risk of abandonment, and employment assistance for low-income individuals. While these resilience interventions would have lessened some damage from the tornado, the interventions are not targeted to tornado protection, because, even with climate change, the likelihood of this disaster repeating in Springfield is extremely low. Even so, the proposed housing rehabilitation program would have prevented housing abandonment that took place after the 2011 tornado. The aftermath of tornado damage included loss of 74 housing units in privately-owned 1-4 family units that owners elected not to rebuild, and 89% of these units were located in the very-low-income neighborhoods: South End, Six Corners and Old Hill. Pre-tornado photos and records indicate that the majority of these properties were in marginal condition prior to the tornado, as is very common in the impacted neighborhoods. If these units had been rehabilitated prior to the tornado, the properties would have been in better condition, which would have led owners to be more likely to adequately insure the properties. With higher values and adequate insurance coverage, the units would have more likely to have been rebuilt following the tornado.

The costs incurred by the City, federal and state government and property owners Springfield for properties is approximately \$7.5 million. This amount includes the actual public cost for demolition and disposal of materials for houses where owners did not do the work, the estimated lost housing value of the 74 units (at \$50,000 each), and unpaid taxes for the 12 properties that were abandoned (the difference between lots with homes and vacant lots in the impacted neighborhoods: \$1350 per property per year over 4 years).

Science indicates that the disaster that Springfield is likely to face in the future is flood, and the proposed interventions are expected to substantially decrease the human and financial impact of a major flood disaster. The costs that are expected to be avoided are detailed in the Benefit Cost Analysis conducted in support of this application, which is in Attachment F. One example is the Van Horn Dam improvements, which will cost \$2.4 million. By preventing breach of the dam, the estimated avoided damage is \$34.4 million.

ii. Estimate total amount of needed investment in resilience in the City of Springfield

The total amount needed to implement the resilience building activities proposed within this application for the Urban Watershed Resilience Zone is \$82 million. The cost of expanding the key Zone resilience interventions City-wide is estimated to be \$147 million. This amount reflects the total actual need for tree canopy, waterway restoration, green infrastructure and resilience upgrades to grey infrastructure. In addition, the amount includes an estimated cost to develop an additional 8 sources of redundant power in the City.

iii. Describe vulnerable populations and quantify disaster impacts

Low income populations, communities of color, and immigrants have been identified as particularly vulnerable to negative impacts of natural disasters and climate change. Zone residents struggle with economic insecurity, with 41% of all residents living in poverty (2013 ACS, 5-year). Thirty-five percent of adults 25 and older living in the Zone have not graduated high school or earned an equivalent credential. Only 8% have a bachelor's degree or higher.

Springfield is a diverse, multi-cultural city with people of color accounting for 66% of its population. Within the Zone, the population is 34% Hispanic, 23% Black, and 2% Asian, and 27% non-Hispanic White. Springfield has a substantial immigrant and migrant population; within the Zone, 11% of the population is foreign-born (2013 ACS, 5-year). Sixteen percent of Zone

households are linguistically isolated, meaning that all household members 14 and older speak a language other than English and none speak English “very well” (2013 ACS, 5-year).

Children and older adults (age 65 and over) are also vulnerable to the negative effects of climate change and natural disasters. In the Zone, 28% of residents are children under 18 and 8% of residents are adults age 65 and over (2013 ACS, 5-year). As poverty rates among children and adults 65 and older are high in Springfield, these populations are expected to experience greater risk of negative impacts of climate change and natural disasters.

The Zone as a whole, and ten census tracts within it, meet the definition for racially/ethnically concentrated areas of poverty: poverty rates over 40% and minority populations of 50% or more. The challenges in these neighborhoods are multiple, and Springfield’s experience has been that disaster recovery in these neighborhoods is particularly difficult and slow. Following the 2011 tornado, the majority of those who became homeless were from these neighborhoods and anecdotal evidence indicates that some still continue to struggle with housing instability.

The unmet resilience needs of lower income households and the businesses that employ them include: health disparities, poor quality housing stock, lack of education and job skills, lack of employment, and lack of opportunity for small business.

Latino and Black Springfield residents experience large health disparities for many health conditions, including asthma, COPD, stroke and mental health ([*Partners for a Healthier Community, Health Equity Report 2014*](#)). Residents in zip codes that include large portions of Metro Center, Six Corners, the South End and the North End are particularly impacted, with chronic disease rates 40-75% higher than that of the City. (*Partners for a Healthier Community - Risk Analysis, 2015, unpublished background for Springfield Climate Change Plan*).

Springfield's experience with the 2011 storms was that the City's numerous small businesses lacked the resources to sustain significant business interruption, frequently had inadequate insurance, and had limited capacity to take on debt to assist with recovery from disaster. Small businesses in communities faced with economic struggles are vulnerable to closing after a disaster due to an inability to recover.

iv. Describe factors that enhance or inhibit resilience

Springfield's experience with so many disasters, and particularly the experience of tornado recovery, has increased the social resilience of the target Zone and the City as a whole. The level of coordination needed to respond to the disaster introduced a deepened level of cooperation and willingness to work together to meet common needs. This strength among City residents is also reflected throughout City leadership and staff. Disaster response and recovery required an unprecedented level of inter-departmental coordination, which has carried forward to increased capacity to break down silos and undertake interdisciplinary initiatives.

There are also challenges. Springfield's tornado recovery has been uneven. Middle-class neighborhoods with high homeownership rates are largely rebuilt, while distressed neighborhoods continue to struggle. The reasons for these disparities have been previously described: varying levels of insurance coverage, pre-disaster household assets, and pre-disaster housing quality. In addition, recovery has been inhibited by low property values and lack of participation in recovery from absentee property investors, which has resulted in abandonment in core neighborhoods.

It has been difficult to fully fund needed recovery projects. As a small city which is not a state capitol, Springfield struggles to attract attention and funding priority for government and philanthropy on a national level and within the state of Massachusetts. The City is located in a

highly segregated region, and has a very low-income and majority-minority population, which contribute to a perception that its needs are disregarded at the regional and state level.

Regional coordination in Massachusetts is a challenge due to the lack of any county level governmental structure. Municipalities function independently and compete for resources. The City's partner, the Pioneer Valley Planning Commission, is the most influential regional organization and has been able to make some progress on bridging the gap. The Western Region Homeland Security Advisory Council—a regional hazard mitigation planning board—also works to enhance regional collaboration.

III. APPROPRIATE APPROACHES

i. General Description of Optimal, Eligible Program Type(s)

Springfield has determined that the optimal eligible approach to its recovery, revitalization and resilience needs is a portfolio of connected interventions in its **Urban Watershed Resilience Zone**, which are the City's most economically distressed neighborhoods. The approach responds to the City's greatest vulnerabilities, which are flooding, extreme storms, and loss of power, while also responding to the city's long-term stressors, which are deep poverty, unemployment, and poor housing conditions. Springfield's approach has been to identify projects that each provide social, economic, and environmental benefits, and to cluster these resilience interventions in the most distressed, low-income, impacted area, in order to increase the revitalization impact of the projects.

In Phase 1, Springfield identified that its approach should respond to flood and extreme storm risks, as well as to the underlying economic distress of certain neighborhoods, and that it would maximize impact by concentrate multi-benefit activities in clusters and tying them to community anchors. The City has refined these concepts, and now identifies the following approach and intended benefits:

Flood & Heat Protection for Vulnerable Populations & Critical Services Springfield will provide flood protection through use of both green and improved grey infrastructure, including greenspace expansion, reduction of impervious surfaces, tree canopy restoration, upgrade of stormwater conveyance systems, and repair and hardening of disaster-impacted dams and streams.

Clean Redundant Energy Sources To address the most critical impacts of power loss, Springfield will introduce redundant power in the form of cogeneration for the regional hospital and hydropower for a new elementary school built to serve as a community center during a disaster.

Healthy Neighborhoods/Healthy People: The City will address indoor air quality and other home hazards, as well as risk of housing abandonment, through a housing rehabilitation and healthy homes initiative. The initiative will provide needed repairs and upgrades, remove lead paint hazards, and provide healthy homes interventions for those with asthma or with other health issues that can be improved or ameliorated through housing improvements. Households will be provided with assistance to combine these benefits with weatherization, solar energy, and green improvements such as trees and rain gardens.

Business and Job Opportunities The City is using two strategies to assist low-income adults and youth, who data indicates have lower levels of education and skills, to gain employment. The first is job training programs geared toward positions that are available, do not require higher education, and pay a living wage. The second strategy is development of a new business incubator, which will provide space, mentoring services, and potential access to capital.

The Zone's projects have significant co-benefits, which include recreation opportunities, local and regional health benefits (including improved water and air quality), decreased heat island effect, disaster preparedness, and climate change mitigation.

ii. General Description of Optimal, Ineligible Program Type(s)

There were several projects that Springfield considered that would increase the City's resilience, but which are ineligible activities in the NDR competition. The primary category of these projects is maintenance, which the City does not have adequate resources for, but which are necessary to prevent destruction in future disasters. For example, proper maintenance of the City's tree canopy is critical to both public safety and the City's overall environmental health.



CITY OF SPRINGFIELD

Exhibit E - Factor 3 - Soundness of Approach

ExhibitE_Approach_Springfield_MA.pdf

I. PROJECT APPROACH

The City of Springfield will increase resilience through a portfolio of activities carried out in its **Urban Watershed Resilience Zone** (see Attachment E – Resilience Zone), an economically distressed area along the Connecticut River. The initiative will provide flood protection, introduce two clean redundant energy sources, create business and job opportunities, provide safe and healthy housing, and engage the community about climate change and environmental stewardship. The Zone’s projects have significant co-benefits, including local and regional health benefits, decreased heat island effect, disaster preparedness, climate change mitigation, and recreation opportunities. The City’s comprehensive approach in a focused target area will support neighborhood revitalization and an improved business environment. Springfield is piloting these projects in its lowest-income neighborhoods, with the long-term plan of expanding key interventions city-wide. This package of interventions provides a resilience model for Pioneer Valley cities and towns and Springfield’s peer cities—mid-sized cities located in the northeast and mid-Atlantic (see Attachment E – Replicability; Attachment E – Regional Context Map).

