Cook County, Illinois

Phase 2 Application
National Disaster Resilience Competition

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Prepared by: **The Department of Planning and Development**
of the Bureau of Economic Development

Exhibit A – Executive Summary

Cook County, Illinois

ExhibitAExecutiveSummary.pdf

Cook County is pleased to submit this Phase 2 proposal which sets forth a comprehensive resilience-focused solution that will enhance disaster recovery, facilitate economic and community revitalization, promote social cohesion, better support vulnerable populations, and address the risks and vulnerabilities outlined in the County's Phase 1 submission from March, 2015.[1] The strategies outlined in this Phase 2 proposal focus on a south suburban demonstration area - including the municipalities of Blue Island, Calumet City, Calumet Park, Dolton, Riverdale, and Robbins - but are designed with effective countywide and regional replication in mind.

Cook County is part of the Northeastern Illinois Resilience Partnership's (the Partnership) unprecedented regional effort to build resilience. This multi-jurisdictional, bipartisan Partnership - led by Cook County, City of Chicago, DuPage County, and the State of Illinois, in coordination with the Chicago Metropolitan Agency for Planning (CMAP) - formed in response to the severe, repetitive, and chronic effects of flooding. National resilience is largely dependent on that of northeastern Illinois, located between the Great Lakes and Mississippi River watersheds and steward of 84 percent of the country's freshwater volume. The region's strengths are its geography and natural assets. It is uniquely poised to bridge the divide across watersheds, grounded in local resilience-building. While the region does not have well-known mega-storms, even small storms pose significant risk and there is a growing frequency of high intensity storm events, resulting in flooding and polluted runoff. The resulting economic, environmental, and social toll of this flooding and other hazards stems from vulnerabilities across social, natural, and built systems and disproportionately impacts low- and moderate income communities and vulnerable households who typically have less capacity both financially and practically to contend with disasters.

[1] Available at https://www.dropbox.com/sh/84qpa25ikpnlmth/AABWXnmjZhsMjB4QNAQjHmgla?dl=0

Cook County is well positioned to implement local resilience-building strategies and drive regionwide efforts that build upon existing partnerships and enhance current initiatives. The County is at the heart of the Chicago region, comprising more than half of its population, jobs, and businesses. It is the second most populous county in the United States, a regional and national transit hub, and anchors the nation's third largest metropolitan economy with 2.6 million jobs and $308 billion in annual output.[2] Despite its many assets, the County also has a disproportionate share of vulnerabilities, regionally and nationally. Industrial decline and shrinking job opportunities coupled with the more recent foreclosure crisis have contributed to the increasing suburbanization of poverty, particularly in the south suburbs.[3] The County has also experienced multiple natural hazard events over the last few decades and currently leads the nation in disaster fatalities.[4]

Cook County's replicable strategic local approach - inclusive of a portfolio of four programs and seven projects - builds physical, individual, and governmental capacity to enhance resilience in the demonstration area. It incorporates extensive stakeholder and public input, aligns with the County's *Planning for Progress* strategic plan, and embodies Board President Toni Preckwinkle's priority focus on economic development to revitalize the south suburbs. This approach is anchored by four overarching programs. First, in partnership with CMAP and the South Suburban Mayors and Managers Association (SSMMA), a resilience-enhancing community planning program will be implemented. The County will also collaborate with Neighborhood Housing Services of Chicago (NHS) to implement a Residential Resilience Program that installs flood-resistant and resilient features in eligible single-family homes. A workforce development program, in partnership with

[2] http://blog.cookcountyil.gov/economicdevelopment/wp-content/uploads/2014/10/Appendix-B-Partnering-for-Prosperity.pdf

[3] http://confrontingsuburbanpoverty.org/the-communities/south-cook-co-chicago/

[4] Spatial Hazards Events and Losses Database for the U.S. -- http://hvri.geog.sc.edu/SHELDUS/

OAI, Inc. will train local residents for careers in manufacturing and green infrastructure management. Lastly, an education program will be deployed in partnership with the Chicago Botanic Garden to educate communities and residents regarding resilience resources. Seven targeted housing and infrastructure projects serve as replicable models of resilient approaches. The County will partner with the Metropolitan Water Reclamation District (MWRD) and SSMMA to develop and implement green and gray infrastructure solutions through two "complete communities" projects focusing on commercial, industrial, and residential property, parkland, and the public right-of-way, as well as two "green streets" projects. In collaboration with Mecca Companies, Inc. and Related Companies, the County will develop two resilient, affordable housing projects. Finally, the County will support completion of the multi-use Cal-Sag Trail, acting as connective social tissue between these programs and projects towards realization of the County's broader resilience vision.

Cook County along with the Partnership, and its diverse public, private, and non-profit partners, will continue to advance a regional resilience framework that maintains and improves the quality of life by minimizing exposure, reducing sensitivity, and increasing the built, natural, and social systems adaptive capacity to current and future hazards, stressors, and shocks. This multi-faceted strategic approach, which aims to provide further relief from and future resistance to flooding, will create and expand employment opportunities, facilitate public and private investment, enhance overall economic growth, expand recreational options, promote environmental stewardship, and increase social cohesion. It will foster stronger connections between and within communities and their residents. The full complement of resilient programs and projects will ensure Cook County and its most vulnerable citizens survive and thrive in the face of future disasters. ***Note – 5 extra pages have been included for each program/project description in Exhibit E in accordance with County interpretation of HUD requirements. Supporting files can be accessed via provided password at: https://www.dropbox.com/sh/mueptvaxk2x3xl5/AAA7qsztl0L3_o02TKul76GNa?dl=0.***

Exhibit B – Threshold Narrative

Cook County, Illinois

ExhibitBThresholdNarrative.pdf

B.1. General Section

In May 2013, Cook County received a Disaster Declaration due to flooding from severe storms (DR-4116) that resulted in widespread flooding leading to losses exceeding $62.7 million. HUD determined all of suburban Cook County to be most impacted and distressed. HUD confirmed that the County's CDBG-NDR Phase 1 application demonstrated Unmet Recovery Needs in both housing ($904.6 million) and infrastructure ($242.0 million). Based on additional data and community-level information gathering, the County has identified Unmet Recovery Need specific to its south suburban demonstration area including the cities of Blue Island and Calumet City and the villages of Calumet Park, Dolton, Riverdale, and Robbins, an area which disproportionately suffered losses from DR-4116. Total FEMA Verified Loss for this area, which contains 4.4 percent of the County's population, was $8.1 million or approximately 13 percent of the County's total FEMA Verified Loss. Despite the County's identification of resources for this demonstration area totaling $9.6 million, unmet housing need totals $151.5 million for an estimated 4,314 housing units. In this Phase 2 application, Cook County sets forth a strategy to address Unmet Recovery Need via a prioritized portfolio of scalable resilience-building solutions and commitments.

B.2 Eligible Applicant

Cook County was identified by HUD as eligible for the CDBG-NDR Competition and was subsequently invited by HUD in June, 2015 to participate in Phase 2 of the Competition.

B.2. (1) Partners A Partner Letter and Phase 2 Partner Agreement is provided in Attachment A for: Northeastern Illinois Resilience Partnership, Chicago Metropolitan Agency for Planning, South Suburban Mayors and Managers Association, Metropolitan Water Reclamation District of Greater Chicago, Neighborhood Housing Services of Chicago, Mecca Companies, Inc., Related Companies, OAI, Inc., and Chicago Botanic Garden.

B.3. Eligible County

Cook County, the area primarily benefitting from the proposed CDBG-NDR assisted activities, experienced flooding from severe storms in May, 2013 resulting in a Presidentially-declared major disaster declaration (DR-4116) under the Stafford Act (PL-113).

B.4. Most Impacted and Distressed Target Area

All of Cook County was determined by HUD to be most impacted and most distressed by DR-4116. In Phase 1, Cook County established and documented Unmet Recovery Needs, including unmet housing recovery need of $904,624,696, equivalent to 25,768 households not served by existing FEMA, SBA, National Flood Insurance Program (NFIP), and CDBG-DR resources due to limited funding. New data identifies 21,722 approved private insurance claims for DR-4116 equaling a total payment of $203,657,950, or an average of $9,376 per household for add-on rider policies for water backup/sump pump discharge. However, 3,800 households submitted claims that were not approved, reflecting potential unmet need.

While these statistics reflect Unmet Recovery Need across the entire County, a demonstration area, described on p.32, will be the primary beneficiary for this funding request and will be used in the design and testing of a model approach to disaster resiliency to be taken to scale across the County and region. This area, in particular, was identified due to its disproportionate share of flood losses compounded by significant socioeconomic need and limited adaptive capacity. Using the same framework as in the County's Phase 1 application, the analysis below identifies Unmet Recovery Need in this area and confirms that it remains most impacted and distressed.

Unmet Housing Need: Existing funding sources are inadequate for addressing repair needs, and per HUD guidance, the County does not currently run a qualifying housing recovery program (see "CookCountyHousingNeedData_Demonstration Area.pdf"[1]). Table 1 summarizes total

[1] https://www.dropbox.com/s/8xwbd5osh8vassf/CookCountyHousingNeedData_DA.pdf?dl=0

housing recovery need, funding sources, and unmet need in Cook County's demonstration area for DR-4116. Unmet need totals $151,454,282, equal to 4,314 households not served.

TABLE 1 – Unmet Recovery Needs Threshold Calculation (Demonstration Area)		
Recovery Need		
FEMA Verified Loss	$8,108,294	6,662 units
[times 10] Housing Impact Multiplier	$81,082,940	
[add $12,000 per unit] Cost of Resilient Measures	$79,944,000	
Total Recovery Need	**$161,026,940**	
Funding Sources		
FEMA Individual & Household Assistance[2]	$5,653,670	3,064 units
National Flood Insurance Program	$261,488	46 units
Cook County CDBG-DR Housing Program	$937,500	25 units
SBA Disaster Assistance Loan Program – Housing	$2,720,000	151 units
Total Funding	**$9,572,658**	
Total Unmet Recovery Need	**$151,454,282**	**4,314 units[3]**

Total FEMA Verified Loss for DR-4116 in the County's demonstration area was $8,108,294, representing approximately 13.0 percent of the County total. These losses were assessed from 6,662 applicants, 19.5 percent of the County total. The losses suffered by the demonstration area are disproportionately high; the area contains just 4.4 percent of the County's population. Similar trends are visible in applicants with special needs (21.1 percent of total) and applicants

[2] Includes owner-occupied real property and personal property in rental units; personal property is a proxy for real property since rental housing is not inspected by FEMA for unit damage.

[3] Assumes per unit repair cost of $35,106 (average SBA award plus cost of resilient measures).

over 60 (16.1 percent of total). A housing impact multiplier of 10.0, described in the Phase 1 application, is applied to FEMA Verified Loss to capture unidentified damage and account for those who didn't apply for or were denied assistance. An additional $12,000 per home is added for resilient measures not completed with repairs (see "CNTCostofResilienceMeasures.pdf"[4]).

Funding sources to assist with housing recovery in the demonstration area include $937,500 from the County's planned CDBG-DR housing program to benefit approximately 25 homes. Additional sources include FEMA, SBA, and NFIP. To date, Cook County has identified and pursued the award of $9,572,658 in recovery-related resources**.**

The windshield survey described in the County's Phase 1 application was conducted in a sub-set of the demonstration area (Blue Island and Calumet City) and identified more than 50 homes with unaddressed flood-related damage. New survey information obtained by Cook County for an additional 25 homes in Blue Island illustrates the magnitude of losses for DR-4116 and flood events over the last decade. This survey, conducted in October, 2014 by the Northeast Blue Island Resident Action Group, covered a four block area and was available in print and online in both English and Spanish. On average, households reported having incurred nearly $10,000 in property damage for basement flooding occurring between 4 and 5 times within the last 10 years. Sixty percent also reported overland flooding in areas such as backyards and alleys. Homeowners reported having spent more than $5,000 on preventative measures, including drain tile, additional sump pumps, gutter systems, sealing and waterproofing, and foundation repair. Several homeowners specifically noted an inability to afford preventative measures, while others questioned the real benefits of such improvements on the incidence and magnitude of

[4] https://www.dropbox.com/s/qt6rjmgc44fy91h/CNTCostofResilienceMeasures.pdf?dl=0

flooding. This survey reinforces the high economic and social cost of flooding in the County's demonstration area and the lack of coordinated resources to build resilience.

The County also obtained additional information on housing need via public meetings and design charrettes held in its demonstration area in Phase 1 and Phase 2. Following three public meetings in early 2015, the County compiled the results of a mapping exercise which identified areas experiencing frequent flooding. These areas were then overlaid with geographies with potential opportunity areas to begin to identify priority areas of need for Phase 2 projects (see "DisasterResilienceMeetingResults2015.pdf"[5]). Additionally, a Phase 1 planning survey that meeting attendees and other residents completed in February 2015 illustrated the economic and social costs of flooding. Of 26 residents who completed the survey, 40 percent said they were 'very much' worried when heavy rains are forecast. Sixty percent had suffered from flooding damage, and more than half said they had experienced trauma or stress as a result. Reported damages included damage to foundation or walls (37.5 percent); mold (37.5 percent); and felled trees (20.8 percent). Despite apparent disaster-related need, *less than 10 percent* indicated that they had requested public assistance from nonprofit, local government, or FEMA resources. Six interactive charrettes continued the assessment of unmet need, particularly among vulnerable populations. Residents expressed frustration with repetitive flooding and an inability to afford flood prevention mechanisms, such as overhead sewers and insurance riders.

B.5. Eligible Activity

Cook County's proposed Phase 2 activities are eligible per CDBG-NDR requirements. The proposed projects and programs directly relate to disaster relief from DR-4116, long-term recovery, and restoration of housing in Cook County, an area determined by HUD to be most impacted and

[5] https://www.dropbox.com/s/r78ua9s45ol3v6x/DisasterResilienceMeetingResults2015.pdf?dl=0

most distressed. Funding from HUD requested is eligible under section 105(a) of the Housing and Community Development Act of 1874 and 24 CFR 570.201-207, and applicable fair housing and civil rights laws and regulations will be complied with. As described below, all activities will meet a national objective and are feasible, long-term solutions which incorporate resiliency measures.

B.6. Resilience Incorporated

Cook County has demonstrated its commitment to resilience via its plan to design, test, and scale a model approach to disaster resiliency. The proposed resiliency portfolio (see Exhibit E, p. 58 for a summary table) will improve resilience to current and future threats and hazards, including climate change, and expand a shared community asset, the Cal-Sag Trail, which will support social cohesion and highlight the natural features of the area. Within the County's proposed portfolio, two projects support 'complete communities' resilience-building by addressing community need within areas containing residential, industrial, and commercial properties with significant opportunities for revitalization and co-benefits. For example, residential resilience projects such as storm sewer improvements, creation of public right-of-way bioswales, and gray and green infrastructure installations (also featured more broadly as part of the proposed Residential Resilience Program on private property), will be coupled with improvements to landscaping, gray and green infrastructure installations, and stormwater management improvements on nearby industrial and commercial land to support redevelopment, increased green space, economic growth, and long-term job creation. 'Green streets' projects in two communities supplement these efforts with a focus on resilient improvements to the public right-of-way. Two housing projects – single-family ownership and multi-family rental - will incorporate resilient features. Finally, a project which completes the Cal-Sag Trail, a 28-mile multi-use trail, and nearby parkland will create a shared community asset, provide an alternative mode of transportation, offer a healthy recreation option for residents, and illuminate the history of the area in a unique way, while also incorporating features for rainwater

storage. These projects are supported by four programs spanning the demonstration area. A Residential Resilience Program will install resilient and flood-resistant features in single-family homes to further address unmet housing need and enhance resilience to future storms. A community planning program will build local capacity to contend with shocks and stressors by supporting continued site planning for redevelopment, enhancing stormwater modeling capacity, and exploring options for shared services on the critical issue of infrastructure maintenance. An education program will conduct public outreach around resiliency, improve information sharing around flood prevention and resilient measures, and educate children about climate change. A workforce development program will help to prepare residents for jobs in manufacturing and the installation and maintenance of green infrastructure, supporting individual capacity to respond to shocks. Collectively, these activities will improve the adaptive capacity of the area's built, natural, and social systems for current and future hazards and shocks and serve as a replicable resilience model.

Additionally, both Cook County and the Northeast Illinois Resilience Partnership firmly commit to activities to enhance resilience in northeastern Illinois and Illinois more broadly. Within one year of Phase 2 notification, both will explore how to best incorporate resilience in policy, design guidelines, workforce development activities, data gathering, modeling and alert systems, capacity-building, and planning, as detailed in Exhibit G – Long Term Commitment. To highlight a few of these commitments, the Partnership will engage the Prairie Research Institute of the University of Illinois to identify metrics for demonstration projects and commits to meeting quarterly for five years to scale successful interventions across the region and State. Additionally, there is a pledge to advancing the principles of the Illinois' Urban Flooding Awareness Act; as recommended by the Act and its mandated Report, the State has already released a model stormwater management ordinance for local communities. At the regional level, CMAP has convened a Resilience Resource Group, which will provide critical input on the next iteration of CMAP's comprehensive regional

plan. CMAP will explore refinements of its current policy and practice areas including green infrastructure co-benefits in parks and open spaces; climate adaption and resilience; and geographically-based regional planning strategies. The Partnership commits to supporting resilience-building measures that address current and future threats while taking into account climate change, population growth, and other factors impacting the magnitude of hazards.

B.7. Meet a National Objective

Each of Cook County's Phase 2 activities, with the exception of general administration and planning, will meet a national objective as outlined in Table 2 (See B.8 for more details).

TABLE 2 – Cook County Activities & Applicable National Objectives	
Activity	**Applicable National Objective(s)**
Complete Communities - Blue Island/Calumet Park Complete Communities - Riverdale	Low/Mod Area, Low/Mod Jobs, Slum/Blight, Urgent Need Low/Mod Area, Low/Mod Jobs, Urgent Need
Green Streets - Dolton Green Streets - Robbins	Low/Mod Area, Urgent Need Low/Mod Area
Housing Projects & Residential Resilience Program	Low/Mod Housing
Cal-Sag Trail	Low/Mod Area
Workforce Program	Low/Mod Area, Low/Mod Limited Clientele
Education Program	Low/Mod Area, Low/Mod Limited Clientele

B.8 Overall Benefit

Using a comprehensive risk approach, Cook County selected a demonstration area for the design and testing of a model resiliency approach that will provide successful examples and can be scaled Countywide and regionally. The County will prioritize investments in this demonstration area,

which is comprised of 57 percent low- and moderate-income households (see Figure A). More than 50 percent of the funds will support activities that benefit such households per HUD requirements.

B.9 Establish Tie-Back

HUD confirmed that Cook County's CDBG-NDR Phase 1 application demonstrated Unmet Recovery Needs exist in both housing ($904.6 million) and infrastructure ($242.0 million). Section B.4 further establishes Unmet Recovery Need for the County's demonstration area, the primary beneficiary of requested CDBG-NDR funds and a model for other areas within the County and region. The proposed projects and programs (described in Exhibit E) designed to reduce flooding risk and increase resilience, directly tie back to DR-4116. Several activities directly address housing damage via resilience-building at the residential property level. The Residential Resilience Program will incorporate resiliency upgrades such as stormwater storage through rain gardens and barrels and overhead sewer systems or backflow valves to reduce flooding impact. Two housing projects - new construction of single-family homes and the renovation of a multi-family rental property - will incorporate resilient features. These projects and programs will directly address Unmet Recovery Need in housing resulting from DR-4116 and are estimated to impact 675 housing units. An education program will help residents affected by DR-4116 understand the importance of home upgrades in preventing flooding.

Other proposed projects and programs in the County's portfolio have a broader focus in addressing Unmet Recovery Need. The County recognizes that resilience-building measures on residential property alone will not fully prepare and protect the community from the effects of future disasters because the demonstration area, developed in the 1930s, was built with combined storm sewer systems that are now severely undersized. As such, the County's portfolio also includes a joint focus on improvements in the public right of way or within adjacent parkland and redevelopment of vacant or underutilized industrial and commercial land,

in tandem with wraparound education, planning, and workforce programs to build resident and municipal capacity. The proposed resiliency portfolio has three main impacts on Unmet Recovery Need in housing from DR-4116: 1) It limits the burden on an aging and outdated infrastructure and makes targeted improvements to maximize flooding reductions. Improvements in the public right-of-way, parkland, and industrial and commercial properties offer valuable opportunities for stormwater management– given their significant acreage – which will reduce inflows to already strained municipal stormwater systems and decrease residential flooding in adjacent areas; 2) It addresses the significant economic need and seeks to build local government and resident capacity to respond to hazards and shocks. By addressing issues of stormwater retention on vacant land with redevelopment potential, the County will create business location and growth opportunities, which in turn supports long-term job creation (particularly in high paying sectors such as manufacturing with available training), growth in the tax base, and new wage-earning opportunities which will increase the capacity of local governments and residents to better respond to existing flood-related housing needs, and prepare for and withstand future hazards and shocks; and 3) It results in multiple benefits for surrounding areas - improved parkland and recreational space, reforestation (particularly in industrial areas needing landscape and livability improvements), and access to a new inter-community multi-use path, the Cal-Sag Trail - which will improve livability, foster social cohesion, create transportation options, and reduce stress in areas most impacted by DR-4116.

B.10 One Application per Applicant

Cook County is a member of the Northeastern Illinois Resilience Partnership's regional effort to build resilience. However, per HUD instructions, the County is applying individually.

B.11 Certifications

All required certifications are provided in Attachment C - CDBG-NDR Certifications.

Exhibit C - Capacity

Cook County, Illinois

ExhibitCCapacity.pdf

C.1 Past Experience

Cook County - General Administrative Capacity

The Cook County Department of Planning and Development (DPD), whose mission is to develop and sustain viable communities, has the operational capacity and legal authority to drive resilience at the County and regional levels in ways that build on existing partners and enhance current planning and programming. DPD is the principal County agency that administers community development, affordable housing, and economic development resources. If awarded, DPD will administer and manage CDBG-NDR funds, oversee related partners, and procure needed vendors.

DPD has a successful track record as an effective grants administrator. A longtime HUD grantee, DPD has historically managed over $544 million in resources including annual entitlement CDBG, HOME, and ESG allocations as well as singular resources such as NSP, HPRP, Section 108 Loan Guarantee, and CDBG-R. Over the past five years, DPD has made significant improvements in its grant administration practices. DPD has committed and expended millions of dollars in expiring funds, cleared audit findings, and updated policies, procedures, and workflows. Reorganization of operations and personnel for increased efficiency, enhanced compliance, and expanded impact continues. DPD has become a model HUD grantee in the region and nation. Currently, DPD is working to deploy $83.6 million in CDBG-DR resources to address unmet needs due to flooding.

DPD, and the County overall, have well established systems and practices related to grants administration, procurement, contract management, financial administration and management, internal/external audits, monitoring, and outcomes evaluation. DPD, based on its prior HUD funding, has direct experience administering and managing complex housing and infrastructure programs through the planning, pre-development, technical feasibility assessment, value engineering, acquisition, new construction, rehabilitation, occupancy, and monitoring phases. Additionally, many of these projects incorporate green, energy-efficient, and sustainable features.

The County has a proven capacity to develop and deploy Federally-funded programming in a rapid, effective, efficient, and compliant manner. Within three months of receiving its Investing in Manufacturing Communities Partnership (IMCP) designation from the U.S. Economic Development Administration (EDA) for the Chicago Metro Metal Consortium, Cook County convened over sixty regional public/private partners, setup a steering committee, and established operational guidelines. DPD also continues to develop programming under the CDBG-DR funding. Given the scope of the program, the relative size of the funding, and its unique regulatory requirements, DPD has hired additional legal/compliance staff and has spent significant time on the related program design. To date, $14,690,000 and $628,935.37 have been obligated and expended respectively. Related activity will accelerate rapidly over the next year.

To guide its partnerships and investments, DPD completed an innovative and collaborative strategic planning initiative, *Planning for Progress*,[1][2] in partnership with CMAP. This planning process spanned fifteen months and incorporated input from over 2,000 stakeholders. *Planning for Progress* resulted in a combined Consolidated Plan and Comprehensive Economic Development Strategy - perhaps the first in the nation - to guide investments and partnerships around housing, community, and economic development. It promotes resilience, particularly for benefit to low- and moderate-income and vulnerable populations, and aligns County resources, including Federal funds, for expanded community impact. Adopted by Cook County in January 2015 with formal implementation beginning on October 1, 2015, *Planning for Progress* has been touted as a national model and best practice by the Brookings Institution, Metropolitan Planning Council, Federal Reserve Bank of Chicago, national, regional, and local HUD, and regional EDA.

[1] http://www.cmap.illinois.gov/programs-and-resources/lta/cook-county

[2] http://blog.cookcountyil.gov/economicdevelopment/planning-for-progress/

This application effort is led by DPD's three Deputy Directors of Community Development, Economic Development, and Housing, and *is written by DPD staff with informational support from other partners.* DPD has also engaged County agencies and affiliates with relevant expertise to align efforts, foster new collaborations, and bolster capacity in developing this application and aimed at making the County more resilient. This interagency team includes the Cook County Forest Preserve District; Commission on Human Rights; Departments of Building and Zoning, Public Health, Transportation and Highways, Environmental Control, Homeland Security and Emergency Management; Chicago Cook Workforce Partnership; Cook County Land Bank Authority; and the Housing Authority of Cook County. Additionally, this resilience initiative is aligned with the County's *Hazard Mitigation Plan*, *Next Century Conservation Plan,* and *Long Range Transportation Plan*.

Partners –Technical Capacity

Partner 1: Northeastern Illinois Resilience Partnership is a Multi-jurisdictional, bipartisan, regional Partnership formed in 2014, coordinated by the Chicago Metropolitan Agency for Planning (CMAP), and inclusive of CDBG-NDR eligible applicants - City of Chicago, Cook and DuPage Counties, and State of Illinois. It focuses on collaborative regional response to severe, repetitive, and chronic effects of flooding.

Relevant Capacity: The Partnership draws on the expertise of an array of public, private, and non-profit partners representing comprehensive planning, research, architecture, landscape architecture, design, engineering, policy, advocacy, stormwater management, environmental stewardship, parks and recreation management, technology, workforce development, civic, philanthropic, and financial institutions sectors. Partnership participants include Center for Neighborhood Technology, Metropolitan Planning Council, Natural Resources Defense Council, Argonne National Laboratory, Illinois State Water Survey, Midwestern Regional Climate Center, Chicago Wilderness, Elevate

Energy, Illinois Department of Natural Resources, Illinois Environmental Protection Agency, Metropolitan Mayors Caucus, Openlands, U.S. Army Corps of Engineers, the Calumet Stormwater Collaborative, U.S. Environmental Protection Agency, Design for America, Delta Institute, Foresight Design Initiative, Chicago Community Trust, Enterprise Foundation, Grand Victoria Foundation, UI Labs, Illinois Chapter - U.S. Green Building Council, Rebuild By Design, etc.

Roles/Responsibilities: The Partnership will provide overarching regional coordination and support of and between the various CDBG-NDR funding applicants. Led by a Convening Chair which will rotate yearly among applicants, the Partnership enables cross-disciplinary technical capacity in specific support of Cook County's proposed approach. Given the range of partners and their sector expertise, capacity will be retained if an individual partner reduces their participation. DPD expects to draw on Partnership capacity specifically related to resiliency planning and design, demographic research, climate modeling/forecasting, and technological innovation.

Partner 2: Metropolitan Water Reclamation District (MWRD), established in 1889, is the County's stormwater management agency and is charged with ensuring management of, access to, and protection/improvement of the quality of the water supply source (Lake Michigan). It regulates development along regional watersheds, governs permitting for suburban municipal sewer construction, owns and manages intercepting sewers, operates water reclamation plants, and plans/finances/implements regional and local flood control projects.

Relevant Capacity: MWRD has extensive expertise related to stakeholder consultation, public engagement, site planning, project design, engineering, and implementation. Through its Cook County Stormwater Management Plan, MWRD created Watershed Planning Councils whereby local governments and the public can communicate related needs. MWRD is undertaking Stormwater Master Plans pilot studies including the Little Calumet River/Calumet Sag Channel Drainage Area, which significantly overlap with the demonstration area, to analyze existing or

potential flooding issues and identify a comprehensive, replicable approach to address those problems through large or small scale, gray and/or green approaches. Additionally, MWRD has significant capacity and experience related to the design, construction/installation, testing, monitoring, and maintenance of green infrastructure including permeable pavement, bio-retention, rain gardens, bio-swales, sustainable streetscapes, stream bank stabilization, and other flood controls, often in partnership with other stakeholders. MWRD is a leader in the green infrastructure industry and regularly provides information and technical assistance to public and private entities exploring or pursuing related improvements.

Roles/Responsibilities:

MWRD has been selected based upon its unique expertise, legal authority, and existing similar work under DPD's CDBG-DR program, to administer the proposed Complete Communities and Green Streets projects in Blue Island/Calumet Park, Dolton, Riverdale, Robbins.

Partner 3: Chicago Metropolitan Agency for Planning (CMAP), created in 2005, is the designated metropolitan planning organization (MPO) for northeastern Illinois, which includes Cook County. It developed and guides the implementation of GO TO 2040, adopted in 2010, as the region's comprehensive plan which establishes coordinated strategies that help the region's 284 communities address transportation, housing, economic development, open space, environment, and quality of life issues.[3]

Relevant Capacity: CMAP has significant experience facilitating expansive and complex planning and policy initiatives including the creation and implementation of comprehensive regional plans like GO TO 2040, management of multiple subcommittees (including an Environment and Natural Resources Committee) focused on a wide variety of metropolitan issues, and its administration of a

[3] http://www.cmap.illinois.gov/about/2040

Local Technical Assistance Program (initially funded by a HUD Sustainable Communities grant) supporting 80 local planning projects inclusive of extensive stakeholder engagement and input.

Roles/Responsibilities: CMAP will continue to serve as the central convener of the Northeastern Illinois Resilience Partnership. Additionally, CMAP via CDBG-DR support, has significantly expanded their Local Technical Assistance Program to focus on stormwater management and resilient planning in suburban Cook County. As such, CMAP will administer the proposed Community Planning program.

Partner 4: South Suburban Mayors and Managers Association (SSMMA), founded in 1978, is an intergovernmental agency that provides technical assistance and joint services to 43 south suburban member municipalities and leads the related subregional Council of Mayors. SSMMA's identifies/pursues collaborative solutions and facilitates interagency partnerships to address common municipal challenges related to transportation, legislation, land use, economic development, recycling, purchasing, stormwater and open space planning, infrastructure, human resources, public safety and housing.

Relevant Capacity: SSMMA has a history of cooperative planning and collaborative execution of programming including ongoing coordination of subregional economic development/affordable housing/stormwater management activities through the Chicago Southland Economic Development Corporation (CSEDC), Chicago Southland Housing and Community Development Collaborative, and Little Calumet River Watershed Planning Council. SSMMA has additional experience in pre-development, site preparation, redevelopment, and brownfield remediation.

Roles/Responsibilities: SSMMA has been selected to administer the proposed Community Planning program to continue its redevelopment site planning with a focus on resilient development and the use of green infrastructure. It will also assist in economic development coordination,

including site redevelopment, in Riverdale, Blue Island, and Calumet Park as part of the Complete Communities projects.

Partner 5: Neighborhood Housing Services of Chicago (NHS) is a nonprofit organization, founded in 1975, that provides first-time homebuyer counseling, fixed-rate lending for housing purchase and rehabilitation, foreclosure assistance, and housing rehabilitation services in Chicago, south suburban Cook County, and Elgin. It is Illinois' largest non-profit lender for homeowners and homebuyers.

Relevant Capacity: NHS has assisted more than 208,000 families, loaned $577 million to borrowers to buy, fix or keep their homes; educated over 34,000 potential new home buyers; created more than 4,100 new homeowners; provided foreclosure counseling to over 27,000 homeowners; saved more than 6,500 families from foreclosure; and reclaimed 980 vacant properties.

Roles/Responsibilities: NHS was selected to administer the proposed Residential Resiliency Program to incorporate resilient features in single-family owner-occupied homes based upon its existing similar work in the sub-region. NHS will also assist with the Dolton Resilient Housing Project via homebuyer counseling, down-payment assistance, and loans.

Partner 6: Related Companies is a leading national real estate company founded in 1972 and focused on residential development, property management, and financial services.

Relevant Capacity: Related is a national industry leader in the development, ownership, and management of housing. It has acquired and developed over 90 properties with 14,000 units and a total development value of $1.3 billion. Related is the largest national owner/manager of affordable multifamily rental housing including 25,000 units across 1,100 properties spanning 47 states.

Roles/Responsibilities: Related was selected to develop the proposed Calumet City multi-family rental housing project based on its response to DPD's rolling Request for Applications (RFA).

Partner 7: Mecca Companies is an affordable housing and student housing development firm founded in 2008 and based in Indianapolis and Chicago.

Relevant Capacity: Mecca has developed more than 1,750 units with a total development cost exceeding $150 million including affordable single-family for sale housing developed in south suburban Cook County with DPD NSP dollars.

Roles/Responsibilities: Mecca was selected to develop the proposed Dolton single-family ownership housing project based on its response to DPD's rolling Request for Applications (RFA).

Partner 8: Opportunity, Advancement, Innovation in Workforce Development (OAI) founded in 1976, is a national non-profit workforce training and development agency. OAI's broad goal is to empower and enhance the capacity of underserved individuals and their communities by applying innovative practices that contribute significantly to social-environmental equity, equal access to educational and employment opportunities and economic self-sufficiency.

Relevant Capacity: OAI offers training for employed, unemployed, and underemployed individuals seeking enhanced job skills and critical health/safety awareness through Pre-Employment Education and Training Programs and Incumbent Worker Training, primarily for front-line workers. Since inception, OAI has successfully managed more than $77 million in Federal, State, local, and philanthropic grants and annually serves 4,500 clients. Since 2011, OAI has led the Calumet Green Manufacturing Partnership, connecting disadvantaged job seekers to high-growth careers in manufacturing in south suburban Cook County. OAI 's affiliate High Bridge employs local residents to install and maintain green infrastructure features and partners on the region's most renowned green jobs training program, Chicago Greencorps.

Roles/Responsibilities: OAI was selected to administer the proposed Workforce Program based upon its existing similar work in the sub-region and its current status as an approved workforce development provider by the Chicago Cook Workforce Partnership. OAI will specifically help train residents in brownfields remediation, green infrastructure for storm water management, eco-restoration, and advanced manufacturing.

Partner 9: Chicago Botanic Garden, created over forty years ago, is a world renowned living museum and conservation science center. It includes 26 gardens and four natural areas uniquely situated on 385 acres on and around nine islands, with six miles of lake shoreline.

Relevant Capacity: With 50,000 members and more than 1 million annual visitors, the Garden offers general and educational programming and recreational opportunities to people of all ages, interests, and abilities. The Garden offers youth, family, and adult education through an array of single and ongoing programs focused on garden design, horticulture, nature and birding, wellness and fitness, gardening, nature-based art, etc.

Roles/Responsibilities: The Garden, a County affiliate agency, was selected to administer the proposed Education Program based upon its existing similar work.

Supplemental Capacity

Two additional efforts that overlap the demonstration area provide supplemental capacity. The Millennium Reserve is a public/private collaboration focused in the Calumet and southeast lakefront regions spanning 210 square miles. The Reserve and its over 100 partners (including 37 south suburban municipalities) promote conservation and sustainable land use in an urban redevelopment context as part of President Obama's America's Great Outdoors initiative. The Calumet Stormwater Collaborative, facilitated by the Metropolitan Planning Council, is comprised of key stakeholders controlling land, infrastructure, financing tools, or regulatory powers related to stormwater. It has been selected as a priority project by the Millennium Reserve steering committee.

Community Engagement and Inclusiveness

DPD has a successful track record of effectively engaging stakeholders and the general public through ongoing HUD-funded programming as well as various special initiatives. All DPD outreach efforts comply with the County's Citizen Participation Plan, updated and adopted in 2012, and ensure sufficient advance notice via newspaper publication, website posting, and electronic email

blast of public review/comment opportunities including public hearings. DPD regularly makes presentations and announces initiatives and related input opportunities to local stakeholder groups and commissions. Formal and informal partnerships are essential to outreach efforts ensuring productive meeting scheduling, logistics coordination, and facilitation. Since DPD's programs largely target low- and moderate-income and other vulnerable populations, DPD coordinates with stakeholder agencies serving these groups. Contingent on local needs, meeting notices, surveys, and summaries are made available in both English and Spanish. Additionally, individuals with disabilities or limited English proficiency are able to request special accommodations. DPD's Economic Development Advisory Committee meets bi-monthly and offers opportunity for public comment. Input regarding program design and operations are solicited a few times annually during the development of strategic plans, performance reports, and related substantial amendments. During *Planning for Progress* an array of outreach methods were deployed including 20+ formal presentations, 3 interactive sub-regional workshops, web-based surveys, 30+ focus groups, and 4 open house events resulting in input from over 2,000 participants regarding local needs, resources, and opportunities for affordable housing, community, and economic development. DPD has also incorporated disaster recovery and resilience into its outreach and engagement strategies presenting relevant information, surveying needs, and conducting interactive meetings with municipal leaders, the development community, service providers, and the general public specific to flooding during the development of its CDBG-DR Action Plan and subsequent amendments.

Cook County more broadly has also achieved local and national recognition for effective regional collaboration and coordination. President Toni Preckwinkle initiated and regularly convenes County leaders throughout the region to share information and resources. The Bureau of Economic Development spearheaded the IMCP regional application as one of just twelve original national awardees and supporting over $11.3 million in investments benefiting metal manufacturers.

DPD and its aforementioned partners have a strong track record for community engagement including building broad-based coalitions to tackle cross-cutting issues at regional and local levels. They are well-versed in best practices to solicit and synthesize input from a wide array of stakeholders and members of the public, particularly when they represent competing interests. DPD is employing similar outreach and engagement modalities specific to resilience with an emphasis on households, institutions, and communities most affected by DR-4116, and most importantly, more likely to be impacted by and vulnerable to future threats and hazards including those resulting from climate change. This outreach is creating and empowering formal and informal leaders on stormwater management and broader resilience topics. Outreach began in earnest during Phase 1 and helped lay the groundwork for intensified outreach that sustains awareness, involvement, and implementation of resiliency efforts during the development of this Phase 2 application. Feedback provided has influenced and impacted the strategy proposed here as outlined later in the application.

C.2 Management Structure

Existing Management Structure:

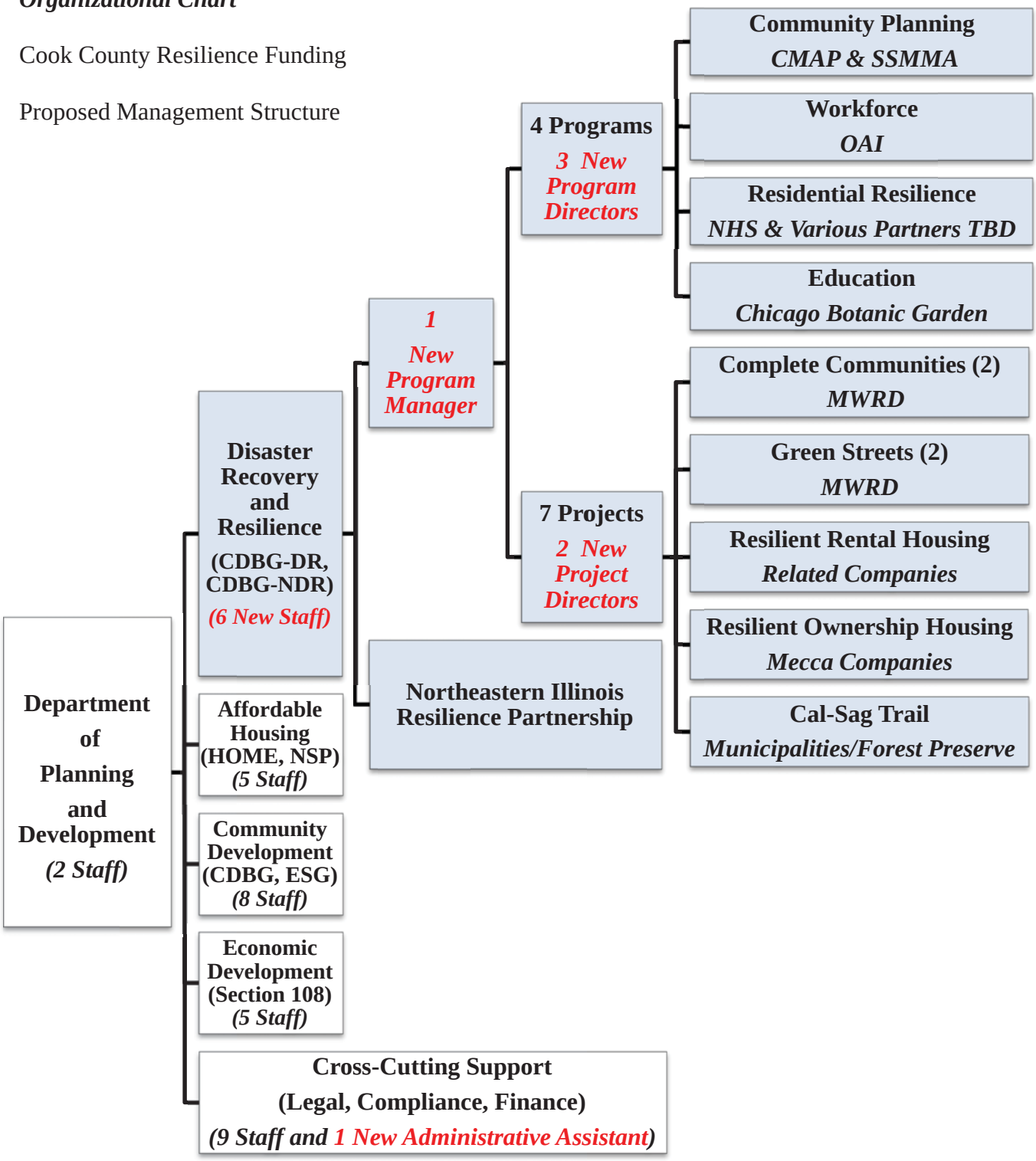
If awarded, DPD will directly administer the CDBG-NDR funding and oversee related staffing, programs, projects, and funding recipients. DPD, along with the Zoning Board of Appeals and the Department of Building and Zoning comprise the Cook County Bureau of Economic Development. DPD is the principal County agency that administers community development, affordable housing, and economic development resources including HUD funding as noted earlier.

