EXHIBIT A – EXECUTIVE SUMMARY

Springfield, Massachusetts was by impacted by five presidentially-declared disasters in 2011-2013, more than any other single community in the country. The most severe of the disasters was an F3 tornado, which ripped a ½ mile wide, 6.2-mile long swath of destruction through the heart of downtown and the City's residential neighborhoods.

Springfield is an old city, a poor community, and is made up predominantly of persons of color, with many vulnerable residents. These factors both increased damage from the disasters, and have also led to uneven recovery. A critical priority for increasing future resiliency is to ensure equity in the City's current ongoing recovery. The City will invest in infrastructure (green and grey) and high-quality housing through initiatives that will bring job opportunities and economic development to the community's most distressed neighborhoods, while simultaneously emphasizing environmental and quality-of-life benefits. Springfield will use this resiliency emphasis as an opportunity to build capacity throughout City departments to consider economic opportunity and environmental impact throughout all major infrastructure and capital projects.

Springfield is a mature post-industrial city. It has grand historical buildings, significant cultural and educational institutions, extensive parkland, and the locational advantage of its siting at the bend of the Connecticut River, along rail lines, and at the intersection of major north-south and east-west interstate highways. Springfield is a regional hub for education, medical care, and financial services, including home to the Fortune 100 company MassMutual, Inc.

The City has struggled with economic decline, beginning in 1968 with the closure of the United States Armory, followed by decades of loss of manufacturing jobs. White flight emptied the City of much of its middle-class. High foreclosure rates stemming from the 2008 housing crisis have led to abandonment and vacant buildings. The City has been fortunate to maintain population

by functioning as a gateway city for migrant Puerto Ricans and immigrants from Vietnam, Eastern Europe, and other nations, and now has an extremely diverse populace. Despite stable population numbers, current residents are poorer and have less economic opportunity than previous generations. The City has an overall poverty rate of 33% and an unemployment rate that averages two percentage points higher than that of the State of Massachusetts. Deepening poverty negatively impacts the tax base, making it difficult for the City to respond to aged infrastructure, deep poverty, and overcrowded schools.

Despite challenges, Springfield has made positive strides in recent years. After a 2003 fiscal crisis, the City has spent over a decade transforming itself into a modern city which follows best practices regarding professional staff, fiscal responsibility, transparency, and citizen engagement. The City has a current Moody's Investor Service bond rating of A2 with a positive outlook. Springfield is in the midst of an economic boom, with $2.7 billion of economic development projects underway or scheduled within the next three years. These include a new multi-modal Union Station, an MGM Springfield Casino and entertainment complex, and repair of the Interstate 91 corridor that runs through downtown Springfield.

Recognizing the need to implement recovery efforts in a manner that both rebuilds devastated neighborhoods and creates a stronger community, Springfield undertook a major City-wide planning process in 2011-2012. "Rebuild Springfield" engaged over 3000 residents, provides the blueprint for rebuilding tornado-devastated neighborhoods, and sets forth a City-wide plan for building a more resilient city, focused on six "nexus domains": Educational, Physical, Cultural, Social, Economic, and Organizational. Springfield's participation in the National Disaster Resilience Competition is a natural extension of its completed, ongoing, and planned recovery and resilience efforts.

EXHIBIT B – THRESHOLD REQUIREMENTS

Springfield, MA has been impacted by five presidentially declared disasters between January 1, 2011 and December 31, 2013. It is located within Hampden County, MA which was designated by HUD in 2014 as a Most Impacted County. The City has substantial unmet recovery needs.

Eligible Activity: No projects or activities are included in the City of Springfield's Phase I Application, but all Phase II activities will meet eligibility criteria outlined by HUD.

Most Impacted and Distressed Area with Unmet Recovery Needs: Hampden County, MA is listed as a most impacted and distressed County in HUD's Appendix A.

Incorporate Resilience: The City of Springfield has incorporated resilience into its project approach and has previously applied them in projects listed in Exhibit G. The City will incorporate resilience into all projects in Phase II.

Meet a national objective: Springfield will meet a minimum of the following national objectives in its Phase II application: low/moderate income, slum or blight or urgent need.

Meet Overall Benefit: Springfield NDRC projects will primarily benefit LMI populations.

Establish Tie-Back: Any activity in the City of Springfield's Phase II application will have a direct tie back to the five qualified disasters between 1/1/2011 and 12/31/2013.

Benefit-Cost Analysis (Phase II Projects): N/A for Phase I.

Execute Certifications: All required certifications can be found in Appendix C.

Meet General Section Administrative Threshold: The City of Springfield meets all Threshold requirements outlined in HUD's FY2014 NOFA for Discretionary Programs.

Target Area(s): N/A

(1) Most Impacted Characteristics: N/A

(2) Distressed Characteristics: N/A

(3) 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, 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. See Appendix X for documentation of these needs, including photos of the properties and certifications from property owners.

Infrastructure: Unmet infrastructure needs include reconstruction of roads due to damage from 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. See Appendix X for a stamped engineering certificate from Christopher M. Cignoli, P.E. certifying damage estimates for repairing unmet needs from the federally qualified disasters.

Economic Revitalization: N/A

Environmental Degradation: The funding gap needed to repair to the Van Horn Dam, Watershops Pond Dam, Debris Removal and Drainage/Culvert in the City of Springfield is $2,620,000. See Appendix X 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 an *Upper Van Horn Reservoir Dam Inspection/Evaluation Report* (2009), an *Inspection/Evaluation Report of the Watershops Pond Dam* (2013), and a *Vegetative Debris Removal report* (2011). It also includes a summary signed by Christopher M. Cignoli, P.E., Director of Public Works for the City of Springfield, MA.

EXHIBIT C - CAPACITY

General Management Capacity

Springfield's Development Services Division ("Development Services"), which includes the offices of Disaster Recovery & Compliance, Community Development, Housing, Neighborhoods, Code Enforcement, and Economic Development and Planning, will implement NDRC projects. Development Services has extensive experience in management of federal grants including Community Development Block Grant (CDBG), HOME Investment Partnerships Program, Neighborhood Stabilization Program, Continuum of Care, and Economic Development Administration grants. In recent years, Development Services 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. Development Services is directed by the City's Chief Development Officer, who reports directly to the Mayor.

The Development Services team will be led by its Office of Disaster Recovery and Compliance, established in 2013 after Springfield was allocated $21.8 million in CDBG-DR funds. This office is led by a Director with 10 years municipal management experience, and also includes a fiscal analyst and a program manager. The City committed $13 million of its DR award in the City's *CDBG-DR Partial Action Plan A* in December 2013, and has already spent almost 50% of these funds. HUD completed an initial monitoring of the DR program in September 2014 and found that robust systems were in place to administer programs. The DR project implementation is well-coordinated with over $75 million in City-led projects funded by FEMA and other public sources, including a new elementary school, a new community center and a new senior center.

Springfield's detailed P*lan for Financial Administration and Management of the CDBG-DR Program*, which describes the City's financial policies, internal controls and procurement policies, has been reviewed and approved by HUD. A September 2014 updated version is available on the City's website. The City of Springfield has emphasized mitigation of fraud, abuse and mismanagement related to accounting, procurement, and accountability. It conducts regular CDBG expenditure and performance progress reporting and adheres to the City's *CDBG-DR Policies & Procedures Manual* detailing the financial management and administration of the grant funds. The City itself is fiscally sound and has a Moody's Investor Service bond rating of A2 with a positive outlook.

The City of Springfield has developed strong capacity over the last decade to implement broad initiatives which coordinate the work of contractors, funders, subrecipients, community stakeholders, and other government agencies. Key initiatives have included the Tornado Disaster Recovery and Redevelopment, the South End Revitalization Initiative, the State Street Alliance, the community-wide collective impact initiative focused on reading success by 4th grade, and the City's Ten Year Plan to End Chronic Homelessness (which has resulted in a 60% drop in chronic homelessness), as well as participation in the Connecticut/Western Massachusetts region's Sustainable Communities initiative.