A critical component of development of this resilience initiative has been to ensure that each activity meets the City’s resilience objectives in a manner that can be tracked and evaluated during full lifecycles. The City has developed preliminary metrics for each activity. The Mayor’s Council on Resilience (detailed in Exhibit G) will be responsible for establishing, tracking, and evaluating appropriate performance metrics for all CDBG-NDR funded projects.

Flood Protection

The core of this proposal is flood protection—inter-related measures that will protect Springfield from the impacts of catastrophic flood, which science indicates is the City’s greatest risk resulting from climate change. The City has already seen rainstorms of increased volume and

duration, and the October 2015 rain in South Carolina, which was close to 8 inches in a 24-hour period, highlighted both the increased likelihood of large rain events and the incredible destruction that such storms can cause. South Carolina's storm caused widespread flooding, dam breaches, and 15 deaths. Springfield's low elevation on the bank of the Connecticut River where it is joined by three other rivers makes the possibility of flood very high. The areas that are lowest and closest to the river are Springfield's most economically distressed areas, made up predominantly of people of color. In addition, they include the region's only Level I Trauma Center, which is at extreme risk in the event of breach of the Lower Van Horn dam, which is designated by the state of Massachusetts as a high hazard potential dam in poor condition. Protection of Baystate Hospital is a critical regional need.

Springfield will reduce flood risk through a number of interconnected projects which increase green space and reduce impervious surfaces in order to increase water absorption to ground; repair and harden two existing dams and a pump station; and increase storage and flow capacity in existing ponds and waterways. In developing this initiative, Springfield considered the fact that grey infrastructure may not be as long-lasting as green infrastructure, and transfers risks from one location to another. Because of these negative characteristics, the selected solutions do not introduce new grey infrastructure. However, the City ultimately determined that it was unable to design realistic green solutions that would enable it to eliminate or significantly reduce the existing storm-damaged grey infrastructure. The disaster-damaged dams and drains that the City will repair and upgrade as part of this package of interventions are integral parts of heavily urbanized areas, where alternate remedies would be extremely expensive and also difficult to accomplish due to the very large number of property owners and extensively built environment that would be impacted.

Expanded Greenspace and Decreased Impervious Surfaces. In the event of a major rain, Springfield would be at risk of the Connecticut River overflowing its banks, ponds overflowing, and increased pressure causing dam breaches. In these instances, it will be critical that as much water as possible infiltrate to ground—the City envisions this as expanding the number and types of areas that can act as a “sponge” for excess water. The City has identified three key flood risk locations where it will improve infiltration: Riverfront Park, the North End Riverside Drive area, and the area below the lower Van Horn Dam.

As its name signifies, Riverfront Park is a ribbon of park along the Connecticut River, separating the River from Metro Center. The park was directly hit by the 2011 tornado, which destroyed trees and impacted infrastructure. As part of the proposed park restoration, the City will increase the park’s capacity to absorb river overflow by increasing greenspace, replacing concrete pavement with pervious surfaces, and introducing bio retention tree boxes and use of structural soils. NDR investments in Riverfront Park will leverage City funds which will make the park handicap accessible by improving the access point from downtown to the park.

Riverside Drive curves along the edge of the very low-income Brightwood neighborhood in the City’s North End, just inside the levee that protects homes from the Connecticut River. As is explained in the section below on the North End Flood Control System, portions of this system were damaged as a result of debris and increased water flow resulting from the 2011 storms. Needed repairs to the drainage system provide the City the opportunity to narrow Riverside Drive and convert the side closest to the levee to a cycle track made of pervious surface. In addition, the City will use bio retention tree boxes in this area and is committing to preserve nearby City-owned land as greenspace (see Attachment E – North End Flood Control and Enhancements).

Baystate Hospital is donating 10 acres of land below the lower Van Horn dam (see Attachment E – Van Horn Park). The City is making this parcel, which was originally laid out as a residential subdivision, into a passive park, which will ensure that it remains undeveloped in perpetuity. This open space is an important part of the overall North End flood control system because it has the capacity to absorb overflow from Van Horn Reservoir.

Expanded Water Storage and Flow Capacity In conjunction with the donated Baystate Hospital land that will become a passive park, the City will daylight discharge from the reservoirs that flows through this land (see Attachment E - Watershed System). In the 1950s, the perennial discharge from the Van Horn reservoirs was directed into a large-diameter storm drain, installed through the Baystate Hospital property to serve as the storm drain for the previously-mentioned planned residential subdivision. Although the street infrastructure was never built, the drain has since conveyed the waters that continually flow from the reservoirs to the Connecticut River. This culvert travels 1,400 feet underground through the Baystate property, then conjoins with a larger-diameter storm drain that does not daylight until it reaches the Connecticut River, about a half mile downstream and to the west. The daylighting of this waterway will increase overflow capacity and prevent flooding that could result from the culvert being overwhelmed.

Both the Van Horn Reservoir and the Watershops Pond provide critical capacity to store water in the event of extreme rainfall, but the storage capacity of both has been lessened by the excessive amount of vegetative and other debris deposited into these bodies of water in the 2011 storms. Clearance of the debris will reduce risk to surrounding properties. As part of this work, the City will remove debris from both the ponds and the streams leading to these ponds. The approach streams will also be subject to streambank stabilization. In order to make pond outlets as resilient

as possible, the City will structurally repair the outlets and install rip-rap splash pads and/or gabions to protect the outlet and improve stormwater quality.

Tree Canopy Restoration and Use of Structural Soils. The City lost 100,000 trees in the 2011 storms, and the City's goal is to replace all of them, through a variety of funding sources and initiatives. The City will use NDR funds to plant 7,000 new trees on public land in the Urban Watershed Resilience Zone. Tree species selection will be based on utilization of i-Tree Species, a US Forest Service software tool which helps to determine appropriate tree species based on a tree's ability to withstand ice and winter storm events, wind threats and drought. No more than 10% of the canopy shall be any one species, in order to increase overall resilience. As part of the tree restoration, the City will undertake a comprehensive survey of existing trees and their condition in order to plan for management of the canopy going forward.

Dam improvements The City will decrease risk of catastrophic flooding from dam breach through repair and hardening at the Van Horn Upper and Lower Dams and the Watershops Pond Dam. The Van Horn dams were damaged by tree destruction in the 2011 October snowstorm, and the Watershops Pond dam was damaged by debris from both the tornado and the October snowstorm.

The Upper and Lower Van Horn Reservoir Dams are earthen dams that provide critical flood protection for the downstream areas. The dam embankments have been covered in large trees which were once thought to be appropriate ground cover on dams, but are now understood to be a hazard. In light of evolving guidelines, policies, and regulations, Springfield will increase protection at the Van Horn dams through tree removal and establishment of an appropriate dense turf vegetative cover over all of these dams and the immediately adjacent lands. This significant undertaking will be accomplished in the context of other dam safety improvements and hardening.

For these dam repairs and improvements, the City has already completed a Phase II Engineering Evaluation and Alternatives Analysis, and design of improvements. Permitting is substantially completed and construction of the improvements can begin almost immediately.

The Watershops Pond dam is a mechanical dam that was developed as part of the power source for the U.S. armory originally at the site (see Attachment E – Watershops Pond). While hydropower was disabled when the armory closed, the dam came into City ownership and has been an important component of water control for the Watershops Pond and provides protection for lower-lying neighborhoods. The path of the 2011 tornado was over the dam and across the upstream pond, and associated wind and heavy debris damaged the dam and made it inoperable. Restoration of the dam improves its flood protection capacity, and also enables adjustment of pond levels, which can be decreased in advance of a predicted heavy rainstorm in order to increase pond capacity for water storage.

Water control and quality monitoring. In response to the risk from the Van Horn and Watershops dams, the City will introduce real-time monitoring of structural, hydrologic, and hydraulic conditions, as well as water quality parameters, at these dams. Monitoring will inform the City of the exact condition of the dams at any moment, and the condition of water quality on an instantaneous basis and will include evaluation of long term trends and response to ongoing stormwater and water quality improvements throughout the watershed. Springfield will develop and install a real-time web-based monitoring system. The City's fiber optics-based dedicated municipal intranet web will be extended to each dam to connect throughout the City's system. Essential personnel will be alerted via electronic medium and can implement the Emergency Action Plans (EAPs) of each structure when the dams are experiencing a dangerous or critical event. In addition to the disaster preparedness functions, the City's monitoring will include real-

time monitoring of water quality-based parameters, based on the US EPA's Water Quality Surveillance and Response System (SRS), to detect emerging water quality issues and respond before they become problems.

North End Flood Control System. Springfield's North End is protected from flooding by a Flood Control System that was constructed by the Army Corps of Engineers following the 1938 Hurricane. While the North End neighborhood would otherwise be a flood zone, local property owners are not required to purchase flood insurance due to the existence of the levee and flood control system.

In early 2012, regularly quarterly inspections identified development of cave-ins and sink holes on the land side of the floodwall, and the frequency of sink-holes occurring has been increasing. The problem is due to significant blockages in the variously-sized aged perforated corrugated metal piping that make up the flood drains, which cause material to be sucked into the drains as storm waters subside. The City damage resulted from tree canopy destruction from the 2011 storms and subsequent dramatic increase in flow volume.

The following will address the deficiencies with the storm drainage system: 1) Replacement of the entire toe-drain system along the flood control wall; 2) Replacement of the roadway underdrain system with an appropriately designed system; and 3) Replacement of the existing roadway drainage system on the west side of the roadway. To measure the success of the flood protection initiatives detailed above, the City and its partners will track and evaluate the following metrics: (1) increased water storage and drainage capacity; and (2) reduction in levels of pollutants in the City's waterways (see Attachment E – North End Flood Control and Enhancements).

Supporting Commitment: Springfield Water and Sewer Commission Flood Protection and Stormwater-Sewer Separation. The City's flood protection work at Watershops Pond (the increased storage capacity and dam restoration/upgrade) is significantly enhanced by work that the Springfield Water and Sewer Commission (SWSC) is undertaking in the same watershed area. SWSC is separating stormwater and sewage pipes in the Upper Hill neighborhood adjacent to Watershops Pond, and in the main interceptor system which extends from the Watershops Pond dam to the Connecticut River. Both projects will incorporate larger pipes with greater carrying capacity, which will both reduce flood events and CSO discharges. SWSC is also adding additional stormwater and sewer pipe crossings from the City side under the Connecticut River to the water treatment plant, and adding an additional pump station to move water through these new crossings. This additional capacity also reduces flood risk and CSO discharge.