Presently, DPD is organized along three program divisions – Affordable Housing, Community Development, and Economic Development – which oversee County corporate and HUD grant resources. If funds are awarded, DPD will establish an additional functional area – Disaster Recovery and Resilience which would include CDBG-DR and CDBG-NDR resources. It is anticipated that existing staff in the other programmatic divisions, as well as legal, compliance, and

Organizational Chart[4]

Cook County Resilience Funding

Proposed Management Structure



[4] Note – proposed staffing will include **7 new hires** supported by existing personnel in our Housing & Community Development Divisions currently administering CDBG-DR.

finance staff in a Cross-Cutting support division, will supplement the efforts of the new Disaster Recovery and Resilience division. Seven new County staff will be specifically hired to administer CDBG-NDR funds. A new Administrative Assistant, housed in the Cross-Cutting division will support resilience efforts. A new Program Manager will be hired and manage the Disaster Recovery and Resilience division including oversight of related internal staffing, programs, projects, and external partners. The Program Manager, as a member of senior staff, will be charged with ensuring that resilience initiatives move forward in a timely, efficient, effective, and compliant manner. This individual will report to the Director of the Department of Planning and Development and will have five direct reports at the Program Director and Project Director levels. The Program Manager will also be the designated Cook County liaison to the ongoing Northeastern Illinois Resilience Partnership and will serve as the convening chair during the County's service rotation. They will also coordinate procurement of additional needed partners. Three new Program Directors will administer the Community Planning, Workforce, Residential Resilience, and Education programs. They will be charged with program development, administration including invoicing, and evaluation as well as coordination with and oversight of related partners as assigned by the Program Manager. Two new Project Directors will manage the Complete Communities, Green Streets, Resilient Housing, and Cal-Sag Trail projects. They will be charged with project administration including approval of related scopes of work, budgets, and timelines, processing of related invoicing, and coordination with and oversight of related partners as assigned by the Program Manager. Moreover, they will coordinate with existing County staff related to construction management and oversight. Existing legal, compliance, and financial personnel will coordinate with the full Disaster Recovery and Resilience division on contract development/execution, environmental review, relocation, lead-based paint, monitoring, accounting, and auditing.

The County's proposed resilience initiative is structured so that the majority of program and project delivery is undertaken by highly capable subrecipients with significant related capacity, many of which DPD has worked with previously and have a successful performance history. With the exception of NHS who may hire additional staff, each partner has existing personnel that will be tasked with administration of the proposed programs and projects based upon the specific funding award. MWRD has identified an Assistant Director of Engineering in their Infrastructure Management Division to administer the Complete Communities and Complete Streets projects. Contingent upon award, DPD may also procure additional partners as HUD-required. In the event of a designated partner leaving the team, DPD would assess the related work and determine whether it can be absorbed by the existing partners or whether a new partner must be selected.

Cook County References:

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MWRD References:

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Exhibit D - Need

Cook County, Illinois

ExhibitDNeed.pdf

D.1 Unmet Recovery Need and Target Geography

Phase 1 detailed the nature and extent of $904.6 million and $242.0 million in unmet housing and infrastructure recovery needs respectively from DR-4116 countywide, the geography identified by HUD to be most impacted and distressed. The County also documented broader resilience needs: the highest national disaster fatality rate; disproportionate property damage, particularly from flooding which accounts for 41 percent of all disaster losses; a substantial gap between insured/ uninsured property losses; significant increases in urban flooding; climate change increasing the frequency and severity of flooding, heat, and winter weather events; and vulnerabilities including an aging, insufficient infrastructure, a poverty rate nearly double that of its neighbors, environmental contamination, and a lack of local government capacity.[1]

In response to these needs, the County has taken a science-based risk approach, described in the its Phase 1 application, to identify a demonstration area in south suburban Cook County that will be the primary beneficiary of funding and be used in the design and testing of scalable and replicable resilience approaches (see Figures B and C for a map of the demonstration area and its location within the County). This will improve the adaptive capacity of the built, natural, and social systems for current and future hazards. The demonstration area is ideal because of demonstrated unmet recovery need, socioeconomic status, and relative representativeness of vulnerabilities/assets.

The County's demonstration area, which contains the cities of Blue Island and Calumet City and the villages of Calumet Park, Dolton, Riverdale, and Robbins, spans two watersheds and is home to 110,000 residents. As detailed in Exhibit B, p. 8, FEMA verified losses resulting from DR-4116 totaled $8.1 million for the area. Though Cook County has obtained more than $9.6 million in resources, unmet housing need in the demonstration area totals $151.4 million for an estimated 4,314 households. Evidence suggests that homeowners in this area experience repetitive, damaging

[1] Spatial Hazards Events and Losses Database for the U.S. -- http://hvri.geog.sc.edu/SHELDUS/

flooding at a frequency of every one to two years and remain 'very much' concerned about heavy rainfall events that result in loss of property, foundation damage, mold, and other costs. Yet, less than 10 percent report having requested public assistance during and after flood events.[2]

DR-4116, while significant, was not a one-time event but rather a reflection of frequent, repetitive flood events that have increased in both frequency and magnitude because of climate change and urbanization. While the total rainfall for DR-4116 was similar in magnitude to a 10-year storm, peak storm intensities were comparable to a 2-year storm which flood models indicate would affect 2,500 households; more than 6,000 were actually impacted in DR-4116. The demonstration area was selected due to socioeconomic need and vulnerabilities including a population in which 60 percent of households earn less than 80 percent of the area median; outmoded and aging infrastructure with limited maintenance resources; environmental contamination; and job loss and economic disinvestment. The County's proposed scalable approach addresses these needs through resilience- enhancing and adaptive capacity-building actions focused on the revitalization of public space and recreational amenities and residential, industrial, and commercial properties.

From a regional perspective, as a global metropolis, transportation hub, and economic center of the Midwest, northeastern Illinois spans the divide between the Great Lakes/Mississippi River watersheds and is a key steward of 84 percent of the country's freshwater. The region's strengths remain its geography and natural assets. Its fundamental vulnerabilities, which contribute to and are exacerbated by flooding, lay within the socioeconomic, governance, and infrastructure disparities that divide its communities. Stormwater management and flood prevention are challenging due to the region's flat topography and broad floodplains. Urban development has led to large swaths under impermeable cover, and now even small storms overwhelm infrastructure and flood

[2] Northeast Blue Island Resident Action Group survey, October 2014; Cook County Phase 1 Planning Survey, February 2015.

communities across the region, causing significant damage to homes and businesses (particularly costly in high density areas), and drain polluted runoff into Lake Michigan. DR-4116 was particularly devastating for Northeastern Illinois. More than 24,000 residents were left without power, roadways and expressways were closed due to standing water, and officials were forced to empty the 109-mile "deep tunnel" system, sending sewage and stormwater into Lake Michigan.

D.2. Resilience Needs within Recovery Needs

Resilience Measures to Limit Effects of Qualified Disaster

As the County has demonstrated, DR-4116 was extremely costly to the region, the County, and the County's proposed demonstration area. This proposal seeks to make future natural hazard events less costly by implementing a portfolio of scalable, resilience-building programs and projects. Multiple options for reducing flooding and increasing resilient response within the demonstration area were considered to determine the most cost-effective response. As illustrated in Table 3, DR-4116 cost a total of $962,083,374 Countywide, including individuals $627,885,060 (estimated using value of Housing Impact Multiplier described in Exhibit B, p. 9), private insurance firms $203,657,950, and Federal government $130,540,364 from FEMA, NFIP, CDBG-DR, and SBA. Within the demonstration area, the costs incurred by DR-4116 are as follows: individuals $81,082,940, insurance firms $2,598,012, and federal government $9,572,658 from FEMA, NFIP, CDBG-DR, and SBA. Table 3 also details the estimated costs of resilient measures for two approaches considered by the County, a Residential Resilience Program (flood mitigation options for single-family homeowners) and a 'Green Streets' Project (installation of green infrastructure in the public right-of-way). The resulting avoided loss totals are significant when compared with recovery need and total private insurance claims from DR-4116.

Avoided losses for these two alternatives were evaluated for a residential neighborhood in northeast Riverdale. Based on hydraulic modeling analyses for the neighborhood, the alternatives

would prevent basement backups at 229 residences within the neighborhood for a 10-year storm (similar in size to DR-4116). Estimates of avoided losses were then extrapolated from the Riverdale residential analysis based on the ratio of the number of benefitting structures.

TABLE 3: Resilience Measures Limiting the Effects of DR-4116

Service Area	Cost of DR-4116[3]	Estimated Costs of Resilience Measure	Benefitting Structures[4]	Expected Avoided Costs (2015 $) - Net Total Benefit
Riverdale Residential				
Residential Resilience	N/A	$10,537,500	229	$27,144,600
Green Streets		$6,170,000		$42,272,021
Demonstration Area				
Residential Resilience	$93,253,610	$175,912,500	4,691	$556,049,426
Green Streets		$126,390,699		$865,930,352
Cook County				
Residential Resilience	$962,083,377	$1,780,875,000	47,490	$5,629,244,777
Green Streets		$1,279,534,061		$8,766,368,023

[3] Calculated by estimated individual costs; actual funding sources defined in Exhibit B (FEMA, NFIP, Cook County CDBG-DR, SBA housing); and actual private insurance payout.

[4] Calculated by adding the total number of households with Unmet Housing Need, plus those that had private insurance claims (approved and not approved). Both are documented in Exhibit B.

Based on this analysis, if these two alternatives had been implemented prior to DR-4116 the expected avoided costs, or net total benefit, would have been more than $556 million and $865 million in the demonstration area for the residential resilience and green streets solutions, respectively. County-wide, this translates to $5.63 billion and $8.77 billion, respectively, in costs that could have been avoided had appropriate investments been made. The net total benefit makes a strong case for pursuing these alternatives in the County's demonstration area and beyond.

Appropriate Investment in Resilience

The County estimates the amount of total investment in resilience necessary to appropriately benefit communities within its demonstration area cost-effectively now and in the future is $118.6 million. The expected benefits of this investment (net total benefit) are equal to $136.0 million in 2015 dollars, and 1,400 structures would benefit in the area. For additional details on this analysis and a breakdown by project, please see Attachment E – Benefit Cost Analysis, Table F.13, p. 387.

Vulnerable Populations

Characteristics of households and vulnerable populations within the MID-URN target area (Cook County) and the demonstration area are included in Tables 4 and 5. For comparison, indicators are provided for the U.S. and Chicago Metropolitan Statistical Area (MSA) where available. As Tables 4 and 5 illustrate, Cook County and, even more so, the demonstration area has vulnerable populations which were considered in the design of proposed recovery and resilience projects and programs. Lower income households, particularly those with unemployed persons and/or fixed incomes, face particular challenges for recovery, including: insufficient financial resources to prepare for and respond to natural hazards, such as regular home maintenance and the purchase of flood proofing measures, air conditioning units and fans, and hazard insurance; increased transportation challenges and costs corresponding with road closures and a limited ability to make

alternate childcare arrangements, both leading to possible job and wage loss; displacement that may become permanent in an absence of affordable housing alternatives; and a lack of time to research

TABLE 4: Geographic Comparison of Economic Indicators

	U.S.	*MSA*	*Cook County*	*Demonstration Area*
Unemployment[5]	5.6%	5.6%	6.0%	10.8% (Dolton) 9.5% (Calumet City)
Poverty Rate	15.8%	14.4%	17.8%	22.8%
Household Median Income	$52,250	$60,564	$53,827	$42,134
Mean Social Security Income			$17,593 (25.4%)	$15,108 (27.4%)[6]
Mean Supplemental Security Income (SSI)			$9,654 (5.4%)	$9,953 (5.3%)
Mean Cash Public Assistance Income			$3,124 (2.9%)	$3,576 (5.7%)
Mean Income – Black Households			$20,021 (23.9%)	$21,091 (71.5%)
Mean Income – Hispanic Households			$16,432 (25.0%)	$13,136 (16.5%)

TABLE 5: Vulnerable Populations in MID-URN and Demonstration Areas

	Cook County	*Demonstration Area*
Female Households w/ Children Under 18	7.6% (149,162)	15.6% (6,093)
Persons 65+ Living Alone	10.0% (193,334)	9.3% (3,618)
Individuals with No Health Insurance	16.7% (864,269)	20.1% (22,102)
Population in Renter-Occupied Housing	38.3% (1,987,858)	34.9% (38,606)
Households with Gross Rent >35% of Income	44.4% (335,675)	51.6% (7,808)

[5] Monthly unemployment rates as of August, 2015. Illinois Department of Employment Security. Rates only available for select municipalities, with those in the demonstration area available listed.

[6] Percentages reflect incidence in the demonstration area's total population.

and access available resources. For example, following DR-4116, just 2.7 percent of more than 6,600 FEMA applicants had flood insurance coverage. An estimated 1,500 of these applicants were below the poverty line. During Phase 2 outreach, residents expressed high levels of frustration and stress related to flooding impacting property, finances, health, employment, and transportation.

Local businesses that employ low-income residents are particularly critical in ensuring the resilience of the communities they operate in, but have also suffered from repetitive flooding. For example, one area Class III railroad recently invested more than $150,000 of its own monies to build and maintain a sewer out valve to address repetitive track flooding adversely affecting its operations. The railroad previously had to halt all train movement - an average of 80 trains per day - during normal storm events, resulting in detours, increased costs, and delayed shipments.

The challenges that vulnerable populations within the County's demonstration area face are in many ways characteristic of lower-income suburban communities in Northeastern Illinois which lack sufficiently strong public assistance and social service provider networks as compared to their urban counterparts. Such areas also have fewer links to public transit and access to employers and/or childcare providers during events impacting transportation networks.

These challenges pose a growing concern for Northeastern Illinois, with demographic and economic trends pointing to greater needs among vulnerable populations. Since 1989, real median household income has declined by 7.1 percent in the region.[7] The share of the metropolitan poor living in the region's suburbs grew from 38.9 percent in 2000 to 48.1 percent in 2010.[8] These data reflect a growing need for more robust social service systems in suburban areas and opportunities for wage and job growth. Statewide, homelessness and affordable housing is growing and limits

[7] CMAP. GO TO 2040.

[8] The Suburbanization of Poverty. Elizabeth Kneebone and Emily Garr. Brookings, 2010.

economic independence. The Illinois State Board of Education reports that public schools identified 59,112 homeless students during the 2013 school year, a 7.7 percent increase from the year prior and more than double what it was five years earlier.[9] Across Illinois, there are only 59 available rental units for every 100 low-income renter households.[10] The need for affordable units is more critical near job and transit centers. Health problems exacerbate economic hardship because they limit a person's ability to work. People with disabilities are twice as likely to be unemployed than those without and have significantly lower incomes.[11]

Factors Affecting Disaster Recovery & Resilience[12]

In considering resilience needs and potential alternatives, the County has given consideration to factors (in addition to those related to the needs of and trends affecting vulnerable populations noted in the previous section) which may support or hinder disaster recovery and resilience activities. ***Social:*** Within the County's demonstration area, recovery is aided by a relatively open conversation around flooding. However, the segregation of minority and low income populations and geographic dispersion create artificial barriers between communities and deter collaboration. ***Governmental:*** Board President Toni Preckwinkle has prioritized regional collaboration and south suburban revitalization. While Cook County and partners like CMAP and SSMMA have successfully solicited Federal funding, like Sustainable Communities Initiative grants, and facilitated inter-jurisdictional collaboration, the resources and capacity of local governments remain limited, infrastructure needs are great, and challenges are compounded by the State's fiscal issues. ***Educational:*** Northeastern Illinois is home to top-ranked universities and research institutions and

[9] Chicago Coalition for the Homeless, 2015. http://www.chicagohomeless.org/faq-studies/

[10] The right choice to cut poverty and restore shared prosperity. Half in Ten Annual Report. 2012.

[11] Wittenburg, D., & Favreault, D. Safety net or tangled web. The Urban Institute, 2003.

[12] Data for this section is from CMAP's GO TO 2040 and U.S. Census 2010, unless marked.

within Cook County's south suburbs there is a strong workforce development network supported by the Chicago Cook Workforce Partnership and providers like OAI. However, an ailing, poorly funded, and highly fragmented K-12 system, with increasing proportions of low-income students, impedes educational attainment. Thornton Fractional Township High School District which serves 3,441 area students, 74 percent of which are low-income, adequately prepares just 19 percent of its students for college (compared to 46 percent State average).[13] ***Environmental:*** The region benefits from 350,000 acres in public and private parks and preservation areas but only 49 percent of the population has adequate access. In the demonstration area, there are assets. Local initiatives such as the Millennium Reserve, a State-led renewal program of President Obama's Great Outdoors Initiative, and the Calumet Stormwater Collaborative along with 1,215 acres in Forest Preserves, are area assets. Resilience efforts are hindered by increasing imperviousness in the region due to population growth and environmental contamination, particularly in the demonstration area with its legacy of steel production and manufacturing. Nearly 10 million pounds of toxic substances were released across Cook County in 2013, 43 percent within the demonstration area.[14] ***Economic:*** Northeastern Illinois is the nation's third largest metropolitan economy, with 2.6 million jobs and $308 billion in annual output.[15] It is a transit hub, with a passenger and freight system that is among the nation's largest. The demonstration area, at the intersection of major highways, is home to 5 Class I railroads, 2 major intermodal terminals, and an international Great Lakes port. Other assets include strong economic development organizations, including CMAP and the Chicago Southland Economic Development Corporation. Key income and employment indicators are lower in Cook

[13] Illinois State Board of Education, At-A-Glance Report Card 2013 – 2014.

[14] U.S. EPA Toxics Release Inventory (TRI) Program data, 2013.

[15] http://blog.cookcountyil.gov/economicdevelopment/wp-content/uploads/2014/10/Appendix-B-Partnering-for-Prosperity.pdf

County as compared to both national average. The region has more than 100,000 vacant or underutilized commercial and industrial properties, and more than 1,000 acres of these properties are within the demonstration area. The demonstration area lost 4,300 jobs between 2002 and 2007, and the number of firms decreased by 210.[16]. Disinvestment is worsened by relatively high tax rates which are due to a weakened tax base. Tax capacity is 25 percent below the regional median.[17]

D.3. Best Actions / Appropriate Approaches

The County's Phase 1 framing was the building of physical, individual, and governmental capacity with the south suburban demonstration area as a pilot geography. The Phase 1 application set forth possible solutions including public infrastructure investment, restoration of ecosystems via green infrastructure, private property buyouts, individual education and skill-building (such as private property retrofits and workforce training), and support and technical assistance for suburban communities. Needs analysis continued and expanded in Phase 2 and looked at the criteria of reducing the risk of vulnerabilities, enhancing the quality of life and place, and creating economic opportunity. The County evaluated potential solutions in Phase 2 against three goals: 1) reducing the risk of vulnerabilities, especially to flooding 2) enhancing quality of life and quality of place, and 3) creating economic opportunity. As the County analyzed the needs, it was obvious that a comprehensive risk approach was needed to revitalize this geography and to make it more resilient.

In Phase 2, through the combination of municipal and resident engagement, along with careful analysis, Cook County identified over 70 projects ranging from large reconfiguration of multiple lots to individual homes that needed 'resilient' measures to alleviate basement flooding. As described in Exhibit E – Soundness of Approach, a prioritization process was undertaken to filter the projects for cost and ongoing benefits to the community. Ultimately, the proposed resilience

[16] 2002 and 2007 U.S. Economic Census, Survey of Business Owners.

[17] CMAP analysis of Illinois Department of Revenue data; U.S. Census Bureau, 2008 – 2012 ACS.

portfolio includes seven projects and four programs: two projects to support 'complete communities' resilience-building in mixed-use residential, industrial, and commercial areas with opportunities for revitalization; two projects to build out a 'green streets' concept in flood-prone neighborhoods; two housing projects to rehabilitate multi-family rental units and construct new single-family homes with resilient features; a project to complete a multi-use recreation path to link the project areas; a Residential Resilience Program targeting single-family owner occupied housing; a community planning program; an education program; and a workforce development program.

The County's selected approach starts with the individual and neighborhood level because as much as residents may have strong community ties, their immediate expressed priority is what is happening to their homes. An intervention focused on private property – home improvements that maintain the housing stock while also making properties flood-proof and resilient– was identified as a high priority. Within the more than 39,000 households in the demonstration area, this intervention could be piloted in several neighborhoods that showed the most significant impacts from DR-4116, as determined by FEMA claim mapping and public input. Private property buyouts, while explored as an option, were not selected due to the very limited number of FEMA severe repetitive loss and repetitive loss properties in the demonstration area, as well as the availability of existing funds through MWRD and FEMA for buyouts. The County also wanted to include pilot housing projects to demonstrate how to incorporate resilience strategies in new construction and the renovation of existing multi-family buildings. In addition to serving as a much-needed model, this approach would also address a community need in providing quality affordable housing for those displaced from DR-4116 and other vulnerable populations. Quality, well-managed affordable housing with resilient features builds capacity at all levels. Education is also needed to build this capacity, including engagement of the adult resident population as community learners on issues related to resilience and the development of curriculums on climate change for youth in local schools.

Yet, the County recognized that private property interventions alone could not address the scale of flooding experienced in these communities. Public infrastructure was also a critical component. As discussed, many communities in the County have outdated, undersized sewer systems which pose a challenge for stormwater management, particularly with rainfall increases due to climate change. Exacerbating this is a lack of sewer maintenance, cleaning, and lining (which falls to individual, financially-constrained municipalities), leading to buildups of debris which reduce flow and capacity to convey rain during storm events. It is difficult to know exactly what impact updated maintenance alone would have on the system's performance, but it would likely be very beneficial. Cleaning these systems was considered by the County as a possible action, but maintenance is a CDBG-NDR ineligible activity and thus an activity in this Phase 2 application. However, due to its importance, the County will explore options through its proposed planning program for a joint maintenance program for its demonstration area. More broadly, the County's approach tries to build municipal resources by growing the tax base so that more resources are available in the future.

As a CDBG-NDR eligible alternative to improve the capacity of public infrastructure, gray and green infrastructure solutions were assessed as a companion to the private property interventions in targeted neighborhoods. The selected public infrastructure investments are within the public right-of-way. These alternatives were appealing because they offer a multitude of co-benefits, including improved recreational opportunities, economic development leading to job creation (better supported through a proposed workforce program), and environmental restoration including clean-up. Outcomes from both Phase 1 and Phase 2 community outreach validated that these co-benefits were very important to community members and should be part of the proposed activities.

In particular, the demonstration area (and many other communities in Cook County) is in great need of economic revitalization to combat decades of loss of industry and jobs, so the County looked at public investments in stormwater management installations that would simultaneously

foster the development of long-dormant sites by removing pre-development hurdles and incorporate amenities – such as green space, walking trails, athletic fields, etc. – to improve communities. This approach demonstrates a model of smart public investment to enhance the tax base and catalyze redevelopment as well as improve stormwater management, create job opportunities from industrial and commercial redevelopment, and promote the health and social benefits of a more amenity-rich, socially connected community. When linked with improved workforce development opportunities for both available industrial jobs and to meet the demand related to green infrastructure installation and maintenance as that industry grows in the County and region, the County's selected interventions are intended to position residents to benefit from these new employment opportunities.

In the demonstration area, the western portion of the long-proposed Cal-Sag Trail which traverses less vulnerable communities, was recently finished, yet the eastern portion through the County's demonstration area still lacks the resources for completion. This project was selected because its completion, using techniques like permeable pavers and bioswales, offered a unique opportunity to achieve many co-benefits: ensuring good stormwater management, improving transit options for residents (particularly important as an alternative to vehicular transport and a connector to public transit options), knitting the communities together, and providing development opportunities.

Taken together, proposed private property and public infrastructure interventions reduce the risk of vulnerabilities to flooding, enhance the quality of life and quality of place in a disadvantaged and previously underserved area, and create significant, lasting economic opportunity. They address both individual and physical capacity but also serve as a demonstration to local governments of innovative ways to approach infrastructure investments and land use options – and these are ways that the County and MWRD will prioritize as they invest respectively in suburban Cook County. Finally, and perhaps most importantly, they reflect solutions that both municipal leaders and community members agree are important to the long-term vibrancy and resiliency of communities.

Exhibit E – Soundness of Approach

Cook County, Illinois

ExhibitESoundnessApproach.pdf

The County and its identified south suburban demonstration area has suffered through many flooding events, in addition to DR-4116, that have caused widespread damage from basement backups and overland flooding. Resiliency efforts proposed by the County are focused on several activities including Complete Communities, Green Streets, and Resilient Housing projects in discrete geographic areas and Residential Resilience, Planning, Education, and Workforce Training programs and the Cal-Sag Trail project throughout the demonstration area. Taken together, this resilience portfolio will integrate resiliency into the fabric of the demonstration area by implementing and increasing protection efforts against stormwater and combined sewer related flooding and loss of affordable housing, while fostering economic development and job creation, increasing connectivity between neighborhoods, and enhancing the community landscape. It is a replicable and scalable model to build resiliency and support vibrant communities that can be taken County- and region-wide with the support of the Northeastern Illinois Resilience Partnership. Please note that all Figures referenced in this exhibit can be found in the County's Attachment E Dropbox: https://www.dropbox.com/sh/i6oypefld46llxg/AACAKsxQJrbtYcxbFZezeHb9a?dl=0.

E.1 Sound Approach Description: Project / Frame Correspondence

Cook County's Phase 1 and Phase 2 selection process was thoughtful and comprehensive, taking into account many sources of information: data and anecdotal information on recovery need from DR-4116 and other natural hazard events; science-based data on climate change; resident and local institution input on community needs and specific projects; and consultation with cross-disciplinary experts. This process is reflected in the resilience portfolio that sets forth a comprehensive solution.

The County's Phase 1 process started with an analysis of quantitative data to gain a strong understanding of the impact of flooding across the County and potential unmet recovery need. A review of estimated damage and recovery assistance from DR-4116, including FEMA, SBA, NFIP, and CDBG-DR, and beneficiaries identified Unmet Recovery Need, was conducted. Then, FEMA

total loss data was overlaid with data on low- to moderate-income households to identify a demonstration area with disproportionate losses, greatest need, and evident vulnerabilities. FEMA data was further analyzed to identify needs for households with incomes less than $30,000, individuals over the age of 60, and those with flood insurance coverage. Finally, a windshield survey within the demonstration area verified flood damage and Unmet Recovery Need in housing.

As detailed in the County's Phase 1 application, community engagement among residents and businesses helped to gain an even better understanding of flooding impacts, unmet needs, responses, needed resources, and resilience opportunities. Phase 1 outreach built upon a survey of local municipalities and housing providers regarding flooding impacts and needs conducted during the County's development of its CDBG-DR strategy plan. A resident survey with regional and County-specific components provided baseline information, and three subsequent local public meetings were held to gather and share information through a mapping exercise and framing discussion in Phase 1. These meetings were community-led conversations about how Cook County could reduce impacts, increase adaptability, create opportunities, and build regional resilience capacity. The County also met with 25 representatives from the planning, public works, and stormwater management departments of the municipalities in the demonstration area to identify the specific locations of flooding. The County conducted two public hearings through its Economic Development Advisory Council, which included informational presentations and offered opportunities for public comment, and put forth its draft Phase 1 application for a 15 day public comment period advertised electronically via website posting and e-blast to 2,000+ stakeholders.

These consultations provided potential focus areas for Phase 2 and the need to: 1) Prioritize vulnerable communities and meet them where they are with information, technology, and resources; 2) Reduce single-points of failure by creating redundancies through decentralized systems; 3) Leverage existing community engagement; 4) Improve trust between residents and public agencies;

5) Balance efforts between recovery and long-term proactive actions; 6) Consider flexible policies and actions encouraging improvement through recovery, rather than return to previous states; 7) Evolve resilience-building strategies with future forces of change (i.e., technology, market demand, shifting hazards, climate change, etc.); 8) Strike a balance between gray and green infrastructure and use holistically; and 9) Capitalize on high interest related to economic growth and job creation.

Research, data gathering, and past experience working in the demonstration area shed light on some of the potential challenges and opportunities facing these communities that could hinder or help resilience-building activities. The Phase 1 application detailed the area's outmoded and aging infrastructure, strained environment and history of environmental contamination, segregation of low-income and racial/ethnic minority populations, disparity in housing markets and a lack of affordable housing, job loss and economic disinvestment, and local government fragmentation. These factors suggested a need to increase the built, natural, and social systems adaptive capacity to current and future hazards, stressors, and shocks. Other trends were also accounted for: urbanization leading to increased imperviousness; climate change causing more frequent and more intense weather; and historic under-insurance for natural hazards, particularly for vulnerable populations.

Finally, the County's Phase 1 process involved consultation via the Northeastern Illinois Resilience Partnership, through expert work groups, Resilience Roundtables, and regional events. Five Work Groups, led by a subject matter expert, provided input as related to: Design and Engineering; Financing the Future; Using Technology to Impact Behavior; Economic Transformation and Opportunity; and Multiplying the Benefits. The County reviewed and considered more than 60 Work Group-recommended resilience building actions covering planning and policy, research and modeling, financing, infrastructure, and adaptive capacity. A series of Resilience Roundtables focused on learnings from national experts, and other regional events gathered feedback on the identification of need and proposed concepts.

Cook County's Phase 1 application proposed to design and test a model approach to disaster resiliency in the selected demonstration area focused on 1) improving physical capacity to handle stormwater in innovative ways and create economic and environmental co-benefits, 2) increasing the capacity of residents and businesses to respond to flooding and other shocks, and 3) building the capacity of local governments. The County proposed to evaluate potential capacity building solutions in Phase 2 against three goals: 1) reducing the risk of vulnerabilities, especially to flooding, 2) enhancing quality of life and quality of place, and 3) creating economic opportunity.

In Phase 2, the County worked to more closely identify recovery and resilience needs and community-defined areas of opportunity building on the learnings from Phase 1's municipal and resident engagement. County representatives and partners MWRD and SSMMA met with municipal leaders and other stakeholders during its Phase 2 kickoff in April, 2014, and with the municipal staff individually in May to solidify these opportunity areas – those with a history of repetitive flooding that also demonstrated high need (poverty or job loss, vacant or underutilized land, etc.) and opportunity (redevelopment opportunities, potential for stormwater storage and/or management, etc.). This municipal outreach fed into work by Arcadis, a consultant of MWRD, to conduct additional outreach and a review of potential project areas.

Arcadis established a website focused on the Phase 2 demonstration area to serve as a repository of related information, link to additional resources, and spotlight opportunities for input. Since inception, over 200 individuals visited the site at least once and nearly half made a return visit. To capture additional resident input, Arcadis also deployed a Phase 2 resident questionnaire to gather additional input on the nature of flooding and to solicit opinions on approaches to flood mitigation. The questionnaire was deployed via a factsheet that included a link to the electronic survey as well as a general summary about the project, sources for additional information, and contact information. The factsheet was mailed to approximately 3,000 residents in known problem

areas and was made available in village halls of Robbins, Calumet Park, Riverdale, and Blue Island, as well as the local libraries, park district offices, community centers, and senior housing developments. Arcadis also engaged the communities directly via door knocks and attendance at community events. In these interactions, residents were interviewed about their experiences and encouraged to complete the full questionnaire. Arcadis found more success with these face-to-face interactions. For example, in Riverdale and Calumet Park, Arcadis knocked on doors of 72 homes and, of those, 32 were interviewed to share their experiences on flooding.

Following this Phase 2 municipal and public outreach, a master list of 70 opportunity areas was compiled by Arcadis which laid out, for each proposed area, the following: current land use; location within a 100 or 500 year flood plain; number of structures impacted by DR-4116; whether a redevelopment opportunity exists; access to transportation including transit-oriented development; existing County or MWRD projects in the area; priority for community space for public amenities; potential environmental hazards; and the potential to provide reduction in stormwater flows (see Figure D for a map of these initial opportunity areas). Consideration was also given to vulnerabilities such as environmental contamination, land fragmentation, absentee ownership and back taxes, high tax rates that would necessitate public investment, and prime locations for catalytic redevelopment. These attributes were weighted, allowing for each project to be scored and ranked. Highly ranked projects were identified and located, and the list was narrowed to approximately 30 project areas. Adjacent projects that offered the opportunity for leveraged outcomes were considered and grouped together to identify potential collective impact.

The County considered several alternatives as it worked to refine its Phase 2 focus. Other industrial areas, such as an eco-corridor along Midlothian Creek in Blue Island, were considered but eliminated due to limited opportunities for co-benefits. A possible detention site along a creek and between railroad tracks was considered but rejected due to limited resident access and a lack of co-

benefits. Potential economic development sites, including several in Dolton, were removed from consideration since they were too early stage to benefit from catalytic public investments, unlike the Complete Communities projects which have strong development interest. Other opportunity areas were not selected due to their further location from passenger or freight rail versus the Complete Communities projects which are adjacent to Metra transit. Finally, all of the most impacted neighborhoods from DR-4116 were considered but some were rejected due to lesser impacts.

Several housing projects were considered as part of the above process for a resilient single- and multi-family new construction and rehab pilot. When looking for opportunities in the demonstration area, the South Suburban Land Bank and Development Authority (SSLBDA) and the Cook County Land Bank Authority (CCLBA) were approached to identify potential sites for new single-family construction. SSLBDA had just purchased a large lot in Dolton that they offered up as a redevelopment site. A large multi-family development (not common in the demonstration area) needing renovation and having flood issues was also identified, and partner Related Companies was in the process of purchasing. Both offered unique opportunities fitting within identified priorities.

The County's list of projects was further refined to address cohesion across communities and identify like resiliency elements that could be piloted for evaluation and future implementation on a county or regional basis. During this stage the County narrowed the projects down to their final state, focusing on several key activities, including: complete communities – projects that provide flood mitigation, redevelopment opportunities, and community enhancement; green streets – projects that minimize flooding and basement backups primarily in residential areas, and resilient housing - projects that provide affordable housing in combination with sustainable measures to low and middle income citizens. For each refined 'complete communities' and 'green streets' project area, several gray and green alternatives were evaluated that looked at both public and private property improvements. Concept designs and life cycle costs were developed for each alternative

and the most cost-effective solution was selected. These projects were then vetted during community meetings and further refined before being finalized. The Cal-Sag Trail, a corridor that weaves through and connects the various communities within the demonstration area, was also included as a project to provide a significant community enhancement and allow local residents to be physically active in a safe environment. These four project types cover the range of social, environmental, and economic needs that will be critical to long-term resiliency and can easily be scaled up to improve resiliency within other vulnerable areas in the county.

With a targeted, more precise summary of potential project areas, the County returned to stakeholder consultation and municipal and community outreach in August, 2015 to further refine the project list. The County also assessed feasibility and potential co-benefits, confirmed tie-back to DR-4116, and analyzed the impact on vulnerable and low-income populations. The County also reviewed the costs and benefits for addressing 5-, 10-, 15-, 25-, 50-, and 100-year storms and agreed that, for these communities, flood mitigation should address up to a 25-year storm, as the cost of addressing 50- or 100-year storms were prohibitive. Following additional consultation and analysis, the County identified 13 opportunity areas that, when combined into geographic concentrations, represent the 7 projects proposed here – two 'complete communities' areas, two 'green streets' pilots, two resilient housing projects, and one multi-use recreational path linking these projects (see Figure E for a map of these near-final opportunity areas). Two programs – focused on single-family residential resiliency and community planning started to take shape during this phase.

The County worked with its partners to further refine its portfolio of project and program descriptions, creating renderings and compiling information to share with the public. As part of the development of this Phase 2 proposal, six additional charrettes were held in each of the demonstration area municipalities inclusive of the general public, representatives from community-based institutions, and municipal leaders. A total of 106 attendees participated. These meetings

were publicized in accordance with Cook County's current Citizen Participation Plan and outreach/engagement approach as outlined earlier in this application. Electronic and hard copy flyers were also distributed through key stakeholder groups to cast a wider net for interested parties. Additionally, presentations highlighting the input opportunities were made at existing stakeholder-led formal meetings and at community events sponsored by local municipalities.

During the charrettes, the County and its partners shared information about the competition, provided a summary of Phase 1 activities and related community input incorporated, identified flooding challenges and discussed related community/individual impacts, spotlighted resilient tools and resources including innovative grey and green infrastructure solutions, and reviewed the proposed programs and projects. See Figure F for resiliency renderings shared with residents to guide conversation. Engaging discussion and visioning exercises followed to advance shared community understanding of flooding risks/impacts, recovery, and resilience. During these discussions, residents, public officials, and other stakeholders shared personal stories regarding the impacts flooding has had at the individual, family, and community levels. A designer was on hand to capture immediate feedback and create on the spot visual renderings of proposed resilience solutions to enhance understanding and provoke interest (see Figures G through K for examples). While some residents had participated in earlier Phase 1 community meetings, others were new to the process. The facilitators of the workshops impressed upon attendees the importance of and County commitment to meaningful incorporation of community input on the proposed resilience approach. The primary facilitator, a consultant provided with support from the Natural Resources Defense Council, ensured that the charrette content and delivery was culturally sensitive and attuned to the unique socio-economic challenges faced by residents in the demonstration area.

Charrette participants spotlighted unique community assets including historical significance, geographic location, and transit access. However, they also highlighted the significant negative

impacts flooding has on their families, pets, properties, belongings, incomes, interpersonal relationships, and physical and mental health. Many attendees noted the negative impact of flooding on their community's property values, tax base, overall image, and attractiveness for investment. Much of this feedback provided validation of the problems that the County had been working to address. Attendees spoke specifically about flooding and environmental resilience but also more broadly about challenges to their economic and social resilience. Resident concern related to flooding primarily focused on their homes. Residents emphasized the need – and support for – community and homeowner education about green infrastructure and how to maintain it. The communities within the demonstration area have both long-time and new homeowners, and very few from either group are educated about what can or should be done to address basement flooding. Residents expressed interest in allocating funds towards education and needed capital improvements to address this gap. Residents also expressed concern about the impact of proposed solutions on other areas and families outside the demonstration area and were pleased that the models proposed were intended for ultimate replication throughout their community, the County, and broader region.