One example of the City's coordinated development work is the South End Initiative, which follows a 2007 Urban Land Institute recommendation that the City make the South End neighborhood its highest priority for revitalization. The City began its focused effort by creating a neighborhood plan based on extensive resident input and working with community members to form the South End Revitalization Coalition. The City has carried out numerous components of the initial plan, including environmental cleanup, infrastructure redevelopment, demolition of

blight, urban renewal takings, park expansion and redevelopment, and development of single family homes. The City's portion of the plan has been carried out with $10 million from a City bond, plus multiple state, federal and private grants. The City's efforts have been coordinated with private development, including an $80 million investment into rehabilitation of 22 historic multi-family residential buildings, and a newly-constructed hotel. Following extensive neighborhood physical improvements, focus has shifted toward human capital, based on the People Plan created through a Choice Neighborhoods Planning Initiative, and a focus on reducing crime, with support of a Byrne Criminal Justice Initiative (BCJI) grant.

Springfield's NDRC application was written collaboratively by the consultant firm GCR Inc. and a City team made up of the directors of the offices of Disaster Recovery, Public Works, Housing, and Community Development/Administration and Finance. The City took the lead in the development of the proposal concepts, through months of interdepartmental, partner and community engagement efforts.

Cross-disciplinary technical capacity

Springfield's Development Services Division will provide the leadership, planning, project and financial management, reporting and coordination for this resiliency initiative. Development Services' capacity will be augmented by the following partners:

The **Springfield Department of Public Works** (DPW) provides expertise in engineering and design, environmental protection, public health and safety, and storm infrastructure systems.

The **Springfield Department of Parks, Buildings and Recreation Management** (PBRM) plays an important role in increasing the resilience of Springfield's infrastructure. PBRM's expertise includes building hardening, green infrastructure and drainage, and energy redundancy.

The **Springfield Department of Capital Asset Construction** (CAC) provides professional project management capacity. The agency's expertise includes health and safety codes compliance, disability access, and energy and other operating cost savings.

Partners for a Healthier Community (PHC), a Springfield non-profit organization, provides expertise in convening and partnering, health policy development, population-based health program delivery, and research and evaluation.

The **Northeast Climate Science Center** (NECSC) provides expertise in climate impact science assessment.

The **Pioneer Valley Planning Commission** (PVPC), a regional planning body, provides resources and professional planning expertise specializing in community development, economic development, environment and land use, regional information and policy, transportation and transit, historic preservation, municipal services, graphics and mapping, and Geographic Information System (GIS) services.

GCR Inc., an international professional services firm, partners with government and commercial clients to deliver consulting services and technology solutions in aviation, disaster management services, elections, nuclear power, public safety, right-of-way and urban planning. GCR has gained vital experience through leading and supporting disaster recovery and community rebuilding efforts in New York, Louisiana, Illinois, Texas and North Dakota.

DevelopSpringfield is a nonprofit corporation which advances development and redevelopment projects, stimulates and supports economic growth, and expedites revitalization. The organization has several programs and projects underway which contribute to the redevelopment in Springfield's disaster impacted areas.

Development Services has existing and well-developed partnerships with many of these entities already—specifically, with the City departments (DPW, PBRM, and CAC)—and with PVPC and DevelopSpringfield. All these entities have collaborated on multiple projects related to recovery from the 2011 tornado. This work has included multi-disciplinary focus in a limited geographic area, including community engagement, building demolition, single and multi-family housing development, road and sidewalk improvements, economic development, park redevelopment, workforce development, and new school construction. City staff in various departments has led inter-connected projects, including planning, design, procurement, and project management. DevelopSpringfield has been a partner in some projects. PVPC has taken a lead on community engagement for several initiatives.

PVPC has steered multiple regional planning initiatives that have included the City as a partner. Most notable of these is the bi-state Sustainable Communities Initiative plan, which was completed in 2014 and includes the following plan components: Land Use; Housing; Food and Agriculture; Environment and Green Infrastructure; Economy; and Climate & Natural Hazards. Springfield was an active partner in creation of these regional plans.

PVPC and the City of Springfield have undertaken comprehensive fair housing and civil rights analysis of the City of Springfield and the greater Springfield region. In 2013, Springfield partnered with PVPC to undertake a comprehensive update of the City's *Analysis of Impediments to Fair Housing*. In 2014, PVPC completed the regional *Fair Housing and Equity Assessment*. Both these analyses used data to illustrate economic and racial disparities, using an opportunity mapping framework. PVPC and the City continue this work through ongoing participation in the regional Inclusive Communities Advisory Group.

Partners for a Healthy Community is also an established partner. PHC is the backbone organization for the LiveWell Springfield initiative, a City-wide collective impact effort, funded by the Centers for Disease Control, which encourages healthy and active living. A number of City departments are engaged in LiveWell Springfield, and have collaborated on a Pedestrian/Bike Plan, Complete Streets, enhancement of the City's Riverwalk, a City Garden ordinance, and location of urban gardens on City-owned vacant lots. LiveWell Springfield, DevelopSpringfield and the City are working together toward creation of an urban supermarket.

NECSC has been brought on as a new partner because of its specific expertise regarding climate change. NECSC's work encompasses several major areas of study that address possible future conditions, risks, benefits and outcomes with emphasis on resilience. NECSC's expertise is complemented by PVPC's experience in regional planning for environmental and climate change needs.

The City will rely predominantly on its internal expertise for creation of designs and plans. Springfield's DPW possesses extensive expertise in engineering and design work and has worked in close coordination with Development Services on the City's disaster recovery efforts. Springfield's NDRC partners, particularly CAC, DevelopSpringfield and NECSC, will work in close coordination with DPW and serve to enhance its existing capacity, particularly with respect to ensuring projects increase Springfield's long-term resilience to future climate change.

Springfield and its partners possess significant capacity in conducting both benefit-cost analyses (BCAs) and cost-efficiency analyses for potential projects. Given the history of disasters in the area, Springfield is well-acquainted with the need for conducting BCAs in accordance with its Hazard Mitigation Grant Program project proposals, in keeping with FEMA requirements. Springfield's partner GCR is particularly well-versed with the FEMA BCA software platform

(Benefit Cost Toolkit Version 4.5.5/4.8/5.0) in conducting BCAs for myriad project types in a variety of disaster environments. In addition, Springfield has a strong degree of familiarity with DOT cost-efficiency analysis program requirements, and is positioned to implement this manner of evaluating project cost-reasonableness.

The City is confident that the partners it has brought on board 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 engage an equally qualified entity to fill any resulting gaps in expertise. Through the City's management of recovery funding, extensive work in communities, and outreach and engagement efforts associated with recent planning processes, it has developed relationships with an extensive array of potential partners.

Community Engagement Capacity

Developing out of the June 2011 tornado and its immediate aftermath, Springfield and its partners have established a robust and extensive community engagement platform. Within months of the tornado, Springfield engaged in a broad planning process that involved multiple interactive public meetings, stakeholder conversations, and consensus-building activities, and included participation by over 3,000 City residents. The master planning resulted in the *ReBuild Springfield Plan* (http://developspringfield.com/projects/rebuild_springfield.html). While Rebuild Springfield was created in response to the tornado, the scope of the initiative goes far beyond simply rebuilding. Citizens, city government, private businesses, and other stakeholders rallied together to use the 2011 tornado as a catalyst for rethinking Springfield's future. The Rebuild Springfield initiative integrated community input with planning expertise to develop a realistic action plan for realizing the vision of neighborhoods and the city as a whole. The City-wide planning process resulted in an ongoing increase in community engagement capacity. The ongoing network of

engagement opportunities includes neighborhood and sector meetings, city-wide meetings, active neighborhood councils, online engagement options, and ward-based city council representation.