Clean Redundant Energy Sources

This initiative introduces two sources of clean redundant power, to address Springfield's frequent power outages resulting from storms. Non-grid energy sources will power critical facilities in the event of disaster that is accompanied by loss of electricity. These clean energy sources have the added benefit of producing electricity without contributing to climate change.

Hydropower. Hydropower will be restored downstream of the Watershops Pond dam, on land owned by the City of Springfield (see Attachment E – Watershops Pond). The City has already conducted a feasibility analysis for this project and has filed a permit application with the Federal Energy Regulatory Commission (FERC). The restored hydropower will have the potential to generate 707,000 kWh during an average year and will be capable of functioning independent of the grid. A portion of this electricity will fully power the newly-built Brookings School, located about 800 feet to the north of the project site, which was developed to have the capacity to be used

as an emergency center/shelter in the event of disaster. The remainder of the energy can be made available in the neighborhood. The expectation is that the availability of an uninterrupted power source will be an attractive amenity to businesses interested in locating in the area, including light industrial businesses that operate out of the former armory building.

To measure the success of the project, the City and its partners will track and evaluate the cost savings resulting from the avoided utility costs at the Brookings School.

Cogeneration Baystate Health is developing a combined heat and power plant that will provide electricity, chilled water and steam to Baystate Medical Center (see Attachment E – Cogeneration Facility) The cogeneration plant will produce 80% of Baystate Health’s annual energy consumption, and will provide an annual reduction of greenhouse gases by 13,513 tons. While Baystate Health’s existing utility system was designed to keep the facility operational for 96 hours after a disaster, the new system will extend resiliency during a utility crisis to more than 30 days. Design and engineering for this \$23 million project is complete. The project will begin construction spring 2016, and be complete by August 2017.

To measure the success of the project, the City and its partners will track and evaluate the following metrics: (1) the cost savings resulting from the avoided utility costs at Baystate Medical Center; and (2) the annual reduction in carbon emissions.

Safe and Healthy Rental Housing

Springfield will operate a Healthy Homes Rehabilitation program, which will be available for owners of 1-4 unit structures to complete rehabilitation, lead abatement, and healthy homes interventions. The program’s impact will be expanded through coordination with the Springfield Healthy Homes Collaborative, which will coordinate the efforts of many programs that provide home assistance (including weatherization, energy efficiency, and education about healthy home

issues) to ensure that residents can receive the benefits of these programs in a coordinated way. The Collaborative's work will include development of coordinated application, assessment, and management of home intervention work.

The Healthy Homes Rehabilitation Program will respond to the significant loss of rental housing stock that Springfield experienced due to the 2011 tornado. The City has decided to undertake rehabilitation rather than new construction because vacancy rates and property abandonment indicate that, even with the disaster loss, there is still a surplus of rental units. However, the condition of the rental units is poor, which appears to be a contributing factor to the willingness of owners to abandon properties once they were damaged. The City's goal is to improve the quality of the rental stock so that, in a future disaster, owners would be more likely to repair rather than abandon. The project's inclusion of a healthy homes component responds to the significant health disparities faced by the low-income population that lives in the Urban Watershed Resilience Zone. In particular, the Zone's high asthma rates support an effort to address indoor air quality issues.

The City will provide rehabilitation and healthy homes interventions in 100 units. To measure the success of the program, the City and its partners will track and evaluate the following: (1) increase in property sales and value of property taxes; (2) decrease in medical costs due to lead abatement and improvements to address chronic health issues; and (3) cost savings from avoided utility costs resulting from weatherization and energy efficiency measures.

Business and Job Opportunities

Springfield Innovation Center. The City's partner DevelopSpringfield will rehabilitate two adjacent buildings in downtown Springfield to create a 16,500 sq. ft. entrepreneurial center (see Attachment E – Springfield Innovation Center). The Innovation Center is a catalytic project

designed to jumpstart reinvestment, job creation and redevelopment activity, while building a community of entrepreneurs. The Center is a collaborative enterprise of DevelopSpringfield, the nonprofit Valley Venture Mentors (VVM), the state of Massachusetts, and MassDevelopment.

VVM will manage the business accelerator, which will support emerging entrepreneurs through mentorship, education and enhanced collaboration. Approximately 9,300 square feet of the Innovation Center make up the business accelerator's presentation, conference and co-working space. The Innovation Center will offer rent-free office space and an "innovation cafe" in the adjacent retail space. In addition to providing food and beverage service, the café will provide a test kitchen and prep area to support the emerging food truck industry and other food service entrepreneurs.

Over a three-year period, the SIC will support the creation of 14 new businesses. To measure the success of the initiative, the City and its partners will track and evaluate the number of jobs created or retained by the businesses benefitting from the SIC's support.

Job Training. In order to address the critical need for low skill jobs which provide a job ladder to better jobs, the City has incorporated job training opportunities in its portfolio of NDR activities. The Regional Employment Board of Hampden County (REB) will provide job training in the areas of home rehabilitation, lead hazard reduction, and healthy homes. The REB will operate three sessions of the Safe Homes Training Program, which will provide training to 42 low-income individuals, with 34 of the individuals becoming employed. Tech Foundry will operate the Information Technology job training program. To measure the success of the training programs, the City and its partners will track and evaluate the following: the number of Section 3 persons able to access jobs in the disciplines noted above.

Community Engagement

This NDR proposal includes several community engagement initiatives.

Community Engagement on Climate Change and the Environment. The City's partner ReGreen Springfield will undertake two programs that engage the community in environmental work. These programs educate the community about the impacts of climate change while providing volunteer assistance that enhances the capacity to care for trees and collect data regarding the natural world and changing environmental conditions. In addition to these projects, the City will undertake a water conservation and water quality education campaign.

The Citizen Tree Steward Program will use volunteer community residents to plant and steward trees throughout the Urban Watershed District. The Community-Based Citizen Science Initiative will engage neighborhood residents, youth, students and others in gathering scientific data related to weather, air and water quality, ecosystem services and sustainability in the Urban Watershed Resilience Zone. The project will use software and protocols developed by the U.S. Forest Service, and will enhance that agency's new urban research projects.

Climate Change Action Plan. While Springfield has already completed phase 1 of a climate change plan, the City will partner with the Pioneer Valley Planning Commission (PVPC) in 2016 to complete phase 2. This will include all public outreach, stakeholder consultation, conducting and compiling all associated research and data collection, drafting the plan, incorporating all feedback and providing final version of the plan.

To measure the success of the initiatives outlined above, the City and its partners will track and evaluate the following metrics: (1) number of volunteer hours spent addressing environmental issues present in the City; and (2) number of individuals engaged and educated regarding climate change.

Significant Community Co-Benefits

The City's portfolio of resilience initiatives provide multiple co-benefits, many of which provide regional benefits.

Co-Benefit: Increased Recreational Opportunities (see Attachment E – Greenways)

Van Horn Park Expansion. The expanded Van Horn Park will provide passive recreation and wildlife habitat preservation to the City's low-income Liberty Heights neighborhood. The park annex will continue the system of pedestrian and bicycle trails and passive park amenities, complimented by a wetlands boardwalk system and general landscaping improvements. The connector trail system will feature 2,700 linear feet of paved trails connecting the 87.8-acre upper park with the 27.9-acre lower park and the 14.9-acre Van Horn Park annex, creating a 130-acre green space with a total of 3.9 miles of multi-use trails (see Attachment E – Van Horn Park).

North End Cycle Track and Riverfront Bikeway/Walkway Access. In connection with the Riverside Road drainage repair and hardening, the City will address neighborhood deficiencies associated with the floodwall (see Attachment E – North End Flood Control and Enhancements). Springfield installed a walkway/bikeway system along its flood control system in the late 1990's. Unfortunately, the North End section of the bikeway/walkway is significantly under-utilized because it is not easily accessible to the residential portions of the neighborhood. There are only two access points to the systems, both at the extreme ends from where the intended users live, well over a mile apart.

In connection with drainage improvements, the City will improve Riverside Drive use and connection to the bikeway/walkway. Specifically, the City will turn Riverside Road into a one-way roadway thus reducing the roadway width; convert the extra roadway space, tree belt and existing sidewalk area to a new cycle track with an expanded landscape area; create new access points over the flood wall to allow the residents to access the bikeway/walkways; and, at the

Plainfield Street and West Street ends of the project, convert the open grass space to a mix of active and passive recreation amenities with parking. To measure the outcomes of the increased recreational opportunities outlined above, the City and its partners will track and evaluate the numbers of persons utilizing the expanded parks and greenways.

Co-Benefit: Neighborhood Revitalization

The introduction of recreation amenities in economically distressed areas—the new 10 acres of Van Horn Park and the new North End Cycle Track and walkway/bikeway access—are improvements that will make these neighborhoods more appealing. While the City will offer its housing rehabilitation initiative throughout the Zone, it will heavily market it in these neighborhoods, in an effort to combine housing upgrades with the new recreation assets. The goal is to increase value in these neighborhoods.

The Watershops Pond area has already been the subject of considerable neighborhood improvement through investment of DR funds in that neighborhood. The area has new homes and a new school, and significant roadway improvements are underway. This neighborhood will also experience park expansion and improvement. With NDR funds, the City will introduce hydropower to the neighborhood, which is expected will attract businesses which can take advantage of this asset and bring economic opportunity to the neighborhood.

To measure outcomes with respect to neighborhood revitalization, the City and its partners will track and evaluate increase in property values in areas proximate to the proposed improvements.

Co-Benefit: Health

The interventions that Springfield has chosen contribute to improved air and water quality in the City and regionally. Trees reduce levels of ozone, small particulate matter and other air

pollutants, which are asthma triggers. Tree cover also provides shade and cooling, lessening urban heat island effect. Further, there is growing evidence of public health benefits from the presence of trees in the urban environment. Trees contribute to an environment conducive to a healthy lifestyle, and to reduction in stress and violent behavior.

The flood protection measures will lessen stormwater flow, which provides protection from contaminants entering water streams, and ultimately the Connecticut River. Most critically, reduction of stormwater flow reduces combined storm water overflow (CSO) events, in which untreated sewage is released into the Connecticut River. This work is enhanced by the SWSC's critically important work to separate stormwater and sewer systems.