The County's proposed resilience approach has and continues to evolve from Phase 1 and throughout Phase 2 based upon outreach and feedback provided. There were major feedback components from these charrettes which influenced and informed the County's proposed resilience approach and resulted in modifications to the original program and project concepts as follows: 1) Residents emphasized a need for targeted community beautification initiatives which were subsequently incorporated in the proposed Complete Communities and Green Streets projects. 2) There was a strong emphasis on the need for resident training in flood prevention and installation/maintenance of resilient features in their homes which led to the development of an Education program. 3) Demonstration area residents and communities are seeking job training and employment opportunities for both available advanced manufacturing jobs and opportunities related

to a growing recognition of the usefulness of green infrastructure. The proposed Workforce program is a direct response to this critical economic need. 4) Residents applauded the County's Residential Resilience Program approach and provided significant feedback regarding how it might be structured for maximum individual and community impact. Residents expressed a strong demand for a better understanding of how to make their homes more resilient and to maintain related upgrades at low-cost. The related program design evolved in light of this input to ensure that residents have the necessary tools to achieve and maintain resilient homes. 5) Attendees noted that any programs and projects that effectively address flooding would alleviate their stress and free up limited financial resources to address other pressing needs. The resulting physical, social, economic, and mental relief would enhance resilience and are critical co-benefits. The County re-evaluated its program and project concepts to ensure that the intended impact was reasonable, achievable, and maximized given limited available resources. Specifically, in Robbins, the initially proposed project evolved to the current Green Streets approach based on resident input regarding the target area.

In addition to the community-based charrettes in Phase 2, Cook County has consulted with a wide array of regional and local public, private, and non-profit stakeholders regarding its proposed strategy inclusive of the identified programs and projects. The defined partners - Northeastern Illinois Resilience Partnership, Chicago Metropolitan Agency for Planning, South Suburban Mayors and Managers Association, Metropolitan Water Reclamation District of Greater Chicago, Neighborhood Housing Services of Chicago, Mecca Companies, Inc., Related Companies, OAI, Inc., and Chicago Botanic Garden – provided ongoing input which was incorporated as concepts evolved from Phase 1 and throughout Phase 2. DPD regularly convened and solicited input from its interagency County team inclusive of representatives from the Cook County Forest Preserve District; Commission on Human Rights; Departments of Building and Zoning, Public Health, Transportation and Highways, Environmental Control, Homeland Security and Emergency

Management; Chicago Cook Workforce Partnership; Cook County Land Bank Authority; and the Housing Authority of Cook County. These County agencies and affiliates provided input regarding appropriate approaches, leverage opportunities, and long-term commitment options.

Once developed, the draft Phase 2 application was released for a 15 day public comment period publicized via website posting, e-blast to the County's stakeholder and public email list, and via newspaper publication. The Northeastern Illinois Resilience Partnership also publicized Cook County's application on related website pages, and CMAP distributed notice of the draft application and comment opportunities through its weekly email blast to 2,000 stakeholders. The County's Economic Development Advisory Council (EDAC) conducted a public hearing inclusive of a presentation on the competition and the proposed Phase 2 strategy. While no written comments were received during the public comment period and no verbal public comments were provided at the EDAC meeting, the extensive feedback on the draft application and related programs/projects provided by the County's partners and interagency team coupled with the most critical input from community-based institutions and residents during the charrettes demonstrated a high level of interest. Related feedback was incorporated in this Phase 2 submission. See Attachment D – Consultation Summary for additional details on stakeholder consultation and public engagement.

On a regional level, during Phase 2, the Northeastern Illinois Regional Partnership has convened 10 regional meetings with stakeholders representing 79 organizations, including 27 non-profit and community based organizations, 24 public sector agencies, 3 insurance companies, 19 businesses, 6 research institutions, and 3 local foundations. During the same period, the Partnership also met with 40 new organizations on top of the 170 that had been engaged during the first phase. See Attachment D – Consultation Summary for additional details on regional stakeholder consultation.

As detailed in Table 6 and the sections which follow, Cook County's Phase 2 application puts forth a resilience portfolio of seven projects and four programs to improve the County's capacity to

respond and adapt to current and future threats and hazards, including climate change. See Figure E for a geographical representation of the proposed projects. A project to complete the Cal-Sag Trail, a planned 26-mile multi-use path with uncompleted stretches in the demonstration area, will link the project areas with other south suburbs, improve transit options and access, and foster social cohesion among these communities and beyond. Two of the selected projects support 'Complete Communities' resilience-building by addressing community need within a demonstration area containing residential, industrial, and commercial properties with significant opportunities for revitalization and co-benefits including job creation. The projects are located in the communities of Riverdale and Blue Island / Calumet Park and represent COD and TOD opportunities. Two other projects will build out a Green Streets concept in flood-prone neighborhoods in Dolton and Robbins. Two housing-specific projects in Calumet City and Dolton will rehabilitate multi-family housing rental units and construct new single-family ownership housing units, respectively, while incorporating resilient measures in both to provide affordable, resilient housing. Several programs will then be overlaid with these project areas, as well as the wider demonstration area, to build resilience. A Residential Resiliency Program targeting single-family owner-occupied housing directly addresses unmet housing need and incorporates resilience measures into the area's existing housing stock. An educational program will build individual capacity by sharing information on climate change and how green infrastructure – particularly on private property – can be a solution. This educational work will build on the Center for Neighborhood Technology's (CNT) RainReady Community program, which the County is supporting in the demonstration area using CDBG-DR funding in tandem with assistance from the U.S. Army Corps of Engineers. Education will not only reach local residents, but also their children ensuring that the resilience effort will carry forward into the next generation. A workforce development program will help prepare residents for available industrial jobs as well as emerging opportunities in the green infrastructure maintenance

and installation. A planning program will support a range of local government capacity needs including redevelopment site planning, stormwater modeling capacity, and an assessment of shared service potential for maintenance of stormwater infrastructure. The projects and programs comprise a resilience portfolio with an array of solutions to improve the physical, individual, and local government capacity within the County's demonstration area.

TABLE 6: Summary of Cook County's Proposed Resilience Portfolio[1]

	Description	**Partners**
'Complete Communities' Projects		
Riverdale	Revitalization of residential areas and industrial and commercial properties and improvements to open space and public-right-of-way for flood mitigation, economic redevelopment, and community enhancement	MWRD; SSMMA
Blue Island – Calumet Park		
'Green Streets' Projects		
Dolton	Green infrastructure in right-of-way for flood mitigation and community enhancement	MWRD
Robbins		
Housing Projects		
Dolton	Construction of 30 new resilient single-family for-sale homes	MECCA
Calumet City	Resilient renovation of 142 multi-family rental housing units	The Related Companies, LLC
Other Projects		

[1] Contingent on CDBG-NDR funding award and subject to Cook County Board Approval.

Cal-Sag Trail	Complete a 26-mile multi-use path	Village of Blue Island; AECOM
Programs		
Residential Resilience	Incorporation of resilient features in owner-occupied single family homes	NHS
Community Planning	Site planning for redevelopment, enhancing stormwater modeling capacity, and exploring options for shared services	SSMMA; CMAP
Education	Public outreach and education; K-8 resilience curriculum	Chicago Botanic Garden
Workforce	Job training for manufacturing and green infrastructure installation and maintenance	OAI, Inc.

Riverdale 'Complete Communities' Resiliency Project

Riverdale, a community of approximately 13,000, has experienced frequent flooding throughout the community, especially in residential areas in the northeast. A loss of industry and high home foreclosure rates has left the Village with one of the highest property tax rates in the County, further impeding growth. Recent planning efforts identified significant redevelopment opportunities for the western portion of the Village tied to the network of rail lines and rail yards that currently exist, including two major switching railroads serving more than 160 industries, and a nearby marshland. Four potential developments identified by SSMMA are estimated at $100 million, with multiple benefits to the community including remediation of a former brownfield site, the creation of nearly 500 jobs in transportation, logistics, and manufacturing, and improved green space. These businesses would provide a huge boost to a declining tax base that has limited Riverdale's ability to

respond to hazards and fund resiliency efforts but also to other, everyday needs of their citizens. In order to catalyze these important new developments, improvements to the area's existing drainage and wetland areas are desperately needed. Public investment can ease hurdles related to environmental issues, fragmented land ownership, stormwater management, and high property tax rates. The County's partner, SSMMA, has been the driving force to bring in the needed resources to these redevelopment sites, including a HUD Sustainable Communities grant (now a revolving loan fund administered by Enterprise Community Partners) and U.S. EPA funding for brownfields cleanup. While both pre-date the CDBG-NDR, they have been important resources for the community with lasting impacts affecting the proposed project.

Improvements to the area's stormwater infrastructure are integral to addressing flooding throughout the Village of Riverdale. Specifically, an adjacent neighborhood in northeast Riverdale experiences frequent basement backups and street flooding. This area is served by combined sewers that can only handle storms up to a 2- to 5-year storm. When sewer backups occur, which is quite frequently, the impacts are significant as the extent of basement flooding is felt until the sewers have capacity again after dry weather conditions return. An opportunity connecting these two areas – the industrial redevelopment in the southwest and the residential neighborhood in the northeast – focuses on commercial redevelopment in an area which is having difficulty maintaining a business presence. A nearby commercial corridor was rehabilitated and redeveloped by the Village of Riverdale, including a building, which houses the Village's Administration offices, so there is an opportunity to build on this development and extend it to another commercial corridor. The Cal-Sag Trail, described later, has its proposed route down this corridor, as well.

The four areas make up the proposed 'Complete Communities' resiliency project in Riverdale, shown in Figure L, covering an area of approximately 350 acres and providing improvements that address resiliency to flooding and other natural hazards in the northeast, facilitate economic and

community revitalization in the west, and use a green streets approach to provide resiliency and promote social cohesion between the two areas. Proposed green and gray infrastructure improvements are capable of mitigating flooding during a 25-year rainfall event, an event larger than DR-4116, and providing additional resiliency to flooding within the community.

Subarea A – New Park and Wetlands: This component will create additional stormwater retainage east of an existing natural stormwater storage facility, the Riverdale Marsh, using constructed wetlands as part of a new park. The park will link to the Cal-Sag Trail and new proposed commercial development on Halsted Street and will provide a hiking trail, picnic area, additional recreational amenities such as a designated bird watching area and/or observation platform for the nearby rail yard, and serve as an educational facility that helps demonstrate resilient measures to the local community. See Figure M for a rendering. The goal of this new park and wetlands is to relieve local drainage issues in the western section of the village and provide stormwater storage in and around the proposed industrial redevelopment areas. By creating this additional drainage, the industrial sites are more attractive to developers, and the IHB has expressed interest in further developing these sites for cargo-oriented development sites (CODs). See Figure N for a concept plan for this proposed industrial park.

Subarea B – Green Streets: Subarea B is approximately 202 acres in size and involves a green streets pilot program along 138th Street in tandem with the Cal Sag Trail that provides resilience, promotes cohesion between the northeast residential and western industrial area, and can serve as a model for future enhancement of the entire 138th Street corridor. Along 138th Street, a County road, just east of where the proposed Cal-Sag Trail turns north toward Patton Elementary, green streets will be implemented two to three blocks to the east. The first six feet of the parking lanes would be permeable, and the gravel storage galleries under the permeable pavement would extend up to 10

feet toward the limits of the right-of-way. The green street design for 138th Street will provide a "face lift" for the corridor adding new sidewalks and landscaping.

Subarea C – Green Streets / Residential Resilience Program: Subarea C is a residential neighborhood in northeast Riverdale that suffers from both surface flooding and basement backups due to limited capacity of the storm and combined sewers passing under the railroad corridor. The proposed intervention reduces the hydrologic flow from the southern portion of the subarea to allow the northern portion to drain through existing pipes during the peak storm events. To achieve this objective, the pavement on the six main north-south streets would be replaced with permeable pavement. This would save the many mature street trees, achieving a goal of maintaining and replacing tree canopy as it absorbs rainwater, cleans the air, and cools the earth. The underlying gravel storage gallery would average six feet deep. A rendering of the proposed improvements is provided in Figure O**.** The estimated total storage provided by green streets should provide sufficient storage to reduce the peak discharge from the 25-year storm event to the combined sewer system. Residents supported the use of permeable pavement during community charrettes due to its relatively low maintenance related to right-of-way bioswales.

Portions of Subarea C will use home rehabilitation and resilient upgrades in tandem with the green street solution. Modeling has determined that green streets would address basement backups and street flooding in 428 homes while 38 homes would be addressed via the proposed Residential Resilience Program. This program would include disconnecting downspouts, use of overhead sewers or back flow preventers, and other gray alternatives to minimize basement backups; and rain barrels, rain gardens, cisterns, and other green alternatives to address surface flooding. Residents in this neighborhood have experienced decades of yard flooding and basement backups, usually three to four times a year, and 85 dwellings in this area filed FEMA verified claims in 2013.

Subarea D – Additional Resilience: Known as the Prairie Park industrial redevelopment, this area has past flooding issues. Proposed improvements include green infrastructure to provide additional resiliency above that required by MWRD's Watershed Management Ordinance for on-site retention for the 25-year storm. Funds committed by IHB will build rail infrastructure to serve the sites. Discussions have also been initiated with ComEd to see if stormwater interventions are possible in the adjacent ComEd right of way, which could provide an opportunity for co-benefits to the adjoining residential areas and possible connections with the Cal-Sag Trail.

Blue Island – Calumet Park 'Complete Communities' Resiliency Project

With areas north of the Calumet-Sag Channel and directly adjacent to the City of Chicago, the City of Blue Island and Village of Calumet Park have a combined population of approximately 30,000. Facing many of the same challenges as other communities in the demonstration area, Blue Island and Calumet Park would benefit from broad-based resilience building. Both communities have experienced frequent flooding, especially in residential areas. Ongoing planning efforts have identified a redevelopment opportunity that straddles the two communities and would repurpose a former dump site to provide much needed retail development and recreational opportunities for the region. The proposed project would tie new development to stormwater improvements in nearby residential areas to provide a multi-community solution to flood prevention and increased economic opportunity including jobs, recreation space, and a healthier living environment.

The City of Blue Island has ownership of an 88-acre former dump site (with significant past environmental issues but opportunity for stormwater management) and scattered commercial properties that are generally in foreclosure or struggling to survive. The City issued a RFQ envisioning mixed-use, transit-oriented development near a Metra station, commercial development, and a blend of recreation, open space, and habitat restoration in the remaining portion. This development would provide a significant boost to the tax base, serve as a signature, gateway

development to the area, and improve Blue Island's ability to respond to hazards and fund resiliency efforts to benefit low- and moderate-income residents. Two nearby residential neighborhoods – one in Blue Island and one in Calumet Park – face flooding issues, including basement backups and street flooding during most major storm events. These areas are served by combined sewers which are undersized by today's design standards. Drainage issues within the Blue Island neighborhood are currently being evaluated by MWRD, and necessary improvements to address drainage issues in the Calumet Park neighborhood have been proposed.

The proposed project in Blue Island and Calumet Park, shown in Figure P, is approximately 300 acres in size and provides improvements that address resiliency to flooding in residential areas, facilitates economic revitalization, and creates recreational opportunities that promote social cohesion between the two communities. The projects are linked by two key elements: stormwater retention facilities that capture runoff from both the industrial/commercial and residential areas, and trails that link the residential areas with the recreational facilities (soccer fields and retention ponds) that are proposed for the industrial/commercial property. This project is co-sponsored by Blue Island and Calumet Park, as well as the developer chosen through the RFQ process, and provides a key building block toward environmental, institutional and social resiliency, and capacity building.

The project area is served entirely by combined sewers. Proposed green and gray infrastructure improvements have been recommended for the Blue Island – Calumet Park area that are capable of mitigating flooding during a 25-year rainfall event, which is larger than DR-4116 and provides additional resiliency to flooding within the community. Proposed interventions were developed based on the layout of the combined sewer collection system and a basic understanding of the local drainage topography and problem areas locations. Surface ponding/flooding may be aggravated by an insufficient number of storm inlets, limited combined sewer capacity and surcharging of the collection system, which results in basement backups by hydrologic overloading the sewers within

the study area. Interventions were developed for three subareas within the project area. These scenarios are targeted at reducing the flow of stormwater into the combined sewer system while also increasing the surface storage, infiltration and transpiration of stormwater runoff.

Subarea A – MWRD Improvements and Residential Resilience Program: Subarea A is a residential area in Blue Island just west of the proposed development. It includes the following proposed gray/green infrastructure: three relief sewers; main line upsizing; five rain gardens; five stormwater bumpouts; and seven green alleys. These features were sized to handle a 5-year storm and prevent flooding of all but one structure up to a 25-year storm. Additional underground storage facilities were proposed to enhance resiliency and minimize flooding; however, a hydraulic modeling review determined that this would not provide a significant reduction in basement backups for the costs incurred, and was therefore not included. Subarea A also includes use of the Residential Resilience Program for 112 homes. This program would include gray and green infrastructure improvements within the homes and yards of residents.

Subarea B – Economic Development: This subarea contains the proposed development, as discussed above, and illustrated in Figure Q. Two blighted commercial buildings need to be demolished as a critical first step to furthering this redevelopment opportunity. New sewers for the proposed redevelopment area will be sanitary lines that tie into the existing combined sewer. Storm sewers will drain to stormwater features within the development or to adjacent properties. A detailed design of the proposed 8 acres of stormwater storage has not been completed; however, for a 25-year storm, an average pond depth of 3.5 feet would be required. While this is certainly a reasonable design depth for wet ponds, the proposed location of the ponds is an area of the site where the existing dump is located. The dump has a cap that ranges from 3 to 15 feet deep which should allow for excavation of the proposed wet ponds to the required depth. Funds committed by the developer will contribute to the costs of the stormwater infrastructure.

Subarea C – Green Streets and Residential Resilience Program: This area is a residential neighborhood in northwest Calumet Park that suffers from both surface flooding and basement backups. The intervention uses green infrastructure to reduce runoff to the combined sewer system in an effort to minimize basement backups. To achieve this objective, the pavement on the six main north-south streets will be replaced with permeable pavement with an underlying gravel storage gallery. A rendering can be found in Figure R. For Subarea C, the Residential Resilience Program is budgeted for 53 homes, and upgrades will be used in tandem with the green street solutions to address basement and overland flooding.

Dolton 'Green Streets' Project

The pilot area in Dolton is an intact community of single-family homes with few vacant lots, making it an ideal demonstration area for the 'green streets' concept. See Figure S for a map. The residential neighborhood south of 142nd Street in northeast Dolton has historically experienced frequent flooding, including basement backups. The area is approximately 134 acres with residential lots approximately 1/8 acre each. Concept plans for a three block green streets program were developed to mitigate flooding during a 25-year storm. This project will serve as a demonstration for how green streets can improve resiliency within the community. The majority of the area is flat, which can make it difficult to route stormwater. Thus, a green street approach to managing stormwater is proposed which will take advantage of wide right-of ways (60 or more feet in width) to detain stormwater throughout the area. Existing mature trees (which provide significant stormwater benefits in the neighborhood currently) will be avoided as excavation sites.

The Green Streets approach suggested for this site includes the following components: 1) Six-feet wide installations of permeable pavement for on-street parking on both sides of road with gravel storage. New street curbing would provide consistent guidance to road runoff for pooling outside the roadway. 2) Additional 12-foot vegetated storage trenches in the area between the edge of

pavement and the sidewalk. These trenches would connect with both surface street runoff and the permeable pavement underdrains to distribute storage. 3) Green alleys to facilitate stormwater capture and reduce impervious surfaces. Green alleys will utilize permeable surfaces to permit runoff interception from garage structures, and downspout extensions.

Robbins 'Green Streets' Project

Located just west of Riverdale with a population just over 5,000, Robbins was where many former slaves and sharecroppers settled during the Great Migration. Robbins is the oldest majority-African American suburb in the Chicago area and one of the oldest incorporated African American municipalities in the U.S. Robbins has the highest poverty rate – 26 percent – within the demonstration area, and its $21,800 median household income ranks dead last among the County's 134 municipalities. Residents maintain a sense of pride of their historic community but also are in great need of resources to build resilience. Flooding is a particular challenge because the Village lacks stormwater drainage infrastructure in several residential areas, leading to frequent surface water flooding. Midlothian Creek, which traverses the village from west to east, is a chronic source of this flooding, due in large part to its limited conveyance and lack of floodplain storage. Improvements to Midlothian Creek to increase its capacity to maintain larger flows, stabilize eroded banks, and restore lost floodplain are being evaluated by MWRD. One residential neighborhood east of Kedzie Avenue experiences street and yard flooding during most major storm events because of overbank flooding from Midlothian Creek. Within this area, 120 acres of single-family homes lack a formal drainage infrastructure and are particularly vulnerable to storms. The proposed project in Robbins, shown in Figure T, is approximately 400 acres in size and provides benefits that minimize flooding in residential areas that extend well beyond the project area.

Subarea A – MWRD Improvements: A major issue in Subarea A with the existing conditions of Midlothian Creek is a relatively flat slope between 139th Street and the Metra Rock lsland railway, a

commuter rail line. To mitigate this issue, widening the creek channel and adding storage along the reach is proposed. The proposed creek channel from 137th to Metra Rock Island Railway has a 3-foot bottom; the creek channel from 137th to 139th Street has a 20-foot bottom width. Figure U shows a rendering of the proposed Creek improvements. A 13-acre pond east of Midlothian Creek is also proposed and features a dry bottom detention basin and an outlet structure/sewer. The subarea also includes a berm/barrier along Kedzie Avenue. Several options exist but a flood wall has been recommended with a top of wall elevation 3 feet above the 100-year flood elevation.

Subarea B – Green Streets: Proposed interventions for this predominantly single family residential area east of Kedzie Avenue will provide a green streets pilot project with protection from the 25-year storm for a two-block area that does not have storm sewers. Gray and green infrastructure scenarios were initially examined in residential areas near Kedzie Avenue. They included construction of new storm sewers, green infrastructure detention devices (rain gardens, bioswales, bio-retention/ detention, etc.) in easement areas, and a green street approach to managing stormwater. Local residents living east of Kedzie voiced strong support for the green streets pilot project. The width of the public right-of-way within the study area ranges from 60 feet to 66 feet with road pavements widths ranging between 24 and 36 feet. The selected concept assumes that two blocks would be reconstructed as green streets using permeable pavement and right-of-way bioswales. This project will demonstrate to the community how Green Streets can reduce flooding and increase visual appeal (of particular appeal to residents). Pavements within each street would be reconstructed using permeable paving blocks over sub-surface gravel galleries, providing new, stronger streets than those which are currently installed. It also improves an area that is ripe for redevelopment because of its location near a Metra station and other railroad lines.

Dolton Resilient Housing Project

This project is the development of 30 new single-family for-sale homes on the site of an abandoned factory on the Little Calumet River owned by the South Suburban Land Bank and Development Authority (SSLBDA). See Figure S for a map of the location of this project area. This large industrial lot was identified by the Village of Dolton for residential redevelopment, and SSLBDA had already begun working with MECCA Companies, a premier home builder, on site plans for the location. This area has been identified by Chicago Wilderness as having wetlands and environmentally sensitive assets, which will be maintained in a park-like setting. The new homes will be set back from this area. The development will include the removal of the existing concrete slab and installation of a new park and homes. The homes will be targeted to households making 80 percent to 120 percent of area median income. The homes will be built on slabs, contain 2 or 3 bedrooms and 1.5 baths, and utilize resilient building materials that can withstand a 500 year rain event. They will include many components consistent with the updated "Enterprise Green Communities" criteria, which are standards for water conservation, energy efficiency, use of recycled materials, and healthy living environments.[2]

This housing will be marketed in compliance with fair housing and equal opportunity rules and requirements. MECCA will be the developer of the project and is a partner that the Village of Dolton, SSLBDA, and Cook County have worked with previously. Under the County's NSP, MECCA built 12 infill homes in Dolton, all of which sold within a year to income-qualified homebuyers. MECCA has proven capacity to complete projects in a timely manner and within budget and has produced over 1,740 units of housing since its inception, including nearly half of Cook County's NSP funded for-sale housing portfolio. Neighborhood Housing Services of Chicago (NHS) will assist offering homebuyer counseling, down-payment assistance, and favorable loans. For more information on MECCA and NHS and their capabilities, please see Exhibit C, p. 23.

[2] http://www.enterprisecommunity.com/servlet/servlet.FileDownload?file=00P1400000dKEkiEAG

Calumet City Resilient Housing Project

This project will renovate 145 existing multi-family housing units in two buildings in the Garden House of River Oaks II to retain existing affordability, as well as build in resilient features to benefit residents and the surrounding residential community. Located within a community consisting primarily of single-family homes, there is a need for multi-family developments. See Figure V for a map of the project area and Figure W for a photo of the existing River Oaks structure. Under the County's existing, ongoing "Request for Application", the Related Companies approached the County about a portfolio of buildings they were looking to acquire and renovate.[3] This portfolio included the Garden House of River Oaks II, providing an opportunity within the demonstration area to incorporate resilient features to the renovation and help reduce flooding in an area near a large suburban shopping mall. The existing building is located between the River Oak's Shopping Center and the Little Calumet River.

The purpose of the renovation, beyond extending the life of the building, is to resurface the surrounding area including the parking area to make it permeable, and to add features into the building that will reduce to effects of flooding. The renovations will bring the buildings into compliance with Enterprise Green Communities standards. This project will include the acquisition and renovation of two existing buildings that stand side by side. The Garden House of River Oaks II will ultimately maintain 145 units of project-based Section 8 housing for households making at or below 60 percent of area median income.. The reserves will be substantial enough to maintain the property for the next 20 years and assure steady operations. Applications will be taken by Related Affordable through their lease center. This housing will be marketed in compliance with fair housing and equal opportunity rules and requirements. Leasing will occur on a first come, first serve basis. This project will be managed by The Related Companies Management, L.P. and Related

[3] http://blog.cookcountyil.gov/economicdevelopment/notices-and-applications/

Affordable, LLC, entities with extensive experience in the acquisition, recapitalization, rehabilitation, and preservation of low- and moderate-income properties across the County. For more information on the capacity of this project partner, please see Exhibit C, p. 24.

Cal-Sag Trail Project

This project will aid in the construction of Cal-Sag Trail, supporting the construction of the eastern portion of the trail in Blue Island, Calumet City, Dolton, Riverdale, and the Forest Preserves of Cook County that will complete the 26-mile multi-use trail and link more than 185,000 people in 14 communities. The western half of the Trail opened in June of 2015. The remaining five eastern Villages – of which four are within the County's demonstration area – have been working to raise local matching dollars, and the funding requested is the last portion needed to complete this eastern edge of the Bike Trail. Planning for the Cal-Sag Trail goes as far back as the 1970s, during which groups promoted a multi-use path along the Little Calumet River and Calumet-Sag Channel. Work began in earnest eight years ago, when representatives from several south suburban municipalities; county, state and Federal agencies; and non-governmental organizations held a series of meetings to advance the initiatives to get to pavement on the ground.

When complete, the Trail will provide a safe transportation corridor to 61,550 residents who live within a 10 minute walk from the trail, of which over 55% are low-income and over 80% are non-white. More than 1.5 million people live within a 15 minute drive of the Trail. When complete, it will span 26-miles, extending from Lemont (enabling connectivity with the Centennial Trail and the I&M Canal Trail) eastward to Burnham (and the Burnham Greenway Trail). See Figure X for a map of the Cal-Sag trail. Much of the lands within the Trail's footprint still bear the scars of the construction of the Calumet-Sag Channel, or of the industrial uses that befouled the Little Calumet River. Design of the Trail includes re-vegetation programs which will stabilize bank sections, control erosion, improve water quality, and provide for enhanced habitat.

The Cal-Sag Trail will provide alternative means of transportation, increased connectivity to the region's trail network, linkages with transit to job and retail centers, opportunities for economic development, enhanced environmental sustainability and greater community health. In the case of a disaster, the Trail can provide a means of evacuation for a population that may or may not own a vehicle. The Cal-Sag Trail will provide direct connectivity to four Metra commuter rail service lines and fifteen Pace bus routes, which serve the Chicago suburbs and provide direct linkages to CTA bus and rail. With these numerous and extensive trail connections, the Cal-Sag Trail was a designated 'priority greenway' in the Northeastern Illinois Regional Greenways Plan by the Northeast Illinois Planning Commission (the precursor agency to CMAP).

The Cal-Sag Trail offers of a variety of benefits to the communities through which it passes: trail-oriented residential and business development, historical and environmental education, community festivals and events space, recreational and cultural facilities, public art, local bike loop networks, and links to local attractions. It will encourage active lifestyles by providing links to many existing trails, with total connectivity in excess of 475 miles, while also including design features that will stabilize bank sections, control erosion, improve water quality, and provide for enhanced habitat. Regional trails such as the Cal-Sag also have the potential to drive economic development and increase property values. A National Association of Homebuilders study identified trails as the number one amenity potential homeowners cite when they are looking at moving to a new community. Trails also improve connectivity between communities for people and connectivity between opens spaces for wildlife. The Cal-Sag Trail's corridor can become an integral element in the green infrastructure network through its incorporation of resilient features like permeable pavement and bioswales to provide stormwater management, in addition to its many other benefits.

The County will work with the involved units of government and the project manager for development of the Trail, AECOM, which was hired to perform Phase 1 Engineering services at the

outset of planning for the Trail 7 years ago and has been involved since. Cal-Sag Trail maintenance, once completed, is the responsibility of each agency that has jurisdiction of the segment within their agency. Typically, little to no maintenance is required other than mowing adjacent to the Trail. The Trail is designed for a 20-year life span.

Residential Resilience Program

A Residential Resilience Program will further address unmet recovery need through support of an assessment of current physical conditions, installation of resilient and flood-resistant features, and education of homeowners regarding related maintenance/prevention. The program will assist up to 500 households earning at or below 80% of the area median income that were also impacted by DR-4116. Targeted outreach will occur within the demonstration area, particularly in areas adjacent to the Complete Communities and Green Streets project locations. This will ensure that infrastructure improvements, which will reduce the level of residential flooding, are the first line of defense in preventing future flooding. The resilient improvements completed at the individual home level will go further to ensure resilience to future storms. Eligible improvements will include the deployment of rain barrels, enhanced landscaping for water retention, and installation of water alert sensors.

As mentioned in Exhibit B, p. 7, the demonstration area has a disproportionate number of FEMA claims from DR-4116 and the highest populations living in poverty in the County. The home ownership rate in the area is 58 percent. Knowing that well over 50 percent of land in the area is privately owned, it is imperative that private owners begin to understand their need to address storm water issues on their own property, and many do not have the resources to begin to address the issue. This program will help defray related costs to incentivize homeowners to make their properties more resilient and can spur their neighbors to do the same. This program can create enhance stormwater storage capacity, increase the value of single-family homes, and ensure the

availability of housing that is decent, safe, sanitary, and resilient for the local workforce. Related improvements can also enhance public health and promote local job creation.

Partner NHS and other sub-recipients will administer this program. They will manage application intake, handle eligibility screening, conduct physical inspections/assessments, develop and oversee the implementation of the related scope of work, budget, and schedule. NHS will be charged with ensuring compliance with any applicable chargeback and/or duplication of benefits requirements. As program resources are limited, properties with existing damage from prior flooding will be referred to NHS or other local housing rehabilitation service providers with other non-CDBG-NDR resources for related assistance. The Residential Resiliency Program also offers a direct opportunity to enhance the County's Section 3 efforts and link vendors and residents with a workforce program for direct on-the-job training.

Education Program

An educational program will engage the general public, municipal leaders, and youth via targeted programming. The general public will benefit from a campaign explaining climate change and how rain gardens and other green infrastructure installments can be helpful. Outreach for this program will be through public service announcements and door hangers in targeted neighborhoods. The engagement of residents will be complemented by the Center for Neighborhood Technology's RainReady Community Program, which the County is already funding in the demonstration area under CDBG-DR. RainReady is a community planning process and tools that focus on affordable, tangible solutions to help communities manage urban flooding. RainReady prioritizes preventative approaches, such as zoning ordinances, and natural solutions when possible, as they can bring wider and more cost-effective benefits to the community compared to large-scale, engineered approaches. A municipal component will provide training on resilience topics for leadership in local governments. Already, the South Suburban Metropolitan Higher Education Consortium and the

Metropolitan Mayors Caucus sponsored an October, 2015 event where over 140 municipal leaders came together. This event is a launching point for other events and programming which will be developed to help municipalities deal with both environmental and economic hazards.

This programming will be supplemented by an inter-disciplinary environmental education curriculum already developed by the Chicago Botanic Garden which will be taught in K - 8 school districts throughout the demonstration area. This curriculum is intended to educate the next generation about climate change education by increasing knowledge, leadership, and engagement in climate action among diverse communities by building on local assets and community life. The approach is placed-based and asset-based, building on existing social structures and community leadership to better equip students to get involved and share positive, active messages with their family, friends, and community leaders.

Workforce Development Program

As new industrial and green infrastructure jobs are created, the County wants local residents to be able to gain from these opportunities. As such, workforce development opportunities will focus on both available industrial jobs and jobs related to green infrastructure installation and maintenance and habitat restoration over a three year period. Local residents will be targeted, as well as low-income, disadvantaged job seekers. The Workforce Development Program also offers a direct opportunity to enhance the County's Section 3 efforts and link vendors and residents with a workforce program for direct on-the-job training. Partner OAI, Inc. will oversee this program.

OAI provides leadership for the Calumet Green Manufacturing Partnership (CGMP), a successful model of training tailored to meet specific employer demand that will be supported through this proposal. CGMP focuses on unemployed, dislocated, and incumbent worker adults, with a priority for those who live in south suburban Cook County. This training program will help residents quickly acquire the skills and credentials that manufacturing companies are looking for,

including punch press operators and CNC machinists and programmers. These jobs are in high demand and well-paid. Training will be provided by Prairie State College, South Suburban College, and Daley College. CGMP partners with more than 60 local manufacturers to place candidates. In less than two years, CGMP has screened over 800 applicants and enrolled 186 students who have earned in excess of 400 industry-recognized certifications in training.

OAI affiliate High Bridge L3C, a social enterprise company which hires local workforce to install and maintain green infrastructure treatments throughout the County's south suburbs, will also be supported as part of this proposal. This is critical given the increasing use of and support for green infrastructure improvements by MWRD, the Illinois Environmental Protection Agency, and as proposed in this CDBG-NDR Phase 2 application. High Bridge offers full-time, short-term employment, enabling residents to benefit both economically and environmentally. During 2015, High Bridge installed a dozen green infrastructure projects, including rain gardens, multi-acre wetland and native tree installations. High Bridge laborers also maintain garden sites, ensuring that green infrastructure performs optimally and that investments are successful. High Bridge plans to hire graduates from workforce training programs such as Greencorps or the Environmental Careers Worker Training Program, which serves low-income disadvantaged job seekers from the area.

Planning Program

A community planning program will build local capacity to contend with shocks and stressors by supporting continued site planning for redevelopment, enhancing stormwater modeling capacity, and exploring options for shared services on the critical issue of infrastructure maintenance over a three year period. The program will be implemented with assistance from SSMMA and CMAP. SSMMA has been an important partner to the County in helping position properties for redevelopment. They have experience with remediation and assembling resources for critical pre-development work that is necessary to attract redevelopment to these communities where hurdles

exist. SSMMA has also been important to the work in the two Complete Communities projects proposed. Cook County wants to see them continue that involvement and also bring additional redevelopment sites along. Most of the Cook suburbs lack stormwater models. To fill this gap, Cook County is seeking resources to perform the necessary stormwater modeling in the demonstration area communities. This will build on work being done by CMAP and the Calumet Stormwater Collaborative, which is working on a common protocol so that models can work together appropriately. Completion of these municipal models would provide valuable decision-making tools to each town, but will also demonstrate how such modeling can be integrated into the broader regional efforts that are taking place. Maintenance has been a recurring issue during the County's Phase 1 and Phase 2 work. DPD is requesting funds for a feasibility study to examine options for municipal shared services on infrastructure maintenance, both performance options and financing options. The southern suburbs have a track record of working together on issues like code enforcement and emergency services, and this work is a logical extension to explore given local capacity challenges, lack of equipment, etc.

The selected projects and programs described above address Unmet Recovery Need from DR-4116. As described in Exhibit B, p. 7, the demonstration area suffered from more than $161 million in damages, and unmet housing need totals $151.4 million. Each project directly addresses unmet housing need through activities which focus on resilience-building at the residential property level. The Residential Resiliency Program will complete flood-related home repairs and mold remediation, where needed and incorporate resiliency upgrades such as rain gardens and overhead sewer systems to reduce the impact of flooding. The Calumet City Resilient Housing Project, which renovates existing multi-family housing units in the Garden House of River Oaks II will create affordable, resilient housing for low-income residents, including those displaced as a result of DR-

4116. The Dolton Resilient Housing Project will create a resilient single-family home community, replicable throughout the region.

The two proposed 'Complete Communities' projects, two 'Green Streets' projects, and the Cal-Sag Trail project have a broader focus in addressing Unmet Recovery Need. Recognizing that resilience-building measures on residential property alone will not fully prepare and protect the community from the effects of future disasters, the County proposes a joint focus on improvements in the public right-of-way, as well as adjacent parkland and redevelopment of vacant and underutilized industrial and commercial land. The expected impact on Unmet Recovery Need in housing from DR-4116 is threefold: 1) This approach seeks to limit the burden on an aging and outdated infrastructure and make targeted improvements with the most impact on flood reduction. Parkland and industrial and commercial properties offer valuable opportunities for stormwater management and water retention – given their significant acreage, in many cases – which will reduce inflows to already strained municipal stormwater systems and will thus further lessen residential flooding in adjacent areas; 2) This approach addresses the significant economic need present in the demonstration area and seeks to build local government and resident capacity to respond to hazards and shocks. The redevelopment of vacant land and associated long-term job creation (particularly in high paying sectors such as manufacturing) will build a larger tax base to and create new wage-earning opportunities, which will in turn increase the capacity of local governments and residents, enabling both to better respond to existing flood-related housing needs, as well as prepare for and weather future hazards and shocks; and 3) A focus on mixed-use redevelopment results in multiple benefits to the immediate residential community, including improved parkland and recreational space, reforestation (particularly in industrial areas needing landscape / livability improvements), and improved access to the Cal-Sag Trail and regional trail network, which will improve livability and reduce stress for residents most impacted by DR-4116.

Each proposed project is allowable under CDBG-NDR funding and includes only components which meet unmet recovery needs from DR-4116 and related community development objectives and economic revitalization needs in a most impacted and distressed target area. Additionally, each project will meet a national objective to benefit low- and moderate-income persons. See Figure A for a map of low- and moderate-income populations in the demonstration area. The Riverdale 'Complete Communities' Resiliency Project primarily benefits residents in the census blocks within and surrounding the project area, 66.4 percent of which are low- to moderate-income. The Blue Island – Calumet Park 'Complete Communities' Resiliency Project primarily benefits residents in the census blocks within and surrounding the project area, 63.4 percent of which are low- to moderate-income. The Dolton 'Green Streets' Project primarily benefits residents in the census blocks within and surrounding the project area, 54.9 percent of which are low-to-moderate income. The Robbins 'Green Streets' Project primarily benefits residents in the census blocks within and surrounding the project area, 70.3 percent of which are low- to moderate-income. The Calumet City Resilient Housing Project will make available housing to residents making up to 60 percent of the area median income and is located in an area in which 56.3 percent of residents are low- to moderate-income. The Dolton Resilient Housing Project will make available housing to residents making between 80 and 120 percent of area median income and is located in an area in which 57.2 percent of residents are low- to moderate-income. The Cal-Sag Bike Trail will provide recreation opportunities for residents within a half-mile of the Trail, of which 56.5 percent are low- to moderate-income. Within the proposed programs, the Residential Resiliency Program will be open to homeowners with a household income of 80 percent or less of area median income. The Workforce Program will qualify as a public service activity that benefits low- and moderate-income individuals. The Education program will be a mixture of public service and planning activities,

while the Planning programs will be eligible as planning and capacity-building activities that are not subject to a national objective.

The County's proposed portfolio of projects and programs benefits vulnerable populations. For those struggling with limited incomes, as noted above, such as the unemployed, those with social security income, supplemental security or public assistance income, and single-headed households with children, the portfolio promises to improve local opportunities for income via job creation, particularly in high-wage jobs such as manufacturing and transportation and logistics. It will also increase options for affordable housing by 675 units, create healthy recreation opportunities, and address community environmental concerns through the redevelopment of several prominent brownfield sites. Homeowners will see improved property values due to new retail development – estimated at more than $12,000 per home – and will have greater access to resources to implement green features to defray the costs of recovery and preparation for future storm events and educational information on the benefits of such renovations. Finally, individuals that experience the racial, ethnic, and socioeconomic segregation that currently divides communities will benefit from increased social cohesion within and between communities in the demonstration area and beyond, with new opportunities and connections for recreation and transportation.