As part of the Rebuild Springfield process, the City, the Springfield Redevelopment Authority and DevelopSpringfield helped to mediate differences in vision for a particularly devastated area where interests of Springfield College, the Springfield School Department, the Springfield Housing Authority, owners and residents of two affordable housing developments, and neighborhood homeowners and renters diverged. Through repeated meetings and with professional guidance, the parties were able to come together to create a master plan that includes complicated interlocking agreements for land swaps and sales, phased redevelopment, and reconciliation of different neighborhood visions. While redevelopment is still taking place, the parties are working collaboratively to create the envisioned plan.

The groups in Springfield most likely to be affected and most vulnerable to future disaster have been given greater voice and agency through the growth of engagement capacity. The 2011 tornado severely impacted three of Springfield's most distressed neighborhoods, and these neighborhoods have been engaged in focused community-building activity since that time. PVPC and the nonprofit HAP Housing have used the NeighborWorks model for building and empowering community leadership in these neighborhoods, and the result has been communities that are active in setting their own agendas for neighborhood recovery and working with the City to implement those agendas. Both Six Corners and Old Hill have developed their own neighborhood plans, and leaders have emerged who champion those plans. In the South End, implementation of the Choice Neighborhood's planning grant and the Byrne Criminal Justice Initiative have led to extensive community engagement activities, including establishment of a small satellite City office in the heart of the neighborhood. Several local leaders are active in the

public safety initiative, which includes weekly meetings of residents, City officials, police and nonprofit and other stakeholders. Citywide engagement of the city's most vulnerable residents has been enhanced by the work of the CDC-funded LiveWell Springfield campaign, the Springfield Food Policy Council, and four neighborhood-based public safety initiatives.

The City continues to work closely with numerous stakeholder entities and a core group of primary partners have been contributing to outreach and engagement in the development of the NDRC application. PVPC has provided, and continues to provide, extensive engagement with a diverse set of stakeholders, having designed the engagement process for this proposal with input from numerous community action and neighborhood groups. As part of the NDRC application development process, PVPC has consulted with the New North Citizens Council, Arise for Social Justice, Maple High-Six Corners Neighborhood leaders, Old Hill Neighborhood leaders, and the Mason Square Task Force. The City has met with the presidents of the City's seventeen neighborhood associations.

Regional or multi-governmental capacity

The City's and its NDRC partners' experience working to address regional challenges is evident in the recently completed regional plans, which include *Our Next Future: An Action Plan for Building a Smart, Sustainable and Resilient Pioneer Valley; One Region, One Future--An Action Agenda for a Connected, Competitive, Vibrant, Green Knowledge Corridor;* and the *Pioneer Valley Climate Action and Energy Plan.* The City played an active role in the development of these plans and the implementation of the strategies detailed therein, including increased food security, expanded housing choices, moving toward a carbon neutral future, protecting greenways and blueways, promoting clean water, offering alternative transportation options, and revitalizing community centers.

Development Services has engaged in an ongoing dialogue with the State of Massachusetts in order to identify how initiatives being proposed and implemented at each respective level of government can best support each other. These efforts have been especially beneficial as it relates to environmental initiatives, watershed management in particular. The State and City have committed to sharing ideas, concepts, data, funding strategies, and other relevant information to develop a cohesive set of solutions that address challenges to the Pioneer Valley region. Discussions to data have confirmed the anticipated benefits, both in terms of project feasibility and cost effectiveness, of the City and State partnering on regional issues.

Springfield is committed to working with its regional partners in the Pioneer Valley to expand the impacts of its proposed activities. Its outreach and engagement efforts for this Phase I application include meeting with eight adjacent jurisdictions in order to discuss Springfield's plans (related to the NDRC or otherwise), how proposed activities may impact each respective jurisdiction, and gather feedback from community representatives.

EXHIBIT D – NEED/EXTENT OF PROBLEM

Unmet Recovery Needs

Springfield, Massachusetts was struck by five separate presidentially declared disasters between January 1, 2011 and December 31, 2013, more than any single community in the country. The City is located in Hampden County, Massachusetts, which was designated by the U.S. Department of Housing and Urban Development in 2014 as a most-impacted area. Springfield has substantial unmet recovery needs from 2011-2013 disasters, which included an EF tornado, extremely damaging snowstorms, and a hurricane.

Springfield is a post-industrial northeast city, with aged infrastructure and buildings and more than a third of residents living with incomes below the federal poverty level. It includes numerous census tracts with poverty rates close to or exceeding 50%, and its most distressed neighborhoods were among those directly hit by the 2011 tornado. The impact of the multiple disasters was harder on the City's low-income population, which is made up disproportionately of people of color. Springfield's recovery has been slowed due to residents' lack of resources and the City's anemic tax base.

Springfield's June 2011 EF3 tornado was part of the region's worst outbreak of tornados in a century, causing $90 million in damages in Hampden County (*PVPC Climate Action and Green Energy Plan 2014*; NOAA). The Springfield tornado cut a half-mile wide, 6.2- mile long swath as it tore through eight neighborhoods. The path of the storm, coupled with the city's development patterns, resulted in the vast majority of residential damage occurring in just five neighborhoods: South End, Six Corners, Old Hill, East Forest Park, and Sixteen Acres (*CDBG – DR Partial Action Plan A*).

In August 2011, rains from Hurricane Irene infiltrated buildings still damaged from the tornado, exacerbating housing problems by causing extensive water damage and mold. In October 2011, a record early snowstorm pummeled the region, snapping branches and taking down power lines causing $30 million in damages and recovery for Springfield (*CDBG – DR Partial Action Plan A*). Thousands were without power, many for more than a week (*PVPC Climate Action and Green Energy Plan 2014*). In addition the power outages and expensive recovery, the death of one Springfield resident was attributed to the storm. Springfield infrastructure, homes and natural habitat were further harmed by an additional blizzard in 2011 and by Superstorm Nemo in 2013.

The 2011-2013 weather disasters caused extensive damage to Springfield's housing stock, infrastructure, environment, and the economy. The 2011 tornado resulted in condemnation of 615 residential units, including 110 privately-owned rental units for which there is no indication of an intent to rebuild, as well as destruction of 74 units of public and subsidized housing. While many homeowner units have been repaired or replaced through homeowners' insurance, Small Business Association (SBA) disaster loans, bank loans, homeowner savings, and donated resources, many rental properties have not been rebuilt, and distressed neighborhoods are scarred by gaps where homes were demolished and the lots abandoned. In its *CDBG-DR Partial Action Plan A*, the City estimates the unmet housing need, after insurance and SBA loans paid out, to be $43 million. The City anticipates that it will spend $4.8 million of CDBG-DR funds addressing these needs. As detailed in in Exhibit B, Springfield has met the NDRC unmet housing needs through verification of a $3.3 million funding gap needed to reconstruct 40 tornado-destroyed units of public and subsidized housing.

Springfield's 2011-2013 disasters damaged Springfield's infrastructure, including roads, flood control drainage systems, two dams, and the utility grid. Roadways and sidewalks

experienced damage from falling trees and operation of heavy recovery equipment. The City has endured damage and destruction of public facilities, including two schools, a community center, and seven parks.

Springfield's environmental degradation from the disasters includes extensive loss of tree canopy, erosion, and damage to water control systems. These factors combine to increase risk of flooding from future storms, as well as increased pollution from storm runoff into tributaries and the Connecticut River. Because Springfield is still working to separate combined sewer and stormwater overflow, greater runoff also means increased health consequences from combined overflow emptying into the Connecticut River during significant storms.