To measure outcomes with respect to improved health, the City and its partners will track and evaluate: (1) overall reduction in incidents of asthma; (2) reduction in ambient temperatures in areas where the tree canopy is restored; and (3) reduction in levels of pollutants flowing into the Connecticut River.

Co-Benefit: Environmental

Springfield activities will provide environmental benefits. The large number of new trees will provide increased carbon sequestration which mitigates the impact of greenhouse gas emissions. Increased greenspace, particularly the Van Horn Park Annex and accompanying daylighting of the urban stream, will improve wildlife habitat. To measure outcomes with respect to environmental benefits, the City and its partners will track and evaluate: (1) amount of increased carbon sequestration; and (2) increase in numbers of native plants and wildlife in new and restored waterways and greenspaces.

Co-Benefit: Disaster Preparedness

The cogeneration and hydropower projects will improve the City's response to a future disaster. Disasters in the northeast are frequently accompanied by loss of power, which compounds the difficulty in responding. Baystate Medical Center currently has capacity to operate at full capacity following loss of power for 96 hours. Following that time period, the hospital must have access to trucked-in fuel to operate generators. Without that access, the hospital cannot operate at full capacity. The introduction of cogeneration will extend the hospital's period of operation without power to 30 days, providing significantly more capacity to continue services in a major disaster. The hydropower will provide all electricity to Brookings Elementary, which was built new in 2014 following tornado destruction at the former school. The new building was developed to be able to operate as a community emergency center in the event of a disaster. Hydropower, which will remain functioning after a disaster, will provide an uninterrupted power source to the facility.

To measure outcomes with respect to disaster preparedness, the City and its partners will track and evaluate the following metrics: (1) total annual number of down hours (including hours with limited operational capacity) at Baystate Medical Center; and (2) reduction in loss of life.

ii. Describe Benefits to Section 3 Persons and Vulnerable Populations

The City of Springfield received a HUD Section 3 Coordination grant in 2012, which enabled it to hire a staff person focused solely on enhancing its Section 3 program. Through this opportunity, the City created a certification process for Section 3 employees and businesses, established a database of such businesses and individuals, and improved City policies and procedures regarding procurement, contracting and monitoring in order to make the Section 3 Program as beneficial to local low-income residents and Section 3 businesses as possible. As part of NDR implementation, Springfield will hire an NDR Section 3 Coordinator. That person will be

able to use the existing database, perform additional outreach, monitor contractors, and provide support to ensure that Section 3 residents and businesses benefit from NDR activities.

iii. Describe How Proposal is a Model (Replicable, Scalable, Integrated)

The proposed activities are designed to serve as catalytic projects to spur similar work in other areas of the City and the region. The neighborhoods within the Resilience Zone have been identified as those with the greatest needs; however, there are a number of other areas that suffer from similar challenges to those that the proposed activities are designed to address.

The overall project and its components are designed so that they achieve the nexus of social, economic, and environmental resilience, integrating the project pillars for modeling a resilient and equitable urban watershed: flood protection, healthy homes, clean and redundant energy, and an improved business environment. The individual activities build upon each other in order to realize both the direct benefits and co-benefits the City has identified as critical to meeting its resilience objectives.

Springfield envisions that this holistic approach will serve as a model for Pioneer Valley towns and cities, as well as for Springfield's peer cities—urban communities in the northeast, mid-west and mid-Atlantic identified by the Federal Reserve as having characteristics similar to Springfield. (See Federal Reserve of Boston, [*Towards a More Prosperous Springfield*](#), 2009). Many of these cities are located on waterfront and have similar challenges regarding a low-income population, flood risk, and air and water pollution (see Attachment E – Replicability).

v. Describe Project Feasibility and Effective Design

The City has proposed activities that are designed to be both feasible to implement and effective with respect to the duration of their useful life and anticipated benefits to the City's overall resilience. With respect to feasibility, the City is proposing activities that are fully funded

(including the requested CDBG-NDR dollars). Thus, design and implementation can begin immediately, without the need to identify and secure additional sources of financing. Cost estimates can be found in the budget section below.

Discussed in detail above within the descriptions of each activity, all proposed interventions are designed to accomplish the City's overall resilience objectives and provide both significant direct benefits and co-benefits. The flood protection measures will increase water storage and drainage capacity, improve water quality within Springfield and downstream via the Connecticut River, and provide increased flood protection to persons and property. The redundant energy sources will reduce loss of life during extended power outages and strengthen an emergency shelter in an area comprised primarily of vulnerable populations. The healthy homes initiative will provide for improved health outcomes and increased personal and social wealth in some of the City's most impoverished communities. The Springfield Innovation Center and job training programs will create job opportunities for the City's LMI residents, thereby increasing personal wealth and resilience at the household level. Finally, the proposed community engagement activities will serve to engage and educate the City's residents regarding environmental issues and the impacts of climate change, creating a citizenry that takes personal responsibility for the City's overall resilience.

The City has placed an emphasis on effective design practices that account for modern science and the best available data. Recognizing there are a number of recovery and resilience needs throughout the City, the activities proposed within this application will address the most critical hazards and future risks and serve as catalytic projects to demonstrate benefits and the need for additional investments in similar projects going forward. As is noted above, an example of the City's commitments to effective design can be found in the design of the resilience upgrades at the

Van Horn and Watershops Pond dams. The design eschews the traditional practice of allowing dam embankments to be covered in large trees that were once thought to be appropriate ground cover on dams but are now understood to be a hazard. In 2014, the U.S. Army Corps of Engineers established that earthen embankment dams must include a vegetation-free zone (all vegetation but turf grasses) that extends fifteen feet beyond any portion of the dam embankment and appurtenances ([Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures, ETL 1110-2-583, April 30, 2014](#)). To ensure conformity with the latest guidelines, policies, and regulations, the City has designed resilience upgrades that will establish of an appropriate dense turf vegetative cover over each dam and the lands immediately adjacent to the dams.

vi. Describe Consultation and Coordination with Regional Partners

As detailed in Exhibit C-Capacity, Springfield assembled a cross-disciplinary team, including multiple City departments and outside experts, that assisted in framing the Phase I approach and in prioritizing Phase II projects. As part of Phase I, the team analyzed Springfield's most likely risks and greatest vulnerabilities in order to create an approach that responds to these factors through concrete projects and also through ongoing learning and processes to institutionalize resilience considerations in all future City capital and development projects. The analysis was informed by research from the Northeast Climate Science Center (NECSC) and planning done by the Pioneer Valley Planning Commission during the period 2012-2014 as part of a HUD Sustainable Communities Regional Planning Initiative. Partners for a Healthier Community identified the social and health impacts resulting from previous and future natural disasters and how those impacts can be expected to change over time, particularly the social and health risks that face the City's most vulnerable populations.

Phase I Consultation: As part of Phase I planning, Springfield and its partners engaged residents, more than ten City departments, eight surrounding municipalities, representatives from the state of Massachusetts and the United States Environmental Protection Agency. The City used electronic surveying to educate and obtain detailed guidance and ideas from nearly 100 partners and local businesses. A resident survey generated over 1900 responses.

Springfield was fortunate to be able to build on PVPC's two-year sustainable communities regional planning effort. Through this work in 2012-2014, PVPC established a regional conversation about sustainability, educated regional municipalities about the impacts of climate change, and engaged regional municipalities in identifying strategies for climate adaptation and mitigation.

The City partnered with PVPC throughout the NDRC planning process to assist with engagement of both regional partners and vulnerable populations. For Phase I of this project, PVPC facilitated input at four small group meetings, targeting residents in the city's economically disadvantaged neighborhoods (see Attachment D for details). The City and PVPC team also consulted with multiple advocacy groups (New North Citizens Council, Mason Square Task Force, Arise for Social Justice, and the LiveWell Springfield Initiative), and sponsored a citywide forum. The forum agenda included a review of projected climate and weather change in Western Massachusetts, transportation vulnerabilities, wastewater infrastructure, flood zones, dams, levees, and environmental justice neighborhoods (see Attachment E).

The extensive amount and cross-disciplinary nature of Phase I consultation and collaboration created a strong vehicle for education of the Springfield NDR team and the community about intersecting issues related to resilience and contributed to a far more inclusive understanding of Springfield's vulnerabilities and opportunities. In particular, the collaboration

prompted the team to identify additional opportunities to achieve co-benefits. The Springfield NDR development team reviewed input from engagement activities as it was produced, and incorporated approaches and ideas into its planning. The team found that issues related to inequity—based on multiple social vulnerability factors—was a major theme that resonated with City residents, and confirmed the importance of the City’s focus on distressed neighborhoods and on job creation as key components of resilience.

Phase 2 Consultation: As the City advanced to Phase 2, it conducted a series of meetings and briefings to inform the public and stakeholders of the progress made since the Phase 1, and to solicit input on particular projects to be incorporated into Phase 2. The City initiated an online survey which received 569 responses. A number of focus groups were held to solicit direct feedback from 698 area residents. These took place in the North End (organized in collaboration with the New North Citizens Council), South End (organized in collaboration with HAP Housing Inc.), the Caring Health Center (organized by the South End Public Safety Initiative), Metro Center (organized in collaboration with ARISE and Christ Church Cathedral), Mason Square neighborhoods (organized in collaboration with the Mason Square Health Task Force), and with the Springfield Climate Justice Coalition.

PVPC and the City hosted a series of events: a Regional Partners Summit (9/9/15), a Stakeholders Forum (9/9/15), and a Regional Partners Convening (9/15/15) to allow for additional stakeholder consultation and regional collaboration (see Attachment E – Outreach Maps). In total Springfield consulted at these events with five surrounding communities: Agawam, Chicopee, Longmeadow, West Springfield and Westfield. Common themes arising from these conversations touched on resource availability and the potential for local and/or regional collaboration to access

resources, as well as the common need for insurance education/assistance for homeowners, renters and business owners.

Springfield collaborated with the State of Massachusetts as the City and state coordinated Phase 2 planning. Both parties have committed to paralleled efforts addressing enhanced tree restoration, replacement of undersized culverts, watershed management, wastewater processing, improved stormwater management, increased dam resilience and the establishment of a local business incubator.

The development of the Phase 2 application provided the City the opportunity to partner directly and in a new way with the Springfield Water and Sewer Commission (SWSC). While the City and SWSC have always coordinated regarding construction and inter-connected infrastructure projects, NDRC introduced far greater recognition of shared interests, as well as a collaborative conversation about responding to flood protection, green infrastructure and climate change.