Cook County is confident that this Phase 2 application reflects feasible projects, programs, and outcomes. In large part, this is due to the County's thoughtful and comprehensive Phase 1 framing and Phase 2 project selection process, which took into account multiple sources of information: data and anecdotal information on recovery need from DR-4116 and other natural hazard events; science-based data on climate change; resident input on broad community needs and specific projects; and consultation with cross-disciplinary experts. Only the highest-ranked projects with strong community partners were selected. Through its experience overseeing 30 – 40 CDBG infrastructure projects per year and managing HOME and NSP funds, the County is capable of

managing larger, complex projects. The County is particularly confident in its proposed resilience portfolio because of the capacity of its partners, detailed more fully in Exhibit C – Capacity. Many of the established partners have significant relevant experience and have successfully collaborated with the County in the past.

The projects and programs recommended for the demonstration area are an achievable and feasible solution for the mitigation of flooding caused by impacts from large wet weather events. They will provide protection against a 25-year, 24-hour design storm. (As comparison, based on modeling analysis, DR-4116 was determined to be somewhere between a 10-year and 15-year rainfall event for the 24-hour duration.) Using FEMA standard values for projects of the types proposed, a 50-year useful life has been assumed for all stormwater management features and green infrastructure. Proposed projects will comply with accepted design practices and established codes and standards. While there are potential costs associated with project construction duration, required no-work times, utility relocation delays, and other restrictions, these are within the capability of the County and its partners to manage. The proposed activities and their respective feasibilities are discussed in greater detail in Attachment F – Benefit Cost Analysis in terms of protection against not only current threats, but against future threats and hazards related to the consequences of climate change. Attachment F – Benefit-Costs Analysis provides detailed calculations for Operations and Maintenance (O&M) costs over the useful life of the projects, an estimated $9 million, and Attachment B – Leverage Documentation & Sources and Uses of Funds illustrates how these costs are allocated. Municipalities within the demonstration area, as noted in leverage documentation, will be responsible for the majority of O&M costs.

For example, ‘Green Streets’ improvements will be constructed in the public right-of-way. As such, the chance for conflicts with existing utilities is likely; however, the depth of improvements is sufficiently shallow that its impact will be limited. Although the groundwater table in most of the

demonstration area is quite high, the shallow depth of the green streets solutions will minimize any impact on the feasibility of construction. Residential Resilience Program improvements will be implemented on private property. While right-of-entry issues can be problematic on some household improvements, the fact that this program is optional and the homeowner will need to apply and be selected for the improvement should eliminate any concerns with home access. The only potential issue would involve rental properties. Due to the high number of low- to moderate-income families in the demonstration area, many live in rental units where their landlord refuses to make improvements to prevent against future flooding. The proposed Educational Program will need to address this situation to ensure that this vulnerable population benefits from the Residential Resilience Program. Together, the proposed 'Green Streets' projects and Residential Resilience Program combine to provide an additional level of protection against future threats and hazards from overland flooding and basement backups. The 'Green Streets' projects will limit the amount of stormwater that reaches the combined sewer system, thereby minimizing the hydraulic grade line in the sewers and reducing the chance of basement backups. The Residential Resilience Program will use backflow preventers or overhead sewers to prevent these backups.

Finally, the County is confident in the feasibility in scaling of projects and programs tested and honed in the County's demonstration area because of strong partners in the Northeastern Illinois Resilience Partnership and CMAP. These partnerships provide necessary cross-disciplinary technical capacity and expertise to help implement, assess, and refine projects and foster multi-jurisdictional collaboration by engaging other local governments that are not eligible for the CDBG-NDR. Additional details on scalability are provided later in this Exhibit.

Of course, with any large-scale project there are always risks associated with implementation and scaling. Given the importance of addressing vulnerabilities and building individual capacity, there is a risk that outreach will not identify and touch the most vulnerable, including low-income

individuals, minorities, persons with disabilities, veterans, and/or elderly persons living alone. The County is committed to a continued, high quality outreach strategy for each project as it moves to implementation that will engage all community members. Public service announcements, door hangers, and outreach by the County and its partners (as well as relevant non-profit, religious, and social organizations within the area) will ensure that the most vulnerable are reached. The County has strong existing relationships with the Alliance to End Homelessness in Suburban Cook County, Southland Human Services Leadership Council, United Way of Metropolitan Chicago, and its network of CDBG- and ESG-funded service providers, all of which can be tapped to support related outreach efforts. Several of the proposed projects and programs are also designed with income restrictions, and the overall benefit to low- and moderate-income individuals has been established.

The projects and programs will be implemented in the context of existing conditions, including an aging infrastructure, a lack of individual capacity to learn about and make green infrastructure improvements on private property, and, broadly, very limited resources at government levels for maintenance. Components of this Phase 2 application are designed to address each of these and mitigate the risks that each poses. In infrastructure, critical upgrades to stormwater systems will be made in the demonstration area and the majority of the projects proposed will lessen rainfall flows into sewer systems, thus reducing the overall burden on the system. This makes a difference in the aggregate. Several projects and, most notably, the Residential Resilience Program in tandem with educational programming, will provide financial and information resources to address individual capacity. Anticipated job creation and workforce training opportunities also increase capacity more broadly. Government capacity is built via a growing property tax base with new economic development, aided by the resilient site redevelopment work of SSMMA that is proposed under the Planning programs. The County is also committed to working with local governments to ensure that green infrastructure installations are maintained as noted in the related commitment letters.

For any given project, technical risks depend on the outcome of a preliminary needs assessment and analysis of the options considered. While Cook County and its partners are very familiar with the types of projects and programs that will be implemented, all capital projects will require further site-specific analysis. It is unclear at this point whether modifications to local building and housing codes and policies that favor resilient measures will need to be made. If this is the case, the time required to implement a specific project could be impacted. Fortunately, MWRD's Watershed Management Ordinance (WMO) provides guidelines on stormwater management criteria that must be used on projects within their jurisdiction which includes the entire demonstration area.

The primary risk to the implementation of proposed project is the capacity of local governments and property owners to manage the various steps of the design and implementation process. While County and MWRD staff have a significant amount of oversight and technical assistance experience working with these communities (including past CDBG infrastructure projects), successful completion of the work is dependent on the community's and/or homeowner's commitment and capacity to work with these organizations to successfully complete the project. The needs of the local community and homeowners will have to be carefully evaluated by the County regarding access, reasonable work hours for construction, adherence to local noise ordinances, and restrictions on days/times of construction.

Climatic conditions will vary but can generally be anticipated based upon the seasonal norms. The prevailing conditions can both prohibit the installation of the work as well as present hazards to personnel and equipment. Ambient temperatures influence the ability to perform such activities as placing concrete and laying asphalt. Frozen ground conditions affect activities such as excavation and the installation of sheet piling. Wet site conditions during and in the days following a heavy rainfall prevents the progress of earthwork until the site has sufficiently dried out. Strong winds and

the presence of lightning make the site generally unsafe for personnel. All of these conditions have the potential to extend the duration of construction.

Many permits would be required from various regulatory agencies. These permits take can take a long time and a lot of coordination and must be procured prior to the start of construction. The County intends to mitigate this issue by coordinating with all of the required agencies during the project design phase. Additionally, the County will initiate the HUD-required environmental review process early on per standard practice as to not cause any unnecessary program/project delays. Likewise, legal issues can always bring a project to a screeching halt. While there is broad community support and no known legal or procedural risks identified with any of the projects or programs, the County would look to resolve any issues as quickly as possible.

While community administrative staff and citizens attending the community meetings have generally been in favor of the proposed resiliency activities, there is always a risk that changes in administrations or specific individuals within a designated project area could seek to prevent implementation of a project/program. The County and its partners would look to resolve any issues as quickly as possible and move forward with the project to minimize any delays. Having the community leaders and general public intimately involved in both Phase 1 and Phase 2 activities should minimize the chance of this occurring. The proposed projects enjoy a strong level of support among the local stakeholders.

Future risks are always difficult to quantify. Changes in technology, governmental policies, environmental and economic conditions and many other conditions can change the long-term performance of the proposed resilient efforts. Cook County has built a strong team of partners that are committed to ensuring the resilient efforts recommended will be fully supported for their entire full life cycle.

Similar to the risks associated with implementation and scaling discussed above, there are several risks to the ongoing benefits expected from the proposed projects. First, some of the benefits evaluated in Attachment F - Benefit Cost Analysis were done so with a low level of confidence. A lack of detailed information on mental & physical health; and loss of function, service or productivity led to assumptions on the impact of the proposed activities and their benefit to vulnerable populations within the demonstration area. Events such as climate change can impact the level and severity of these items well beyond what was estimated.

Climate change can increase the frequency and magnitude of future wet weather events beyond the design capacity of the proposed infrastructure. Fortunately, each proposed activity is currently designed as a stand-alone project. This separation helps reduce the risk to the County and the overall system – if any activity fails during a storm event, such as a failed backup valve, the other activities are not compromised. Each activity also operates independently from the other – this independence allows phasing of additional, similar measures if more resiliency is needed. For example, if an area with Green Streets experiences flooding beyond its design capacity, additional gray and/or green measures can be introduced in the public right-of-way or private property to enhance resiliency from future large wet weather events. Moreover, projects are built to handle the 25-year design storm (4 percent annual chance storm), which can be reasonably expected to protect residents from climate change that will impact the level and severity of future storms.

Anticipated job creation and workforce training opportunities tied to resiliency efforts could not meet expectations. However, the County is committed to working with local governments to ensure that green infrastructure installations are maintained, and SSMMA continues to build government capacity via growing the property tax base of demonstration area communities with new economic development to help support for future resiliency efforts. Cook County has built a strong team of

partners that are committed to ensuring the resilient efforts recommended will be fully supported for their entire full life cycle.

The following initial metrics have been developed to help assess local resilience progress in the community context. They have been crafted on the basis of reasonable, actionable goals and are delineated per proposed project and program. Cook County will be primarily responsible for establishing metrics, developing related goals, soliciting and analyzing internally or externally provided data, reporting to HUD on progress and associated challenges, and determining appropriate program or project modifications for enhanced impact. Related metrics will likely be incorporated with existing performance measurement systems specific to *Planning for Progress* and the Countywide Set Targets Achieve Results (STAR) system. Program and project partners will be charged with monitoring progress and reporting on performance to the County based on mutually agreed timeframes, processes, and documentation. Additionally, the frequency of metric collection and reporting will likely vary based upon the funding award, seasonable impacts on construction progress, and HUD requirements. These initial indicators fall into several logical groupings: reduction of flood damage or increased permeable surface, expanded tree cover, habitat, and water quality and wetland maintenance; enhanced recreational opportunities and activity, increased jobs and business attraction; increased property values and tax base. While some of these metrics are already captured by the County or its partners and just require improved coordination, others are brand new. Metric refinement, specific target setting, and development of corresponding monitoring systems to capture related data will be completed soon after funding award.

<u>Blue Island / Calumet Park ‘Complete Communities’ Project</u>: The County will continually assess related progress during construction inspections and draw meetings which will occur at least monthly. Partner MWRD will be responsible for collecting and reporting on the metrics noted below on an annual status basis and again overall upon project completion. Metrics include the

following: *Resiliency Value:* 30% reduction in residential property damage claims from flooding as properties should now withstand a 25-year storm; *Environmental Value:* 20% reduction in heat island effect; *Social Value:* 20% increase in usage of improved recreational options; and *Economic Revitalization:* 15% aggregate increase in local tax base.

Riverdale 'Complete Communities' Project: The County will continually assess related progress during construction inspections and draw meetings which will occur at least monthly. Partner MWRD will be responsible for collecting and reporting on the metrics noted below on an annual status basis and again overall upon project completion. Metrics include the following: *Resiliency Value*: 30% reduction in commercial property damage claims from flooding as properties should now withstand a 25-year storm; *Environmental Value:* 5% increase in local aggregate wildlife population based upon enhanced habitat. 5% increase in local aggregate tree cover improving air quality; *Social Value*: 20% increase in usage of improved recreational options; and *Economic Revitalization*: 15% increase in available industrial job opportunities.

Dolton 'Green Streets' Project: The County will continually assess related progress during construction inspections and draw meetings which will occur at least monthly. Partner MWRD will be responsible for collecting and reporting on the metrics noted below on an annual status basis and overall upon project completion. Metrics include the following: *Resiliency Value:* 20% reduction in residential and commercial property damage claims from flooding as properties should now withstand a 25-year storm, and improved stormwater management by creating alternatives for stormwater other than sewers; *Environmental Value:* 5% increase in local aggregate wildlife population based upon enhanced habitat. 5% increase in local aggregate tree cover improving air quality; *Social Value:* 20% increase in the number of residents reporting an improved living environment including better community aesthetics and pedestrian friendliness; and *Economic Revitalization:* 5 new businesses locating in community based on enhanced curb appeal.

Robbins ‘Green Streets’ Project: The County will continually assess related progress during construction inspections and draw meetings which will occur at least monthly. Partner MWRD will be responsible for collecting and reporting on the metrics noted below on an annual status basis and overall upon project completion. Metrics include the following: *Resiliency Value:* 20% reduction in residential and commercial property damage claims from flooding as properties should now withstand a 25-year storm; *Environmental Value:* 10% increase in water quality; *Social Value:* 20% increase in the number of residents reporting an improved living environment including better community aesthetics and pedestrian friendliness; and *Economic Revitalization:* 10% increase in residential property values.

Calumet City Resilient Housing: The County will continually assess related progress during construction inspections and draw meetings which will occur at least monthly. Partner Related Companies will be responsible for collecting and reporting on the metrics noted below on an annual status basis and again overall upon project completion. Metrics include the following: *Resiliency Value:* 10% increase in permeable area, thus reducing the amount of stormwater into the sewer system; *Environmental Value:* 10% increase in water quality; *Social Value:* 142 residents reporting an improved living environment; and *Economic Revitalization:* 5% increase in local tax base.

Dolton Resilient Housing: The County will continually assess related progress during construction inspections and draw meetings which will occur at least monthly. Partner Mecca Companies will be responsible for collecting and reporting on the metrics noted below on an annual status basis and overall upon project completion. Metrics include the following: *Resiliency Value:* 30 housing units with building materials that can withstand a 500-year storm; *Environmental Value:* 10% increase in local soil absorption of water; *Social Value:* 30 new low/moderate-income homeowners; and *Economic Revitalization:* 5% increase in local tax base.

Cal-Sag Trail: The County will continually assess related progress during construction inspections and draw meetings which will occur at least monthly. Additionally, designated municipal and Cook County Forest Preserve partners will be responsible for collecting and reporting on the metrics noted below on an annual status basis and again overall upon project completion. Metrics include the following: *Resiliency Value:* 20% of users identifying transportation as central purpose for use; *Environmental Value:* 10% decrease in the number of car trips due to trail availability; *Social Value:* 20% of residents reporting community identity and social cohesion, more recreation, healthier lifestyle; and *Economic Revitalization:* 5 new businesses resulting due to trail development. 20% increase in patronage of local businesses by trail users.

Residential Resiliency Program: The County will continually assess related progress during program implementation and bi-monthly status discussions with the related partners. Partners including NHS will be responsible for collecting and reporting on the metrics noted below on a quarterly status basis, annual status basis, and again overall upon program completion. Metrics include the following: *Resiliency Value:* 30% reduction in residential property damage claims to FEMA and/or private insurance from flooding as properties should now withstand a 25-year storm; *Environmental Value*: 10% increase in water quality; *Social Value*: 20% of residents reporting stress reduction due to reduced flooding; and *Economic Revitalization:* 10% increase in residential property values, and 25% increase in number of homeowners reporting ability to redirect limited financial resources previously spent on flood response to other needs.

Workforce Program: The County will continually assess related progress during program implementation and bi-monthly status discussions with the related partners. Partner OAI, Inc. will be responsible for collecting and reporting on the metrics noted below on a quarterly status basis, annual status basis, and again overall upon program completion. Metrics include the following: *Resiliency Value:* 30 residents trained in resilient property maintenance, and 20% increase in the

number of residents reporting increased health, well-being, and property values; *Environmental Value:* 25% increase in number of residents recognizing role as environmental stewards; *Social Value:* 30% increase in the number of residents noting increased community connectivity through shared values; and *Economic Revitalization:* 25% increase in the number of trained residents reporting enhanced resilient knowledge, 10% increase in local employment in green infrastructure, and 15% increase in the number of local jobs available in green infrastructure and/or manufacturing.

Education Program: The County will continually assess related progress during program implementation and bi-monthly status discussions with the related partners. Partner Chicago Botanic Garden will be responsible for collecting and reporting on the metrics noted below on a quarterly status basis, annual status basis, and again overall upon program completion. Metrics include the following: *Resiliency Value:* 20% increase in the number of residents reporting increased understanding of resilience opportunities and resources; *Environmental Value:* 25% increase in the number of educated residents reporting improved understanding of environmental threats. 25% increase in the number of educated residents reporting a commitment to advancing resilience locally; *Social Value:* 30% increase in the number of residents noting increased community connectivity through shared values; and *Economic Revitalization:* 25% increase in the number of educated residents reporting enhanced resilient knowledge.

Planning Program: The County will assess related progress during program implementation and quarterly status updates on projects. Metrics include the following: *Resiliency Value:* 10% increase in the number of community plans or studies that incorporate resilience; *Environmental Value:* 20% increase in the number of municipalities reporting improved understanding of environmental threats; *Social Value:* 20% increase in the number of municipalities reporting increased understanding of resilience opportunities and resources; and *Economic Revitalization:* 10% increase in the number of programs or projects implemented as a result of resilience-focused planning.

The Northeastern Illinois Regional Partnership with the assistance of Prairie Research Institute, a joint venture of the University of Illinois Champaign and Purdue University, will evaluate its effectiveness in improving regional resilience over time by regularly measuring key indicators. These indicators will be used as summary measurements that provide information on the progress made to improve resilience of built, natural, and social systems. Informed by the structure of the Rockefeller Foundation's City Resilience Framework, regional resilience indicators will fall under the four categories: (1) the health and wellbeing of individuals; (2) infrastructure and environment; (3) economy and society; and (4) leadership and strategy. Regional resilience indicators will be selected based on their ability to be measured on a regular basis; usefulness for decision-making; responsiveness to levers of change; and clarity and ease of comprehension

A sample list of potential regional resilience indicators are outlined below. Specific goals are currently under development and would be finalized soon after funding award across the four eligible CDBG-NDR applicants. **Health and Wellbeing:** Percentage of disaster-related deaths; Social Vulnerability Index (SoVI); Percentage of population with health insurance; and Percentage of mold-related illnesses. **Infrastructure & Environment**: Number of structures within FEMA 100-year floodplain; Disaster-related transportation corridor closures (or energy blackouts); Percentage of residents (or buildings) with Air Conditioning; Percentage of residents with access to emergency response services (e.g. 911); Public facilities with backup power source; Open space per capita; and Number of communities that adopt 2-foot freeboard standard. **Economy & Society:** Percentage of households covered with flood insurance and basement backup riders; Household savings as percentage of household income; Number of people trained on resilience/preparedness; and Percentage of disaster-related financial losses. **Leadership & Strategy:** Participation rates in platforms for coordinating across jurisdictions (e.g. Partnership meeting attendance); Number of local plans with clearly delineated hazard mitigation goals; Number of updated hazard mitigation

plans that reflect resilience planning; Percentage of communities demonstrating improvement in and Community Rating System ranking.

E.2 Increases Resilience

The demonstration area represents portions of Cook County with the highest Unmet Recovery Need and largest concentration of most vulnerable populations. Implementing the proposed resilience portfolio will address much of the flooding concerns from DR-4116 and provide models for replication in other portions of these communities and, more broadly, across the County and region. But for this work, the demonstration area would continue to struggle with these issues, making recovery more difficult to achieve after the next set of storms and climatic stressors.

The proposed resilience portfolio of projects and programs will improve the County's resilience to current and future threats and hazards, including those impacted by climate change, by increasing physical, individual, and governmental capacity. This will be accomplished by increasing stormwater retention in the public right-of-way, on public property including vacant abandoned property, and private property, thus reducing the amount of water going into sewer systems and subsequent backups into basements; providing new resources and education for homeowners to incorporate green infrastructure features; and rehabilitating and constructing affordable and resilient single- and multi-family housing. As detailed in Table F.13 in Attachment F – Benefit Cost Analysis, the proposed resilience portfolio, if implemented prior to DR-4116, would have reduced damages by more than 70 percent. Modeling suggests that 1,841 structures in the demonstration area will benefit from the implementation of these projects, leading to avoided costs of more than $140.5 million (2015 dollars).

By decreasing flooding issues, residents have fewer worries and can focus on other things and spend scarce resources on other priorities to further build resiliency. The proposed projects also expand a shared community asset, the Cal-Sag Trail, which will support social cohesion, offer

additional transit options, and highlight the natural features of the area; and create land available and ready for redevelopment leading to increased tax revenues, job opportunities, retail amenities, and sustained economic growth. Collectively, these projects will enhance the quality of life for residents in the demonstration area and increase property values, stabilizing the community and making it more 'livable'. The impact of this work is most critical for low- and moderate- income households who serve to benefit most from additional resources for recovery and preparedness, new training and job opportunities, and valuable community assets which provide transit opportunities and connections to other communities.

The resilience value of the proposed portfolio goes beyond the County's demonstration area, as the proposed projects and programs are intended to be a replicable and scalable model for the County and region. For example, the 'green streets' projects feature innovative ways to manage and store rainwater through the installation of bioswales, permeable pavement or parking lanes with gravel storage galleries underneath, and more resilient landscaping features. This type of project will be piloted in residential neighborhoods in Dolton and Robbins as well as the residential portions of Calumet Park and Blue Island, refined, and then replicated in other residential neighborhoods facing repetitive flooding. Likewise, the two resilient housing projects in Calumet City and Dolton put forth a new model for how to incorporate green and gray infrastructure into rehabilitation and construction projects for affordable single- and multi-family homes. If successful, the County could share this model with affordable housing providers and support its replication. Beyond these discrete projects and programs which offer natural opportunities for scaling, Cook County and the Northeast Illinois Resilience Partnership's long-term commitments to enhance resilience, detailed in Exhibit G, p. 112, further the impact of this proposal by incorporating resilience in policy, design guidelines, workforce development activities, data gathering, modeling and alert systems, capacity-building, and planning.

E.3 Model / Replicable / Holistic

Cook County's strategic approach was designed with interconnectedness, scaling, and replication in mind. As noted earlier, *Planning for Progress*, the County's recently adopted 5-year strategic plan, incorporates disaster recovery and resilience approaches. The resilience portfolio outlined in this application is aligned with this strategic vision and was developed to holistically address the immediate needs resulting from continual flooding but to also go beyond to enhance overall living conditions, improve and preserve the housing stock, create educational and workforce development opportunities, upgrade and strengthen commercial and industrial bases, facilitate job creation, promote economic investment, create and enhance community amenities and recreational opportunities, expand the local tax base. The proposed activities can stimulate further investment, foster development and redevelopment, and precipitate community revitalization. Most importantly, the proposed improvements will play a critical role in enabling and strengthening connections between communities, their institutions and leaders, and residents.

Project concepts were designed with the assumption that they can be scaled and applied to other areas that are subject to similar risk to communities within the County's demonstration area. Since the topography and soil conditions in Cook County are very similar throughout the entire county, 'Green Streets' programs should have similar results regardless of location. They would just need to be sized based on the tributary drainage area. Green infrastructure elements are already being installed in many areas of the County, including some within the demonstration area in Blue Island. The Residential Resilience Program can also be used anywhere within the county, though with primary benefit to the 82 percent of households that have a basement.

The proposed approach can be replicated throughout suburban Cook County, particularly in older, inner ring suburbs, as well as throughout similar communities in the broader region and nation. It is a scalable model that can be adapted for different challenges. It can inspire changes in

how and where infrastructure investments occur so that they are inclusive of street maintenance, enhanced stormwater management and flooding mitigation measures, and green space installation. The Residential Resiliency Program can be customized to meet the needs of varying housing stock. A common concern is the education of property owners – whether homeowners of single-family or owners of multi-family rental property – regarding how they can incorporate improvements to enhance the resilience of their own individual property as well as that of their neighbors and surrounding community. Given its geographic size, demographic diversity, and regulatory complexity, Cook County's approach offers many opportunities for scaling and replication in other communities. This approach encompasses innovative ways to approach redevelopment in areas with significant hurdles: land fragmentation, environmental contamination, absentee owners, stormwater requirements, and high tax rates. It creates a new paradigm whereby the public sector takes a lead role on addressing stormwater management challenges in ways that expand and protect community amenities (through the utilization of vacant land for stormwater retention) as well as remove barriers to redevelopment. Initial public investment can be catalytic in the development process, particularly in a challenged area like the demonstration area, and many other parts of suburban Cook. To support replication within the County, lessons learned from the demonstration area will be applied via the County's annual CDBG projects.

Cook County will continue to explore opportunities for scaling of its proposed approach through regional and local coordination and consultation. The County's participation in the Northeastern Illinois Resilience Partnership will help facilitate this through continual peer review and feedback from regional experts. Evaluation by the Prairie Research Institute at the University of Illinois will help to identify best practices and retool / improve projects and programs for optimal scalability. Regional coordination will avoid problematic approaches, like making infrastructure investments that simply push flooding problems downstream. The "regional scaling" process provides an

opportunity for other jurisdictions to be involved; beyond the Partnership, adjacent units of government have expressed willingness to cooperate, as well. This approach allows resilience concepts to be applied beyond the timeframe of the CDBG-NDR grant, providing a lasting, long-term commitment to address resilience.

E.4 Schedule

A detailed and feasible schedule for all projects and programs is provided in Table 7. Start and completion dates are provided, and a milestone is noted for the dates at which projects will become functional and the expected benefits realized. As noted earlier, Cook County would commence the HUD-required environmental review immediately upon funding award notification as to not cause further delay. This would incur in tandem with final negotiations with partners on their respective contracts. While environmental review can be a time consuming process, it is one that the DPD is well versed in, including tiered review, based on its existing HUD grants. As noted in Exhibit C – Capacity, DPD and its partners are well-equipped to promptly launch and effectively manage infrastructure projects, housing projects and programs, and planning and service activities such as the workforce and education programs. The Complete Communities and Green Streets projects fit well within MWRD's existing project pipeline. The Cal-Sag Trail project has an AECOM project manager who supported its earlier phase development and a long history of collaborative work among the adjacent municipalities. The County has considered potential risks and constraints related to the proposed schedule and the primary one that has surfaced is one outside local control – weather patterns which can impact or delay construction. However, DPD is confident that the proposed schedule includes sufficient buffering time for any weather-related delays and that the high capacity of its internal operations and partners will ensure continual progress in accordance with the specified timelines. Additionally, DPD in its oversight of related partners and work, will continually monitor progress and identify/implement appropriate modifications as needed.

Table 7: CDBG-NDR Activity Schedule		
Activity Name	***Start***	***Finish***
Riverdale Complete Community Project	**02-Jan-17**	**27-Dec-18**
Design	02-Jan-17	08-Sep-17
Environmental Review	11-Sep-17	01-Dec-17
Permits	11-Sep-17	29-Dec-17
Bidding / Procurement	01-Jan-18	23-Mar-18
Construction	23-Mar-18	27-Dec-18
Substantial Completion / Functional		01-Nov-18
Final Completion / Benefits Realized		27-Dec-18
BI - Calumet Park Complete Community Project	**04-Jan-16**	**27-Dec-18**
BLUE ISLAND	**04-Jan-16**	**29-Dec-17**
Design	04-Jan-16	12-Sep-16
Environmental Review	13-Sep-16	05-Dec-16
Permits	13-Sep-16	02-Jan-17
Bidding / Procurement	03-Jan-17	27-Mar-17
Construction	27-Mar-17	29-Dec-17
Substantial Completion / Functional		02-Nov-17
Final Completion / Benefits Realized		29-Dec-17
CALUMET PARK	**02-Jan-17**	**27-Dec-18**
Design	02-Jan-17	08-Sep-17
Environmental Review	11-Sep-17	01-Dec-17
Permits	11-Sep-17	29-Dec-17

Bidding / Procurement	01-Jan-18	23-Mar-18
Construction	23-Mar-18	27-Dec-18
Substantial Completion / Functional		01-Nov-18
Final Completion / Benefits Realized		27-Dec-18
Dolton 'Green Streets' Project	**02-Oct-17**	**26-Sep-19**
Design	02-Oct-17	08-Jun-18
Environmental Review	11-Jun-18	31-Aug-18
Permits	11-Jun-18	28-Sep-18
Bidding / Procurement	01-Oct-18	21-Dec-18
Construction	21-Dec-18	26-Sep-19
Substantial Completion / Functional		01-Aug-19
Final Completion / Benefits Realized		26-Sep-19
Robbins 'Green Streets' Project	**04-Jan-16**	**29-Dec-17**
Design	04-Jan-16	12-Sep-16
Environmental Review	13-Sep-16	05-Dec-16
Permits	13-Sep-16	02-Jan-17
Bidding / Procurement	03-Jan-17	27-Mar-17
Construction	27-Mar-17	29-Dec-17
Substantial Completion / Functional		03-Nov-17
Final Completion / Benefits Realized		29-Dec-17
Cal-Sag Trail Project	**03-Aug-15**	**30-Apr-18**
Design	03-Aug-15	01-Apr-16
Environmental Review	01-Feb-16	29-Apr-16

Permits	01-Mar-16	31-Mar-16
Bidding / Procurement	02-May-16	30-Jun-16
Construction	01-Jul-16	30-Apr-18
Final Completion / Benefits Realized		30-Apr-18
Dolton Resilient Housing Project	**02-Aug-15**	**01-Sep-17**
Design	03-Aug-15	31-Mar-16
Environmental Review	04-Jan-16	31-Mar-16
Permits	01-Jun-16	30-Jun-16
Closing on Loans	01-Jun-16	30-Jun-16
Construction	30-Jun-16	28-Apr-17
Substantial Completion / Functional		28-Apr-17
Final Completion / Benefits Realized		01-Sep-17
Calumet City Resilient Housing Project	**03-Aug-15**	**08-Dec-17**
Design	03-Aug-15	01-Apr-16
Environmental Review	02-Nov-15	29-Jan-16
Bidding / Procurement	04-Jan-16	01-Apr-16
Permits	04-Apr-16	29-Apr-16
Construction	29-Apr-16	29-Sep-17
Substantial Completion / Functional		29-Sep-17
Final Completion / Benefits Realized		08-Dec-17
Residential Resilience Program	**01-Jun-16**	**31-Jul-19**
Grant Agreement Signed	01-Jun-16	30-Jun-16
Major Outreach Campaign	01-Jul-16	30-Dec-16

Functional / Program Implementation	01-Sep-16	31-Jul-19
Final Completion / Benefits Realized		31-Jul-19
Education Program	**01-Jun-16**	**28-Jun-19**
OUTREACH COMPONENT	**01-Jun-16**	**28-Jun-19**
Grant Agreement Signed	01-Jun-16	30-Jun-16
Design of Outreach Materials	01-Jul-16	31-Aug-16
Functional / Program Implementation	01-Sep-16	28-Jun-19
Final Completion / Benefits Realized		28-Jun-19
K-8 COMPONENT	**01-Jun-16**	**28-Jun-19**
Grant Agreement Signed	01-Jun-16	30-Jun-16
Functional / Program Implementation	01-Sep-16	28-Jun-19
Final Completion / Benefits Realized		28-Jun-19
Workforce Development Program	**01-Jun-16**	**30-Sep-19**
Grant Agreement Signed	01-Jun-16	30-Jun-16
Functional / Program Implementation	30-Jun-16	28-Jun-19
Benefits Realized / Job Placements	02-Jan-17	30-Sep-19
Planning Program	**02-May-16**	**30-Sep-19**
Identification / Selection of Projects	02-May-16	31-May-17
Functional / Program Implementation	01-Jul-16	28-Jun-19
Benefits Realized / Planning Outputs & Outcomes	03-Jan-17	30-Sep-19

E.5 Budget

Please see Table 8 for budgets in DRGR format for each proposed project and program. A detailed Sources and Uses Statement for the resilience portfolio is in Attachment B – Leverage Documentation. Cook County's Attachment F - Benefit-Cost Analysis, while not required due to the absence of a covered project, was instrumental in determining the cost-effectiveness of activities and selecting those identified to be the most prudent – and impactful – use of funds. Net total benefits from the proposed resilience portfolio are in excess of $252 million. The County will ensure that costs are in line with industry standards and appropriate for the scope of the project.

The proposed projects and programs can be scaled, scoped, or phased in a number of ways. The Cal-Sag Trail could be scaled to exclude certain segments, but the value of completing the trail and making linkages across multiple communities would be lost. Alternatively, the project could be scoped to eliminate some of the green infrastructure features, including use of permeable material and bioswales, but again, the loss to the project is in terms of benefits to stormwater management. The new construction housing project in Dolton could reduce the number of homes built down to 20 instead of 30 homes. In terms of scoping, the project could be revised to incorporate fewer resilient features per home, thus reducing the total cost. This poses a challenge, though, in terms of the overall concept which is to create resilient housing projects which can be a model for others in the region. The Residential Resiliency Program could be reduced to fund only a more limited scope of work, or reduce the number of homes treated to 350 rather than 500 homes, but that could leave remaining unmet need in these communities. The projects most challenging to adjust are the two 'complete communities' projects in Riverdale and Blue Island – Calumet Park. If a significant revision to these projects needed to be made, it would make the most sense to select one to focus on, out of the two. MWRD projects in Blue Island do not yet have an established schedule, so it would not be as difficult to delay. Reducing the scope of stormwater management features is a possibility,

but the trade-off would be losing some of the resilient features or other features that provide other co-benefits. For example, the green streets components within each project could be phased or re-sized as needed (i.e., less linear feet, fewer blocks). Additionally, in Riverdale, the Riverdale Marsh portion of the project could be scoped by removing the hiking trail or other park amenities, but not without the loss of key value. A final way to consider scoping, scaling, and phasing is to look at the County's resilience portfolio by geographic focus area. The proposed projects in Dolton – green streets and single-family housing construction – could be eliminated because both are standalone projects. For reasons discussed above and due to the more comprehensive nature of the projects, the two 'complete communities' projects are of higher priority. Of course, cost-benefit implications would be paramount in making these types of re-sizing or elimination decisions.

E.6 Plan Consistency

The proposed activities in this Phase 2 application are consistent with Cook County's combined Consolidated Plan and Comprehensive Economic Development Strategy, both adopted in 2015. They are consistent with GO TO 2040, CMAP's comprehensive regional plan which serves as a U.S. Department of Transportation approved fiscally constrained long-range transportation plan, and also CMAP's regional sustainability initiatives. The proposed activities are consistent with the Cook County Multi-Jurisdictional All Hazards Mitigation Plan, last revised November, 2014. This Mitigation Plan includes all federally required elements and has been adopted by the Illinois Emergency Management Agency and FEMA. Supporting documentation can be found in Attachment D – Consultant Summar

Table 8: Cook County CDBG-NDR Budget								
Project Area Description / Proposed Solution	**Cost Amounts**			**Direct Leverage Amounts**			**CDBG-NDR Request**	**Source of Direct Leverage**
	Estimated Project / Capital Costs*	**Life Cycle O&M Costs**	**Total Project Costs**	**MWRD Commitment**	**Other Leveraged Amount**	**Total Leveraged Amount**		
Blue Island-Calumet Park 'Complete Communities' Resiliency Project								
Subarea A – MWRD Phase 2 Design / Residential Resilience Program								
Residential Resilience Program	$4,191,750	$154,256	$4,346,006	$0	$0	$0	$4,191,750	
Bumpouts, Permeable Alleys, Native Plantings	$1,132,558	$0	$1,132,558	$0	$1,132,558	$1,132,558	$0	Illinois Green Infrastructure Grant to Blue Island
Relief Sewers (Phase 2 Design)	$3,570,093	$77,397	$3,647,490	$2,499,065	$0	$2,499,065	$1,071,028	MWRD

Sewer Mainline Upsizing (Phase 2 Design)	$818,350	$17,741	$836,091	$572,845	$0	$572,845	$245,505	MWRD
Rain Gardens (Phase 2 Design)	$644,144	$15,780	$659,923	$450,900	$0	$450,900	$193,243	MWRD
Stormwater Bumpouts (Phase 2 Design)	$220,968	$5,413	$226,381	$154,677	$0	$154,677	$66,290	MWRD
Green Alleys (Phase 2 Design)	$792,532	$63,098	$855,630	$554,772	$0	$554,772	$237,760	MWRD
SUBTOTAL	**$11,370,394**	**$333,685**	**$11,704,079**	**$4,232,260**	**$1,132,558**	**$5,364,818**	**$6,005,576**	
Subarea B – Economic Redevelopment								
Demolition of blighted properties	$1,300,000	$0	$1,300,000	$0	$650,000	$650,000	$650,000	Cook County CDBG
Green infrastructure	$3,400,000	$231,840	$3,631,840	$0	$2,000,000	$2,000,000	$1,400,000	Private developer
Land donation by	$2,500,000	$0	$2,500,000	$0	$2,500,000	$2,500,000	$0	City of Blue

Blue Island for redevelopment								Island
SUBTOTAL	**$7,200,000**	**$231,840**	**$7,431,840**	**$0**	**$5,150,000**	**$5,150,000**	**$2,050,000**	
Subarea C – Green Streets Design/Residential Resilience Program								
Residential Resilience Program	$2,004,750	$73,775	$2,078,525	$0	$50,000	$50,000	$1,954,750	Calumet Park cost-sharing program
Green Streets	$7,200,000	$476,928	$7,676,928	$4,500,000	$0	$4,500,000	$2,700,000	MWRD
SUBTOTAL	**$9,204,750**	**$550,703**	**$9,755,453**	**$4,500,000**	**$50,000**	**$4,550,000**	**$4,654,750**	
TOTAL	**$27,775,144**	**$1,116,228**	**$28,891,372**	**$8,732,260**	**$6,332,558**	**$15,064,818**	**$12,710,326**	
Robbins 'Green Streets' Project								
Subarea A – MWRD Phase 2 Design								
Inlet/Outlet Structures (Phase 2 Design)	$1,549,996	$427,799	$1,977,795	$1,084,997	$0	$1,084,997	$464,999	MWRD
Channel Widening	$661,532	$1,932	$663,464	$463,072	$0	$463,072	$198,460	MWRD

(Phase 2 Design)								
Detention Basin (Phase 2 Design)	$896,909	$376,740	$1,273,649	$627,836	$0	$627,836	$269,073	MWRD
Flood Wall along Kedzie (Phase 2 Design)	$747,033	$103,091	$850,124	$522,923	$0	$522,923	$224,110	MWRD
Mobilization (Phase 2 Design)	$192,773	$0	$192,773	$134,941	$0	$134,941	$57,832	MWRD
SUBTOTAL	**$4,048,243**	**$909,561**	**$4,957,804**	**$2,833,770**	**$0**	**$2,833,770**	**$1,214,473**	
Subarea B – Green Streets Pilot Project								
Green Streets Pilot Project	$2,000,000	$105,984	$2,105,984	$1,250,000	$0	$1,250,000	$750,000	MWRD
SUBTOTAL	**$2,000,000**	**$105,984**	**$2,105,984**	**$1,250,000**	**$0**	**$1,250,000**	**$750,000**	
TOTAL	**$6,048,243**	**$1,015,545**	**$7,063,788**	**$4,083,770**	**$0**	**$4,083,770**	**$1,964,473**	
Riverdale 'Complete Communities' Resiliency Project								
Subarea A – New Park and Wetlands								

Constructed wetlands	$877,410	$32,599	$910,010	$0	$0	$0	$877,410	
Right-of-way bioswale	$260,000	$8,280	$268,280	$0	$0	$0	$260,000	
Porous pavement parking lot	$96,000	$21,197	$117,197	$0	$0	$0	$96,000	
Permeable hike/bike trail	$300,000	$19,872	$319,872	$0	$0	$0	$300,000	
Park amenities (educational signage, etc.)	$20,000	$6,900	$26,900	$0	$0	$0	$20,000	
SUBTOTAL	**$1,553,410**	**$88,848**	**$1,642,258**	**$0**	**$0**	**$0**	**$1,553,410**	
Subarea B – Green Streets Pilot Project/ Residential Resilience Program								
Residential Resilience Program	$668,250	$24,592	$692,842	$0	$0	$0	$668,250	
Green Streets Pilot Project	$2,150,000	$105,984	$2,255,984	$1,344,970	$0	$1,344,970	$805,030	MWRD

SUBTOTAL	**$2,818,250**	**$130,576**	**$2,948,826**	**$1,344,970**	**$0**	**$1,344,970**	**$1,473,280**	
Subarea C – Green Streets Design/Residential Resilience Program								
Residential Resilience Program	$1,425,000	$52,440	$1,477,440	$0	$0	$0	$1,425,000	
Demolition of properties in target area for greening	$280,000	$0	$280,000	$0	$280,000	$280,000	$0	Cook County Land Bank Authority
Green Streets	$6,170,000	$339,149	$6,509,149	$4,319,000	$0	$4,319,000	$1,851,000	MWRD
SUBTOTAL	**$7,875,000**	**$391,589**	**$8,266,589**	**$4,319,000**	**$280,000**	**$4,599,000**	**$3,276,000**	
Subarea D – Industrial Redevelopment including Additional Resilience								
Green infrastructure	$2,155,600	$166,585	$2,322,185	$0	$0	$0	$2,155,600	
Investment in rail infrastructure	$2,000,000	$0	$2,000,000	$0	$2,000,000	$2,000,000	$0	IHB Railroad
Demolition of blighted granary	$1,600,000	$0	$1,600,000	$0	$1,600,000	$1,600,000	$0	Village of Riverdale
SUBTOTAL	**$5,755,600**	**$166,585**	**$5,922,185**	**$0**	**$3,600,000**	**$3,600,000**	**$2,155,600**	

TOTAL	**$18,002,260**	**$777,597**	**$18,779,858**	**$5,663,970**	**$3,880,000**	**$9,543,970**	**$8,458,290**	
Dolton 'Green Streets' Project								
Residential Resilience Program	$4,934,250	$181,580	$5,115,830	$0	$0	$0	$4,934,250	
Green Streets Pilot Project	$2,432,000	$169,574	$2,601,574	$1,520,000	$0	$1,520,000	$912,000	MWRD
TOTAL	**$7,366,250**	**$351,155**	**$7,717,405**	**$1,520,000**	**$0**	**$1,520,000**	**$5,846,250**	
Dolton Resilient Housing Project								
Housing Redevelopment	$10,760,000	$1,242,000	$12,002,000	$0	$5,660,000	$5,660,000	$5,100,000	Chicago Community Loan Fund; SSLBDA
TOTAL	**$10,760,000**	**$1,242,000**	**$12,002,000**	**$0**	**$5,660,000**	**$5,660,000**	**$5,100,000**	
Calumet City Resilient Housing Project								

Housing Redevelopment	$24,525,403	$4,002,000	$28,527,403	$0	$20,775,403	$20,775,403	$3,750,000	Illinois Housing Development Authority
TOTAL	**$24,525,403**	**$4,002,000**	**$28,527,403**	**$0**	**$20,775,403**	**$20,775,403**	**$3,750,000**	
Calumet City Residential Resilience Program								
Residential Resilience Program	$6,648,750	$244,674	$6,893,424	$0	$100,000	$100,000	$6,548,750	Calumet City cost-sharing program
TOTAL	**$6,648,750**	**$244,674**	**$6,893,424**	**$0**	**$100,000**	**$100,000**	**$6,548,750**	
Cal-Sag Trail Project								
Cal Sag Trail (Blue Island)	$7,984,000	$85,264	$8,069,264	$0	$4,811,600	$4,811,600	$3,172,400	Multiple state/federal sources - all committed

								before 9/17/14
Cal Sag Trail (Riverdale)	$3,213,000	$96,008	$3,309,008	$0	$2,713,000	$2,713,000	$500,000	Same as above
Cal Sag Trail (Dolton)	$1,995,000	$85,840	$2,080,840	$0	$1,580,342	$1,580,342	$414,658	Same as above
Cal Sag Trail (Calumet City)	$1,755,000	$26,324	$1,781,324	$0	$1,481,788	$1,481,788	$273,212	Same as above
Cal Sag Trail (Forest Preserve)	$2,200,000	$57,761	$2,257,761	$0	$1,486,528	$1,486,528	$713,472	Only $289,440 counts for NDRC, from Forest Preserves of Cook County
TOTAL	**$17,147,000**	**$351,198**	**$17,498,198**	**$0**	**$289,440**	**$289,440**	**$5,073,742**	
Overall Programs (Throughout demonstration area)								
Education Program	$500,000	$0	$500,000	$0	$0	$0	$500,000	

Workforce Development Program	$1,200,000	$0	$1,200,000	$0	$200,000	$200,000	$1,000,000	Cook County CDBG
Planning Program	$800,000	$0	$800,000	$0	$0	$0	$800,000	
Administrative Costs	$2,700,000	$0	$2,700,000	$0	$0	$0	$2,700,000	
TOTAL	**$5,200,000**	**$0**	**$5,200,000**	**$0**	**$200,000**	**$200,000**	**$5,000,000**	
GRAND TOTAL	**$123,473,050**	**$9,100,397**	**$132,573,447**	**$20,000,000**	**$37,237,401**	**$57,237,401**	**$54,451,831**	

Notes:

* - For infrastructure and other projects involving construction, the cost usually includes 30% for contingency. Costs for easements and property acquisition are not included.