Both the Watershops Pond Dam and the Van Horn Dam, which control water flow in tributary waterways that run into the Connecticut River, sustained disaster-related damages which have yet to be repaired due to insufficient resources. Each of these dams is classified by the state of Massachusetts as a High Hazard Area because they are places where failure will likely cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways or railroads (PVPC Climate Change and Green Energy Plan 2014). The tributary waterways affected, which will need 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 trauma center.

In its *CDBG-DR Partial Action Plan A*, the City calculates the unmet infrastructure need, after insurance and SBA loans paid out, to be $59 million. The City anticipates that it will spend $14 million of CDBG-DR funds addressing these needs. As detailed in in Exhibit B, Springfield has met the NDRC unmet infrastructure needs through verification of a $4 million funding gap to repair heavily storm-damaged roads and upgrades/replacement for the City's flood control

drainage system on Riverside Road, severely damaged by runoff from multiple extreme storms. Exhibit B also details the NDRC unmet environmental degradation needs through verification of a $5.8 million funding gap for needed repairs for storm damage to Van Horn Dam, Watershops Pond Dam, drainage/culverts in the City, and remaining necessary debris removal, especially from ponds and waterways.

The 2011 tornado had widespread effects on the Springfield business community, with 69 businesses impacted. In the immediate aftermath of the storm, the most significant issues were damage to buildings; power loss; access with many closed roads and closed transit services; delivery challenges; and access to work for staff. 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. While most businesses reestablished at their former location, others were forced to reestablish in other locations, and a small percentage were unable or chose not to reestablish. Permanent loss of some businesses resulted in long-term job loss.

In its *CDBG-DR Partial Action Plan A*, the City estimates the unmet business/economy need, after insurance and SBA loans paid out, to be $20 million. The City anticipates that it will spend $2 million of CDBG-DR funds addressing these needs.

Comprehensive Risk Assessment Approach to Recovery

The City's risk assessment framework is an approach adapted from United Nations Disaster Programme Disaster Risk Assessment (UNDP). This five-step approach relies on local and regional scientific literature to provide the foundation of data collection. The steps include, 1) understanding the current situation including the needs and gaps, 2) identifying the likelihood of

major hazards prevailing in Springfield, 3) identifying the population and assets at risk and delineating disaster-prone areas, 4) determining the capacity (or lack of it) of elements at risk to withstand the given hazard scenarios, and 5) estimating the potential losses and their potential impacts on Springfield. A complete list of citations is included in Exhibit [XX].

The threats and hazards described in this section were identified through the unmet need assessment, review of scientific literature, and local and regional planning reports. Data was drawn from a variety of available data sources, including the U.S. Census Bureau, the Massachusetts Department of Public Health data sets, and housing data sources. Information from the Pioneer Valley Planning Commission's "Climate Action and Clean Energy Plan" was utilized as part of this process.

Likelihood of Major Disasters: Accounting for the anticipated effects of climate change, the following are the natural disaster threats and hazards that are most likely to occur in Springfield: 1) rising temperatures and heat waves, 2) increased precipitation and flooding, and 3) extreme storm events.

Springfield's Vulnerabilities: A variety of factors make communities vulnerable to the impacts of natural disasters and climate change, including the built environment and infrastructure, as well as the social, economic and health status of the community.(Lynn 2011). The following section describes Springfield's vulnerabilities.

Low Elevation and Water Control Issues: Downtown Springfield's location at low elevation on the Connecticut River, combined with densely populated surrounding neighborhoods, make the downtown and its vulnerable low-income North End and South End neighborhoods subject to flooding. Threat from flood is exacerbated by the existence of two dams that were damaged in the 2011 storms and are classified by the state of Massachusetts classifies as being in

High Hazard Areas, which are those where dam failure will likely cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads (*PVPC Climate Action and Green Energy Plan 2014*).

Lack of Water Infiltration and Tree Canopy: Springfield's downtown and close-in 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. Both these factors combine to decrease opportunity for water infiltration to ground. Decreased water infiltration is exacerbated by the City's extreme loss of tree canopy from the 2011 tornado and autumn snow storm, which causes more stormwater to hit the ground more quickly.

Combined Sewer Outfalls (CSOs): 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 outfalls (CSOs). This has significant health consequences indicated by the issuance of health safety alerts to advise that people avoid contact with the water for 48 hours. While Springfield is working to separate its sewer system and reduce the number of CSOs, this is a very expensive undertaking and is a long-term project. (*PVPC Climate Action and Green Energy Plan 2014*).

Damaged Highway: Springfield is intersected by the major north-south I-91 highway, with a viaduct through the heart of the City. The viaduct is aged and compromised. Fortunately, it is scheduled for repair by the Massachusetts Transportation Department over the next three years. The viaduct portion of I-91 carries approximately 70,000 cars and trucks per day. (*PVPC Climate Action and Green Energy Plan 2014*).

Frequent power interruption: Most of Springfield is served by above-ground electrical service, which is at risk and is frequently interrupted by winter storms and high wind events. Both the 2011 tornado and the 2011 October snowstorm left thousands of residents and businesses without power for a week or more. An additional vulnerability for Springfield's power system is the location of two power facilities in flood zones. Putts Bridge, a hydroelectric facility, is located in the 100-year floodplain, and Consolidated Energy at Indian Orchard is in the 500-year flood zone (Oliver).

Aged housing stock and a weak housing market: Springfield's housing stock is aged, and the City's housing market is weak. The result of this combination is that properties are subject to deferred maintenance or existing need for 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. Another consequence of Springfield's weak housing market is that much of the rental stock—particularly rentals of single-, two-, and three-family homes—are owned by investors who may have little long-term interest in the community. The City's experience in 2011 was that many investors simply abandoned damaged properties. Abandoned buildings create safety hazards and are a maintenance burden for the City.

Small business owners with limited resources: 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.

Health Disparities: Springfield residents experience large health disparities when compared to the state and the nation. As illustrated by Table 1, residents are disproportionately

impacted by high rates of asthma, stroke, chronic obstructive pulmonary disease (COPD), obesity, hypertension, childhood lead poisoning, and diabetes. Some neighborhoods that were impacted by the tornado and continue to have unmet needs experience even larger inequities.

Table 1. Emergency Room and Hospitalization Rates

		Emergency Room Visit Rates**				Hospitalization Rates***
Zip Code*	**Neighborhood**	**Asthma**	**Hyper-tension**	**Mental Health**	**COPD**	**Stroke**
01109	Old Hill	1590	444	3493	1998	340
01103	Metro Center	2225	#	5359	2818	#
01105	Six Corners/South End	2740	436	9172	3276	267
01108	Forest Park	1476	273	3584	1826	297
01118	East Forest Park	566	108	1829	724	233
01107	North End	2640	361	4675	3207	369
	Springfield	1593	301	4017	1976	281
	Massachusetts	586	131	2150	894	246

* Neighborhoods may have more than one zip code. Zip codes were identified that included the largest portion of the neighborhood or that were entirely for a given neighborhood.

** 2009-2011 Emergency Room Visit Dataset, MDPH; Age-adjusted per 100,000

*** 2009-2011 Inpatient Hospitalization Discharge Dataset, MDPH; Age-adjusted per 100,000

Suppressed due to too few numbers

Environmental Risk Factors: 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). The City has also been identified by the Massachusetts Office of Energy of Environmental Affairs as an Environmental Justice (EJ) community. A more recent analysis that was conducted using the Pioneer Valley Metropolitan Planning Organizations' definition of environmental justice, which includes those neighborhoods that have rates of poverty or racial/ethnic minorities above the regional average, found that large parts of Springfield meet the criteria for an EJ community, as can be seen in Exhibit [X].