The City received valuable input from the Connecticut River Watershed Council (CRWC), both in development of the resilience initiative and in comments on the City’s draft application. CRWC input reinforced the importance of green infrastructure and low impact development strategies, while also highlighting for the City the importance of incorporating water conservation education into the overall approach.

II. BENEFIT-COST ANALYSIS

Below is a summary of the total benefits and costs. The full benefit-cost analysis and evidence justifying costs is in Attachment F.

Benefits	
Resilience	\$ 152,996,567

Environmental	\$	11,855,567
Community	\$	5,788,600
Economic	\$	77,856,017
Total Benefit	\$	248,496,750
Costs		
Life Cycle Costs	\$	102,613,027
Benefit-Cost Ratio = 2.42		

III. SCALING/SCOPING

i. Narrative Description of Priorities

The entirety of the identified Resilience Zone suffers from high concentrations of poverty and has similar needs with respect to housing, environmental restoration, flood control, and economic development. The City has considered current and future risks to prioritize its proposed activities and determined that the flood protection measures are the most critical. The proposed flood protection measures are prioritized as follows: (1) Based on the potential impacts to Baystate Medical Center and vulnerable populations in the areas surrounding the upper and lower Van Horn reservoirs, repairing and hardening the Van Horn dams (total cost of \$4,640,000); (2) resilience upgrades to the North End flood control system (total cost of \$7,626,600); (3) repairs and hardening of the Watershops Pond dam (\$2,390,000); (4) restoration of the tree canopy and other green infrastructure activities (\$4,956,900); and (5) increasing water storage and flow through restoring waterways and habitats and daylighting a portion of the flow from the Van Horn reservoir (\$18,358,250). The City has identified the proposed Healthy Homes Rehabilitation Program (\$5,542,066) as its sixth (6) overall priority due to the critical need for safe, healthy housing and

the prevalence of asthma amongst the City’s most vulnerable populations. The proposed economic development activities: job training and the Springfield Innovation Center rank seventh (7), respectively. The proposed community engagement initiatives—the Citizen Tree Steward Program, the Citizen Science Initiative, and the Climate Change Action Plan—have impacts across multiple aspects of the City’s proposal and are considered integral to the success of the City’s resilience strategy.

ii. Identify opportunities for Scaling Proposed Project(s)

The City recognizes that there are opportunities for scaling the proposed project – both as a whole and through its components—that would serve to expand its impacts across the City, throughout the Pioneer Valley, and to other areas in the Northeast and Mid-Atlantic (specifically the peer cities identified in Attachment E – Peer Cities). The cost of expanding the key Resilience Zone interventions citywide is estimated to be \$147 million. This amount reflects the total actual need for tree canopy, waterway restoration, green infrastructure and resilience upgrades to grey infrastructure. In addition, the amount includes an estimated cost to develop an additional eight sources of redundant power in the City.

IV. PROGRAM SCHEDULE

i. Detailed Schedule for Completion of Proposed Activities

A summary of the overall project schedule is below. The City has designed all activities to ensure that the CDBG-NDR funding received will be obligated and expended within the established statutory deadlines—both with respect to the two-year timelines associated with obligation and the overall deadline to obligate and expend dollars appropriated through Public Law 113-2. Timeframes for procurement, environmental reviews, permitting, and other pre-construction/pre-development aspects of each activity (where applicable) have been taken into

consideration and built into the overall schedule. While the City anticipates meeting all deadlines, the City will reevaluate all schedules based on the amount of funding awarded and the scale and scope of the activities ultimately implemented. If needed, the City will request expenditure deadline waivers per the guidance issued in the May 11, 2015, Federal Register Notice. A more detailed version of the schedule can be found in Attachment E – Project Schedule.

Project Components	Term
Flood Protection	
I. Expanded Greenspaces & Decreased Impervious Surfaces	
Riverside Dr. Roadway/Cycle Track/Enhanced Bikeway Access	22 months
Riverfront Park Enhancements	18 months
Van Horn Park connector trails	18 months
II. Increased Water Storage & Flow Capacity	
Van Horn Park Annex and Daylighting Waterway	18 months
Aquatic habitat restoration - Watershops	24 months
Aquatic habitat restoration - Van Horn Park	30 months
Outlets/outfalls	16 months
Streambank stabilization - Watershops	16 months
Streambank stabilization - Van Horn	16 months
Waterway debris removal - Watershops	14 months
Waterway debris removal - Van Horn	14 months
South Branch Greenspace Expansion	16 months
III. Tree Canopy Restoration	

Tree planting	22 months
Stormwater treeboxes	22 months
Tree canopy survey	22 months
IV. Dam Improvements	
Upper Van Horn Dam	27 months
Lower Van Horn Dam	30 months
Watershops Dam	27 months
V. Water Control & Quality Monitoring Systems	
Water monitoring system - Watershops	18 months
Water monitoring system - Van Horn (upper and lower)	18 months
VI. North End Flood Control System	
Roadway drainage system	22 months
Underdrain system replacement	22 months
Floodwall toe-drain	22 months
Flood control pump station upgrades	22 months
Clean Redundant Energy Sources	
I. Baystate Medical Center Co-Generation	24 months
II. Hydro-electric Power Restoration	40 months
Safe and Healthy Rental Homes	
I. Lead Abatement	30 months
II. Housing Rehabilitation	30 months
III. Testing, Education, and Outreach	30 months

Business and Job Opportunities	
I. Job Training	
Safe Homes training	36 months
IT Workforce Program	36 months
II. Springfield Innovation Center	60 months
Community Engagement	
I. Citizen Tree Stewards Program	22 months
II. Community Based Citizen Science Initiative	22 months
III. Climate Change Plan	24 months

V. BUDGET

i. Budget Summary

The table below presents a summary of the overall cost proposal, including all sources of funding. A sources and uses statement is included in [Attachment B](#).

Project No.	Project Title	Activity Title	Source	Resp. Org.	Project Budget	Activity Budget
001	Administration				\$2,754,437	
		Administration	CDBG-NDR	City of Springfield		\$2,764,437
002	Flood Protection				\$43,671,750	

		Riverfront Park improvements	CDBG-NDR	City of Springfield		\$900,000
		Riverfront Park Improvements	City of Springfield	City of Springfield		\$1,000,000
		Bikeway access	CDBG-NDR	City of Springfield		\$2,800,000
		Van Horn Park connector trails	CDBG-NDR	City of Springfield		\$1,000,000
		Van Horn Park annex and waterway daylighting	CDBG-NDR	City of Springfield		\$3,500,000
		Aquatic habitat restoration - Van Horn	CDBG-NDR	City of Springfield		\$2,800,000
		Aquatic habitat restoration - Watershops	CDBG-NDR	City of Springfield		\$5,800,000

		Outlet/outfall upgrades	CDBG-NDR	City of Springfield		\$2,950,000
		Streambank stabilization - Van Horn	CDBG-NDR	City of Springfield		\$34,500
		Streambank stabilization - Watershops	CDBG-NDR	City of Springfield		\$718,750
		Waterway restoration - Van Horn	CDBG-NDR	City of Springfield		\$530,000
		Waterway restoration - Watershops	CDBG-NDR	City of Springfield		\$1,625,000
		South Branch greenspace expansion	Commonwealth of Massachusetts	City of Springfield		\$400,000
		Tree canopy restoration	CDBG-NDR	City of Springfield		\$4,400,000
		Tree boxes	CDBG-NDR	City of Springfield		\$317,000

		Tree boxes	Pioneer Valley Planning Commission	City of Springfield		\$239,900
		Dam hardening - Van Horn	CDBG-NDR	City of Springfield		\$2,140,000
		Dam hardening - Van Horn	Commonwealth of Massachusetts	City of Springfield		\$1,000,000
		Dam hardening - Van Horn	MassMutual	City of Springfield		\$1,000,000
		Dam hardening - Watershops	CDBG-NDR	City of Springfield		\$630,000
		Dam hardening - Watershops	City of Springfield	City of Springfield		\$1,000,000
		Water quality monitoring systems - Van Horn	CDBG-NDR	City of Springfield		\$500,000

		Water quality monitoring systems - Watershops	CDBG-NDR	City of Springfield		\$760,000
		Flood control and drainage systems	CDBG-NDR	City of Springfield		\$7,626,600
003	Clean Redundant Energy Sources				\$28,667,243	
		Hydro-electric facility	CDBG-NDR	City of Springfield		\$5,067,500
		Co-gen facility	CDBG-NDR	City of Springfield		\$5,000,000
		Co-gen facility	Baystate Health	City of Springfield		\$18,599,743
004	Safe & Healthy Rental Homes				\$5,542,066	
		Housing rehabilitation	CDBG-NDR	City of Springfield		\$4,675,001

		Housing rehabilitation	Partners for a Healthier Community	City of Springfield		\$367,065
		Housing rehabilitation	City of Springfield	City of Springfield		\$500,000
005	Business & Job Opportunities				\$4,666,130	
		Safe Homes training	CDBG-NDR	City of Springfield		\$191,716
		IT workforce program	CDBG-NDR	City of Springfield		\$300,000
		Springfield Innovation Center	CDBG-NDR	City of Springfield		\$300,000
		Springfield Innovation Center	Develop Springfield	City of Springfield		\$3,874,414
006	Community Engagement				\$522,663	

		Citizen Tree Steward Program	CDBG-NDR	City of Springfield		\$150,000
		Citizen Science Initiative	CDBG-NDR	City of Springfield		\$150,000
		Climate Change Plan	CDBG-NDR	City of Springfield		\$222,663

ii. Narrative Description of How Budget Was Developed

Starting with the City’s core resilience objectives, specific activities were developed that both met those objectives and addressed remaining recovery needs. City of Springfield personnel and key technical consultants partnered in the developing activity scopes and corresponding costs (initial investments and long-term operations and maintenance).

VI. CONSISTENCY WITH OTHER PLANNING DOCUMENTS

i. Consolidated Plan and/or Regional Sustainability Plan

The City affirms that the activities proposed in this application are consistent with the City’s Consolidated Plan. The Certification is provided in Attachment C. The City also affirms that the activities are consistent with the regional sustainability plan, [*Our Next Future: An Action Plan for Building a Smart, Sustainable, and Resilience Pioneer Valley.*](#)

ii. Hazard Mitigation Plan

The City affirms that the activities proposed in this application are consistent with the City’s Hazard Mitigation Plan. A certification can be found in Attachment C.