- Additional budget/cost details can be found in Attachment B - Sources and Uses and Attachment F – Benefit-Cost Analysis.

- Life Cycle O&M costs are the responsibility of the unit of government in the case of public infrastructure. All six communities in the demonstration area have committed to this maintenance in their leverage letters. For housing projects, the property owner is responsible.

- The budget above shows the three main budget set-up levels of DRGR.

- The full Cal-Sag Trail Project leverage is included in the above budget, but only a small portion ($289,440) is included in the Grand Total. Most of the leverage was committed prior to 9/17/2014. (See Direct Leverage column above.)

Exhibit F - Leverage

Cook County, Illinois

ExhibitFLeverage.pdf

Cook County has significant leverage for its proposed CDBG-NDR projects and programs, which will increase the effectiveness of the proposed activities, enabling the County to maximize the limited Federal CDBG-NDR dollars requested. Overall leverage – representing both direct financial commitments and supporting commitments – totals $68,124,625 and represents 125% of the total $54,451,831 in CDBG-NDR funds requested. Documentation for the leverage commitments listed in this exhibit can be found in Attachment B – Leverage Documentation and Sources & Uses of Funds.

Direct financial commitments, or cash commitment by the applicant or partner that is part of the Sources and Uses statements for the CDBG-NDR eligible activities proposed, total $57,237,401 and represent 105% of the total $54,451,831 in CDBG-NDR funds requested. Below is a summary of related commitments:

- $650,000 in CDBG funding from the Cook County Department of Planning and Development to the City of Blue Island to support demolition and blight reduction activities in Blue Island in coordination with the proposed Complete Communities project.
- $200,000 in CDBG funding from the Cook County Department of Planning and Development to OAI, Inc. and the Calumet Green Manufacturing Partnership to support workforce development in the demonstration area.
- $289,440 from the Cook County Forest Preserve District to support the proposed Cal-Sag Trail project.
- $280,000 from the Cook County Land Bank Authority (CCLBA) to support demolition and blight reduction activities in Riverdale in coordination with the proposed Complete Communities project.

- $20,000,000 from the Metropolitan Water Reclamation District to support stormwater management and infrastructure improvements in the demonstration area in support of the Complete Communities and Green Streets projects. Includes: $8,732,260 - Blue Island/ Calumet Park, $5,663,970 – Riverdale, $4,083,770 – Robbins, $1,520,000 – Dolton.
- $20,775,403 from the Illinois Housing Development Authority (IHDA) for the proposed resilient housing project in Calumet City.
- $5,660,000 from the South Suburban Land Bank and Development Authority (SSLBDA) and Chicago Community Loan Fund (CCLF) for the proposed resilient housing project in Dolton.
- $1,132,558 from the City of Blue Island through an Illinois Green Infrastructure Grant for the implementation of stormwater management best practices in Blue Island.
- $50,000 from the Village of Calumet Park from their overhead sewer cost-sharing program to support the proposed Residential Resilience Program.
- $100,000 from the City of Calumet City from their overhead sewer cost-sharing program to support the proposed Residential Resilience Program.
- $1,600,000 from the Village of Riverdale to support demolition and blight reduction activities in Riverdale in coordination with the proposed Complete Communities project.
- $2,000,000 from the Indiana Harbor Belt to support rail-oriented infrastructure improvements in the demonstration area.
- $2,000,000 from the developer of Marshfield Plaza South for stormwater management improvements in coordination with the proposed Complete Communities project in Blue Island.
- $2,500,000 in donated property from the City of Blue Island to support the Complete Communities project.

Supporting Commitments, or funding that the applicant or partner has to carry out supporting activities but that is not part of the Sources and Uses statements for the CDBG-NDR eligible activities proposed, total $11,107,224, and represent 20% of the total $54,451,831 in CDBG-NDR funds requested. Below is a summary of related commitments:

- $1,304,775 in CDBG funding from the Cook County Department of Planning and Development since September 17, 2014, to the demonstration area for resilience-enhancing capital improvements related to streets, drainage, and/or public facilities including:
    - $146,775 to the Village of Robbins (the Village is matching with $29,175)
    - $200,000 to the Village of Riverdale (the Village is matching with $100,000)
    - $200,000 to the Village of Dolton (the Village is matching with $50,000)
    - $153,000 to the City of Calumet City
    - $485,000 to the City of Blue Island (the City is matching with $218,795)
    - $120,000 to the City of Calumet Park
- $3,500,000 from the Cook County Department of Transportation and Highways to support critical street/drainage improvements in the Village of Riverdale in coordination with the proposed Complete Communities project and with the intention of contributing to job creation/retention and building of economic resilience.
- $15,000 from the Cook County Department of Environmental Control from an Illinois Science and Energy Innovation Fund grant to support resident education around energy efficiency within the demonstration area to build resilience to the stressor of high energy costs.
- $25,000 from the Cook County Forest Preserve District to supports its Conservation Corps program in the demonstration area.

- $111,937 from the Cook County Department of Public Health to develop an active transportation plan in Calumet Park and to implement Complete Streets projects in Calumet City and Calumet Park with the overall aim of improving health outcomes.
- $317,161 from the Cook County Forest Preserve District in NOAA funding for development of the Conservation Action Plan for Critical Wetlands in the Millennium Reserve overlapping with the demonstration area to ensure natural habitat preservation/restoration.
- $1,155,171 from the Illinois Department of Natural Resources in EPA funding to support the Millennium Reserve Compact: Uniting to Control Invasives to control invasive species overlapping with the demonstration area to ensure natural habitat restoration as well as the Great Lakes Restoration Initiative and the Great Lakes Water Quality Agreement. Partners, including IDNR, the Forest Preserves of Cook County, and The Nature Conservancy, will restore 12 sites totaling 287.5 acres of wetlands, prairies, and savannas and will employ a 'conservation corps' for experiential learning for hard-to-employ adults.
- $168,234 from the Field Museum in NOAA funding for Advancing Youth Conservation Action in the Millennium Reserve education and training on climate change overlapping demonstration area.
- $611,758 from the Metropolitan Water Reclamation District (MWRD) to conduct a pilot study overlapping with the demonstration area inclusive of green and gray infrastructure approaches at varying scales.
- $375,000 from OAI, Inc. to support workforce development in the demonstration area.
- $260,000 from South Suburban Mayors and Managers Association (SSMMA) through the Great Lakes Restoration Initiative to support green infrastructure improvements and the High Bridge workforce development program in Robbins, Blue Island, and Calumet Park.

- $235,295 from South Suburban Mayors and Managers Association (SSMMA) through the Chi-Cal Rivers Fund for green infrastructure installation in Blue Island.
- $2,055,923 from Metropolitan Water Reclamation District to support preliminary engineering in the demonstration area along the Little Calumet / Cal-Sag area.
- $253,000 from the Calumet Stormwater Collaborative to support stormwater modeling and land use planning along the Calumet River within the demonstration area.
- $89,000 from the Delta Institute for development of a green infrastructure toolkit.
- $150,000 from the U.S. Army Corps of Engineers to support flooding studies in the demonstration area.
- $12,000 from the South Metropolitan Higher Education Consortium.
- $70,000 in waived permit fees from the Village of Dolton for the resilient housing project.

Other Resources

Additional resources which do not meet the HUD definition for direct or supporting leverage but that offer support for the County's resilience initiative include:

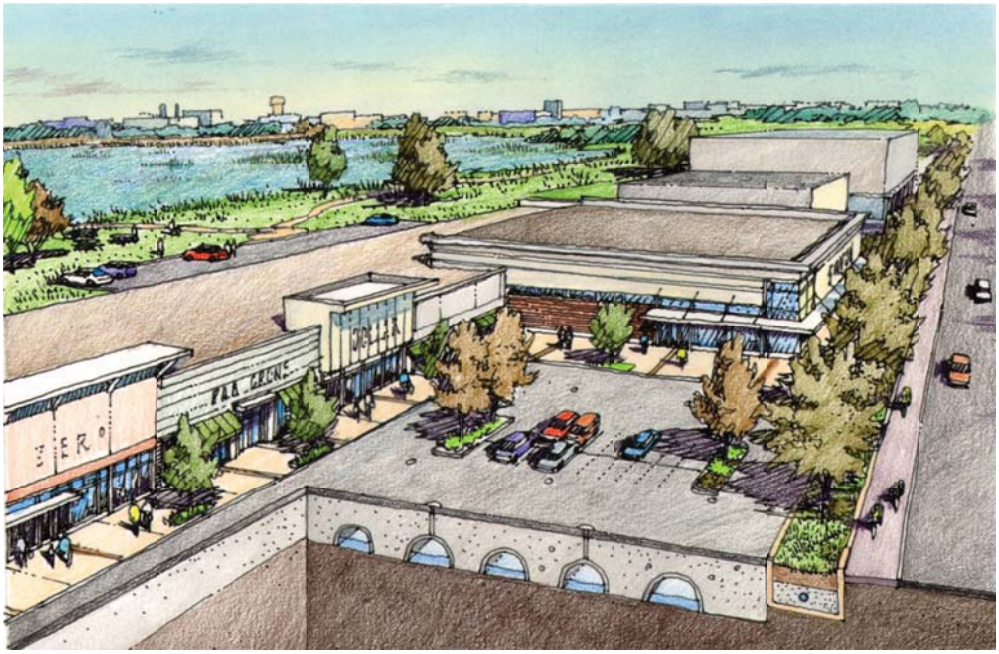
- $11,783,818 combined from the Transportation Alternatives Program (TAP), the Congestion Mitigation and Air Quality Improvement (CMAQ) program, Surface Transportation Program (STP), and the Illinois Department of Natural Resources to support the construction of the Cal-Sag Trail (funding committed prior to 9/17/14).
- $311,722 in CDBG-DR funding to the Metropolitan Water Reclamation District for their consultant Arcadis to assist with development of Cook County's NDRC application.
- Anticipated additional CDBG-DR support for the Forest Preserve's Conservation Corps, High Bridge, Greencorps, and the Center for Neighborhood Technology RainReady Community initiative to support their proposed work under CDBG-NDR

- $100,000 from the Chicago Community Trust to Foresight Design Initiative, a capacity-building partner to the Northeastern Illinois Resilience Partnership, to convene a resource group of multidisciplinary experts to develop a consensus strategy for integrating resilience into the next regional comprehensive plan (the *GO TO 2040* successor plan) due for completion in 2018.

Exhibit G – Long-Term Commitment

Cook County, Illinois

ExhibitGCommitment.pdf



Cook County is a committed member of the multi-jurisdictional, bipartisan Northeastern Illinois Resilience Partnership (see MOU provided in Attachment A – Partner Documentation). Regardless of the outcome of its Phase 2 application, both the County and Partnership commit to activities to enhance resilience. High priority commitments are described in detail below, including two that reflect significant changes in policy and thinking around flooding and resilience. The first is the **passage of and response to the Urban Flooding Awareness Act (PA 098-0858) in Illinois**, signed into law in August, 2014, that seeks solutions to increasing urban flooding. A June, 2015 Act-mandated report researched the prevalence and cost of urban flooding and made 33 recommendations which are being explored in detail.[1] The second is collaboration **with the Prairie Research Institute of the University of Illinois to identify metrics to evaluate progress for the demonstration areas** set forth by the Partnership. This collaboration will ensure the successful replicability and scalability of proposed resilience initiatives. The Institute's evaluation will find ways to retool current projects to increase effectiveness and address scaling challenges. Successful scaling of projects will validate the Partnership's model and promote regional and State take-up.

Local Commitments: The County added a preference for resilient measures in CDBG infrastructure funding requests. *Category:* Raising standards. *Metric:* At least one project funded per year with resilient features protecting 200 people. *Baseline:* No projects with such features. *Timeline*: Implemented in February 2015. The County will also allocate a portion of CDBG infrastructure funding requests for resilient investments. *Category:* Financing. *Metric:* At least $500,000 of annual CDBG allocation will be set aside. *Baseline:* $0. *Timeline*: Effective program year starting October, 2016. The County's Department of Building and Zoning passed an ordinance adopting updated regulatory codes (2012 IECC and 2012 IMC) for all of unincorporated Cook County which requires single-family homes to have 'fresh air ventilation system'. *Category:* Raising standards.

[1] https://www.dnr.illinois.gov/WaterResources/Documents/Final_UFAA_Report.pdf

Metric: Ordinance to raise construction standards. *Baseline:* No ordinance. *Timeline:* Completed November, 2014. The County's floodplain ordinance also requires a 'two-foot freeboard' that allows for the enforcement of flood provisions two feet above the base flood elevation.

The Department of Homeland Security and Emergency Management (DHSEM) developed the County's first Hazard Mitigation Plan (HMP) and enrolled 114 planning partners, making them eligible for FEMA mitigation resources. *Category:* Plan updates. *Metric:* Approved HMP; enroll at least 100 planning partners. *Baseline:* No plan or partners. *Timeline:* Completed September 26, 2014. As a result of its HMP, the County commits to work with DHSEM to educate communities about the Community Rating System (CRS). *Category:* Plan alignment. *Metric:* Outreach leading to enrollment of at least 5 new communities in CRS over the next several years. *Baseline:* 20 communities currently enrolled. *Timeline:* Outreach beginning June, 2016. The County commits to submitting applications to FEMA for hazard mitigation funds to access new resources. *Category:* Financing. *Metric:* Apply annually to buyout at least 5 properties or protect at least 10 structures. *Baseline:* No previous application. *Timeline:* First application submitted in August, 2015.

Cook County's Department of Environmental Control commits to hiring a Sustainability Coordinator who will work with Cook County communities, residents, and businesses to put the County on track for reducing Greenhouse Gas emissions by 80 percent by 2050. *Category:* Lessons learned. *Metric:* Hiring a Sustainability Coordinator. *Baseline:* No coordinator / defined staff resource. *Timeline:* Completed by December 2016. The Department of Public Health commits to implementing corner store conversions in the south suburbs to increase the availability of healthy food options. *Category:* Lessons learned. *Metric:* 10 corner store conversions to provide better access for 35,000 residents. *Baseline:* 6 corner store conversions to date. *Timeline:* Completed by December 2016. The Forest Preserve District of Cook County commits to implement a Conservation Corps program in suburban communities. *Category:* Financing. *Metric:* Improve 800

acres and engage 25 residents. *Baseline:* No implementation in suburban Cook. *Timeline:* Completed by December 2016. Please see Attachment A – Partner Documentation for a firm commitment from the County for implementation of the above commitments.

MWRD is committed to working to install green infrastructure in Cook County. MWRD's Green Infrastructure (GI) Plan which outlines the procedures to collaborate with stakeholders to identify, plan, and implement GI projects. *Category:* Raising standards. *Metric:* Approved Green Infrastructure Plan. *Baseline:* No plan. *Timeline:* Approved by EPA on October 7, 2015. MWRD also commits to develop Stormwater Master Plans for all communities in the County. The plans will analyze flooding problems and identify approaches to address problems. MWRD is currently conducting five pilot studies. *Category:* Lessons learned. *Metric:* Stormwater Master Plan for all communities in Cook County. *Baseline:* No plans. *Timeline:* Underway.

Regional Commitments: The Partnership is committed to meeting quarterly for five years to facilitate cross-jurisdictional coordination in scaling up successful interventions across the region and State, and to advance a regional resilience framework. Its work will be guided by an advisory committee of experts representing diverse sectors, from insurance to public health, which will review progress. *Category:* Lessons learned. *Metric:* Meet quarterly for five years. *Baseline:* 0 – no regular meetings prior to CDBG-NDR. *Timeline:* Underway, through 2020. The Partnership will evaluate its progress (in terms of both ability to improve resilience and to scale projects) annually to adapt its approach and explore extension of this initial commitment. Key metrics include the number of homes with reduced flooding risk and the number of individuals engaged in programs.

To ensure ongoing regional focus and delivery on resilience the State of Illinois, DuPage County, Cook County, and the City of Chicago will each serve rotating one year terms as the Convening Chair of the Northeastern Regional Resilience Partnership. This structure will kick off following a collaborative process to review best practice research on cross-sectoral collaboration; this best

practice research effort will be facilitated by a local non-profit, Foresight Design Initiative, and has been awarded funding by the Chicago Community Trust. The ongoing structure will be supported by a proposed Resilience Coordinator to be engaged by the State of Illinois. The Partnership has established priorities: ***Policy*** – Examine and revise zoning and building codes for greater resilience, stormwater management, and grey water use. ***Workforce Development*** – Create a green infrastructure training and certificate program. Require, through MS4 permits and procurement processes, the use of certified contractors. Align existing workforce training programs with certification. ***Information & Data*** – Update Bulletin 70 "Frequency Distributions and Hydroclimatic Characteristics of Heavy Rainstorms in Illinois" to represent current rainfall frequency. ***Modeling*** – Improve and update regional climate projection models. ***Capacity & Network Building*** – Establish statewide Regional Resilience Partnerships. ***Scaling*** – Create mechanisms for scaling successful projects to communities across the region and State. ***Metrics*** – Develop local, regional, and State indicators to measure success. ***Monitoring & Evaluation*** – Monitor local demonstration projects to determine effectiveness and inform replicability and scalability. ***Financing*** – Conduct or commission an assessment of optimal revenue generation options for long-term investment in stormwater infrastructure, operations, and maintenance. ***Outreach*** – Coordinate to co-brand an outreach campaign and possibly shared website.

CMAP also commits to regional resilience planning. In the Phase 1 application, CMAP committed to integrating climate considerations in its Local Technical Assistance (LTA) projects through climate vulnerability assessments and recommendations. Cook County is supporting CMAP's LTA program via its CDBG-DR funding in the amount of $250,000 over the next 3 years, starting in July, 2015. Already, CMAP has initiated three projects that incorporate more advanced analytical techniques and robust recommendations for stormwater management, capital improvements, and comprehensive planning. These projects cover 59,380 residents across three

municipalities in Cook County. CMAP has recommended the initiation of five additional projects impacting over 130,000 residents for the upcoming year that will also likely include a significant stormwater resilience aspect (pending approval from CMAP's Board). CMAP has also applied for $900,000 to pursue climate assessments through two grants from NOAA. *Category:* Plan alignment. *Metric:* At least four LTA projects per calendar year account for climate change. *Baseline:* 0 – no prior plans developed account for climate change. *Timeline:* N/A – already underway.

CMAP is linking the Partnership's work with its process to develop a new regional comprehensive plan. The planning process began in July 2015 and will occur over three years to provide recommendations for the region on land use, transportation, environmental, economic development, and governance issues. This effort includes development of a regional resilience strategy, which is expected to be a significant issue covered in the plan. The regional resilience strategy largely builds upon the collective efforts of the Partnership by: 1) Fostering multi-jurisdictional collaboration by engaging other jurisdictions in the Chicago area not eligible for the NDRC; 2) Ensuring that the Partnership's long-term ideas can be achieved beyond the time-frame of the CDBG-NDR; and 3) Incorporating the shared resilience vision and innovative strategies into a formal, region-wide plan that covers planning issues for communities, economies, infrastructure systems, and ecosystems. CMAP has established a cross-sectional resource group to guide regional resilience strategy which includes representatives from the Partnership and experts from public health, philanthropy, transportation, emergency management, stormwater, utility companies, land management, and environmental justice community-based organizations. Ultimately, the regional comprehensive plan will provide a framework for CMAP and its partners (including members of the Partnership) to implement resilience policies and programs in a concerted, strategic manner.

State Commitments: In Phase 1, the State committed to the passage of Urban Flooding Awareness Act. This occurred in August, 2014, and corresponding recommendations were published in June

2015. In response, the Illinois Department of Natural Resources (IDNR) completed and released a model stormwater management ordinance for communities. IDNR is working on additional recommendations: appropriation of expenditures of state revolving funds for stormwater measures and coordination of mitigation programs through the Illinois Mitigation Advisory Group. IDNR also committed to expand the implementation of a GIS database of flood hazard risk for structures located within or near a floodplain. *Category:* Lessons learned. *Metric:* Assess all 1,000 structures. *Baseline:* Data does not currently exist. *Timeline:* Underway. Finally, the Illinois Environmental Protection Agency (IEPA) committed to make low interest financing available through its Clean Water State Revolving Fund (CWSRF) for urban stormwater, green infrastructure, and water efficiency. *Category:* Financing. *Metric:* Funded projects to support green infrastructure. *Baseline:* 0 – no CWSRF funding can be used for green infrastructure currently. *Timeline:* Underway.

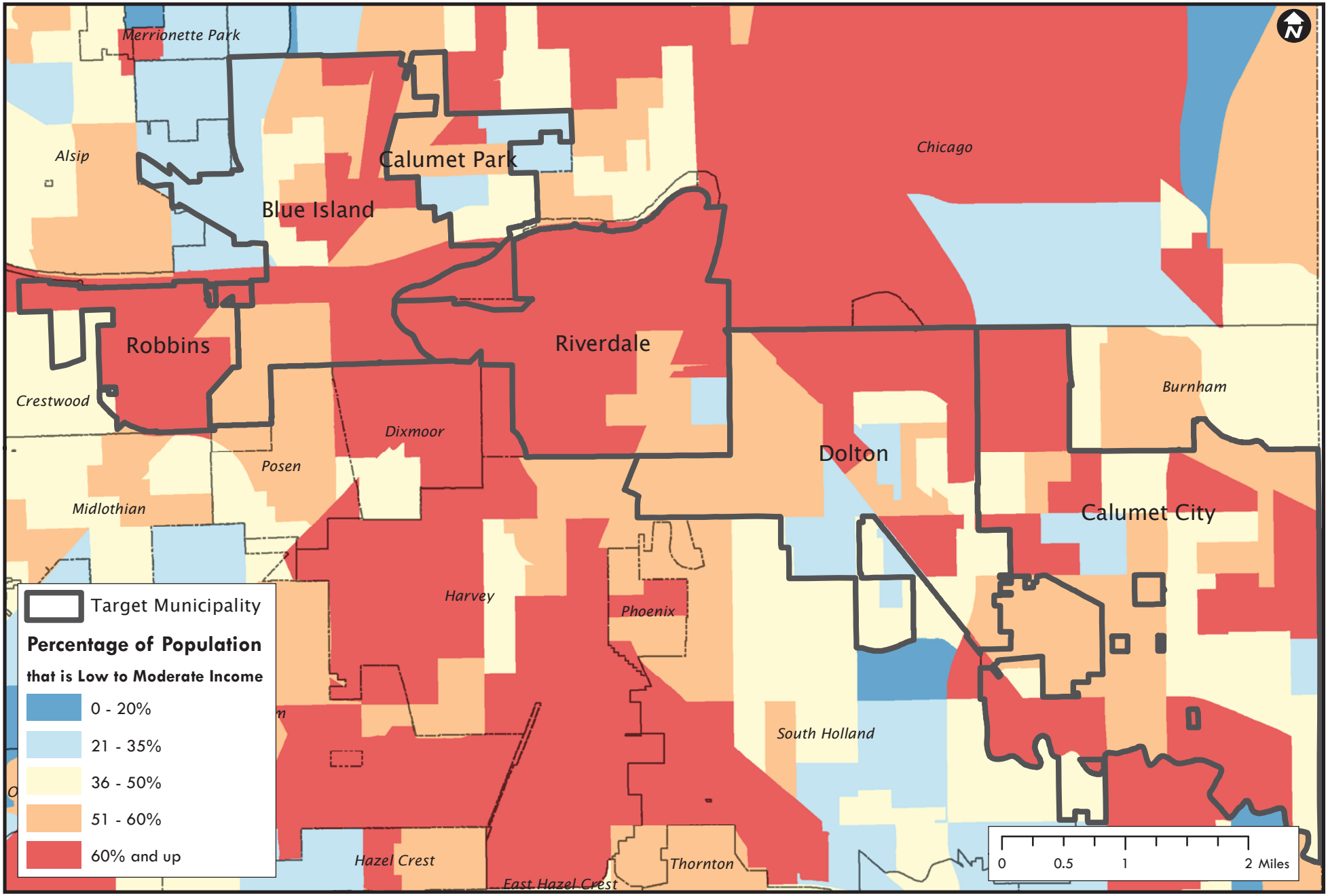
The State now commits to updating Bulletin 70 rainfall values for all new floodplain mapping studies and for the design of water-handling structures. *Category:* Lessons learned / plan updates. *Metric:* Update all rainfall values statewide. *Baseline:* N/A. *Timeline:* Completed by December 2018. The State will lead collaboration with the Prairie Research Institute of the University of Illinois to identify metrics to evaluate the progress for all of the target communities and regional actions set forth by the Partnership. Category: *Lessons learned. Metric:* Complete set of metrics development. *Baseline:* N/A. *Timeline:* Completed by December 2016. Finally, the Partnership is the first and model partnership of two others that will form across the State. The State will be an integral part in ensuring that policies, programs, and commitments to support resilience are scaled Statewide. *Category:* Lessons learned. *Metric:* Two additional Resilience Partnerships statewide. *Baseline:* 0. *Timeline:* To be completed by December 2017. Please see Attachment A – Partner Documentation for a firm commitment from the State for the commitments described in this section.

Attachment E – Maps and Drawings

Cook County, Illinois

Figure A

Cook County Target Area
for National Disaster Resilience Competition, 2015



Map prepared on Oct. 16, 2015; Department of Geographic Information Systems, Cook County Bureau of Technology; cook_disastrRslnceLowMod_2015.pdf;

Figure B

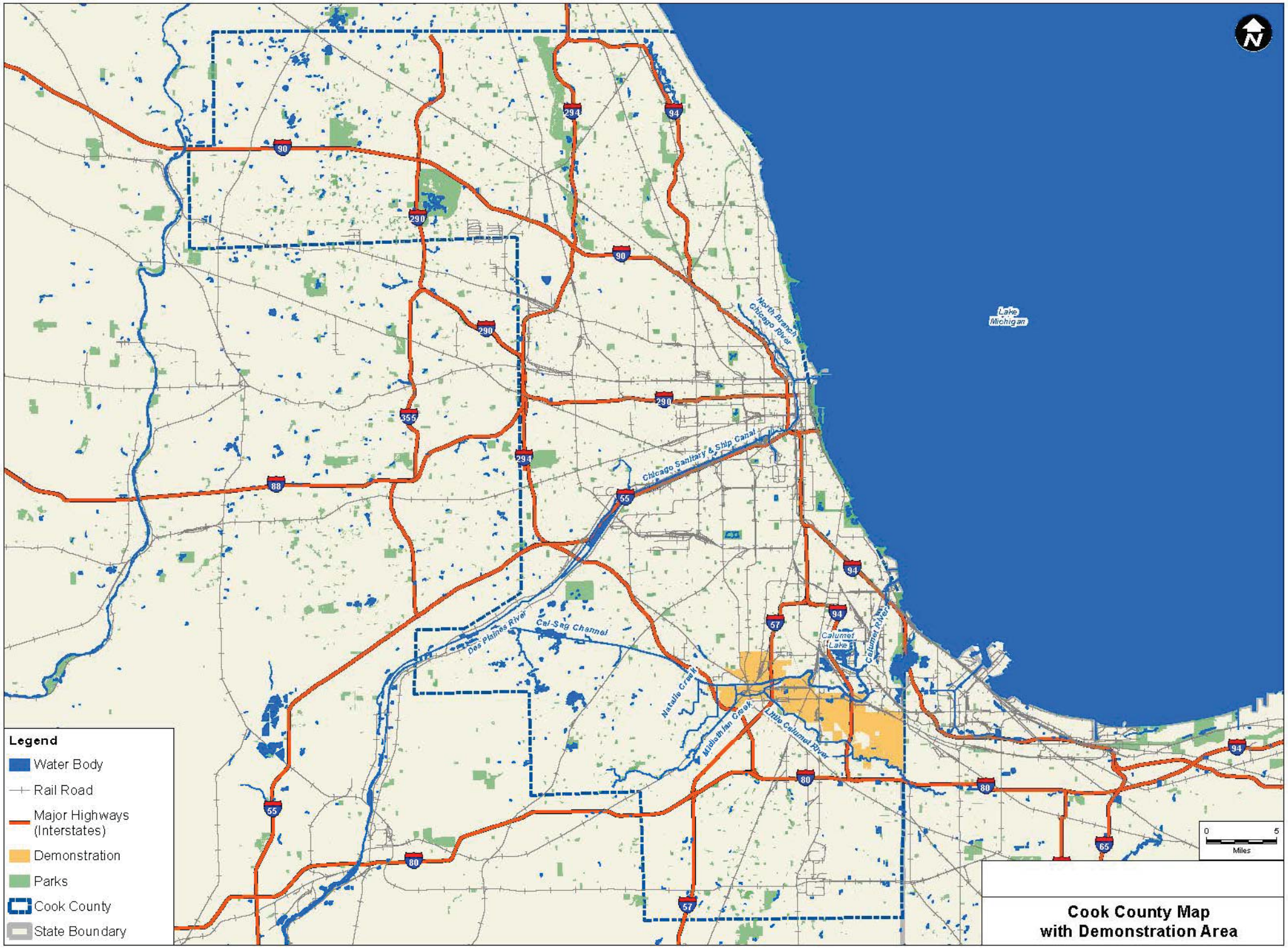

Legend
Water Body
Rail Road
Major Highways (Interstates)
Demonstration
Parks
Cook County
State Boundary
Lake Michigan
North Branch Chicago River
Chicago Sanitary & Ship Canal
Des Plaines River
Cal-Sag Channel
Natalie Creek
Midlothian Creek
Little Calumet River
Calumet Lake
Calumet River
0
5
Miles
Cook County Map
with Demonstration Area

Figure C

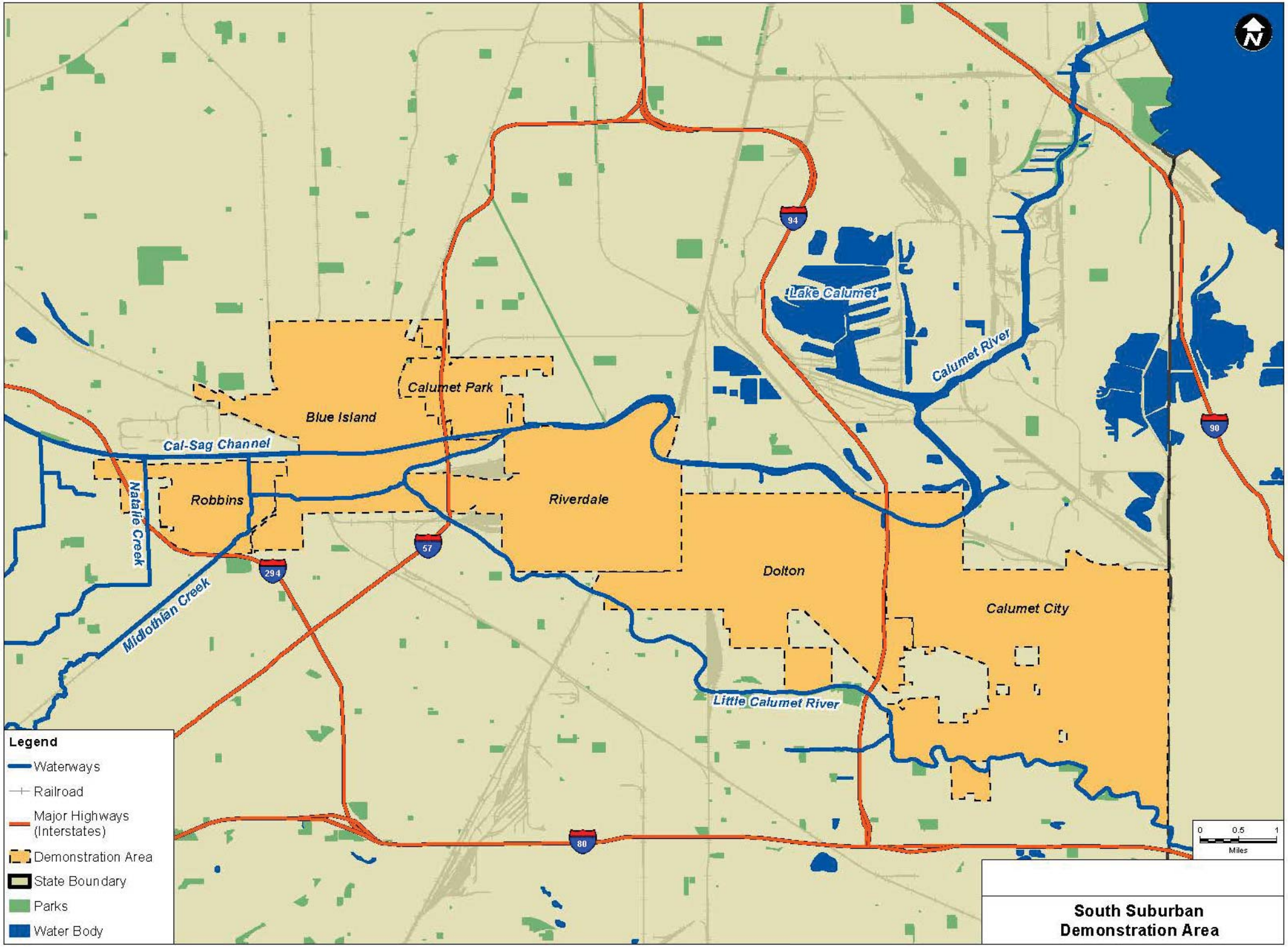

Lake Calumet
Calumet River
Calumet Park
Blue Island
Cal-Sag Channel
Robbins
Natalie Creek
Riverdale
Dolton
Calumet City
Midlothian Creek
Little Calumet River
94
90
57
294
80
Legend
Waterways
Railroad
Major Highways (Interstates)
Demonstration Area
State Boundary
Parks
Water Body
0 0.5 1
Miles
South Suburban Demonstration Area