Presence of Food Deserts: Springfield residents struggle with limited access to affordable, healthy food with most neighborhoods having limited access based on USDA's Food Access Research Atlas (Partners for a Healthier Community, Health Equity Report). In particular, among the neighborhoods impacted by the tornado with unmet need, Six Corners, Old Hill and parts of Metro Center, Forest Park and Memorial Square are described as having limited access.

Vulnerable Populations: Low income populations, communities of color, and immigrants have been identified as particularly vulnerable to negative impacts of natural disasters and climate change. (Wisner 2004; Lynn 2011). Springfield residents struggle with economic insecurity with a median household income of $31,356, half that of the state, and 33% of residents living in poverty; 48% of Springfield children live in poverty (U.S. Census, ACS, 2012). Rates of poverty are almost 50% in all but two of the neighborhoods with unmet need from the tornado. Residents in these neighborhoods have high rates of unemployment and lower levels of education.

Springfield is a diverse, multi-ethnic city with people of color accounting for 66% of its population. An estimated 43% of Springfield's population is Latino, 19% is Black, and 2% is Asian (U.S. Census Bureau, ACS, 2012). Springfield has a substantial immigrant and migrant population with an estimated 10% of Springfield's population foreign-born and 18% migrants from Puerto Rico (U.S. Census Bureau, ACS, 2012). Forty-one percent of the Springfield population speaks a language other than English, and 17% speak English "less than well," with the majority of those primarily Spanish speaking (81%) (U.S. Census Bureau, ACS, 2012).

Children and older adults age 65 and over are also vulnerable to the negative effects of climate change and natural disasters. In Springfield, there are an estimated 20,951 children age 9 and under and 17,461 adults age 65 and over. (U.S. Census Bureau, ACS, 2013). As poverty rates among children and adults 65 and older are high in Springfield (Table 2), these populations are expected to experience greater risk of negative impacts of climate change and natural disasters.

Capacity to Withstand Risk Some of Springfield's vulnerable assets and populations have very limited capacity to withstand risk, or damage from a disaster is likely to have catastrophic impact.

Racially/ethnically areas of concentrated poverty: Springfield includes ten census tracts with poverty rates over 40% and minority populations of 50% or more, including two that were severely damaged by the 2011 tornado. The challenges in these neighborhoods are multiple, and Springfield's experience has been that disaster recovery in these neighborhoods is particularly difficult and slow. Lack of resources, lack of family and friends with resources, and lack of insurance make the impact of a disaster especially severe. Following the 2011 tornado, the majority of those who became homeless were from these neighborhoods, and some still continue to struggle with housing instability.

Renters and Predominantly Rental Neighborhoods: More than half of Springfield residents are renters, who have less capacity to withstand and recover from disaster. The combination of renter status and low incomes mean that few of these households have renter's insurance. In the aftermath of the 2011 tornado, homeowners were frequently protected from homelessness by virtue of interim housing protection as part of homeowner's insurance; in contrast, renters had nowhere to go. Further, renters have little control over maintenance, and may be precluded from taking protective measures. Neighborhoods that are made up predominantly of renters are also impacted by investor-owners who may have less or no urgency to repair. Rental Neighborhoods are at risk of both lingering property damage and abandonment.

High flood risk: Downtown distressed neighborhoods—particularly the North End and the South End—are at high risk of destruction from flooding due to failure of the Van Horn Pond Dam and Watershops Pond Dam, each of which was damaged by 2011 disasters. Both of these neighborhoods are racially/ethically areas of concentrated poverty, which results in them having less capacity to withstand disaster. In addition, the North End is home to Baystate Medical Center, the region's only trauma hospital. The hospital would be unable to continue operation following a dam failure.

Vulnerable Populations: Low-income individuals, people with health problems or disabilities, the elderly, children, and people with limited ability to speak English are all at particular risk in the presence of a disaster or extreme weather.

Potential Losses and Impacts

Baystate Medical Center: Western Massachusetts' only regional trauma center is located in the low-lying North End neighborhood, which is protected by the damaged Van Horn Dam. Dam failure would be catastrophic for the hospital.

Transportation: There are a number of interconnected transportation impacts that could result from a disaster. The I-91 highway, with its already-damaged viaduct, and a major north-south rail line both cross through Springfield following the edge of the Connecticut River. Access to I-91 through downtown Springfield, at interchanges 3-8, are all in low-lying areas prone to flooding. The rail lines proximity to the River also makes it susceptible to flooding.

Water Quality: Extreme storms and large amounts of rainwater create water pollution problems for the Connecticut River and for communities and wildlife downstream. Numerous studies show a direct correlation between the amount of impervious surfaces and the quality of water in rivers, streams, and lakes receiving discharges from these areas. Water quality is also significantly compromised by the continued existence of CSOs in Springfield.

Homelessness: The 2011 tornado rendered over 300 households homeless; most of them were very low-income. The combination of a high renter population and a very low-income population mean that there is high risk of widespread homelessness following a disaster.

Loss of Life and Compromised Health: Springfield was fortunate to have experience no deaths as a result of the 2011 tornado. There was one death attributed to the 2011 October snowstorm. The high presence of so much chronic disease in City residents make them at increased risk of death in disasters.

Individuals with diabetes, obese individuals, children, elderly, hypertension, stroke, and depression are all at risk for negative effects of increases in temperature (Kovatz 2008). Heat stress can also increase strain on the cardiovascular system which would negatively impact those with existing cardiac disease (e.g. stroke). Increase in temperature is likely to also increase ozone pollution levels which would potentially adversely affect all residents but particularly vulnerable populations which include the elderly, children, and individuals with asthma, COPD, stroke, and

diabetes (Eze 2014)(Anderson 2012; Brooke 2004). Damage from flooding or extreme weather conditions can lead to exposure to hazards in the home, including lead, asbestos and mold, as well as opportunities for pest infestation. It is estimated that 21% of asthma cases can be attributable to mold and moisture exposure in housing and buildings (Mudarri & Fisk 2007).

Property damage and insurance coverage: The disasters most likely to impact Springfield—flooding and extreme storms—are both events that can cause extensive property damage, for both residents and businesses. Further, climate change is expected to affect the price, affordability and availability of insurance coverage (*PVPC Climate Action and Green Energy Plan 2014*).

Focus of Resiliency Efforts

Conclusions from this risk assessment are that a more resilient Springfield starts with an equitable recovery from previous disasters. Springfield's core neighborhoods that were devastated by the June 2011 tornado are also the neighborhoods that are most at risk from future disasters. These neighborhoods are densely populated with very-low income residents and are made up predominantly of people of color, and with higher-than-average rates of chronic disease and non-English-speaking population. While shocks and stresses in the form of natural disasters and severe weather are increasingly occurring, the City's approach for increasing its future resilience includes addressing persistent problems like aging infrastructure, distressed housing, poverty and particularly vulnerable populations.

Springfield's risk assessment approach has led to a plan to improve equity and increase resilience through investment in infrastructure (green and grey) and high-quality housing, through initiatives that will bring job opportunities and economic development to the community's most distressed neighborhoods, while simultaneously emphasizing environmental and quality-of-life benefits. Springfield will use this resiliency emphasis as an opportunity to build capacity throughout City departments to consider economic opportunity and environmental impact throughout all major infrastructure and capital projects. Because the City is in the midst of a $2.7 billion building boom, there is substantial current opportunity to use improved and cutting-edge practices to achieve wide-spread resiliency for the City and its most vulnerable populations.

EXHIBIT E – SOUNDNESS OF APPROACH

Consultation

In order to understand its risks and vulnerabilities in the face of climate change, Springfield engaged scientific and planning expertise in its development of its approach. The City used lessons

learned to educate community residents, including its most vulnerable populations, in order to receive meaningful input into this NDRC Phase 1 application.