CITY OF SPRINGFIELD

Exhibit F: Factor 4 - Leverage and Outcomes

ExhibitF_Leverage_Springfield_MA.pdf

Springfield's receipt of NDR funds will leverage a total of \$82.33 million, which is made up of direct financial commitments of \$27.98 million and supporting commitments of \$54.35 million.

I. DIRECT FINANCIAL COMMITMENTS

Direct commitments are listed below and documentation is included in Attachment B.

City of Springfield: \$2.5 million

- Riverfront Park: \$1,000,000
- Watershops Pond Dam: \$1,000,000
- Healthy Homes Initiative: \$500,000

MassMutual Financial Group: \$1 million, Lower Van Horn Dam: \$1,000,000

Baystate Health Center: \$18,599,743, Cogeneration facility: \$18,599,743.

State of Massachusetts: \$1,400,000

- Lower Van Horn Dam, \$1,000,000
- South Branch Park, \$400,000

Partners for a Healthier Community: \$367,565

Pioneer Valley Planning Commission, \$239,900, Tree Canopy.

Develop Springfield: \$3,874,414, Springfield Innovation Center.

II. SUPPORTING COMMITMENTS

Supporting commitments are listed below and documentation is in Attachment B.

Springfield Water & Sewer Commission: \$54.35 million, Activities that directly align with the City's efforts to improve flood protection and water quality throughout Springfield.



CITY OF SPRINGFIELD

Exhibit G: Factor 5 - Long-Term Commitment

ExhibitG_LongTerm_Springfield_MA.pdf

Springfield has made numerous long-term commitments to resilience, a number of which were highlighted in Exhibit G of the City's Phase 1 application. One of the commitments in Phase 1 is a project contained in this application, development of the Baystate Health cogeneration facility. This facility is expected to be operational in 2017. Additional commitments are detailed below.

i. Lessons Learned

Mayor's Council for Resilience. In 2015, Mayor Sarno created the Mayor's Council on Resilience. The Council consists of representatives from key City government agencies, including the Mayor's Office, Department of Public Works, Office of Disaster Recovery, Office of Planning and Economic Development, Housing Department, and the Parks and Recreation Department. The Originating Charter on Resilience identifies the five key principles that lead the Council's work: Leadership, Engagement, Scholarship, Collaboration, and Stewardship.

100 Resilient Cities. In November 2015 the City is applying to be selected to join the Rockefeller Foundation 100 Resilient Cities. This designation would provide support for a Chief Resilience Officer, support in furthering Springfield's plans and strategies to increase resilience, and connection to other cities that are focused on improving resilience. The role of Chief Resilience Officer will be to coordinate and oversee resilience activities, coordinate stakeholders, and ensure resilience is a city-wide priority.

Climate Change Plan. Springfield completed the first phase of its Climate Change Plan in October 2015. For this phase, the City engaged the Pioneer Valley Planning Commission and Partners for a Healthier Community (with participation from the Springfield Climate Justice Coalition) to produce a preliminary framework for the plan, review the framework with stakeholders, and revise to reflect community input. Phase 2 of this planning process will inventory

actual greenhouse gas emissions; establish baselines and progress benchmarks; engage stakeholders to establish goals, actions, strategies and policies; and produce a final plan. While the City is seeking NDR funds to support phase 2, Springfield commits to complete the Climate Change Plan by Dec. 31, 2016, whether or not the Plan receives CDBG-NDR funds.

Reduction in Municipal Energy Use. The City has been focused on reduction of municipal energy use since 2007, and it reduced energy use 23% from the first year through FY14. In FY14, the City used 2,016,289 BTUs of natural gas and 46,455,434 electric kWh. The City has committed to take actions to reduce energy amounts an additional 5% within the next year and 17% by 2020. Springfield's commitment and performance on this metric have enabled it to be a designated Massachusetts Green Community, which provides the opportunity to apply for state grants for energy projects. A component implementing the energy reduction plan is the restoration of hydropower at Watershops Pond. The benefit-cost analysis (see Attachment F) outlines the benefits of the restoration and the resulting cost savings that the City will be able to utilize for other resilience building initiatives. GZA GeoEnvironmental, Inc.'s recently completed feasibility study concluded that the hydropower facility will produce 707,000 kWh of energy. Of that total, only 424,200 kWh will be consumed on site, with the balance (282,800 kWh) being sold back to the utility company. See Exhibit E for additional details on the facility.

ii. Legislative Action

Complete Streets Policy, Plan, and Implementation Guide. The Springfield City Council adopted a Complete Streets Policy on October 5, 2015. The policy increases transportation options and aims to reduce reliance on cars. Specifically, the policy requires the City, to the maximum extent practical, to scope, plan, design, construct, operate, and maintain all City streets to provide a comprehensive and integrated network of facilities for people of all ages and abilities traveling

by foot, bicycle, automobile, public transportation, and commercial vehicle. The Policy will be carried out through use of the [City of Springfield Complete Streets Plan](#) and [Complete Streets Implementation Guide](#), both of which were created by the City of Springfield and the Pioneer Valley Planning Commission with funding from the Centers for Disease Control and Prevention's (CDC) Community Transformation Grant initiative.

iii. Raising Standards

Springfield Department of Public Works (DPW) Site Plan Design Review Standards. Springfield's Department of Public Works is updating its Site Plan Design Review Standards, which will also be completed by December 31, 2015. The standards are being revised to promote the use of green infrastructure in private development, in order to improve capacity to control stormwater; improve water quality; and provide for increased vegetation. The revised Site Plan Design Review Standards are based upon a projection of 20% increased rainfall rates, which increases the required stormwater drain capacity for all new or modified development by 20%.