Figure D

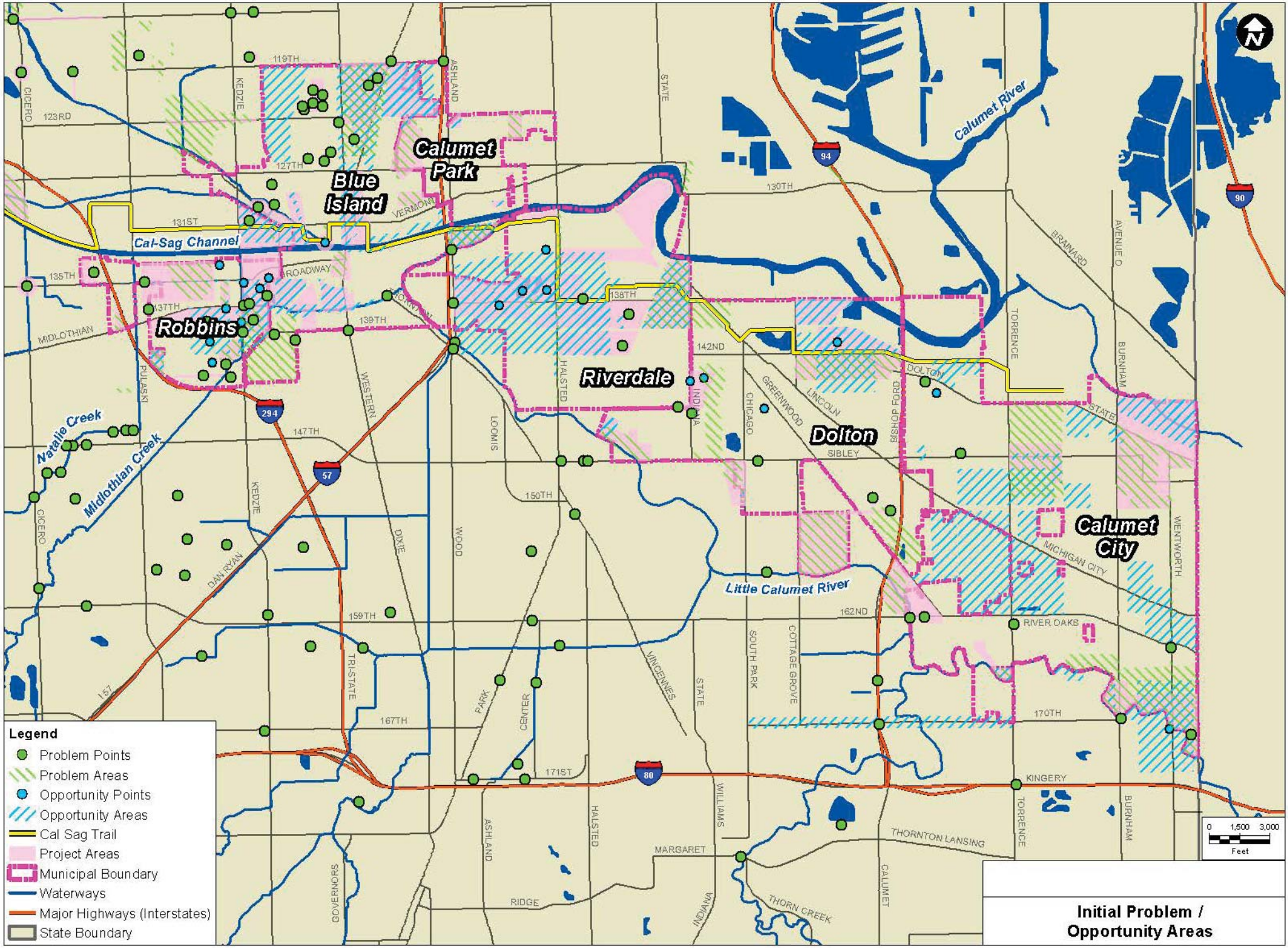

Calumet Park
Blue Island
Robbins
Riverdale
Dolton
Calumet City
Cal-Sag Channel
Calumet River
Little Calumet River
Natalie Creek
Midlothian Creek
119TH
123RD
127TH
131ST
135TH
137TH
139TH
142ND
147TH
150TH
159TH
162ND
167TH
171ST
170TH
KINGERY
MARGARET
RIDGE
THORNTON LANSING
THORN CREEK
RIVER OAKS
MICHIGAN CITY
SIBLEY
DOLTON
VERMONT
BROADWAY
MIDLOTHIAN
CICERO
KEDZIE
PULASKI
WESTERN
ASHLAND
HALSTED
STATE
INDIANA
CHICAGO
GREENWOOD
LINCOLN
BISHOP FORD
TORRENCE
BURNHAM
AVENUE O
BRAINARD
LOOMIS
DIXIE
WOOD
DAN RYAN
TRI-STATE
PARK
CENTER
VINCENNES
SOUTH PARK
COTTAGE GROVE
WILLIAMS
CALUMET
GOVERNORS
WENTWORTH
94
90
294
57
80
I-57
N
0 1,500 3,000
Feet
Legend
Problem Points
Problem Areas
Opportunity Points
Opportunity Areas
Cal Sag Trail
Project Areas
Municipal Boundary
Waterways
Major Highways (Interstates)
State Boundary
Initial Problem / Opportunity Areas

Figure E

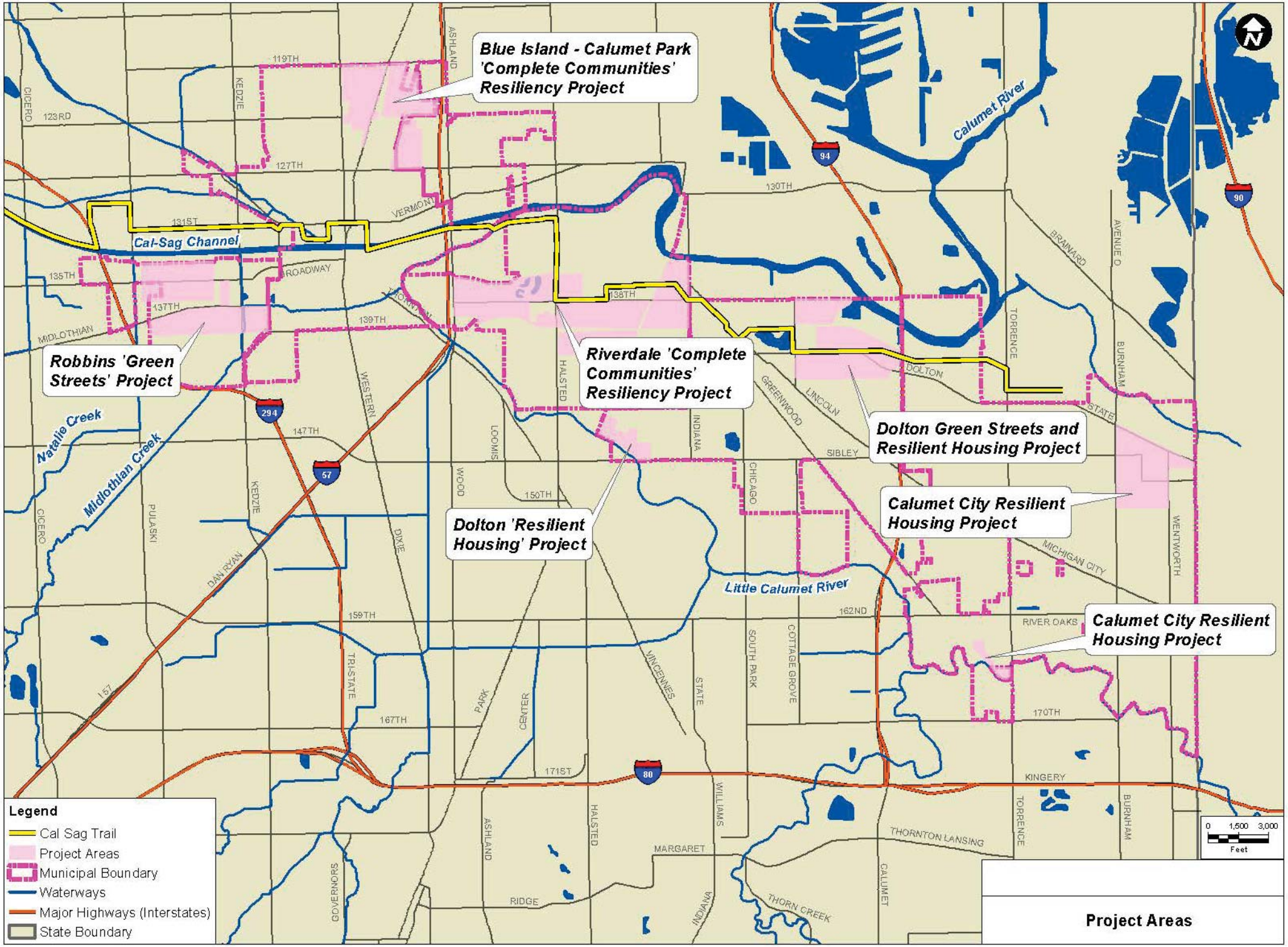
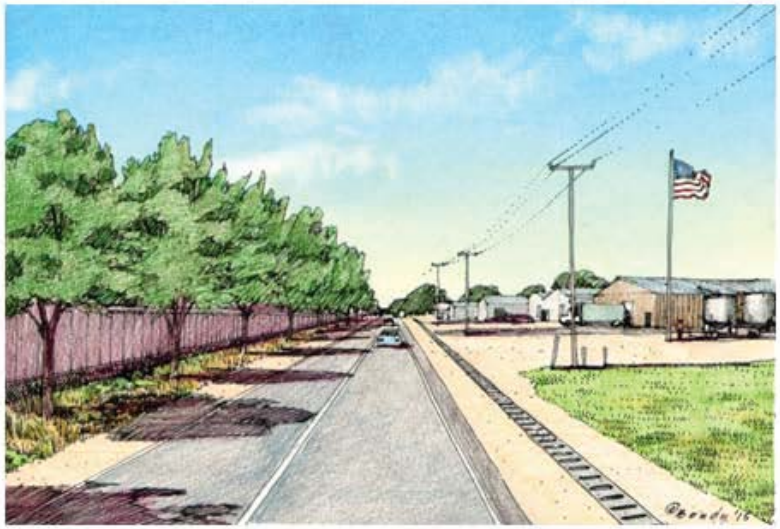

Blue Island - Calumet Park 'Complete Communities' Resiliency Project
Robbins 'Green Streets' Project
Riverdale 'Complete Communities' Resiliency Project
Dolton Green Streets and Resilient Housing Project
Calumet City Resilient Housing Project
Dolton 'Resilient Housing' Project
Calumet City Resilient Housing Project
Cal-Sag Channel
Calumet River
Little Calumet River
Natalie Creek
Midlothian Creek
Legend
Cal Sag Trail
Project Areas
Municipal Boundary
Waterways
Major Highways (Interstates)
State Boundary
0 1,500 3,000
Feet
Project Areas

Figure F

Example Resiliency Renderings

Right-of-Way Bioswale and Bikeway/Pedway in Commercial Area



Tree Trench and Underground Storage in Industrial Area

Right-of-Way Bioswale, Tree Trench, Permeable Pavers, Green Roofs and Cisterns in Commercial Area

Right-of-Way Bioswale, Permeable Pavers, and Underground Storage in Residentiall Area

Figure G

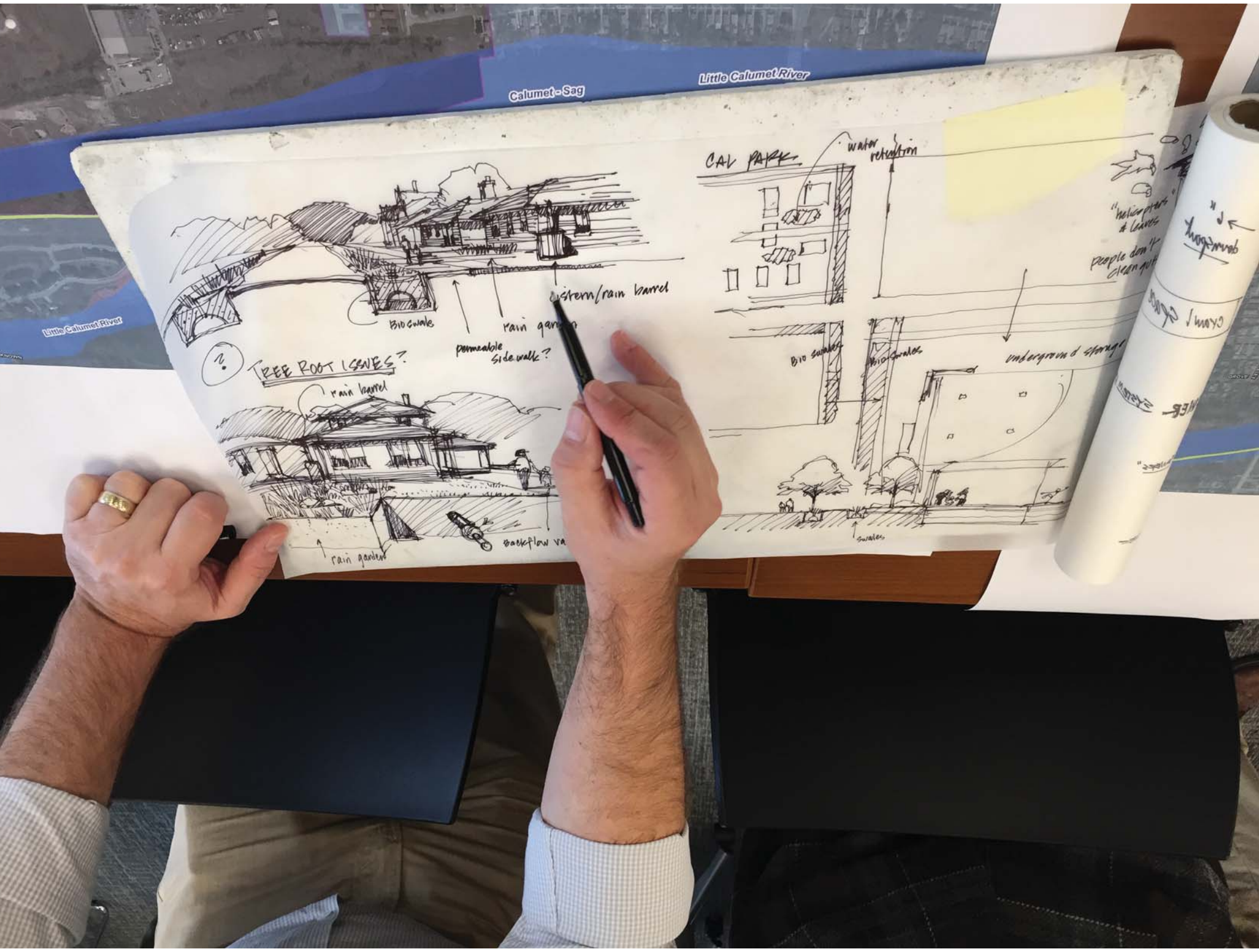

Calumet - Sag
Little Calumet River
Little Calumet River
CAL PARK
water retention
Bioswale
rain garden
permeable sidewalk?
cistern/rain barrel
TREE ROOT ISSUES?
rain barrel
rain garden
backflow va
Bio swales
underground storage
swales

Figure H

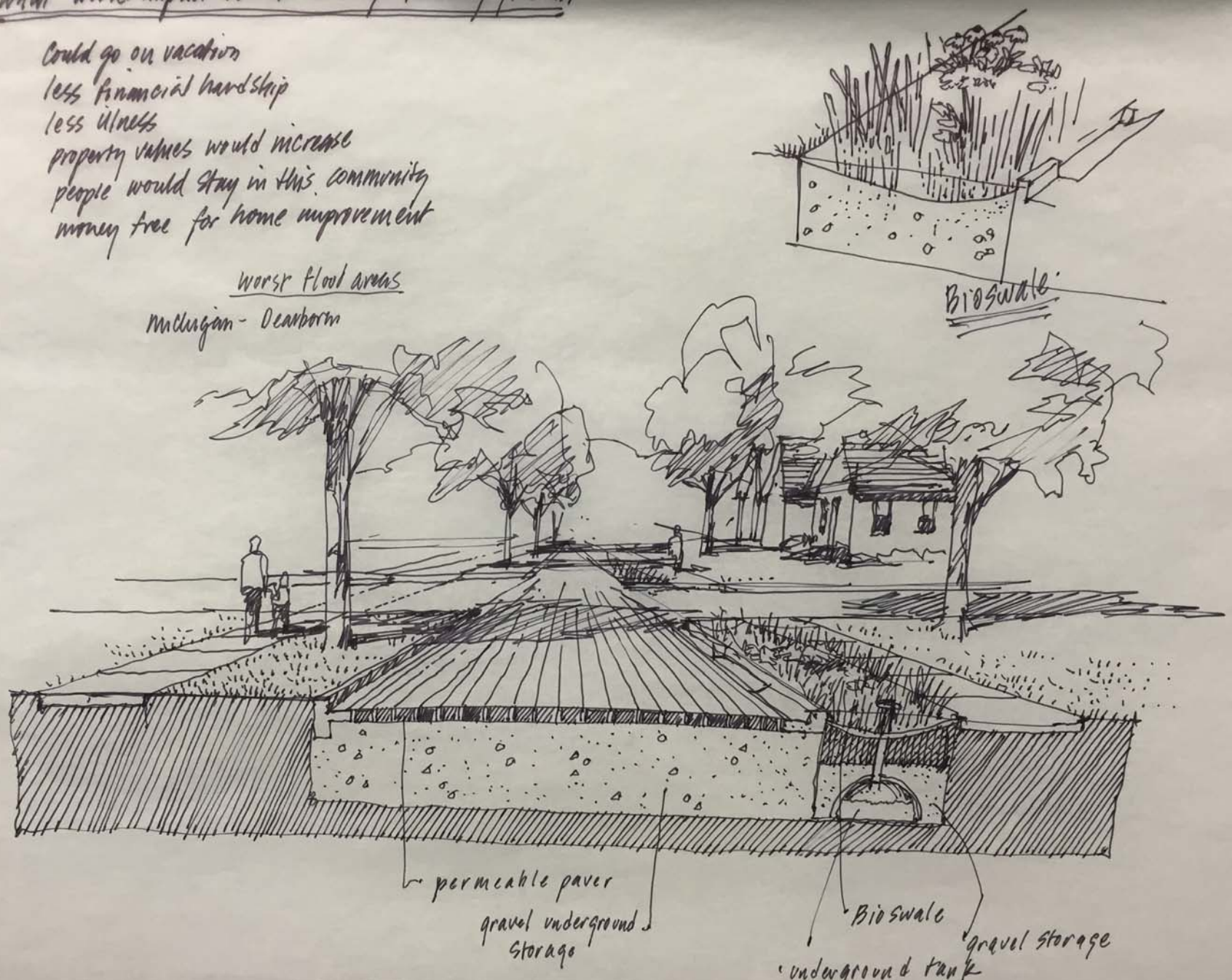
2015

what would impact be of solving flooding problem?

Could go on vacation
less financial hardship
less illness
property values would increase
people would stay in this community
money free for home improvement

worst flood areas

McClugan - Dearborn



tions"

Figure I


rooftop green gardens
Jobs
Tree wells
Green Roof in Commercial Buildings
water storage under metro Gradrin ?
Green Roof
bioswales
water flow

Figure J

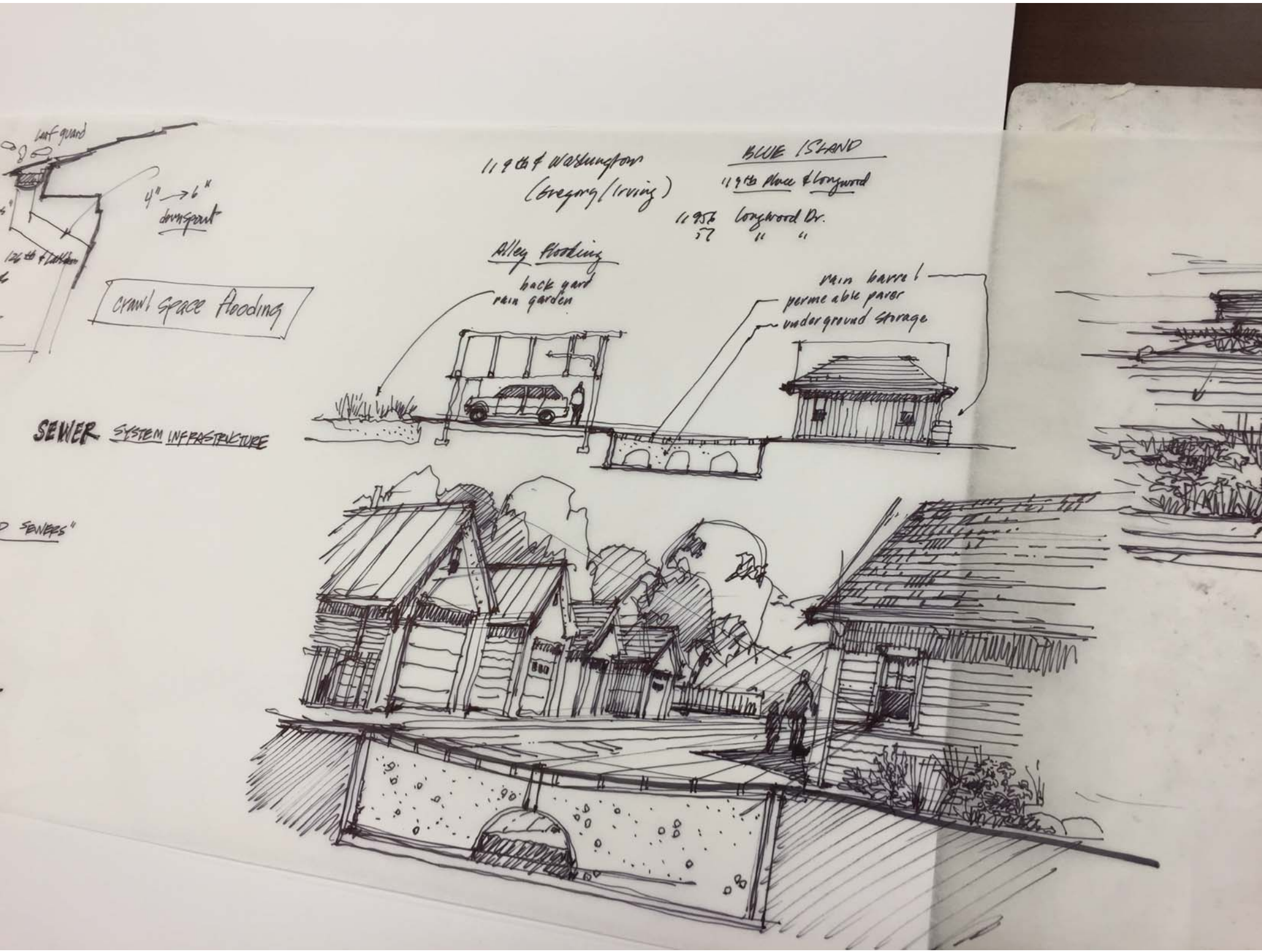
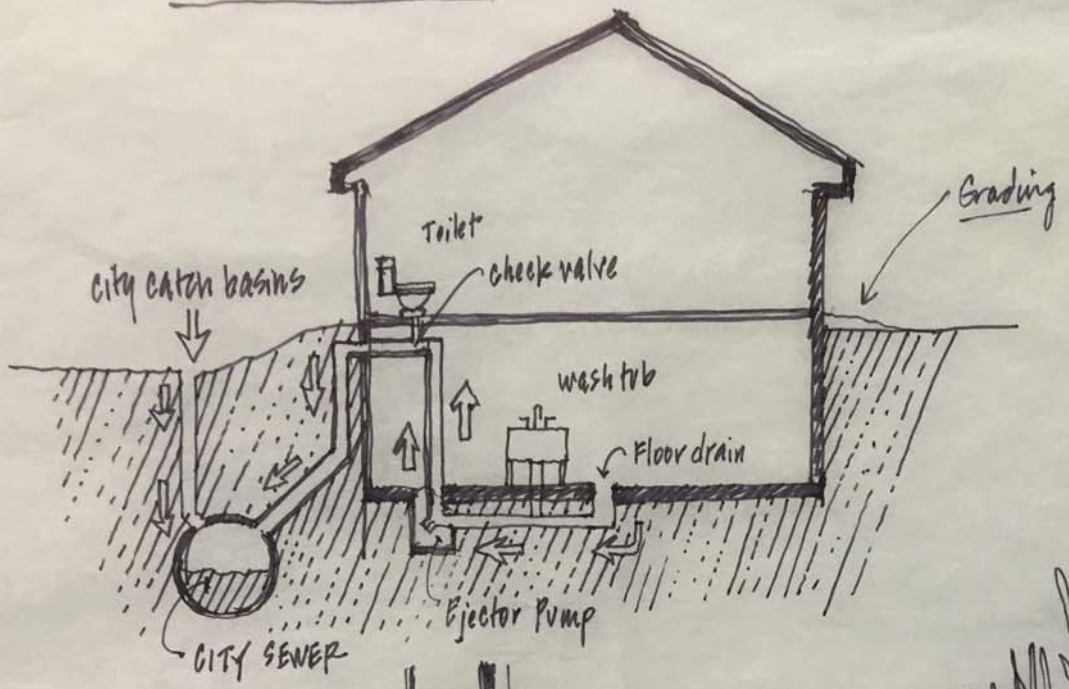
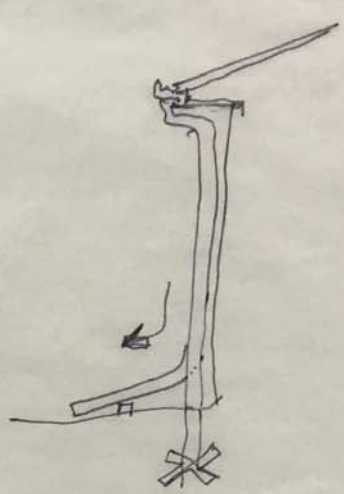
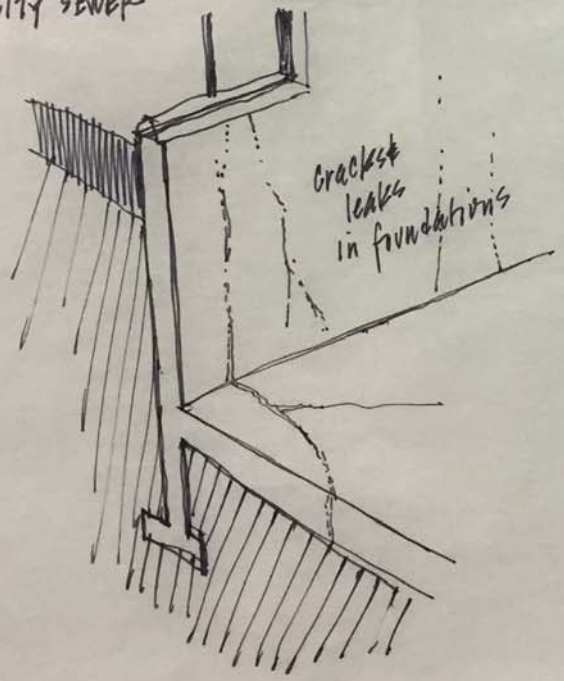

leaf guard
4" → 6"
downspout
crawl space flooding
SEWER SYSTEM INFRASTRUCTURE
SEWERS"
11 9th & Washington
(Gregory/Irving)
BLUE ISLAND
11 9th Place & Longwood
11 95th Longwood Dr.
" "
Alley flooding
back yard
rain garden
rain barrel
permeable paver
underground storage

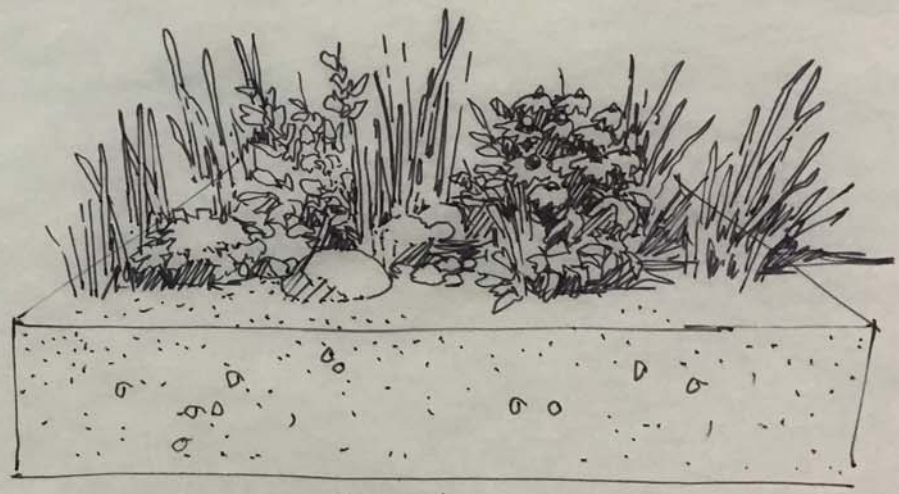
Figure K

OVERHEAD SEWER









Rain garden

Figure L

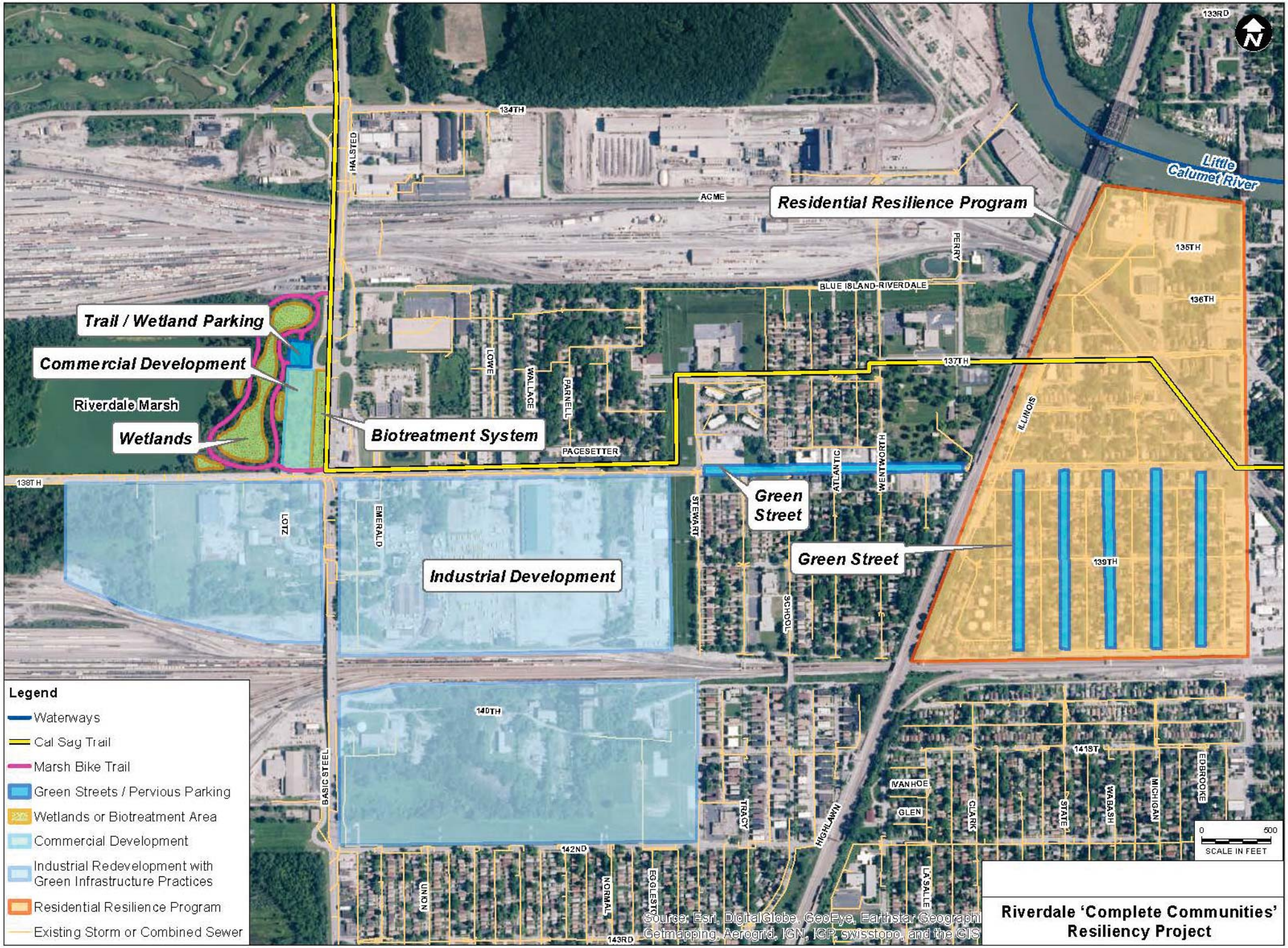

Trail / Wetland Parking
Commercial Development
Riverdale Marsh
Wetlands
Biotreatment System
Residential Resilience Program
Green Street
Green Street
Industrial Development
Little Calumet River
133RD
134TH
135TH
136TH
137TH
138TH
139TH
140TH
141ST
142ND
143RD
HALSTED
ACME
PERRY
BLUE ISLAND-RIVERDALE
LOWE
WALLACE
PARNELL
PACESETTER
ILLINOIS
ATLANTIC
WENTWORTH
STEWART
SCHOOL
LOTZ
EMERALD
BASIC STEEL
TRACY
HIGHLAWN
VANHOE
GLEN
CLARK
STATE
WABASH
MICHIGAN
EDBROOKE
UNION
NORMAL
EGGLESTON
LASALLE
Legend
Waterways
Cal Sag Trail
Marsh Bike Trail
Green Streets / Pervious Parking
Wetlands or Biotreatment Area
Commercial Development
Industrial Redevelopment with Green Infrastructure Practices
Residential Resilience Program
Existing Storm or Combined Sewer
0
500
SCALE IN FEET
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographi
Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS
Riverdale 'Complete Communities' Resiliency Project

Figure M

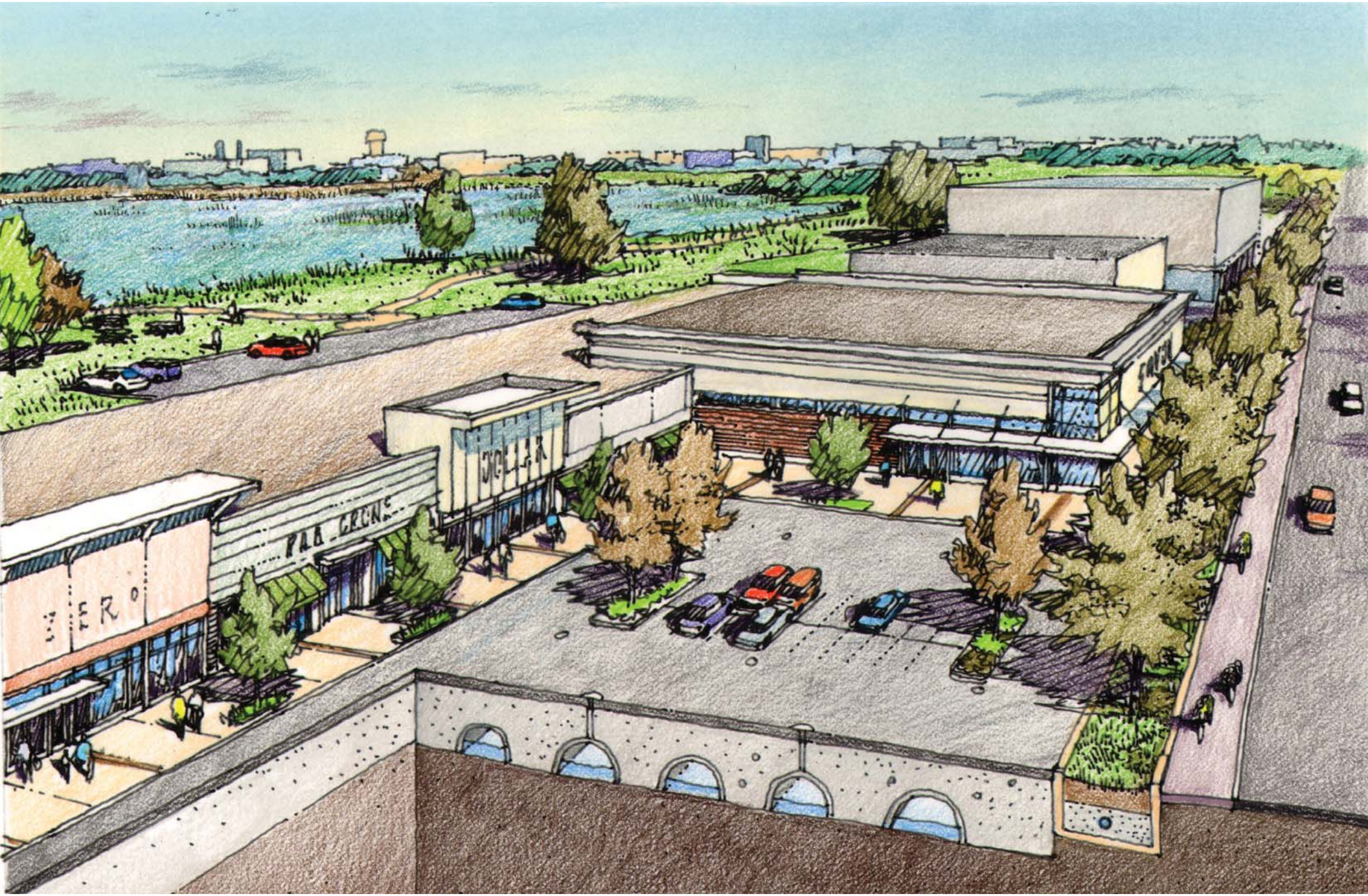


Figure O


24 ft
Gravel
Gallery
6 ft
Gravel
Gallery

Figure P


Residential Resilience Program
Green Street
Green Alley
Relief Sewer
Stormwater Bumpout
Rain Gardens
Relief Sewer
Commercial / Industrial Redevelopment
Green Streets
MAPLEWOOD
CAMPBELL
OAKLEY
BELL
HALE
WATKINS
119TH
120TH
121ST
122ND
123RD
124TH
125TH
126TH
ARTESIAN
Western
ANN
GREGORY
IRVING
LONGWOOD
DIVISION
PAULINA
GREENWOOD
MAPLE
GRUNEWALD
ORCHARD
KRUEGER
COLLINS
COCHRAN
FLORENCE
VERNON
Wincanton
OLIVE
DAVIS
PRAIRIE
HOYNE
PAGE
WINCHESTER
LINCOLN
HONORE
WOOD
MARSHFIELD
INTERSTATE 57
JUSTINE
LAFLIN
BISHOP
ADA
LOOMIS
Legend
Relief Sewer
Stormwater Bumpout
Green Streets /
Rain Garden
Commercial / Industrial Redevelopment
Residential Reslience Program
Existing Storm or Combined Sewer
0 250 500
SCALE IN FEET
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographi
Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS
Blue Island-Calumet Park 'Complete Communities' Resiliency Project