Multiple City departments formed a workgroup to learn about resiliency and bring disparate perspectives to the planning process. The core of the City planning workgroup included departments of Disaster Recovery, Community Development, Housing, Public Works, Parks and Facilities, Economic Development, Finance, and the Mayor's Office. Four department heads participated in a Rockefeller Foundation Resiliency Academy. The core group educated other City departments and the Springfield City Council about this effort.

The City obtained detailed climate change information and its likely impacts on Massachusetts from the Northeast Climate Science Center (NECSC). Partners for a Healthier Community, a local nonprofit affiliated with Baystate Health Center, 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.

The Pioneer Valley Planning Commission (PVPC), a regional planning body, provided expertise regarding climate change, adaptation and resiliency; clean energy and green infrastructure; and sustainable communities. PVPC has extensive expertise in these areas, having authored *Our Next Future: An Action Plan for Building a Smart, Sustainable and Resilient Pioneer Valley; One Region, One Future--An Action Agenda for a Connected, Competitive, Vibrant, Green Knowledge Corridor;* and the *Pioneer Valley Climate Action and Energy Plan.*

PVPC was the Massachusetts lead for the HUD-funded bi-state Sustainable Communities Initiative in 2012-2014.

For Springfield residents, community engagement in planning for the National Disaster Resiliency Competition is a next step following an extensive outreach and engagement effort and planning campaign that began following the 2011 tornado. During 2011 and 2012, the City worked with DevelopSpringfield, the Springfield Redevelopment Authority and a New Orleans-based planning firm to simultaneously plan for rebuilding of the tornado path and also as a catalyst for rethinking Springfield's future on a City-wide basis. This initial planning effort engaged over 3,000 residents, city government, private businesses and other stakeholders, and created a plan for building a more resilient city, focused on six City-wide "nexus domains:" Educational, Physical, Cultural, Social, Economic, and Organizational. The domains continue to be led and championed by appointed community leaders, who meet with their domain groups,and report back out to City residents on progress toward community-defined goals. The rebuilding portion of the plan focuses on the damaged neighborhoods, divided into three districts, also steered by community leaders who continue to meet with their districts.

Springfield was awarded CDBG-DR funds in 2013. The City held community meetings in the low-income disaster-impacted neighborhoods in order to learn more about continuing resident needs and obtain input on specific spending proposals for the DR funds.

As the City began planning for its NDRC application, it engaged the PVPC to conduct outreach which would inform residents about the meaning of planning for resiliency, and seek input into an approach for the City to follow to determine its highest-priority resiliency projects. PVPC is a particularly strong partner for engaging vulnerable populations about climate change because it has extensive expertise with both the subject matter and with engaging vulnerable populations. PVPC also solicited input from the following stakeholders: Arise for Social Justice; Baystate Health; Behavioral Health Network; Caring Health Center; Develop Springfield;

Gardening the Community; Health New England; HAPHousing; Mason Square Health Task Force; Massachusetts Department of Public Health; New North Citizens' Council; North End Organizing Network; Partners for a Healthier Community; Pioneer Valley Planning Commission; Pioneer Valley Riverfront Club; University of Massachusetts - Amherst School of Public Health; Verdant Multicultural Media; and the Vietnamese American Civic Association. City of Springfield staff met with representatives of the City's 17 neighborhood organizations.

The Phase I application engagement process included a citywide forum. The agenda included a review of climate and weather change in Western Massachusetts over the next 50 to 100 years (the probability of more extreme weather, power outages, and diseases and other health related problems), transportation vulnerabilities, wastewater infrastructure (including impacts to wastewater treatment facilities), flood zones, dams, levees, and environmental justice neighborhoods. Participants provided dozens of comments and suggestions. PVPC facilitated input for Phase 1 at four small group meetings targeting residents in the city's economically disadvantaged neighborhoods.

Springfield in undertaking its Consolidated Planning process in early 2015, so it used the public input process from this effort to seek input into this NDRC application. The City carried out an online survey which included questions related to disaster recovery and resilience; the survey received over 1900 responses.

Neighborhood and community meetings included Spanish language translation. The on-line survey was available in Spanish, and could be completed on a computer or on paper forms that City staff later entered into the survey instrument.

PVPC met with adjacent local governments to solicit their engagement and feedback regarding the Phase I application. These communities included Wilbraham, East Longmeadow, Longmeadow, Agawam, West Springfield, Westfield, Chicopee, and Ludlow.

In support of the Phase II Application, PVPC will work with city staff to organize future neighborhood and city-wide meetings and use a variety of means (networking, outreach, media etc.) to publicize these meetings. Outreach and engagement efforts will continue to include small group meetings targeting residents in the city's economically disadvantaged neighborhoods. PVPC will continue engagement with Neighborhood Councils, seeking their assistance in publicizing ongoing engagement efforts and city/neighborhood meetings to their residents. PVPC will also spearhead continued engagement with adjacent local governments. Development Services will closely coordinate with the state of Massachusetts regarding coordination of NDRC projects.

Concepts

The City of Springfield seeks to become more resilient by emphasizing equity in the recovery from recent catastrophic events, including floods, snowstorms, and tornados. Springfield's neighborhoods have not recovered in the same ways from these events, leaving areas of the city more vulnerable to future disasters. The city will build a framework of equitable recovery, focusing on alleviating shocks and stresses to build resilience through the recovery process, while meeting the unmet needs of the disasters.

Shocks and stresses come in the form of both natural disasters, like severe weather and snowstorms, but also persistent problems, like aging infrastructure, poverty, and inequality. Neighborhoods affected by natural disasters that also have persistent problems face a longer road to recovery. Without the resources of wealthier neighborhoods, these areas of Springfield have not just unmet needs, but increased vulnerability to the next disaster or economic downturn. Therefore,

building resilience in Springfield must begin with an equitable recovery from existing disasters. The long-term goals of resilience are supported by the short-term goals of equitable recovery, including:

- Modern infrastructure, including sensible flood mitigation that anticipates the effects of climate change
- Economic opportunities for all residents, not just those with resources
- Improved housing stock, resilient to cold New England winters and storms
- Public safety, so everyone can participate in public life
- Job training and education, so no one is forced to leave Springfield to find opportunity
- Increased social and individual wealth, to prepare Springfield for the next generation
- Increased tax base, to fund improvements that reinforce these principles of resilience

The city's approach – building a framework for equitable recovery – includes building an internal process to incorporate resilience in every capital project, a suite of policy changes, and implementing development concepts that co-locate critical infrastructure projects, market-rate and affordable housing, green stormwater infrastructure, and commercial development.

The City is open to alternatives, but is committed to moving forward in a way that reflects the previous plans and community involvement that have followed the recent disasters, including Springfield's CDBG-DR Action Plan A, the Rebuild Springfield Plan, Our Next Future, and other recently completed efforts. These plans outline the considerable policies, programs, and capital projects that will be undertaken by the city and its partners over the coming years.

The city currently has over $1.8 billion in capital projects underway or planned for the next several years. This wide range of community development and critical infrastructure projects, including the Union Station rehabilitation and a viaduct replacement, will extend resilience beyond

the current slate of unmet needs from the qualified disasters. The city's goal though this NDRC application is to leverage these existing capital projects to build an equitable recovery process that addresses the elements of long-term resilience, including economic opportunity, education, housing, and sustainable growth.

The City of Springfield is examining best practices from other municipalities experienced with disaster recovery, especially cities with protracted poverty and inequality. Cities like Boston, Milwaukee, Hoboken, and New Orleans have incorporated practices that include community engagement at the neighborhood level with respect to resilience planning for disaster recovery. This approach has proven extremely valuable as an educational and preparation tool, but also as an actionable tool. This community engagement has created a sense of ownership and accountability for individual, family, and community preparedness against future disasters. Given the need for this type of program in Springfield, the Mayor and City Council have expressed interest in implementing these types of changes.