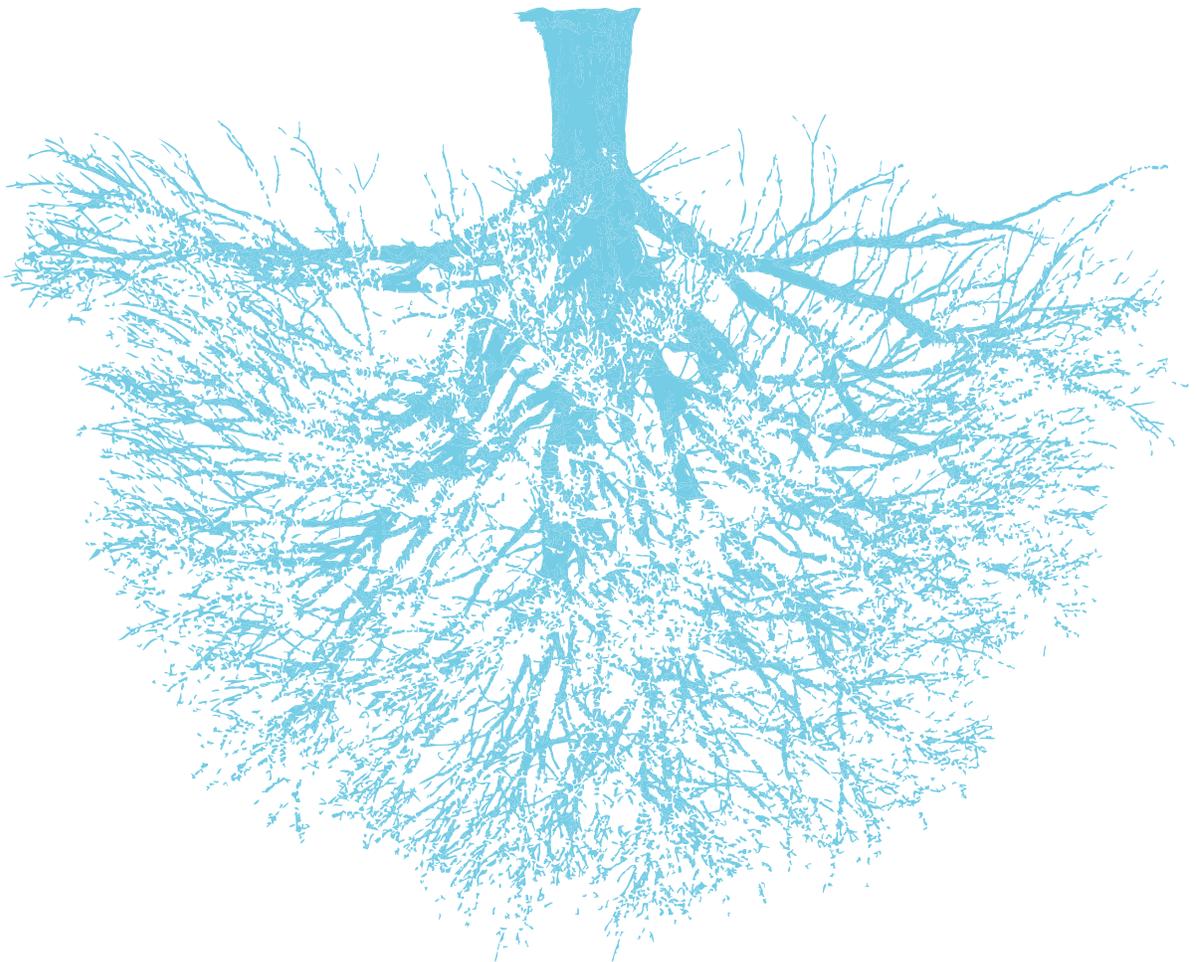
iv. Plan Updates or Alignment

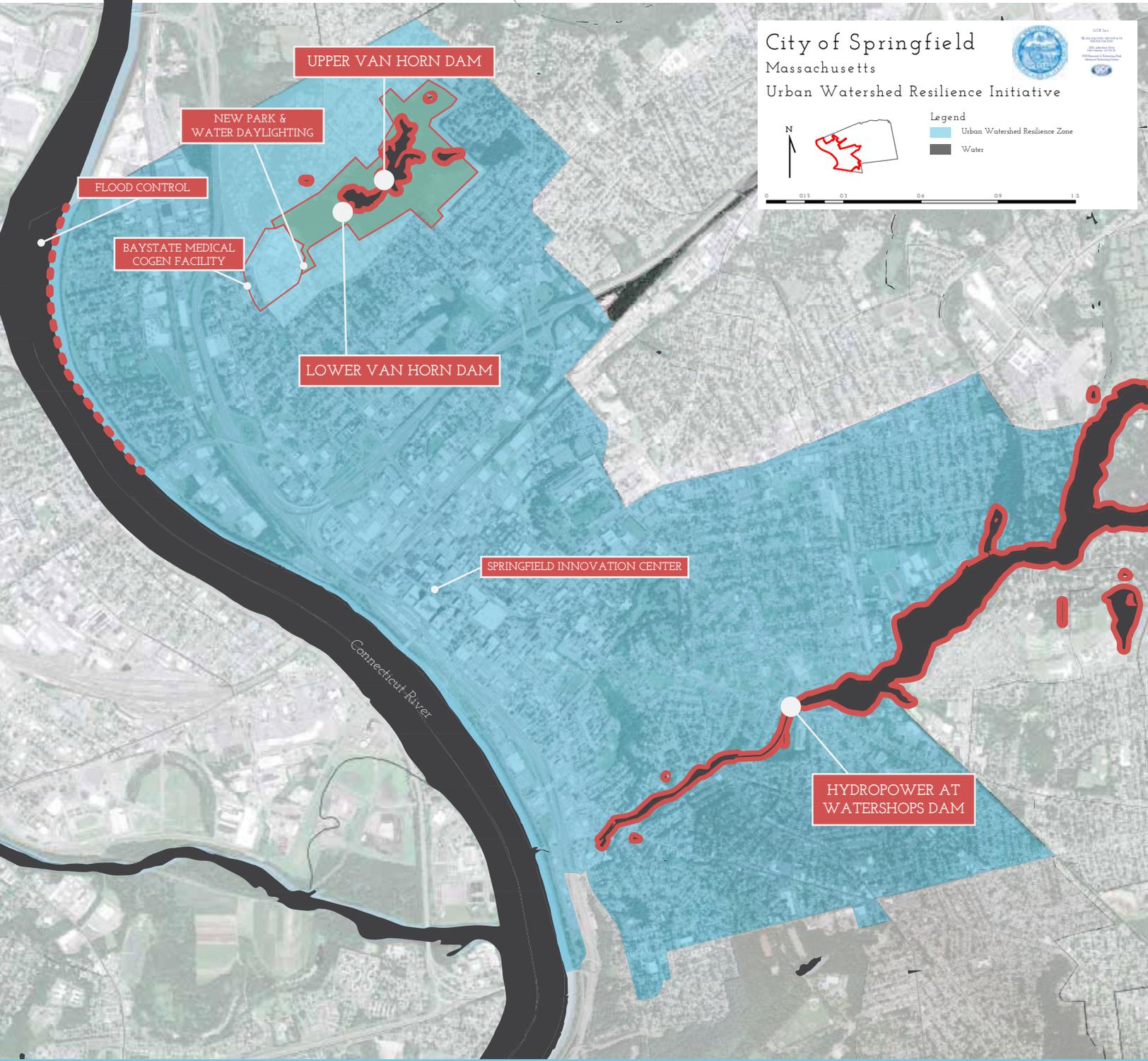
Hazard Mitigation Plan. Since the 2011-2013 disasters, Springfield has created a comprehensive Hazard Mitigation Plan, which incorporates projections and risk from climate change science to guide the City's disaster planning. For example, the Plan specifically addresses increased risk from rain events of increased capacity and duration. The [Hazard Mitigation Plan](#) was approved by the Massachusetts Emergency Management Agency (MEMA) in October 2015, and has been forwarded to the Federal Emergency Management Agency (FEMA) for its approval.

Attachment E: Optional Maps, Drawings, Renderings

AttachE_Maps_Springfield_MA.pdf

CITY OF SPRINGFIELD





City of Springfield
 Massachusetts
 Urban Watershed Resilience Initiative

Legend
 Urban Watershed Resilience Zone
 Water

0 0.15 0.3 0.45 0.6 0.75 0.9 1.2



CITY OF SPRINGFIELD

Urban Watershed Resilience Initiative

FLOOD PROTECTION

- Resilience upgrades at Van Horn and Watershops Pond dams
- Water control monitoring system at Van Horn and Watershops Pond
- Tree canopy restoration
- Waterway and habitat restoration
- Upgrade drainage systems along Riverfront Park
- Van Horn Park expansion and waterway daylighting
- Citizen Scientists and Tree Stewards

BUSINESS ENVIRONMENT & JOB OPPORTUNITIES

- Springfield Innovation Center
- Job training: green infrastructure and healthy homes

REDUNDANT ENERGY

- Hydropower at Watershops Dam - to power Brookings Elementary
- Cogeneration at Baystate Hospital

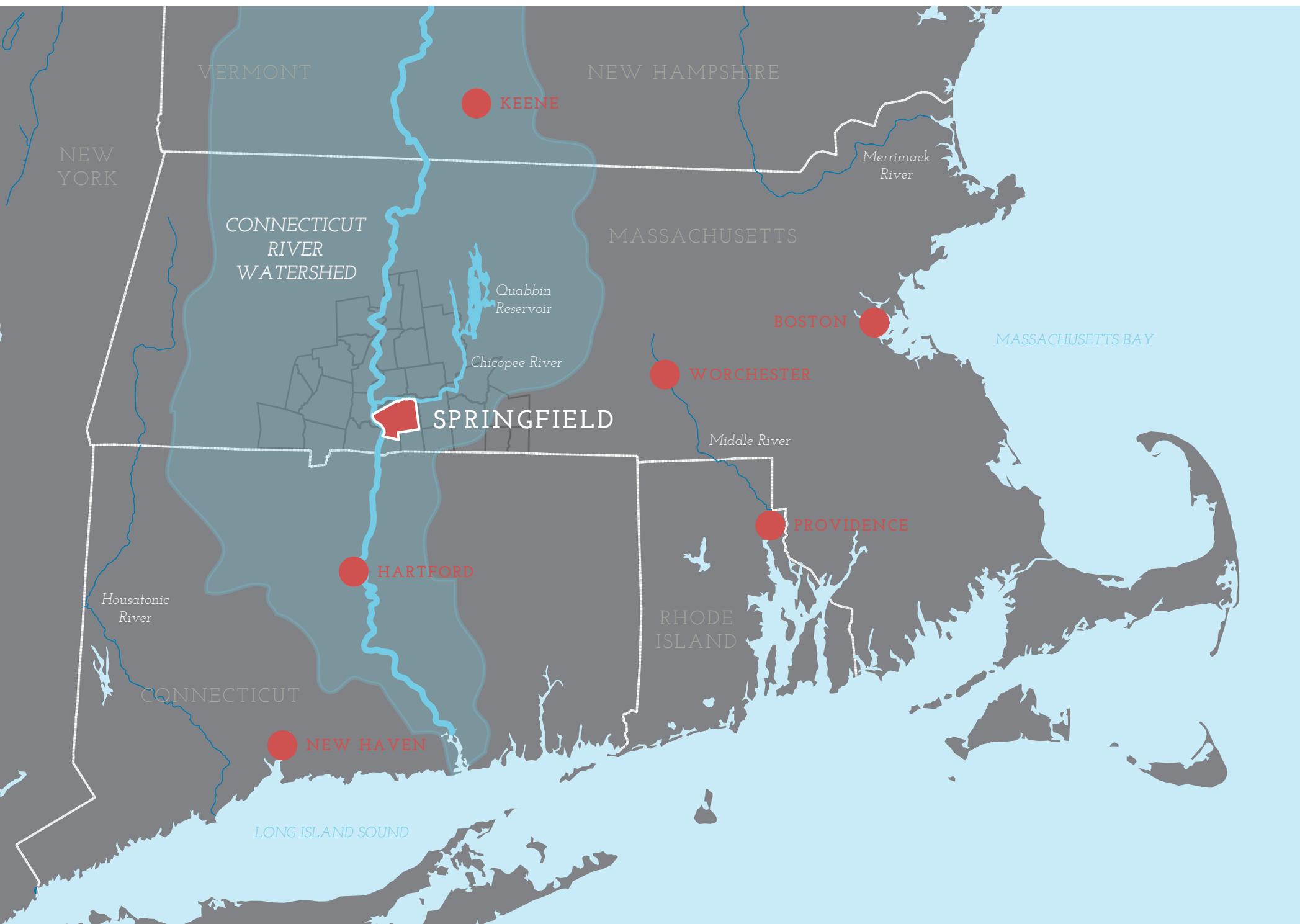
HEALTHY HOUSING

- Rehabilitation of existing rental housing (1-4 units)
- Address healthy homes issues & remove toxins, asthma triggers, lead

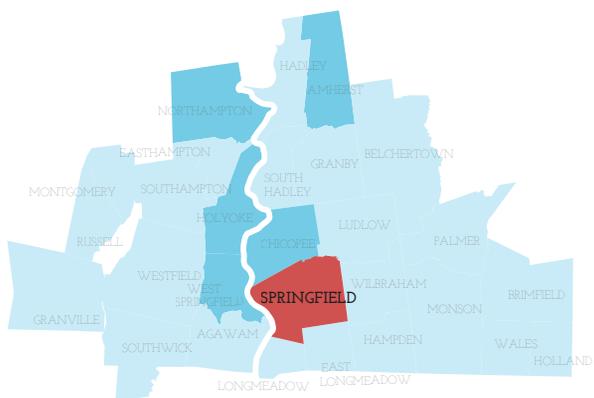


CITY OF SPRINGFIELD

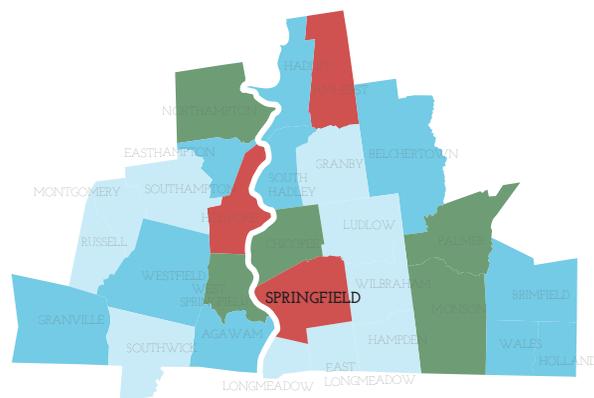
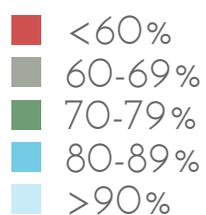
National Disaster Resilience Competition - Phase II



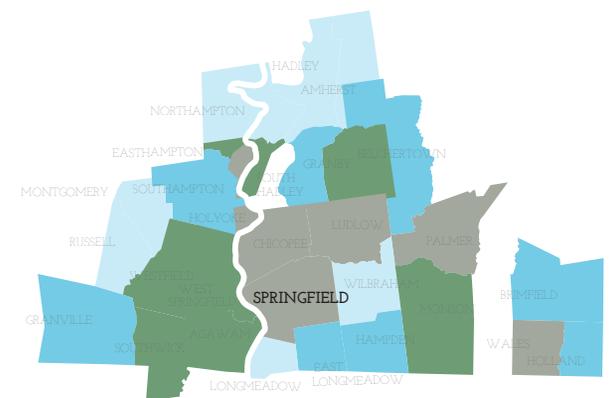
Pioneer Valley Demographics



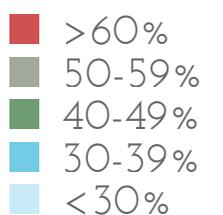
Percentage of town population that identifies as white.