Figure R

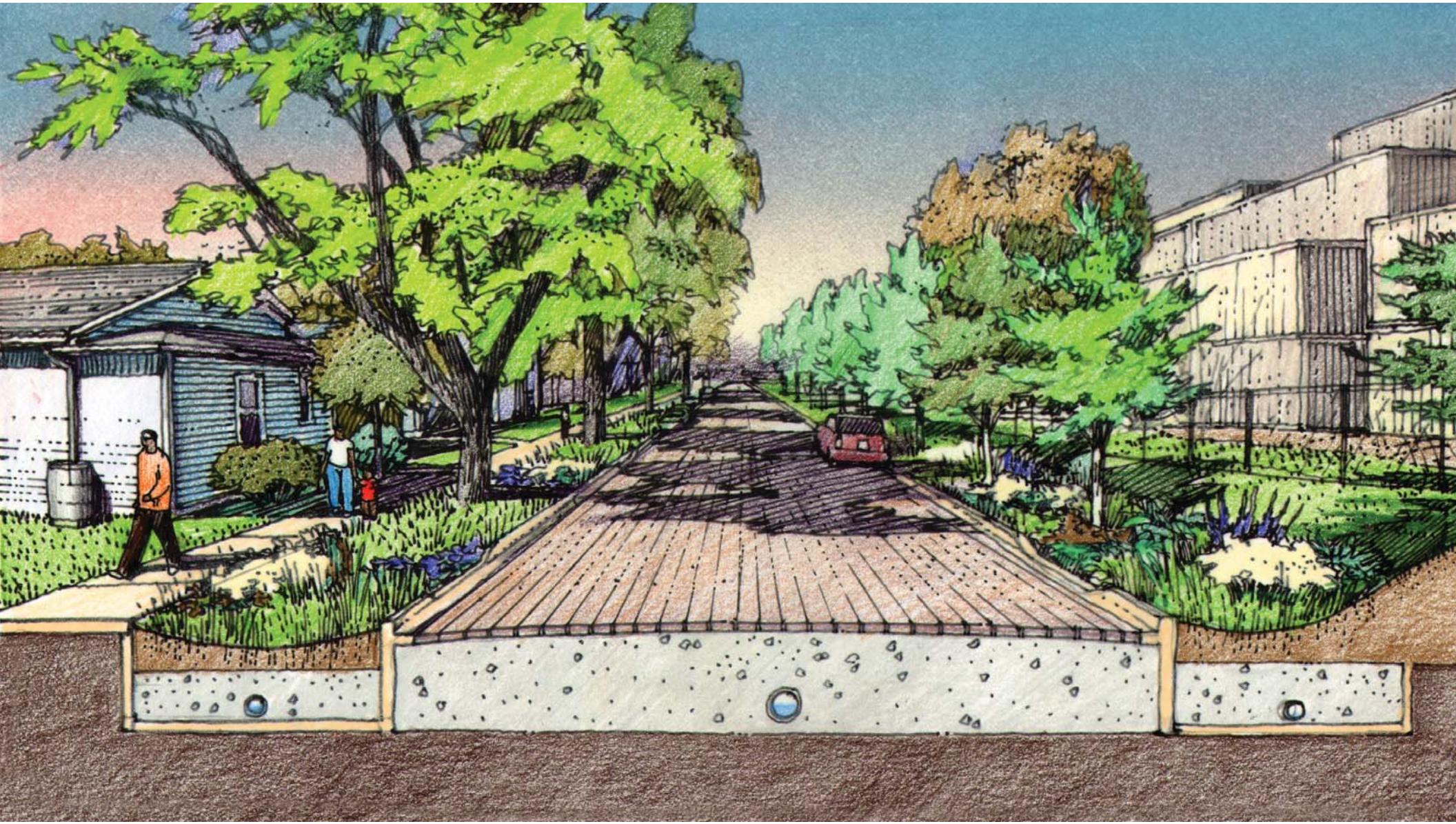


Figure S

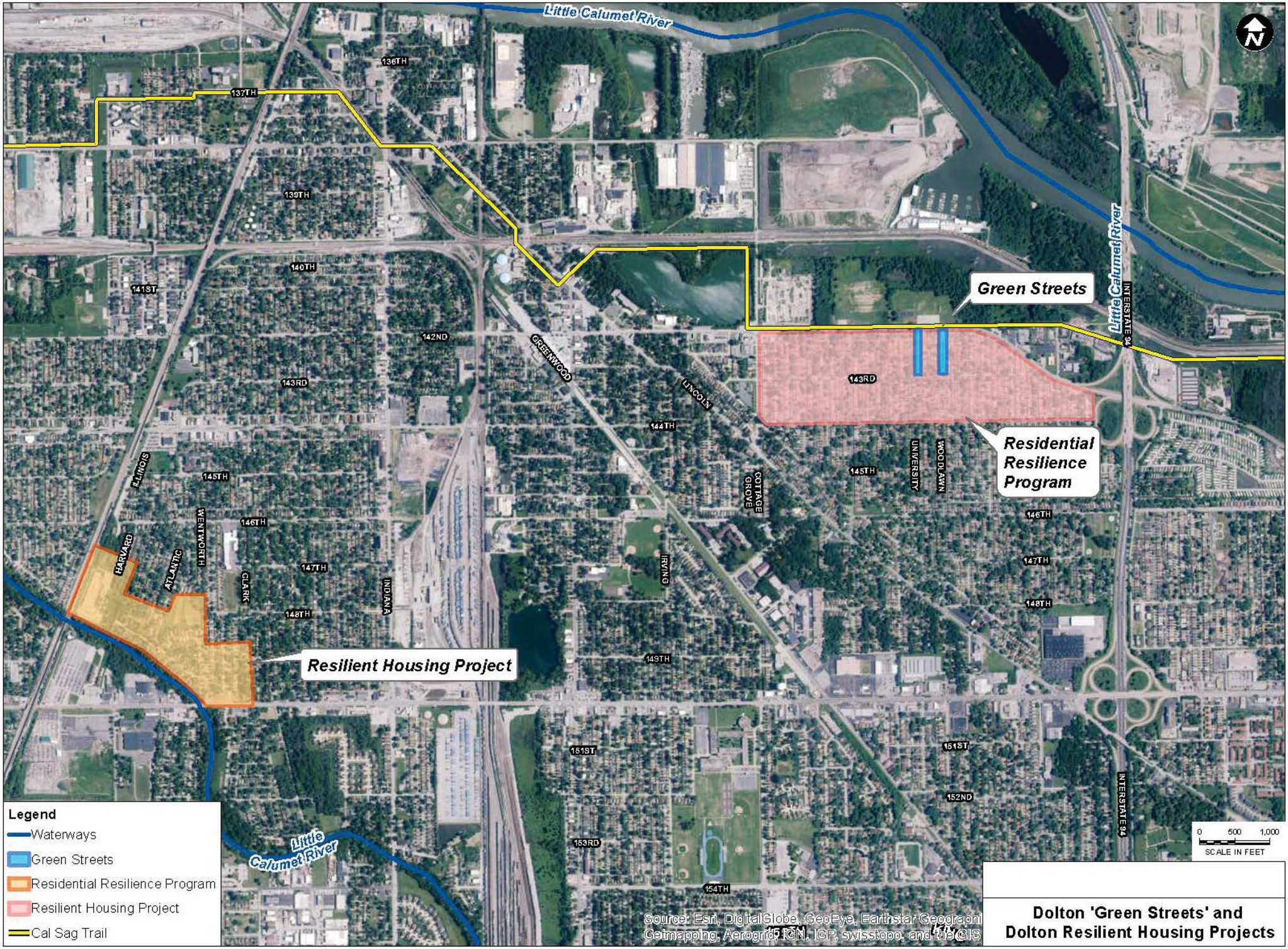

Little Calumet River
136TH
137TH
139TH
140TH
141ST
142ND
143RD
144TH
145TH
146TH
147TH
148TH
149TH
151ST
152ND
153RD
154TH
GREENWOOD
LINCOLN
ILLINOIS
WENTWORTH
HARVARD
ATLANTIC
CLARK
INDIANA
IRVING
COTTAGE GROVE
UNIVERSITY
WOODLAWN
INTERSTATE 94
Green Streets
Residential Resilience Program
Resilient Housing Project
Legend
Waterways
Green Streets
Residential Resilience Program
Resilient Housing Project
Cal Sag Trail
0 500 1,000
SCALE IN FEET
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographi
Geimapping, Aerogrid, IGN, IGP, swisstopo, and the GIS
Dolton 'Green Streets' and
Dolton Resilient Housing Projects

Figure T


Midlothian Conduit
Existing 48" Bypass Conduit
48" Dia Conduit
Midlothian Creek
137TH
18.84 ac-ft Storage
HOMAN
CLAIRE
7'x5' Box Culvert
KEDZIE
SPAULDING
Troy Ave
Albany Ave
Utica Ave
SACRAMENTO
Green Streets (1 of 3)
Channel Improvements
Flood Wall
139TH
LYDIA
COOPERS GROVE
N
0
250
SCALE IN FEET
Legend
Midlothian Creek Improvements
Green Streets Project
Waterways
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographi
Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS
Robbins
Green Streets Project

Figure U


© BONDY STUDIO 15

Figure V

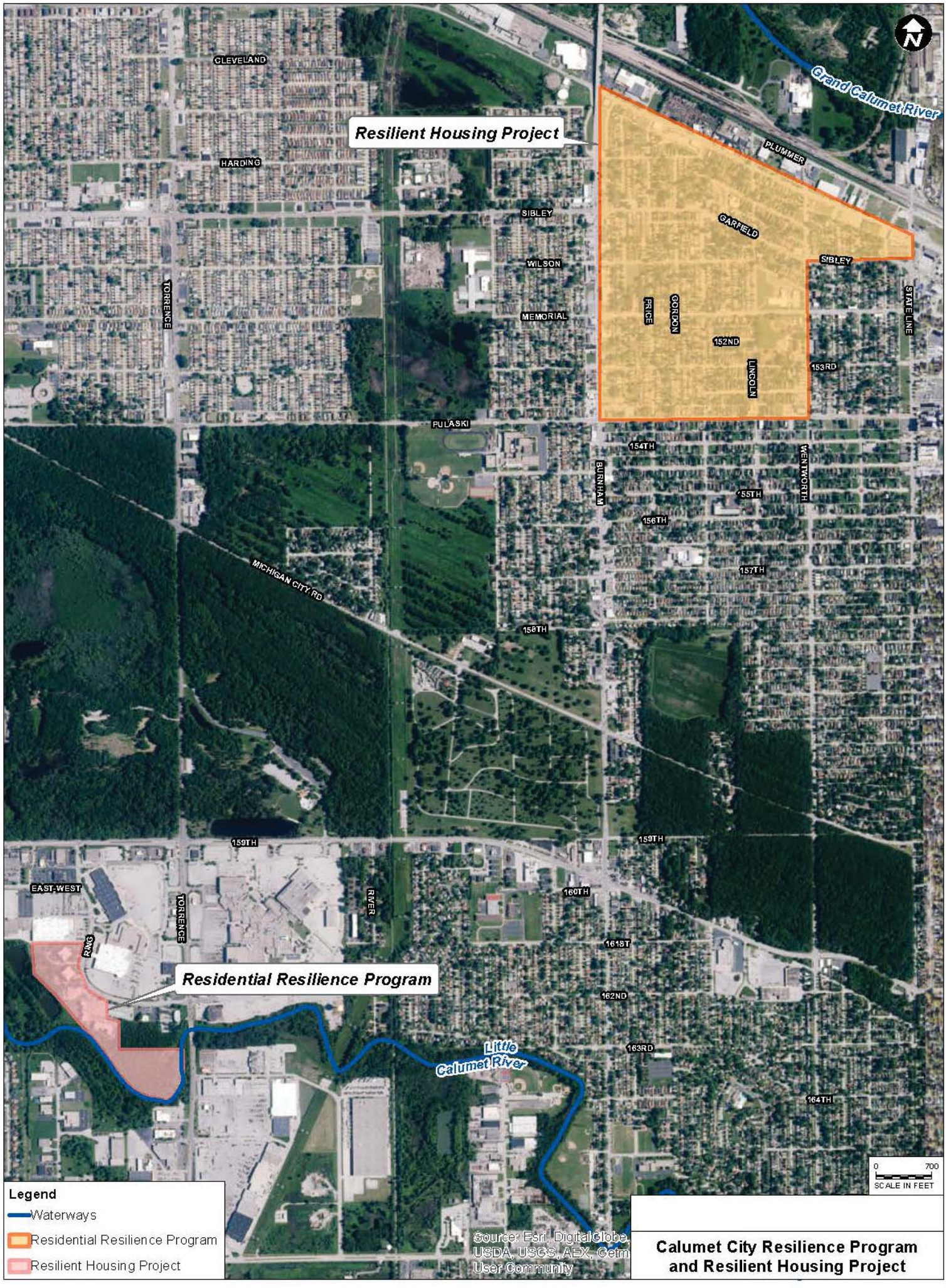
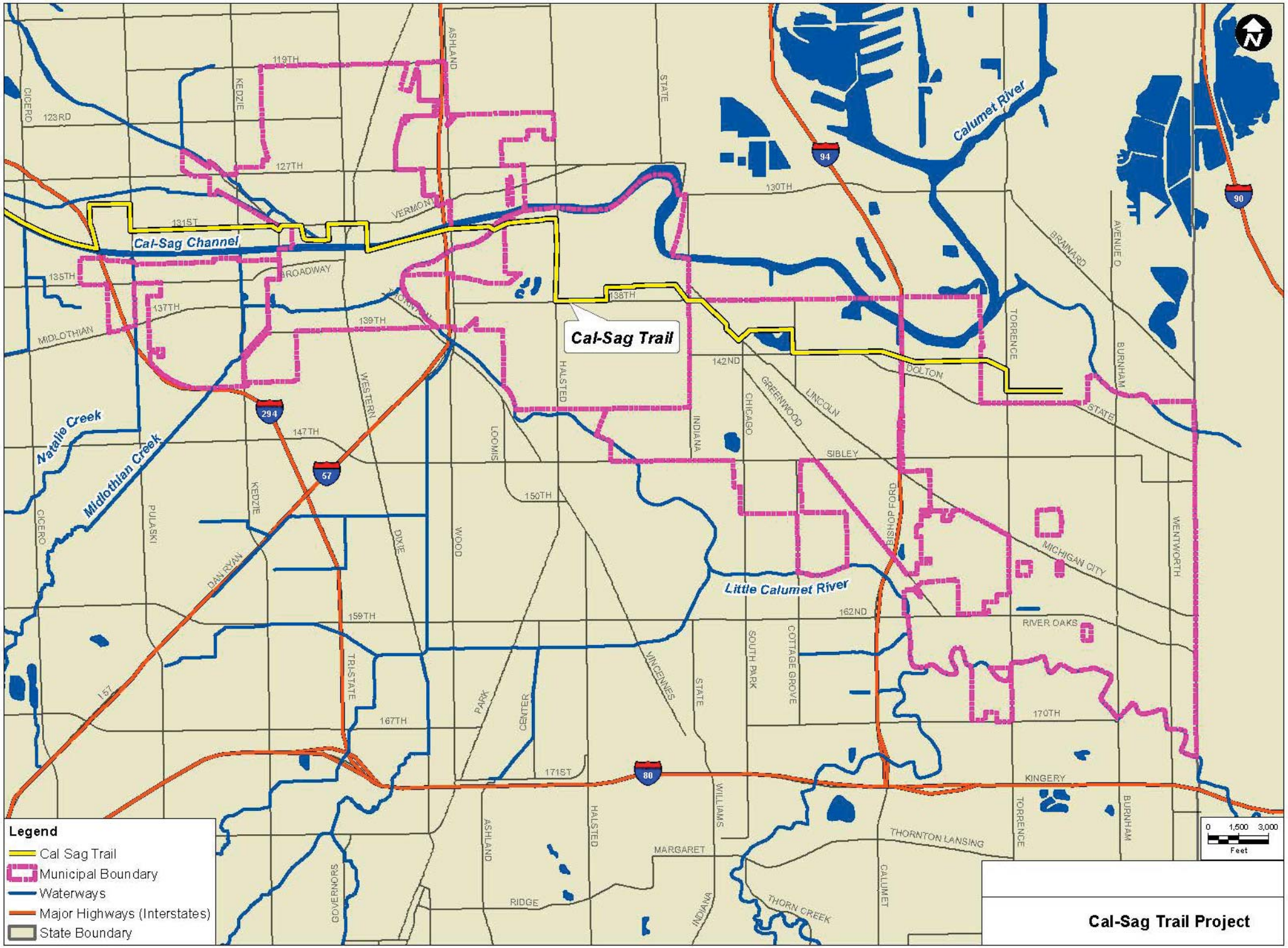

Resilient Housing Project
Residential Resilience Program
Grand Calumet River
Little Calumet River
CLEVELAND
HARDING
SIBLEY
WILSON
MEMORIAL
TORRENCE
PULASKI
PLUMMER
GARFIELD
SIBLEY
PRICE
GORDON
152ND
LINCOLN
153RD
STATE LINE
154TH
BURNHAM
WENTWORTH
155TH
156TH
157TH
MICHIGAN CITY RD
158TH
159TH
159TH
EAST-WEST
TORRENCE
RIVER
160TH
161ST
162ND
163RD
164TH
0
700
SCALE IN FEET
Legend
Waterways
Residential Resilience Program
Resilient Housing Project
Source: Esri, DigitalGlobe, USDA, USGS, AEX, Getm User Community
Calumet City Resilience Program and Resilient Housing Project

Figure W

Figure X


Cal-Sag Trail
Cal-Sag Channel
Calumet River
Little Calumet River
Natalie Creek
Midlothian Creek
119TH
123RD
127TH
131ST
135TH
137TH
138TH
139TH
142ND
147TH
150TH
159TH
162ND
167TH
170TH
171ST
CICERO
KEDZIE
ASHLAND
STATE
VERMONT
BROADWAY
MIDLOTHIAN
WESTERN
HALSTED
INDIANA
CHICAGO
GREENWOOD
LINCOLN
DOLTON
SIBLEY
TORRENCE
BRAINARD
AVENUE O
BURNHAM
LOOMIS
WOOD
DIXIE
PULASKI
DAN RYAN
TRI-STATE
PARK
CENTER
VINCENNES
SOUTH PARK
COTTAGE GROVE
BISHOP FORD
MICHIGAN CITY
WENTWORTH
RIVER OAKS
KINGERY
WILLIAMS
MARGARET
RIDGE
GOVERNORS
THORNTON LANSING
THORN CREEK
CALUMET
94
90
294
57
80
157
N
0 1,500 3,000
Feet
Legend
Cal Sag Trail
Municipal Boundary
Waterways
Major Highways (Interstates)
State Boundary
Cal-Sag Trail Project

ATTACHMENT F: BENEFIT COST ANALYSIS

Overview

This section provides an overview of the purpose of the BCA, the approach taken to conduct the analysis, and presents analysis results. Phase 2 applicants pursuing funding for covered projects through HUD's National Disaster Resilience Competition (NDRC) must complete a comprehensive benefit cost analysis (BCA). The BCA must consider economic, environmental, social, and resiliency factors to ensure that project benefits outweigh the costs. The results of the BCA alone are not cause to reject or approve a proposal. For the purposes of this grant competition, HUD recognizes that soundness of approach includes fundamental project elements such as feasibility, replicability, public desirability, meeting unmet needs, reducing risk, and improving resiliency. The value of the project will increase as it prevents future loss time and time again.

Cook County's demonstration area has suffered through many flooding events, in addition to the qualifying 2013 event (DR-4116), that have caused widespread damage from basement backups and overland flooding. Resiliency efforts proposed by the County are focused on two primary activities: a set of five proposed Complete Communities Projects in discrete geographic areas and a proposed Single-Family Rehab Program throughout the demonstration area.

Complete Communities are projects that encompass three primary building blocks fundamental to long term resiliency within the demonstration area: flooding mitigation, economic redevelopment, and community enhancement. Five individual projects are proposed within this activity and are identified by the community in which they are located, and function primarily at the community level. Three projects, those in Riverdale, Blue Island - Calumet Park, and Robbins, include all of the primary elements mentioned above. Two projects, those in

Dolton and Calumet City, are focused on housing improvements for low to middle income residents, but include portions of the Complete Communities elements. The ***Single Family Rehab Program*** addresses flood mitigation, specifically basement backups, on an individual homeowner level. It provides a range of gray and green alternatives that provide resiliency and will minimize future damages to structures and valuables and reduce stress to residents from constant flood cleanup for events as low as a 2-year design storm. Taken together, these activities will integrate resiliency components into the urban fabric of the demonstration area by implementing and increasing protection efforts against stormwater and combined sewer related flooding and loss of affordable housing, while increasing connectivity between neighborhoods and enhancing the community landscape.

Quantified Results

The BCA considers both quantified and unquantified benefits in accordance with the NDRC NOFA Appendix H. The quantified benefits, which can be represented in monetary terms and are used to develop the benefit-cost ratio (BCR) are broadly divided into Resiliency values and Inherent values. Results are provided in three ways: annual benefits, net present value, and the BCR.

- ***Annual Benefits***: Annual benefits are the avoided damages and added benefits per year expected over the useful life of the project.
- ***Net Present Value***: In order to compare the future benefits to the current cost of a project, a discount rate, or coefficient, is applied over the life of the project to calculate the net present value of annual benefits. The present value coefficient used in this analysis is 13.80 for a 50-year project useful life. The net present value is the benefit used in the benefit-cost ratio, and once all benefits are aggregated, the project net present value is the sum of the benefits

minus the net present costs. Annual benefits and net present value are calculated for each value measure presented herein so that they may be incorporated into the benefit cost ratio.

- ***Benefit Cost Ratio***: To evaluate cost effectiveness, a project's total net benefits are divided by the total project cost, resulting in a benefit cost ratio. A project is considered to be cost-effective when the ratio is greater than or equal to 1.0, indicating that the benefits are sufficient to justify the costs.

The application in total, as shown in Table 1 below, is cost beneficial with benefits of almost $200 million compared to a total estimated cost of just over $100 million. While the Complete Communities projects in Blue Island - Calumet Park and Riverdale have BCRs well over 1.0, the remaining project areas have BCRs that range from 0.78 to 0.88. While the benefits do not match the costs for these areas, in general these communities have the most low- to moderate-income and vulnerable populations within the demonstration area. The proposed housing projects and flood mitigation efforts recommended for these communities are drastically needed and would help the long-term resiliency of these areas.

Table 1: Project Benefit-Cost Ratio Summary

Project Area	**Estimated Cost**	**Net Total Benefits[1]**	**BCR**
Blue Island - Calumet Park	$29,656,586	$77,933,822	2.63
Robbins	$4,874,838	$4,304,643	0.88
Riverdale	$15,563,260	$66,348,320	4.26
Dolton	$21,189,250	$17,980,956	0.85
Calumet City	$32,929,153	$25,840,649	0.78
TOTAL	**$104,713,087**	**$192,408,390**	**1.84**

[1] NPV coefficient for a 50 year project useful life using a 7% discount rate.

A summary of methodologies used to calculate these benefits and the associated results and uncertainty related to the analysis are provided for each project area on the following pages in Tables 2, 3, 4 and 5.

This BCA was prepared by Arcadis, a consultant to MWRD on the Stormwater Master Plan for the Little Calumet River/Calumet Sag Channel Drainage Area. Arcadis is a design firm focused on natural and built assets, and through its consultant agreement with MWRD, is providing support to Cook County for this NDRC application. The County worked with Arcadis to develop a full list of benefit categories and provided input throughout the analysis. In particular, the County provided significant input on the valuation of social value and economic revitalization.

Table 2: Blue Island - Calumet Park – Methodologies Used to Develop Benefits

Category	Identify	Quantify	Monetize	Uncertainty
Mental & Physical Health	Reduced health costs for severe and mild/moderate illnesses due to flooding of homes	Improvements will reduce doctor visits and sick days of estimated 65 households in Calumet Park and 7 in Blue Island based on number of FEMA claims	Physical health benefit valued at $2,443/year per person	4: Low Certainty
Loss of Productivity	Reduced productivity due to mental health issues from flooding	Improvements will minimize downtime due to mental health issues for an estimated 65 households in Calumet Park and 7 in Blue Island based on number of FEMA claims	Mental health benefit valued at $8,736/year per person	4: Low Certainty
Recreation	New wet ponds,	Improvements will avoid cost	Recreational benefit	3: Medium

Category	Identify	Quantify	Monetize	Uncertainty
	bike/pedestrian trails and soccer fields to provide recreational opportunities and reduce cost in health benefits	in health benefits for an estimated 918 local households	valued at $865/year per person	certainty
Aesthetics	Improved aesthetics from GI based on hedonic pricing/contingent valuation from national tax data assessor data, land cover data, flood zones, location of open spaces	Proposed development includes 8 acres of wet ponds; Phase 2 Design includes 1 acre of GI; green streets program includes 7.5 acres	Improved aesthetics from GI valued at $1,623/acre	3: Medium certainty
Property Values (Near GI)	Increased property values for homes along greens	Green streets program will provide tree trenches and	Property values expected to increase	3: Medium certainty

Category	Identify	Quantify	Monetize	Uncertainty
	streets	bioswales for 918 nearby homes	by 3.5 to 5.0% when trees and other greenery such as GI added. Home values in the project area average $128,000 for Calumet Park and $134,000 for Blue Island.	
Property Values (No Flooding)	Increased property values for homes no longer subject to flooding	MWRD Phase 2 Design, green streets and Single Family Rehab program will reduce basement backups and street flooding to an estimated 918 homes	Property values expected to increase by 2.0 to 8.0% when homes are no longer subject to flooding. Home values in the	3: Medium certainty

Category	Identify	Quantify	Monetize	Uncertainty
			project area average $128,000 for Calumet Park and $134,000 for Blue Island.	
Job Creation	New development will create permanent new job opportunities for the region	Proposed development is estimated to create 741 retail jobs (based on 846,800 sf of retail space) and 530 full-time light industrial jobs (based on 1,060,900 sf of industrial space)	Chicago MSA retail jobs at $10,806/year and industrial jobs at $26,845/year	2: High certainty
Wildlife Habitat	New wet ponds, green streets, and other green areas provide habitat for various forms of wildlife	Proposed development includes 8 acres of wet ponds	Habitat value for wet ponds estimated at $7,853/acre	3: Medium certainty

Category	Identify	Quantify	Monetize	Uncertainty
Water Quality	Avoided cost due to improved water quality from stormwater retention and flood prevention	Proposed development includes 8 acres of wet ponds; Phase 2 Design includes 1 acre of GI; green streets program includes 7.5 acres	Water quality improvement value for wet ponds/GI estimated at $293/acre	3: Medium certainty
Tree Cover	New trees/forest area on site provides habitat and helps reduce carbon footprint		New trees provide carbon sequestration value of $7,853/acre	3: Medium certainty
Air Quality	Pollutant sequestering value of GI	Proposed development includes 8 acres of wet ponds; Phase 2 Design includes 1 acre of GI; green streets program includes 7.5 acres	New stormwater BMPs provide $204/acre of air pollutant sequestration	3: Medium certainty
Avoided Treatment Cost	Avoided marginal cost by Metropolitan Water	Annual stormwater runoff captured by 50 gallon rain	Average MWRD cost to treat wastewater	2: High certainty

Category	Identify	Quantify	Monetize	Uncertainty
	Reclamation District of Greater Chicago of treating its wastewater and stormwater	barrels as part of Single Family Rehab Program is anticipated to be 4,313 gallons/year for 53 homes in Calumet Park and 112 homes in Blue Island	and stormwater is $0.0000919/gallon	
Avoided Potable Water Cost	Avoided cost potable water cost by homeowner for using rainwater from Rain Barrel for watering lawn or garden	Annual stormwater runoff captured by 50 gallon rain barrels as part of Single Family Rehab Program is anticipated to be 4,313 gallons/year for 49 homes in Calumet Park and 73 homes in Blue Island	Average cost of potable water in the Chicago area is $0.00381/gallon	2: High certainty
Flood Damage to	Reduced damage to	Hydraulic model indicates	USACE model values	2: High certainty

Category	Identify	Quantify	Monetize	Uncertainty
Property	property from SW BMPs sized to capture 25yr/24hr design storm	497 less structures to be affected by flooding after construction of BMPs	reduced risk to flooded structures at $7,000/year	

Table 2: Robbins – Methodologies Used to Develop Benefits

Category	Identify	Quantify	Monetize	Uncertainty
Mental & Physical Health	Reduced health costs for severe and mild/moderate illnesses due to flooding of homes	Improvements will reduce doctor visits and sick days of estimated 21 local households based on number of FEMA claims	Physical health benefit valued at $2,443/year per person	4: Low Certainty
Loss of Productivity	Reduced productivity due to mental health issues from flooding	Improvements will minimize downtime due to mental health issues for an estimated 21 local households based on number of FEMA claims	Mental health benefit valued at $8,736/year per person	4: Low Certainty
Recreation	Restored Midlothian Creek and new sidewalks/bikeway will provide recreational opportunities and reduce	Improvements will avoid cost in health benefits for an estimated 222 local residents and employees	Recreational benefit valued at $865/year per person	3: Medium certainty

Category	Identify	Quantify	Monetize	Uncertainty
	cost in health benefits			
Aesthetics	Improved aesthetics from GI based on hedonic pricing/contingent valuation from national tax data assessor data, land cover data, flood zones, location of open spaces	Includes 1 acre for green streets program and 13 acres for Phase 2 Design	Improved aesthetics from GI valued at $1,623/acre	3: Medium certainty
Property Values (Near GI)	Increased property values for homes along greens streets	Green streets program will provide tree trenches and bioswales for 21 nearby homes	Property values expected to increase by 3.5 to 5.0% when trees and other greenery added. Home values in the project area average $72,700.	2: High certainty

Category	Identify	Quantify	Monetize	Uncertainty
Property Values (No Flooding)	Increased property values for homes no longer subject to flooding	MWRD Phase 2 Design, green streets and Single Family Rehab program will reduce basement backups and street flooding to an estimated 222 homes	Property values expected to increase by 2.0 to 8.0% when homes are no longer subject to flooding. Home values in the project area average $72,700.	2: High certainty
Wildlife Habitat	Restored Midlothian Creek and new green areas will provide habitat for various forms of wildlife	Includes 13 acres for Phase 2 Design	Habitat value for wet ponds estimated at $7,853/acre	3: Medium certainty
Water Quality	Avoided cost due to improved water quality from stormwater retention	Includes 1 acre for green streets program and 13 acres for Phase 2 Design	Water quality improvement value estimated at $293/acre	3: Medium certainty

Category	Identify	Quantify	Monetize	Uncertainty
	and flood prevention			
Flood Damage to Property	Reduced damage to property from SW BMPs sized to capture 25yr/24hr design storm	Hydraulic model indicates 222 less homes to be affected by flooding after construction of BMPs	USACE model values reduced risk to flooded structures at $7,000/year	2: High certainty

Table 3: Riverdale – Methodologies Used to Develop Benefits

Category	Identify	Quantify	Monetize	Uncertainty
Mental & Physical Health	Reduced health costs for severe and mild/moderate illnesses due to flooding of homes	Improvements will reduce doctor visits and sick days for an estimated 56 households in the Single Family Rehab program allocation	Physical health benefit valued at $2,443/year per person	4: Low Certainty
Loss of Productivity	Reduced productivity due to mental health issues from flooding	Improvements will minimize downtime due to mental health issues for an estimated 56 households in the Single Family Rehab program allocation	Mental health benefit valued at $8,736/year per person	4: Low Certainty
Recreation	New constructed wetlands, trails and park to provide recreational opportunities	Improvements will avoid cost in health benefits for an estimated 595 local	Recreational benefit valued at $865/year per person	3: Medium certainty

Category	Identify	Quantify	Monetize	Uncertainty
	and reduce cost in health benefits	households		
Aesthetics	Improved aesthetics from GI based on hedonic pricing/contingent valuation from national tax data assessor data, land cover data, flood zones, location of open spaces	Proposed project includes 11 acres of constructed wetlands; and 7.4 acres of residential green streets	Improved aesthetics from GI valued at $1,623/acre	3: Medium certainty
Property Values (Near GI)	Increased property values for homes along greens streets	Green streets program will provide GI for 409 nearby homes	Property values expected to increase by 3.5 to 5.0% when trees and other greenery added. Home values in the project	2: High certainty

Category	Identify	Quantify	Monetize	Uncertainty
			area average $91,100.	
Property Values (No Flooding)	Increased property values for homes no longer subject to flooding	Green streets and Single Family Rehab program will reduce basement backups and street flooding to an estimated 447 homes	Property values expected to increase by 2.0 to 8.0% when homes are no longer subject to flooding. Home values in the project area average $91,100.	2: High certainty
Wildlife Habitat	New wet ponds, green streets, and other green areas provide habitat for various forms of wildlife	Proposed project includes 11 acres of constructed wetlands	Habitat value for wet ponds estimated at $7,853/acre	3: Medium certainty
Water Quality	Avoided cost due to improved water quality	Proposed project includes 11 acres of wet ponds; and 7.4	Water quality improvement value for	3: Medium certainty

Category	Identify	Quantify	Monetize	Uncertainty
	from stormwater retention and flood prevention	acres of residential GI	wet ponds/GI estimated at $293/acre	
Air Quality	Pollutant sequestering value of GI	Proposed project includes 11 acres of wetlands; 1 acre of commercial GI; and 7.4 acres of residential GI	New stormwater BMPs provide $204/acre of air pollutant sequestration	3: Medium certainty
Avoided Treatment Cost	Avoided marginal cost by Metropolitan Water Reclamation District of Greater Chicago of treating its wastewater and stormwater	Annual stormwater runoff captured by 50 gallon rain barrels as part of Single Family Rehab Program is anticipated to be 4,313 gallons/year for 56 homes	Average MWRD cost to treat wastewater and stormwater is $0.0000919/gallon	2: High certainty
Avoided Potable Water Cost	Avoided cost potable water cost by homeowner for using rainwater from Rain	Annual stormwater runoff captured by 50 gallon rain barrels as part of Single	Average cost of potable water in the Chicago area is	2: High certainty

Category	Identify	Quantify	Monetize	Uncertainty
	Barrel for watering lawn or garden	Family Rehab Program is anticipated to be 4,313 gallons/year for 56 homes	$0.00381/gallon	
Flood Damage to Property	Reduced damage to property from SW BMPs sized to capture 25yr/24hr design storm	Hydraulic model indicates 447 less homes to be affected by flooding after construction of BMPs	USACE model values reduced risk to flooded structures at $7,000/year	2: High certainty

Table 4: Dolton – Methodologies Used to Develop Benefits

Category	Identify	Quantify	Monetize	Uncertainty
Mental & Physical Health	Reduced health costs for severe and mild/moderate illnesses due to flooding of homes	Improvements will reduce doctor visits and sick days of estimated 132 local households based on number of households for Single Family Rehab program allocation	Physical health benefit valued at $2,443/year per person	4: Low Certainty
Loss of Productivity	Reduced productivity due to mental health issues from flooding	Improvements will minimize downtime due to mental health issues for an estimated 132 local households based on number of households for Single Family Rehab program allocation	Mental health benefit valued at $8,736/year per person	4: Low Certainty

Category	Identify	Quantify	Monetize	Uncertainty
Recreation	New constructed wetlands, trails and park to provide recreational opportunities and reduce cost in health benefits	Improvements will avoid cost in health benefits for an estimated 58 local households	Recreational benefit valued at $865/year per person	3: Medium certainty
Aesthetics	Improved aesthetics from GI based on hedonic pricing/contingent valuation from national tax data assessor data, land cover data, flood zones, location of open spaces	Proposed project includes 2 acres of residential green streets	Improved aesthetics from GI valued at $1,623/acre	3: Medium certainty
Property Values (Near GI)	Increased property values for homes along greens streets	Green streets program will provide GI for 58 nearby homes	Property values expected to increase by 3.5 to 5.0% when	2: High certainty

Category	Identify	Quantify	Monetize	Uncertainty
			trees and other greenery added. Home values in the project area average $116,200.	
Property Values (No Flooding)	Increased property values for homes no longer subject to flooding	Green streets (58) and Single Family Rehab program (132) will reduce basement backups and street flooding to an estimated 190 homes	Property values expected to increase by 2.0 to 8.0% when homes are no longer subject to flooding. Home values in the project area average $116,200	2: High certainty
Wildlife Habitat	New wet ponds, green streets, and other green	Proposed project includes 2 acres of GI	Habitat value for GI estimated at	3: Medium certainty

Category	Identify	Quantify	Monetize	Uncertainty
	areas provide habitat for various forms of wildlife		$7,853/acre	
Water Quality	Avoided cost due to improved water quality from stormwater retention and flood prevention	Proposed project includes 2 acres of residential GI	Water quality improvement value for GI estimated at $293/acre	3: Medium certainty
Air Quality	Pollutant sequestering value of GI	Proposed project includes 2 acres of residential GI	New stormwater BMPs provide $204/acre of air pollutant sequestration	3: Medium certainty
Avoided Treatment Cost	Avoided marginal cost by Metropolitan Water Reclamation District of Greater Chicago of treating its wastewater and	Annual stormwater runoff captured by 50 gallon rain barrels as part of Single Family Rehab Program is anticipated to be 4,313	Average MWRD cost to treat wastewater and stormwater is $0.0000919/gallon	2: High certainty

Category	Identify	Quantify	Monetize	Uncertainty
	stormwater	gallons/year for 132 homes		
Avoided Potable Water Cost	Avoided cost potable water cost by homeowner for using rainwater from Rain Barrel for watering lawn or garden	Annual stormwater runoff captured by 50 gallon rain barrels as part of Single Family Rehab Program is anticipated to be 4,313 gallons/year for 132 homes	Average cost of potable water in the Chicago area is $0.00381/gallon	2: High certainty
Flood Damage to Property	Reduced damage to property from SW BMPs sized to capture 25yr/24hr design storm	Hydraulic model indicates 132 less homes to be affected by flooding after construction of BMPs	USACE model values reduced risk to flooded structures at $7,000/year	2: High certainty
Housing Affordability	New housing developments will provide opportunities to low and moderate income persons	Proposed project will add 30 new units of affordable housing	Benefit of affordable housing is $611/unit	2: High certainty

Table 5: Calumet City – Methodologies Used to Develop Benefits

Category	Identify	Quantify	Monetize	Uncertainty
Mental & Physical Health	Reduced health costs for severe and mild/moderate illnesses due to flooding of homes	Improvements will reduce doctor visits and sick days of estimated 177 local households based on number of Single Family Rehab program allocation	Physical health benefit valued at $2,443/year per person	4: Low Certainty
Loss of Productivity	Reduced productivity due to mental health issues from flooding	Improvements will minimize downtime due to mental health issues for an estimated 177 local households based on number of Single Family Rehab program allocation	Mental health benefit valued at $8,736/year per person	4: Low Certainty
Property Values (No Flooding)	Increased property values for homes no longer subject	Single Family Rehab program will reduce basement backups	Property values expected to increase	2: High certainty

Category	Identify	Quantify	Monetize	Uncertainty
	to flooding	and street flooding to an estimated 177 homes	by 2.0 to 8.0% when homes are no longer subject to flooding. Home values in the project area average $111,500	
Avoided Treatment Cost	Avoided marginal cost by Metropolitan Water Reclamation District of Greater Chicago of treating its wastewater and stormwater	Annual stormwater runoff captured by 50 gallon rain barrels as part of Single Family Rehab Program is anticipated to be 4,313 gallons/year for 177 homes	Average MWRD cost to treat wastewater and stormwater is $0.0000919/gallon	2: High certainty
Avoided Potable Water Cost	Avoided cost potable water cost by homeowner for using rainwater from Rain	Annual stormwater runoff captured by 50 gallon rain barrels as part of Single	Average cost of potable water in the Chicago area is	2: High certainty

Category	Identify	Quantify	Monetize	Uncertainty
	Barrel for watering lawn or garden	Family Rehab Program is anticipated to be 4,313 gallons/year for 177 homes	$0.00381/gallon	
Flood Damage to Property	Reduced damage to property from SW BMPs sized to capture 25yr/24hr design storm	Hydraulic model indicates 177 less homes to be affected by flooding after construction of BMPs	USACE model values reduced risk to flooded structures at $7,000/year	2: High certainty
Housing Affordability	New housing developments will provide opportunities to low and moderate income persons	Proposed project will add 145 new units of affordable housing	Benefit of affordable housing is $611/unit	2: High certainty

Project Description

Cook County's Phase 2 application puts forth a resilience portfolio of seven projects and three programs to improve the County's capacity to respond and adapt to current and future threats and hazards, including climate change. Projects are as follows:

- A project to complete the Cal-Sag Trail, a planned 28-mile multi-use path with a gap in the demonstration area, will link the project areas and foster social cohesion among the communities and beyond.
- Three projects to support 'complete communities' resilience-building by addressing community need within a demonstration area containing residential, industrial, and commercial properties with significant opportunities for revitalization and co-benefits. The projects are located in the communities of Riverdale, Robbins, and Blue Island / Calumet Park.
- One project to build out a 'green streets' concept in a flood-prone neighborhood in Dolton.
- Two housing projects in Calumet City and Dolton to rehabilitate multi-family housing rental units and construct new single-family ownership housing units, respectively, while incorporating resilient measures in both to provide affordable, resilient housing.

Several programs will then be overlaid with both these project areas and the wider demonstration area to build resilience. Programs are as follows:

- A single-family rehabilitation program to address unmet housing need and incorporates resilience measures into the area's existing single-family housing stock.
- A community planning and capacity building program to enhance resilience at the local level. Planning programs will support a range of needs including redevelopment

site planning, stormwater modeling capacity, assessment of shared service potential and the regional resilience efforts.

- An educational program to build individual and government capacity by sharing information on climate change and how green infrastructure – particularly on private property – can be a solution.

A more detailed description of each of these projects and programs is provided in Exhibit E – Soundness of Approach in the narrative.

Existing Conditions

Several existing conditions, as noted in the County's Phase 1 application, exacerbate vulnerability but will be reduced through the proposed activities. These conditions include an outmoded and aging infrastructure; a strained natural environment exacerbated by population growth and climate change; environmental contamination from years of manufacturing; segregation of low-income and minority populations; a lack of affordable housing; job loss and economic disinvestment; and government fragmentation. A detailed description of how these risks and vulnerabilities will be reduced by the proposed resiliency portfolio is addressed in Exhibit E – Soundness of Approach in the narrative.

Benefits Not Included in the Benefit-Cost Ratio

Benefits discussed in this section are not included in the benefit cost ratio (BCR) for one of the following reasons:

- There is no currently available or defensible method to assign a dollar value to the effect
- It is not logical to include the benefit value in the benefit cost analysis, although the benefits are important to understanding the full value of the proposed projects

The benefit categories that were evaluated but not included in the BCR and the rationale for their exclusion are provided below.

Avoided Costs from Displacement

This category includes reduced relocation of residents/ businesses due to flooding and reduced use of shelters due to flooding. County records show that 1,160 households in the pilot area received FEMA rental assistance from DR-4116; however, there was no data available to quantify the costs for the displacement efforts. It is evident from the number of displaced residents above that a significant amount of households were affected by DR-4116 and the proposed resiliency efforts should significantly reduce future relocation and use of shelters by residents in the pilot area.

Avoided Injuries/Deaths

This category includes reduction in the number of injuries and deaths due to flooding. Three fatalities were recorded within last 10 years in Cook County due to flood events and one moderate injury from a sinkhole related to the 2013 flood was noted, but the location of these events could not be confirmed for the project area. It is highly likely that injuries from DR-4116 event occurred, but were just not recorded by the County or FEMA. The proposed resiliency efforts should significantly reduce future injuries or deaths with the pilot area.