The city has planned for supporting the recovery from the five federally-declared disasters, including the *Rebuild Springfield* plan, and has also planned for long-term resilience at a regional level through the PVPC plans like *Our Next Future*. The capital projects and approaches in these plans are based on best practices in urban planning and resilience. Some approaches outlined in these plans include transit-oriented development, zoning adjustments that support green energy, modernizing critical infrastructure like wastewater treatment plants, forming a municipal housing trust, land conservation, recreational trails, green infrastructure development, and many more.

As Springfield develops the framework for equitable recovery, the City will prioritize the projects, policies, and programs that can have the greatest impact on long-term resilience. These will be assessed throughout the span of the NDRC funding. Springfield is making major

investments in critical infrastructure, especially in heavily-damaged neighborhoods that have also suffered from poverty and disinvestment prior to the disasters. The city's framework will include co-locating investments in housing, commercial development, and green infrastructure adjacent to these critical infrastructure investments. The idea is that as safety is improved as, for example, repairs are made to a dam, the adjacent area can be built up more sustainably and in a way that lessens the risks from future disasters. Develop Springfield, a partner on this application, has completed many commercial development projects in recent years and has the expertise to assist the city in these projects.

Co-benefits are of critical importance to Springfield and the larger region as the City examines its role in building long-term resilience through an equitable recovery framework. The regional plan, *Our Next Future*, is a climate action plan that follows the Livability Principles developed by HUD as part of the Sustainable Communities initiative, recognizing that sustainable communities encourage transportation choices, equitable and affordable housing, enhance economic competitiveness, support existing communities, coordinate policies, leverage investments, and value neighborhoods. Similarly, the *Rebuild Springfield* initiative identified six "nexus domains" to group their recommendations for building a more resilient Springfield after the tornado of 2011: Educational, Physical, Cultural, Social, Economic, and Organizational. Implementing recommendations from these plans, which are tied to the qualified disasters as well as long-term resilience against climate change and future disasters, is putting these co-benefits and concepts into practice.

Springfield proposes to augment existing recovery and resilience plans at the local and regional level by creating a framework of equitable recovery, where residents who have been most affected by previous disasters and are most vulnerable to future threats can participate equally in

the city's revitalization. Several of the neighborhoods affected by the tornado of 2011, including Six Corners and Old Hill, are home to predominantly African-American and Latino populations with median household incomes below $25,000. These neighborhoods have been slow to recover from the disasters. The city has conducted extensive outreach in these neighborhoods, as part of the *Rebuild Springfield* initiative and other efforts in order to include these residents and engage with them to construct their vision for the future.

The City of Springfield has also initiated long-term grant proposals and other initiatives aimed at vulnerable residents and businesses. In the tornado's aftermath, the city applied for, and received, a $300,000 US Department of Housing and Urban Development (HUD) Choice Neighborhoods Initiative planning grant for the South End, and following the tornado, the City applied for and received a $1 million US Department of Justice (DOJ) Byrne Criminal Justice Initiative (BCJI) grant in the South End neighborhood. In late 2014, the City submitted an application seeking Promise Zone designation for a target made up of Springfield's most distressed neighborhoods. These large-scale initiatives show the city's commitment to equity among neighborhoods, especially those recovering from multiple disasters. Springfield looks forward to furthering this work by developing and codifying a program of projects that constitute a framework for equitable recovery and promote long-term resilience.

Springfield is part of a larger corridor, the Sustainable Knowledge Corridor between Hartford (CT) and Springfield, which under the PVPC umbrella created the *Our Next Future* climate action plan. Many of the recommendations in the plan are regional in nature and seek to address regional problems, including watershed management and sprawling development patterns. By implementing the projects and strategies outlined in *Our Next Future* and *Rebuild Springfield*, the city will contribute to a more sustainable region that is better prepared and more resilient to

catastrophic events. An equitable recovery that builds wealth for all Springfield residents will also increase tax revenue to the state of Massachusetts through income and sales taxes. Interdependencies among sectors have been thoroughly explored in the local and regional planning efforts that have occurred in the past five years. The City of Springfield and its partners are cooperatively implementing projects that seek to address multiple sectors, and will continue these efforts with CDBG-NDR funding.

The City of Springfield has had many supportive partners throughout the recovery and planning processes that have taken place over the last several years, including the Pioneer Valley Planning Commission, Partners for a Healthy Community, Develop Springfield, and the New England Climate Science Center at the University of Massachusetts. All partners have signed letters of support, available in Appendix {X}. The city will continue to reach out to implementation partners as project concepts are developed in Phase II.

Springfield, as part of the Pioneer Valley Planning Commission (PVPC), participated in the planning process for Our Next Future: An Action Plan for Building a Smart, Sustainable, and Resilient Pioneer Valley, which was released in 2014. This plan was funded by HUD's Sustainable Communities Initiative and outlines several strategies for overall resilience, including: Climate Action & Clean Energy, Food Security, Housing, Environment, Green Infrastructure, Sustainable Transportation, Brownfields, and Catalytic Projects.

As a major city in Massachusetts, Springfield is also part of the statewide Massachusetts Clean Energy and Climate Plan for 2020, which includes policies and mandates on green building, renewable electricity, greenhouse gas reductions, and other steps to mitigate the causes and effects of climate change.

The City of Springfield has also made internal commitments to addressing resilience through capital projects undertaken by the Department of Parks, Buildings, and Recreation Management (PBRM). Since 2007, six schools have been retrofitted (a $25 million investment) with double-pane windows and roofs designed to withstand high winds and rains. City parks are being upgraded with new drainage systems as other construction projects are undertaken in the area, designed to handle a 100 year storm event. Currently, 30 parks have been upgraded in this manner. Additionally, emergency generators have been installed at six fire stations and two park locations, which were used during the snowstorm (one of Springfield's five federally declared disasters). PBRM continues to program these resilience upgrades into all capital projects undertaken by the city as funding is available.

EXHIBIT F – LEVERAGE AND OUTCOMES

Outcomes

The City of Springfield seeks long-term resilience from disasters, grounded in an equitable recovery from the previous disasters that have impacted the city and its residents. The city has developed a mix of strategies that include nearly-permanent water management infrastructure, including sustainable 'green' water management infrastructure; these types of projects require ongoing maintenance but a lower upfront cost. Other strategies, including dams or new housing, have larger upfront costs but lower maintenance costs and an eventual replacement cost. This mix of strategies thus requires more up-front funding as well as some longer-term maintenance of sustainable water infrastructure.

The city proposes co-locating critical infrastructure investments, including maintenance and repairs to dams that are near heavily damaged neighborhoods, with housing and commercial developments that jump-start market investment and provide green infrastructure that increases the safety of residents. These developments will include infrastructure investment as well as stormwater management features wherever possible. The city is also committed to developing housing in neighborhoods that have seen little investment, even prior to the tornados. Through these projects, the city seeks specific co-benefits from their investments, including resiliency from future disasters, economic development opportunities and employment for low-income Springfield residents, and neighborhood and recreation amenities.

Springfield's current program of projects, many of which are outlined in the city's CDBG-DR Action Plan, include the development of ownership and multi-family housing, blight removal, workforce training, business recovery loans, streets and sidewalks, parks, and schools. The city also has a larger capital program that is developed annually and is funded through municipal bonds.

This program currently has over $1.8 billion in projects for the next several years, encompassing all types of development, from fire stations to viaduct repairs to solar farms, senior and community centers, sidewalks and street repairs, and more. The co-benefits of this extensive program of projects are foremost economic: the multiplier effect of billions in public and private development is not insubstantial, increasing economic activity and employment in Springfield. The construction of community amenities increases the quality of life for residents, while the construction of green energy facilities, like the solar farm and the biomass plant, decrease the city's reliance on fossil fuels. The City of Springfield seeks to amplify these investments by locating additional housing and development near the critical infrastructure repairs that are going into heavily damaged neighborhoods – increasing the amount of safe, sustainable housing that is available to residents, increasing employment options in historically poor neighborhoods, and promoting quality of life and resilience through smart infrastructure investments.