Percentage of town population below the poverty line



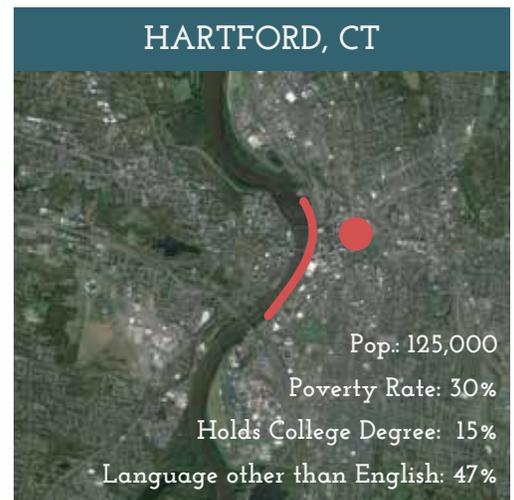
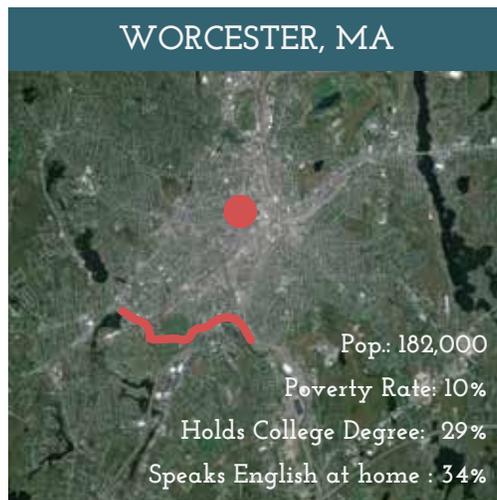
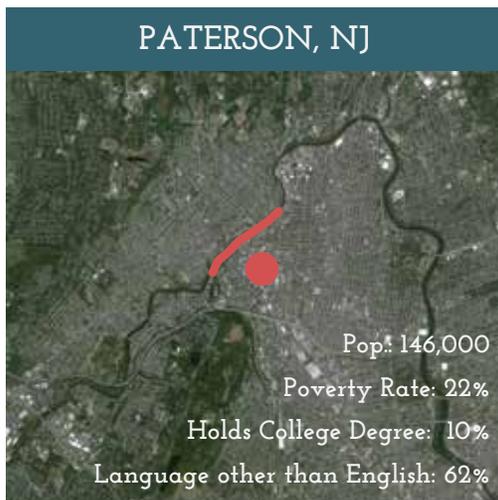
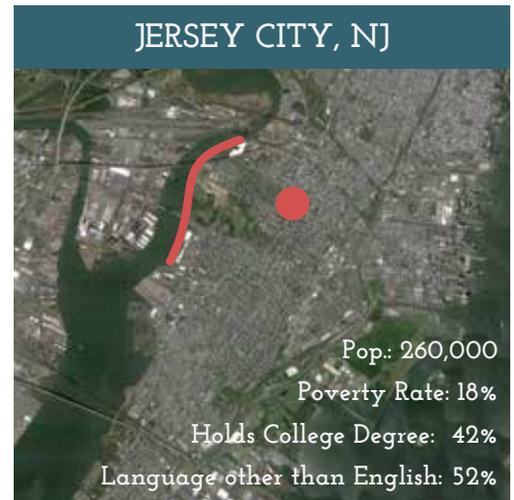
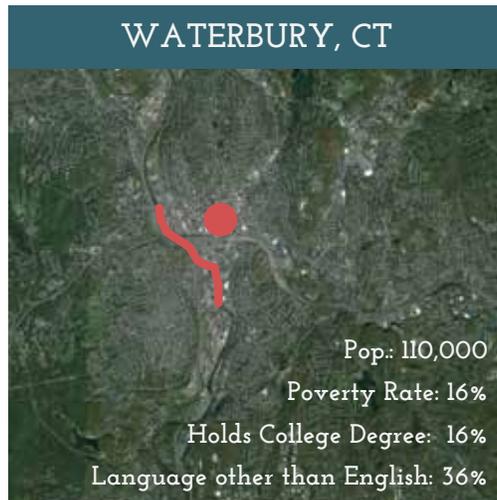
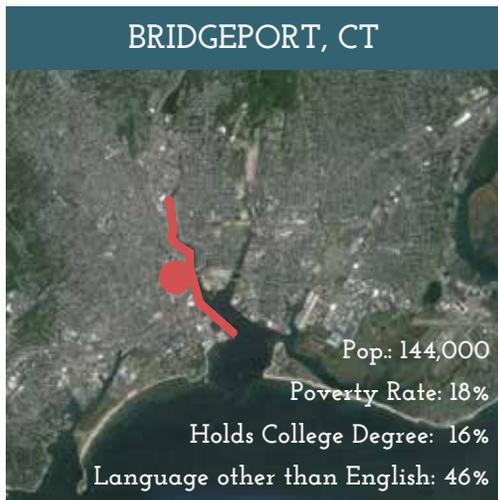
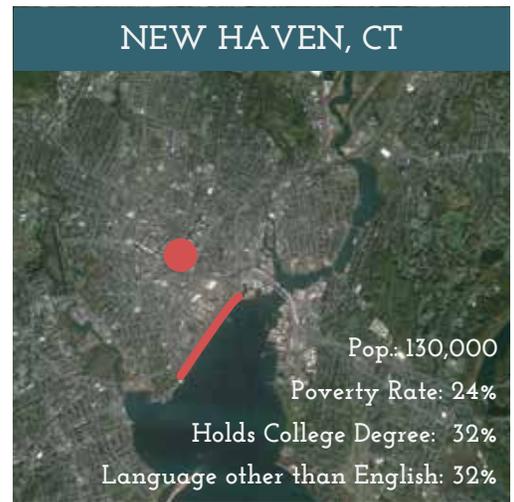
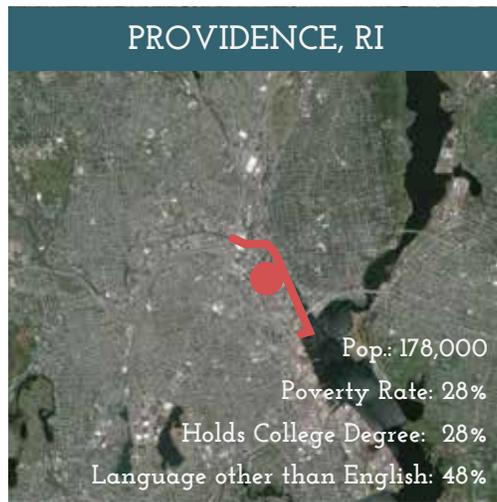
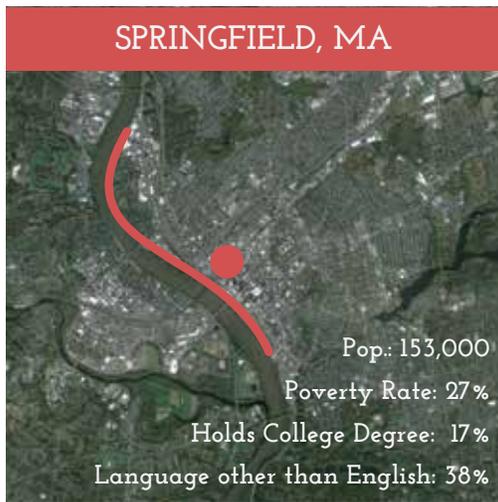
Percentage of town population that has not attended college





CITY OF SPRINGFIELD

National Disaster Resilience Competition - Phase II



Springfield's Peer Cities

The City of Springfield is committed to creating a holistic, integrated solution through community housing rehabilitation, flood protection, and economic development, thereby catalyzing its revitalization and serving as a model for its peer cities - urban communities in the northeast, mid-west and mid-Atlantic identified by the Federal Reserve as having characteristics similar to Springfield.



Data from Census 2010



Legend

Urban Watershed Resilience Zone

Water

Existing Complete Streets, Greenways, & Trails

Planned Complete Streets, Greenways, & Trails

VAN HORN CONNECTOR TRAIL

- Add 2,700 linear feet of paved trails
- Connect the 87.8 acre upper park with the 27.9 acre lower park and the 14.9 acre Van Horn Park expansion
- Will create a 130-acre green space with a total of 3.9 miles of multi-use trails

VAN HORN PARK TRAILS

PLAINFIELD ST. AMENITIES

LOWER VAN HORN PARK

UPPER VAN HORN PARK

ARMORY ST.

BAYSTATE MEDICAL CENTER VAN HORN PARK ANNEX

RIVERSIDE ROAD

CYCLE-TRACK

WEST ST. AMENITIES

RIVER WALK

NORTH END RIVERSIDE ROAD ENHANCEMENTS

- Convert Riverside Rd. into a one-way roadway with a new cycle-track to create over a two mile circuit
- Construct new gateways over the existing flood wall to allow the residents to access the track at multiple locations
- Develop new active and passive recreation amenities with parking at the Plainfield St. and West St. ends

RIVERFRONT PARK

- Increase the capacity to absorb river overflow through expanding greenspace, new pervious surfaces, and bio-retention tree boxes
- Enhance handicap accessibility through improving the access point from downtown to the park