The City of Springfield's commitment to an equitable recovery recognizes the deep poverty and inequality present in many Springfield neighborhoods. Without a strong focus on these neighborhoods, Springfield's long-term resilience will not come to fruition. The city's CDBG-DR Action Plan includes workforce training and blight abatement programs, and the city will monitor and assess those programs to make sure they are successful. Additionally, the city will partner with Develop Springfield to explore ways that unemployed or disconnected workers can be included on the many capital projects the city will undertake over the next several years.

In 2011, the City of Springfield was awarded a competitive Section 3 Coordination and Implementation grant from HUD. The city maintains a strong commitment to Section 3 and will work to incorporate these residents and businesses in any current or future capital projects.

The City of Springfield is committed to developing and monitoring a suite of metrics to measure program success, including homeownership rates, public safety metrics, unemployment rates, household income, and more. A successful project will affect all of those metrics, increasing homeownership, household income, and public safety while decreasing unemployment.

Leverage

The City of Springfield is a strong partner in implementation and maintenance. The city completes a five-year capital improvement plan each year. The current plan, for fiscal years 2015 to 2019, indicates over $535.2 million in capital needs; however, a bond to be issued in February 2015 for $54.7 million will fund projects totaling $357 million, by leveraging funding from FEMA and the Massachusetts School Building Authority (MSBA). The city has judiciously used its debt capacity, leaving funding for implementation and maintenance of CDBG-DR and CDBG-NDR projects.

The City of Springfield is also partnering with Develop Springfield, an agency with the ability to implement real estate projects. Develop Springfield managed the *Rebuild Springfield* planning process and has received private funding to implement some of the recommendations. The City of Springfield will work with Develop Springfield to align projects and programs through the Phase II application to leverage these investments in the built environment.

Many of the city's partners are also working towards long-term resilience for Springfield. The Springfield Water and Sewer Commission, a non-City entity, is addressing Springfield's combined storm drainage and sewers throughout the city with a long–term separation program. The Commission has spent between $10 and $15 million per year on these projects, resulting in a reduced need for sewage treatment and cleaner stormwater entering the watershed. The City of Springfield assists the Commission with a small investment each year (between $50,000 and

$100,000 per year) to construct additional enhancements to the separated systems, including catch basins, separators, and treatment devices. This program is expected to continue for several more years, increasing the city and region's water quality dramatically.

Another partnership that is increasing long-term resilience is with Baystate Medical Center. The City was awarded over $2.7 million in grant funds in December 2014 from the Commonwealth of Massachusetts Department of Energy Resources, and will fund the installation of a cogeneration heat and power system that will save millions each year in utility costs and produce 84% of the hospital's energy. Critically for post-disaster situations, the hospital will be able to run for 30 days (as opposed to the current 72 hours) off this new power system, improving the resilience of the entire community.

Prior to the tornado, the City of Springfield was 100% self-insured. After the tornado, any building that was repaired required new insurance certificates from private insurance as a FEMA requirement. These conversations with insurance representatives regarding the risk considerations and premiums for public and private property are ongoing and have not yet resolved. However, the City of Springfield anticipates that repairs to dams, extending their useful life, will improve the risk considerations in adjacent neighborhoods.

The co-benefits that the City aims to see through these projects, including reduced unemployment, increased homeownership, and increased public safety, all can positively impact the city's general revenue collections through sales and property taxes. Any revenue-side increase will decrease the amount of debt that the city has to issue to fund continued programs, decreasing the net costs for the city.

By incorporating green stormwater infrastructure into the developments adjacent to dams and other major projects, the city can improve its resilience to flooding, increasing property values

and safety for residents. Stormwater management techniques can also save money for the city: cities like Chicago, Portland, and Seattle have found cost savings from green management techniques like permeable pavement, rain barrels, bio swales, and downspout disconnections.

The City of Springfield is committed to implementing the concepts in the most impacted and distressed neighborhoods in the city. This commitment to an equitable recovery recognizes the deep poverty and inequality present in many Springfield neighborhoods, and the need to focus on relieving the shocks and stresses of vulnerable residents who are reeling from the five disasters over the last several years. Without a strong focus on these neighborhoods, Springfield's continued resilience will be in jeopardy. However, to the extent that this program and approach are successful, the City will examine the feasibility of extending these types of co-located investments in other neighborhoods. Additionally, it is a goal of this approach to develop a framework and process that the City can use to implement sustainable and resilient features in any capital project, anywhere in the city. In that sense, the idea extends citywide, as the goals of resilient infrastructure and neighborhoods can be addressed through this new process as [non-CDBG] projects are proposed and implemented.

Committed Leverage Resources

The City of Springfield is committing an initial $250,000 towards implementation of projects in this proposal. The commitment letter can be found in Appendix {{X}}.

EXHIBIT G – LONG-TERM COMMITMENT

Springfield is taking many steps to speed disaster recovery and increase resilience, including the following:

Increasing Energy Resilience: Springfield is in the midst of implementing a 20% energy reduction plan. Also, the City has partnered with Baystate Medical Center in applying for and receiveing a $2.7 million grant to fund installation of a cogeneration heat and power system. This "cogen" system will provide back-up power for essential services in the event of a disaster with little interruption for a period of 30 days instead of 72 Hours, which is the current ability. The new system will produce 84% of Baystate's annual energy.

Comprehensive Redevelopment – Rebuild Springfield: The City's recovery efforts and overall resiliency plan is *Rebuild Springfield*, which is both a response to the 2011 tornado and a comprehensive response to many of the long-standing development challenges throughout the city. Progressive and forward-thinking in its approach, *Rebuild Springfield* draws upon the Nexus Planning Framework, which identifies six key domains: Educational, Economic, Organizational, Physical, Social, and Cultural. It is a realistic and reachable action plan for achieving a more resilient and sustainable city.

City-wide Capital Projects – Economic Development: As of the December 2014 update, $149.8M has been invested in completed projects in Springfield within approximately the last two years. Some examples of these projects include hospital/medical facilities, parks & recreation areas, high schools & universities, restaurants, New England Public Radio building, downtown lighting, and a solar farm built over a former landfill. Over the next three years, Springfield will experience another $1.817 billion dollars' worth of projects, including key capital improvements, critical facilities, infrastructure, and transportation projects. As both the

source of funds and nature of projects would indicate, there is significant investment underway in resilient critical infrastructure and capital improvements.

Infrastructure Improvements: Springfield storm water drainage and sewer systems are owned and operated through a partnership with a non-city governed entity, the Springfield Water and Sewer Commission (SWSC). While the City still owns a significant amount of the combined sewer systems, the Commission has control over the combined sewer system and is in the midst of addressing sewer separation projects throughout the City. SWSC has been spending $10-$15M per year to separate the systems within the City, and has pledged to continue this program of separation for at least the next 6-8 years, with the ultimate goal of complete sewer/storm separation. In partnership with SWSC, the City has contributed $50,000 - $100,000 per year for additional improvements to drainage systems.

One Region, One Future: A major regional inter-state/inter-community regional initiative was launched in October 2014, with the release of 'One Region, One Future.' This effort was a result of a partnership of forty-four public and private agencies including regional planning organizations, municipalities, educational institutions and other community partners in the greater Hartford, CT—Springfield, MA region. This initiative focuses on key components such as transportation improvements, access to information technology, food security, and implementation of green growth strategies among others.

Public Sector Commitment: Springfield has demonstrated its commitment to resilience, by implementing resilience measures into new projects and retrofits. Examples include school building retrofits at 26 locations, park drainage improvements at 30 locations, and emergency generator installations at 8 locations.