Emergency Response

This category includes reduced cost of emergency response to flooding. No specific data was available for the cost for emergency response to historic events. It is likely that any emergency response efforts to attend to the vulnerable population within the pilot area should be reduced future wet weather events if the proposed resiliency efforts are implemented.

Tax Base for City/Village

This category addresses increased revenue from new commercial and industrial businesses that are tied to resiliency efforts within the pilot area. Information for the tax base generated for proposed commercial and industrial development within the project areas was not evaluated since the developments are currently at the concept stage. However, a portion of the tax base from these businesses can be allocated to address future resilience efforts such as O&M and expansion of green infrastructure, and are critical to improved living for residents with the pilot area.

Trickle Down to Local Business

This category addresses increased revenue for local retailers from new jobs. Information on the impacts of the proposed commercial and industrial developments related to trickle down revenue increases for local businesses was unavailable and not evaluated. However, it is anticipated that this effect would occur if new commercial and industrial businesses are located in the pilot area.

Cultural Value

This category includes improved culture within the pilot area due to new retail development. Information on the impacts of the proposed commercial and industrial developments on the local culture could not be quantified; however, the pilot area is a known food desert and lacks other retail options. It is anticipated that these businesses would have a very positive impact on the culture within the local communities.

Soil Contamination

This category includes remediation or removal of contaminated soils in the proposed project areas. This category was not evaluated further because SSMMA has brownfield redevelopment

efforts currently underway that will be addressing soil contamination within the pilot area communities.

Methodologies

This section provides an understanding of the research and processes that developed the benefit-cost ratios that represent the analysis results for Cook County's Phase 2 application. The proposed projects described herein will provide residents of the selected demonstration area with significant benefits.

Attachment F has been broken into segments by benefit type to facilitate understanding. First, the method through which detailed results from each benefit evaluation are compiled together into a single benefit cost ratio is discussed. Next, the methodologies and detailed results associated with Resiliency Value, or the losses avoided expected as a result of project implementation are provided. Losses avoided include direct physical damage and disruption, displacement, and human impacts, such as injury or loss of life. Third, this section presents methodologies and detailed results associated with the programmed elements of the project. These are the inherent social, economic, and environmental benefits that are associated with improvements being made to the pilot area communities.

It is important to note that the circumstances surrounding the NDRC require that alternatives proposed for each activity are evaluated for cost-effectiveness. These project alternatives are not final and as project designs move forward, benefits and costs of the project will likely change. The overall benefits considered and those used in the Benefit Cost Analysis (BCA) are detailed in Table 6 on the following page.

Table 6: Overall Benefits Considered

Benefit Category	Description	Benefit Calculated
Resiliency		
Direct Physical Damages to Buildings	Used USACE depth-damage functions (DDFs) of vulnerable structures in the proposed project areas. Includes content and inventory loss.	• Avoided flood damage to residential and commercial/ industrial property
Displacement	Not used.	• Reduced relocation of residents/ businesses due to flooding • Reduced use of shelters due to flooding
Stormwater Management	Avoided costs and additional resiliency provided by use of stormwater BMPs to capture runoff before it enters the combined sewer system	• Avoided treatment cost • Avoided potable water cost • Additional resiliency to flooding
Avoided Injuries/Deaths	Not used.	• Reduction in injuries deaths due to flooding
Emergency Response	Not used.	• Reduced cost of emergency response to flooding

Benefit Category	Description	Benefit Calculated
Economic Impacts		
Tax Base for City/Village	Not used.	• Increased revenue to address future resilience efforts
Increased Property Values	Increased property values for homes that benefit from GI and reduced flooding/basement backups	• Increase value for homes along greens streets • Increased value for homes no longer subject to flooding
Trickle Down to Local Business	Not used.	• Increased revenue for local retailers from new jobs
Job Creation	New commercial and industrial developments impacted by resiliency measures will create permanent new job opportunities for the region	• New permanent jobs created
Social Impacts		
Mental & Physical Health	Reduced health costs to residents for illnesses and workers for loss productivity due to flooding of homes.	• Reduced health costs due to flooding • Reduced productivity due to flooding
Recreation	New wet ponds, bike/ped trails and soccer fields provide recreational opportunities that	• Reduced cost in health benefits

Benefit Category	Description	Benefit Calculated
	reduce costs in health care	
Aesthetics	Improved aesthetics from green infrastructure provides added value to the community	• Improved aesthetics from GI
Cultural Value	Not used.	• Improved culture due to new retail development
Environmental Impacts		
Wildlife Habitat	New wet ponds, green streets, and other green areas provide habitat for various forms of wildlife	• New habitat from GI
Improved Water Quality	Avoided cost due to improved water quality from stormwater retention/ flood prevention	• Improved WQ from GI
Soil Contamination	Not used.	• Remediation/removal of contaminated soils
Tree Cover	New trees and forested areas provide habitat and help reduce carbon footprint	• New habitat/carbon footprint reduction from trees
Air Quality	Green infrastructure provides some pollutant sequestering value similar to trees	• Pollutant sequestering value of GI

Stormwater Backup and Flooding

Most communities in the demonstration area collect wastewater from buildings and stormwater from streets, sidewalks, homes, and businesses in a combined sewer system. Combined sewer systems are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipes. In general, interceptor sewers receive wastewater flow from trunk sewer mains and lateral sewers, which take flow from homes, businesses, and catch basins on streets.

Under dry weather conditions, the combined sewer system transports all wastewater to a sewage treatment plant managed by MWRD, where it is treated and then discharged to a local water body. During periods of heavy rainfall or snowmelt, the capacity of the interceptors are exceeded and a large portion of the flow is diverted to through outfalls directly to the receiving water body. The resulting mix of sewage and stormwater, referred to as a combined sewer overflow, then adversely affects water quality. In addition, during large storm events such as DR-4116, the capacity of the trunk sewers and lateral sewers within the various communities in the pilot area is exceeded, causing street flooding and basement backups. During dry weather conditions combined sewers generally run partially full with depths cycling through the day based on water usage. However, during large storm events the flows tributary to these sewers, which are often shallow and undersized, exceed the pipe capacity and water levels within manholes begin to rise. Street flooding occurs when water levels get above the rim of sewer system manholes. Basement backups occur when water levels are high enough to cause backflow into homes and businesses through their sewer laterals. Communities within the pilot area are also affected by flooding from local creeks, which overflow their banks during large storm events causing similar impacts to nearby homes and businesses.

Immediate damages include inundation impacts to the structure itself, losses from damage to affected contents, and health impacts on residents during the clean-up. Long-term, if a flooded structure is not cleaned up and dried out fully and immediately, the wet environment created by the floodwaters, whether stormwater only or a mix of sewage and stormwater, provides an ideal breeding ground for mold.

Hydraulic models of the various stormwater conveyance systems causing flooding, whether combined sewer systems or local creeks, were developed to establish system impacts and explore the benefits of potential solutions within the selected project area. For the Riverdale and Calumet Park project areas, coarse planning-level models of the local combined sewer system were developed using conservative assumptions for pipe slopes and inverts (Manning's pipe slope), where survey elevations were not available. For the Blue Island project area and the analysis of Midlothian Creek in Robbins, existing models from MWRD's Phase 2 design projects were used to support the BCA. Results for the Dolton and Calumet City project areas were developed from the Riverdale model results with adjustments for project area size and total number of structures. Model simulations were performed for a wide range of design storms, including the following return periods:

- 2 year(50% annual chance flood event)
- 5 year (20% annual chance flood event)
- 10 year (10% annual chance flood event)
- 25 year (4% annual chance flood event)
- 50 year (2% annual chance flood event)
- 100 year (1% annual chance flood event)

For the Riverdale and Calumet Park project areas, 24-hour duration design storms with an SCS Type 2 distribution were used for analysis of flooding impacts and potential solutions. For Blue Island and Midlothian Creek, the critical durations for those project areas were used for the BCA. These critical durations, 2 hours for Blue Island and 48 hours for Midlothian Creek, were identified during the on-going Phase 2 design projects.

Estimates of the number of structures affected by either basement backups or overland flooding from manholes or local creeks were then developed for each model simulation. Structures affected by overland flooding were identified by overlaying the structure location and estimated ground elevation (from Cook County LiDAR data) with the inundation extents for each simulation. Structures potentially affected by basement flooding for a specific design storm were identified based on water levels in the nearest manhole downstream of the structure's lateral connection to the sewer system. Basement backups were assumed to occur at all structures, where water levels at that nearest manhole came within five feet of the ground surface.

The total rainfall for DR-4116 is similar in magnitude to a 10-year 24-hour design storm event; however, storm intensities were quite low when compared with the SCS Type 2 distribution. Where possible based on available area, a 25-year 24-hour design storm was used as the basis for design to provide additional resiliency.

Resiliency

Direct Physical Damages to Buildings

Direct physical damages are damages that occur to residential, commercial, industrial, institutional, and public property that result from the action of flooding from local sewers and creeks. These damages include the destruction and degradation of property and are quantifiable

as monetary losses. For the purpose of the benefit cost analysis (BCA), property loss is categorized as structural damage and contents damage. Structural damage is damage that applies to real property and contents damage is damage that applies to personal property.

Flood damage can be predicted in two ways: through a review of historical impacts and through modeling expected damages from future events. This section provides an overview of the existing conditions upon which the evaluation is based, introduces historical impacts and how these impacts have been used in the evaluation; describes how expected losses avoided were calculated; reviews limitations, uncertainties, assumptions, and sensitivities; and provides an overview of the detailed results. In general, the number of potential basement backups were significantly higher than the number of structures affected by overland flooding from manholes. As such, estimates of the direct physical damage to buildings were developed based on the number of potential basement backups, where both types of problems occurred.

Tables 7 and 8 summarize the number of structures affected by flooding damage for the six design storms under existing conditions and following implementation of the NDRC projects. Table 9 provides the number of structures directly benefitting from project implementation by the elimination of flooding impacts. As noted above, the total rainfall for DR-4116 is similar in magnitude to a 10-year 24-hour design storm event; however, storm intensities were quite low when compared with the SCS Type 2 distribution. The resulting number of structures affected by flooding for DR-4116 were generally similar to the estimates for the 2-year design storm, causing flooding impacts at nearly 2,500 structures. And with implementation of the NDRC projects, flooding impacts at nearly 1,200 structures will be eliminated if the April 2013 event occurs again.

Table 7: Existing Conditions – Projected Number of Structures Affected by Flooding

Community	2-year Design Storm	5-year Design Storm	10-year Design Storm	25-year Design Storm	50-year Design Storm	100-year Design Storm
Blue Island-Calumet Park	888	900	909	912	915	915
Calumet City	721	899	899	926	937	943
Dolton	536	667	667	687	695	700
Riverdale	327	408	408	420	425	428
Robbins	0	0	3	8	31	73
Total	**2,472**	**2,874**	**2,886**	**2,953**	**3,003**	**3,059**

Table 8: Future Conditions after NDRC Project Implementation – Projected Number of Structures Affected by Flooding

Community	2-year Design Storm	5-year Design Storm	10-year Design Storm	25-year Design Storm	50-year Design Storm	100-year Design Storm
Blue Island-Calumet Park	390	491	538	649	729	729
Calumet City	544	722	722	749	760	766
Dolton	360	480	480	498	505	510
Riverdale	0	109	123	259	369	372
Robbins	0	0	0	2	16	26

Total	**1,294**	**1,802**	**1,863**	**2,157**	**2,379**	**2,403**

Table 9: Projected Number of Structures Benefitting from NDRC Project Implementation

Community	2-year Design Storm	5-year Design Storm	10-year Design Storm	25-year Design Storm	50-year Design Storm	100-year Design Storm
Blue Island-Calumet Park	498	409	371	263	186	186
Calumet City	177	177	177	177	177	177
Dolton	176	187	187	189	190	190
Riverdale	327	299	285	161	56	56
Robbins	0	0	3	6	15	47
Total	**1,178**	**1,072**	**1,023**	**796**	**624**	**656**

Expected Impacts

Direct physical damages associated with modeled flood frequencies are calculated through the use of standardized depth-damage functions (DDFs) specific to the characteristics and occupancy of a structure. The percent of structural and contents damage is related to 1-foot depth increments multiplied by a structure or contents replacement value. The United States Army Corps of Engineers (USACE) produces DDFs that were used to model direct physical damages.

The steps taken to determine the affected number of structures in each community and the avoided losses that can be expected for the six design storms included:

1. Develop structure inventory from Cook County address points data for the project area

2. Map structure types and occupancies to USACE depth damage functions by overlaying the Cook County address points with Hazus data for each project within the overall area.
3. Calculate the overall building and contents replacement value for the project area
4. Compare the resulting damage estimates for a range of depths with FEMA claim data for basement backups from CNT and DR-4116. Based on those comparisons, select the DDFs for use in each project area.
5. Calculate the percent damage and physical loss values for existing conditions and proposed solutions to determine the avoided losses totals.

Data Sources

The following data sources have been used to calculate expected structure and contents damages and associated losses avoided for the proposed projects:

- U.S. Army Corps of Engineers: USACE modeled six design storms, 50%, 20%, 4%, 2%, and 1%, for the project area to determine avoided damage costs for structures.
- RS Means Building Construction Cost Data (2014): This publication provides location-specific building replacement square foot costs to calculate the total replacement values for structures in the project area.
- FEMA claims data from DR-4416 in the project area.
- Center for Neighborhood Technology's analysis for FEMA claims data for Cook County from 2007 through 2012.

Limitations, Uncertainties, Assumptions, and Sensitivities

Structural Replacement Costs were calculated using a combination of FEMA Hazus default values and R.S. Means 2014, where available by structure and use type, inflated to 2015 values. As Hazus values are national figures, these figures may be significantly lower than actual

construction costs in the Chicago area. Limitations with the direct physical damage calculations include:

- USACE depth damage functions were developed for use with overland flooding from rivers and creeks, rather than basement backups from local sewers.
- Since the majority of the impacted structures are located in residential areas, all affected properties for the analysis were assumed to be residential structures. This assumption is likely conservative, considering commercial properties generally have larger footprint s and would have more content and inventory loss.
- Limitations on available data regarding number of homes with basements and basement elevations.
- USACE damage functions provide default shares by structure occupancy in order to determine contents and inventory replacement values. Contents and inventory were combined within the USACE damage functions to come up with one avoided cost number.

Detailed Results

Avoided costs by annual chance flood event, annual benefits and net total benefits for each community within the project area are shown in Table 10 on the following page.

Table 10: Avoided Costs for Direct Physical Damage to Buildings

Project Area	Expected Avoided Costs in 2015 Dollars by Annual Chance Flood Event						Post Mitigation Benefits	
	2yr Design Storm (50%)	5yr Design Storm (20%)	10yr Design Storm (10%)	25yr Design Storm (4%)	50yr Design Storm (2%)	100yr Design Storm (1%)	**Annual Benefits**	**Net Total Benefits**[2]
Blue Island- Calumet Park	$5,163,811	$3,196,787	$2,404,532	$617,369	$23,100	$11,550	$3,486,988	$48,120,439
Robbins	$0	$1,760	$61,767	$76,170	$149,996	$421,722	$16,793	$231,738
Riverdale	$3,867,661	$4,130,104	$3,710,530	$2,666,241	$164,856	$163,596	$3,242,487	$44,746,319
Dolton	$1,032,328	$651,376	$94,965	$42,758	$18,480	$9,240	$658,108	$9,081,893
Cal City	$619,500	$247,800	$123,900	$49,560	$24,780	$12,390	$374,302	$5,165,366
Total Avoided Costs	**$10,683,300**	**$8,227,828**	**$6,395,693**	**$3,452,098**	**$381,212**	**$618,498**	**$7,778,678**	**$107,345,756**

[2] NPV coefficient for a 50 year project useful life using a 7% discount rate

Stormwater Management

Avoided Treatment Cost

Use of green infrastructure can capture stormwater runoff and prevent it from reaching the combined sewer system. This flow eventually makes its way to a wastewater treatment plant where it is treated before being release back to local waterbodies.

Expected Impacts

The total annual number of gallons intercepted by each green infrastructure feature was calculated using the equation below:

$$[annual\ preciptation\ (inches) * GI\ area\ (SF) * \%\ retained] * 144\ sq\ inches\ per\ SF * 0.0043\ gallons\ per\ cubic\ inch = total\ runoff\ reduction\ (gal)$$

Where % retained = 80% for bioretention and 30% for pervious pavement

In addition, 50 gallon rain barrels proposed for the Rain Ready Program were also analyzed. An annual maximum storage capacity per barrel that would be expected was projected as 4,313 gallons/year. This volume was multiplied by the number of homes proposed for the Rain Ready Program to come up with a total volume captured. Table 11 provides the estimated volume reduction of all proposed GI.

Table 11: Estimated Annual Volume Reduction of Proposed GI

Project Area	Wet Ponds & Other GI (acres)
Blue Island-Calumet Park	16.5
Dolton	2.0
Riverdale	19.4
Robbins	14.0
TOTAL	**51.9**

The volume captured by all GI was then multiplied by the current cost (2014) of wastewater treatment by MWRD of $0.0019139/gallon to obtain the annual avoided treatment costs. This value ended up being almost negligible when factored in with the other benefit categories.

Data Sources

The following data sources were used to determine the removal efficiency of various GI and the maximum storage capacity of a 50 gallon rain barrel over the course of an average year:

- NDRC, *The Green Edge: How Commercial Property Investment in Green Infrastructure Creates Value*, P. 22 (based on original data from Jennings et al., 2013).
- New York City DEP study of GI removal performance

Limitations, Uncertainties, Assumptions, and Sensitivities

The cited study was not in the Chicago area but was for another Great Lakes area community with similar annual rainfall and housing sizes to the project area.

Detailed Results

Avoided treatment costs for each community are shown in Table 12 below.

Table 12: Avoided Treatment Costs

Project Area	**Post Mitigation Benefits**	
	Annual Benefits	Net Total Benefits[3]
Blue Island-Calumet Park	$65	$903
Robbins	$0	$0
Riverdale	$22	$306
Dolton	$52	$722
Calumet City	$70	$968

[3] NPV coefficient for a 50 year project useful life using a 7% discount rate

TOTAL AVOIDED COSTS	**$210**	**$2,899**

Avoided Potable Water Cost

Use of green infrastructure can capture stormwater runoff which can be reused for watering plants and gardens by homeowners with the pilot area. This water reuse allows homeowners to avoid use of potable water which costs money to treat and transport, and saves money for the homeowners by reducing their water bill.

Expected Impacts

The analysis focused on the 50 gallon rain barrels proposed for the Rain Ready Program and the annual maximum storage capacity that could be expected, projected as 4,313 gallons/year. This volume was multiplied by the number of homes proposed for the Rain Ready Program and the current customer cost of water, $3.81 per 1,000 gallon in the project area, to obtain the annual avoided user purchase costs. The water treatment/transport cost was not considered in the analyzation.

Data Sources

The following data source was used to determine the maximum storage capacity of a 50 gallon rain barrel over the course of an average year and current potable water cost for residential customers in Northeastern Illinois:

- NDRC, *The Green Edge: How Commercial Property Investment in Green Infrastructure Creates Value,* P. 22 (based on original data from Jennings et al., 2013).
- http://www.cityofchicago.org/city/en/depts/water/provdrs/cust_serv/svcs/know_my_water_sewerrates.html

Limitations, Uncertainties, Assumptions, and Sensitivities

- The cited study was not in the Chicago area, but was for another Great Lakes area community with similar annual rainfall and housing sizes to the project area.
- The water rates are not specifically for the pilot area but are representative of the area

Detailed Results

Avoided potable water costs for each community within the project area are shown in Table 13.

Table 13: Avoided Potable Water Cost

Project Area	**Post Mitigation Benefits**	
	Annual Benefits	Net Total Benefits[4]
Blue Island-Calumet Park	$2,005	$27,666
Robbins	$0	$0
Riverdale	$920	$12,699
Dolton	$2,169	$29,933
Calumet City	$2,169	$29,933
TOTAL AVOIDED COSTS	**$7,263**	**$100,232**

Additional Resiliency to Flooding

Additional stormwater volume was provided for several BMPs within proposed development areas to provide additional resiliency for future large wet weather events.

Expected Impacts

The BMPs increased above standard design requirements to provide additional stormwater storage to meet the 25 year/24 hour storm event include:

- Blue Island-Calumet Park Subarea B – Redevelopment wet ponds

[4] NPV coefficient for a 50 year project useful life using a 7% discount rate

- Riverdale Subarea A – Constructed wetlands

These BMPs were generally increased from a required 1-inch of stay on volume, equivalent to a 15-year design storm, to a 25 year/24 hour design storm.

Data Sources

Standard design criteria and costs were obtained from a spreadsheet specifically developed for this project based on national and local design/cost data.

Limitations, Uncertainties, Assumptions, and Sensitivities

Benefits for the upsized BMPs are already being considered in several other categories; therefore, a benefit value was not calculated for this item.

Detailed Results

N/A

Economic Impacts

Economic impacts in general are inherent values that include:

- Jobs created, especially for vulnerable populations
- Increased economic output and value
- Property value benefits that are expected to be impacted by the project

Indirect economic losses as a result of natural disasters can be quantified in several ways including lost output, retail sales, wages and work time, utility disruptions, lost tourism, and increased financial market volatility.

Tax Base for City/Village

Information for the tax base generated for proposed commercial and industrial development within the project areas was not evaluated since the developments are currently at the concept stage.

Increased Property Values

There have been many studies that have looked at the impact trees and green infrastructure has on property values. Similarly, homes no longer subject to flooding also will have an increase in property values.

Expected Impacts

The Green Streets projects are proposed for neighborhoods within the majority of the demonstration area communities including Blue Island, Calumet Park, Dolton, Riverdale, and Robbins. Improvements will include bioswales, tree trenches, permeable pavers, and other green features. The Center for Neighborhood Technology's "*The Value of Green Infrastructure*" publication states that property values are expected to increase by 3.5 to 5.0% when trees and other greenery such as GI added. A 4% increase for green infrastructure has been used for the analysis. The same CNT publication states that property values are expected to increase by 2.0 to 8.0% when homes are no longer subject to flooding. MWRD's Phase 2 Design, the Green Streets Program and Single Family Rehab program will reduce basement backups and street flooding to an estimated 1,954 homes within the pilot area. A 5.0% increase for elimination of flooding has been used for the analysis. Expected property increases from green infrastructure and flood reduction are shown in Table 14 on the following page.

Table 14: Increased Property Values by Community

Community	Average Property Value	Increase Value Due to Green Infrastructure (4% increase)	Increase Value Due to Reduced Flooding (5% increase)
Blue Island	$134,000	$5,360	$6,700
Calumet Park	$128,000	$5,120	$6,400
Dolton	$116,200	$4,648	$5,810
Riverdale	$91,000	$3,640	$4,550
Robbins	$72,700	$2,908	$3,635

Data Sources

- Property Value Increase from GI: Center for Neighborhood Technology, "The Value of Green Infrastructure", P. 48 (Increased property values from LID/GI based on original data from Status 2009; Ward et al. 2008)
- Property Value Increase from Flood Reduction: Center for Neighborhood Technology, "The Value of Green Infrastructure", P. 24 (Floodplain home values based on original data from Braden and Johnston 2004; Bin and Polasky 2004; MacDonald et al 1990; Harrison, Smersh and Schwartz 2001; Shilling, Benjamin and Sermins 1985; MacDonald, Murdoch and White 1987)
- Community Property Values: http://quickfacts.census.gov/qfd/states/17000.html

Limitations, Uncertainties, Assumptions, and Sensitivities

National not local values were used for the project area.

Detailed Results

Increased property values for each community within the project area are shown in Table 15 below.

Table 15: Increased Property Values

Project Area	Post Mitigation Benefits	
	Annual Benefits	Net Total Benefits[5]
Blue Island-Calumet Park	-	$4,849,200
Robbins	-	$61,068
Riverdale	-	$1,490,396
Dolton	-	$269,584
Calumet City	-	$0
TOTAL ADDED VALUE	**$0**	**$6,670,248**

Trickle Down to Local Business

Information on the impacts of the proposed commercial and industrial developments related to trickle down revenue increases for local businesses was unavailable and were not evaluated.

Job Creation

One of the primary components of the "complete communities" concept that ties the various cities and villages within the demonstration area together is industrial and commercial redevelopment. These developments not only become a part of the effort to increase resiliency to flooding but to provide capacity for local governments. The economic benefits of these new businesses include added economic output and employment. Added retail employment may

[5] NPV coefficient for a 50 year project useful life using a 7% discount rate

benefit the low to moderate income population by contributing to the reduction of economic inequality in the project area. Additionally, this expanded retail employment opportunity is anticipated to reduce the number of residents who travel outside the project area for work. Increased economic output will benefit the entire community, as goods and services are traded and economic activity is increased, and increased employment is an economic benefit for many reasons. First, unemployment is an economic burden to society as a whole and for the unemployed. Furthermore, employment generally provides income security, as well as increased production of goods and services and increased spending, which stimulate economic activity. There are various social benefits associated with created jobs which are difficult to quantify but worthy of mention, including financial security; higher living standards; decreased crime; benefit to the elderly; improved income distribution and reduced inequality; as well as reduced social costs such as those related to drug abuse, poor health, or family disruption.

Expected Impacts

The proposed industrial and commercial development in Blue Island-Calumet Park is estimated to create 741 retail jobs based on 846,800 sf of retail space and 530 full-time light industrial jobs based on 1,060,900 sf of industrial space. The proposed industrial and commercial development in Riverdale is estimated to create 303 full-time and 616 indirect jobs. Chicago MSA estimates retail jobs at $10,806/year and industrial jobs at $26,845/year.

Data Sources

- ***No. of Jobs***: SSMMA, based on numbers sourced from Minnesota Implan Group, Cambridge Systematics, Internal Revenue Service (Sales to Assets Ratio) and DHK

- ***Value of Full-time Industrial Jobs***: BLS - May 2014, Chicago MSA - Median Hourly Wage for Production Occupations http://www.bls.gov/oes/2014/may/oes_16974.htm#41-0000
- ***Value of Part-time Retail Jobs***: BLS - May 2014, Chicago MSA - Median Hourly Wage for Retail Salespersons http://www.bls.gov/oes/2014/may/oes_16974.htm#41-0000

Limitations, Uncertainties, Assumptions, Sensitivities

- The Blue Island-Calumet Park development would likely be moving forward without local resiliency work so no additional benefit is assumed
- The Riverdale developments are critical to the improved economic health of the village and would not be moving forward without local resiliency efforts

Detailed Results

Estimated jobs creation within Blue Island-Calumet Park, Riverdale and Robbins are shown in Table 16 below.

Table 16: Anticipated Jobs Creation

Project Area	**Post Mitigation Benefits**	
	Annual Benefits	Net Total Benefits[6]
Blue Island-Calumet Park	$0	$0
Robbins	$0	$0
Riverdale	$813,404	$11,224,968
Dolton	$0	$0
Calumet City	$0	$0
TOTAL ADDED VALUE	**$813,404**	**$11,224,968**

[6] NPV coefficient for a 50 year project useful life using a 7% discount rate

Social Impacts

Social impacts in general are also inherent values that include:

- Recreational value
- Aesthetic value
- Expected improvements in health of those who make use of the project improvements

Mental/Physical Health

Natural disasters like flooding can threaten or cause loss of health, social, and economic resources, which leads to psychological distress. Research indicates that individuals who experience a high number of stressors and property damage are more likely to experience symptoms of mental illness, Post-Traumatic Stress Disorder (PTSD), and higher levels of stress and anxiety. Residents with initially low levels of health, social, or economic resources are more vulnerable to the negative impacts of natural disasters and tend to experience relatively steeper declines in emotional and physical health.

The alternatives proposed in the pilot area will provide flood protection for low to moderate income and vulnerable populations, and these populations are at a higher risk to mental/physical health impacts after a disaster event. These residents have fewer resources to prepare for disaster events and are less prepared to invest in recovery, which can lead to a progressive depletion of resources and hamper recovery efforts.

Expected Impacts

The project area has a large proportion of low to moderate income households and vulnerable population including seniors, people with disabilities, and non-English proficient residents. These populations are at a higher risk of mental and physical health issues after a disaster event, as they may have lower levels of health, social, or economic resources.

The analysis looks at reduced mental/physical health costs for illnesses due to flooding. The resources used to quantify impacts in this analysis include HUD's "*Benefit Cost Analysis: Data Resources and Expert Tips*", which provides a standard value per person for treatment costs after a disaster. This value was applied to the number of residents that would be impacted if the project did not occur. The result of the analysis is avoided treatments costs due to the implementation of the pilot area projects.

An estimated 65 households in Calumet Park, 8 in Blue Island, 15 in Robbins, and 85 in Riverdale had confirmed FEMA claims for DR-4116 and may have been susceptible to physical or mental health issues. Physical health benefits for affected residents are valued at $2,443/year per person. The number of known households impacted by DR-4116 was multiplied by the average number of residents (2.6 per household) and by the probability of design storm occurrence to come up with the avoided mental/physical health cost.

Data Sources

- ***Mental/Physical Health Benefit***: HUD, "Benefit Cost Analysis: Data Resources and Expert Tips" Webinar, 2015
- ***Avg. People Per Residence***: http://quickfacts.census.gov/qfd/states/17000.html

Limitations, Uncertainties, Assumptions, and Sensitivities

- Benefits are calculated for only 41% of the impacted population because research indicates that only that portion of the population with mental health issues will seek treatment. This significantly lowers the calculated treatment costs.

Detailed Results

A summary of the mental stress and anxiety treatment costs expected to be avoided are shown in Table 17 below.

Table 17: Avoided Mental Health Issues

Project Area	Post Mitigation Benefits	
	Annual Benefits	Net Total Benefits[7]
Blue Island-Calumet Park	$44,316	$611,561
Robbins	$12,826	$176,995
Riverdale	$34,202	$471,988
Dolton	$80,619	$1,112,542
Calumet City	$108,103	$1,491,818
TOTAL AVOIDED COSTS	**$280,066**	**$3,864,904**

Avoided Loss of Productivity

Work productivity can be lost due to mental and physical illness. The impacts described in the previous section indicate that mental health issues will increase after a disaster, and research related to lost productivity due to mental problems indicates that economic productivity can be impacted by an increase in mental health issues post-disaster. Lost work productivity can be avoided by implementation of the proposed alternatives in the pilot area because an increase in mental health impacts will be avoided, as people will not experience as many stressors, such as damage to homes, as a result of the disaster. The protection of life, property, and critical infrastructure for low to moderate income and vulnerable populations allows these groups to recover more quickly after disasters, preventing increased psychological distress, stress, and symptoms of mental illness.

Expected Impacts

[7] NPV coefficient for a 50 year project useful life using a 7% discount rate

Levinson et al (2010) conducted research using the World Health Organizations Mental Health Surveys and found that individuals in the United States with mental health illnesses experience a significant reduction in earnings. HUD's "*Benefit Cost Analysis: Data Resources and Expert Tips*", was used to quantify impacts for this analysis. Mental health benefits for affected residents are valued at $8,736/year per person. The number of known households impacted by the 2013 event (DR-4116) was multiplied by the number of wage earners (1.22 per household) and by the probability of design storm occurrence to come up with the number of avoided loss of productivity.

Data Sources

- ***Avoided Loss of Productivity***: HUD, "Benefit Cost Analysis: Data Resources and Expert Tips" Webinar, 2015
- ***Avg. People Per Residence***: http://quickfacts.census.gov/qfd/states/17000.html

Limitations, Uncertainties, Assumptions, and Sensitivities

- It is assumed that the average number of workers per household for the affected properties from the 2013 event (DR-4116) entire county.

Detailed Results

A summary of the cost of loss of productivity expected to be avoided is shown in Table 18.

Table 18: Avoided Loss Productivity

Project Area	Post Mitigation Benefits	
	Annual Benefits	Net Total Benefits[8]
Blue Island-Calumet Park	$158,471	$2,186,900
Robbins	$45,864	$632,923
Riverdale	$122,304	$1,687,795
Dolton	$288,288	$3,978,374
Calumet City	$386,568	$5,334,638
TOTAL AVOIDED COSTS	**$1,001,495**	**$13,820,632**

Aesthetics

Research has revealed that parks, green space and other amenities help improve the quality of life and social sustainability of communities by providing recreation opportunities and aesthetic enjoyment, promoting physical health, contributing to psychological well-being, enhancing social ties, and providing opportunities for education. The benefits calculated for this category are added value rather than losses avoided.

Expected Impacts

There are several currently accepted methods to value the aesthetic benefits of amenities such as those proposed for the projects within the pilot area such as green infrastructure, trees, soccer fields, new roads and sidewalks, etc. Improved aesthetics are based on hedonic pricing/contingent valuation from national tax data assessor data, land cover data, flood zones,

[8] NPV coefficient for a 50 year project useful life using a 7% discount rate

location of open spaces and is valued at $1,623/acre. Improved aesthetics from green infrastructure and other amenities by community are shown in Table 19 below.

Table 19: Acreage of Improved Aesthetics by Community

Project Area	Wet Ponds & Other GI (acres)
Blue Island-Calumet Park	16.5
Dolton	2.0
Riverdale	19.4
Robbins	14.0
TOTAL	**51.9**

Data Sources

- Economic Valuation of Riparian Buffer and Open Space in a Suburban Watershed. Journal of the American Resources Association. 42. 6, 1583–1596, Qiu, Z., Prato, T., Boehm, G. 2006.

Limitation, Uncertainties, Assumptions, and Sensitivities

It is assumed that the results of previously conducted studies can be applied to Cook County, even though research reveals that population density, age, and income distribution influence the valuation of benefits.

Detailed Results

A summary of the value of improved aesthetics is shown in Table 20 below.

Table 20: Improved Aesthetics

Project Area	Post Mitigation Benefits	
	Annual Benefits	Net Total Benefits[9]
Blue Island-Calumet Park	$26,780	$369,557
Robbins	$22,722	$313,564
Riverdale	$31,486	$434,510
Dolton	$3,246	$44,795
Calumet City	$0	$0
TOTAL ADDED VALUE	**$84,234**	**$1,162,425**

Recreation

Exercise has a major influence on an individual's health. Adequate space for outdoor recreation influences how often an individual exercises. Studies reveal that accessible outdoor recreation can increase the exercise rate of a surrounding population by 48 percent. The improved health due to increased exercise leads to reduced health care costs and increased work productivity.

Expected Impacts

Demographic data for the project area was used since the local population would theoretically get the most use of the recreational facilities and amenities due to proximity. The percentage of the population meeting physical fitness guidelines was reviewed and a conservative number of 20% was used based on national data for the typical persons meeting aerobic exercise requirements. The proposed Cal-Sag Trail, walking trails, wet ponds, soccer fields, and other

[9] NPV coefficient for a 50 year project useful life using a 7% discount rate

recreational amenities will increase recreation throughout the pilot area, which would increase physical activity by 48 percent based on a study conducted by the Trust for Public Land, according to Earth Economics.

The number of residents was multiplied by the percentage meeting the physical fitness guidelines and by the 48 percent anticipated increase in physical activity d to obtain the increase in the number of residents meeting fitness guidelines. The increase in the population was applied to health care cost savings based on Pratt et al. 2000 data on increased exercise. The outcome is the avoided health care costs for each age group due to increased physical activity.

Data Sources

The health care cost savings was taken from the Center for Neighborhood Technology's "The Value of Green Infrastructure", P. 49, which referenced Pratt et al. 2000 data on increased exercise.

Limitation, Uncertainties, Assumptions, and Sensitivities

- National not local percentages of people meeting physical fitness guidelines were used for the project area.
- Benefits to employees who work in the project area and use the recreation spaces but do not live there are not considered.
- For this analysis, the entire population in the project area was assumed to benefit from the added recreational opportunities regardless of distance from the amenity.

Detailed Results

A summary of the equivalent cost of improved recreation is shown in Table 21 below.

Table 21: Improved Recreation

Project Area	Post Mitigation Benefits	
	Annual Benefits	Net Total Benefits[10]
Blue Island-Calumet Park	$198,200	$2,735,158
Robbins	$44,634	$615,949
Riverdale	$123,522	$1,704,604
Dolton	$12,041	$166,163
Calumet City	$0	$0
TOTAL ADDED VALUE	**$378,397**	**$5,221,874**

Environmental Impacts

Environmental impacts in general are also inherent values that include:

- Recreational value
- Aesthetic value
- Reduced energy use
- Reduced air pollution
- Reduced carbon dioxide emissions

Wildlife Habitat

The addition of new wet ponds, bioswales and other green areas can provide habitat for various forms of wildlife. Habitat value for GI is estimated at $7,853/acre. The value of wildlife habitat from green infrastructure and other amenities by community are shown in Table 22 below.

[10] NPV coefficient for a 50 year project useful life using a 7% discount rate

Table 22: Acreage of GI for Wildlife Habitat by Community

Project Area	Wet Ponds & Other GI (acres)
Blue Island-Calumet Park	8.0
Dolton	2.0
Riverdale	11.0
Robbins	13.0
TOTAL	**34.0**

Data Sources

- HUD, "Benefit Cost Analysis: Data Resources and Expert Tips" Webinar, 2015

Limitations, Uncertainties, Assumptions, and Sensitivities

Various forms of green infrastructure are assumed to have similar habitat which is not necessarily true in nature.

Detailed Results

A summary of the equivalent cost of wildlife habitat is shown in Table 23 below.

Table 23: Value of Wildlife Habitat

Project Area	Post Mitigation Benefits	
	Annual Benefits	Net Total Benefits[11]
Blue Island-Calumet Park	$62,824	$866,971
Robbins	$102,089	$1,408,828
Riverdale	$86,383	$1,192,085
Dolton	$15,706	$216,743

[11] NPV coefficient for a 50 year project useful life using a 7% discount rate

Calumet City	$0	$0
TOTAL ADDED VALUE	**$267,002**	**$3,684,628**

Improved Water Quality

The addition of new wet ponds, bioswales and other green areas can improve water quality. The water quality improvement value for wet ponds/GI is estimated at $293/acre. The acreage of wet ponds and other GI by community is shown in Table 24 below.

Table 24: Acreage of GI for Improved Water Quality

Community	Wet Ponds & Other GI (acres)
Blue Island-Calumet Park	16.5
Dolton	2.0
Riverdale	19.4
Robbins	14.0
TOTAL	**51.9**

Data Source

- Trust for Public Land, "The Economic Benefits of Seattle's Park and Recreation System", 2011 (http://cloud.tpl.org/pubs/ccpe-seattle-park-benefitsreport.pdf)

Limitations, Uncertainties, Assumptions, and Sensitivities

National, rather than local information, on the water quality benefits was used.

Detailed Results

A summary of the equivalent cost of improved water quality is shown in Table 25.

Table 25: Value of Improved Water Quality

Project Area	Post Mitigation Benefits	
	Annual Benefits	Net Total Benefits[12]
Blue Island-Calumet Park	$4,835	$66,716
Robbins	$4,102	$56,608
Riverdale	$5,684	$78,442
Dolton	$586	$8,087
Calumet City	$0	$0
TOTAL ADDED VALUE	**$15,207**	**$209,852**

Tree Cover

Trees are not only an excellent habitat for various creatures, but help reduce the carbon footprint. The proposed new development in Blue Island-Calumet Park includes 8 acres of new trees. Trees included as part of a tree trench Green Streets system have not been included in the evaluation. Trees provide carbon sequestration valued at $7,853/acre.

Data Source

- HUD, "Benefit Cost Analysis: Data Resources and Expert Tips" Webinar, 2015

Limitations, Uncertainties, Assumptions, and Sensitivities

Tree morbidity is not factored into the analysis.

Detailed Results

A summary of the added value of tree cover is shown in Table 26.

[12] NPV coefficient for a 50 year project useful life using a 7% discount rate

Table 26: Value of Tree Cover

Project Area	Post Mitigation Benefits	
	Annual Benefits	Net Total Benefits[13]
Blue Island-Calumet Park	$62,824	$866,971
Robbins	$0	$0
Riverdale	$5,684	$78,442
Dolton	$0	$0
Calumet City	$0	$0
TOTAL ADDED VALUE	**$68,508**	**$945,413**

Air Quality

Benefits quantified for air quality include the annual uptake and avoided pollutant emissions captured by trees and other green infrastructure. The added value by GI of avoided pollutant emissions is valued as $204/acre. The acreage of wet ponds and other GI by community that is improving air quality in the project area is shown in Table 27.

Table 27: Acreage of GI for Improved Air Quality

Community	Wet Ponds & Other GI (acres)
Blue Island-Calumet Park	16.5
Dolton	2.0
Riverdale	19.4
Robbins	14.0
TOTAL	**51.9**

[13] NPV coefficient for a 50 year project useful life using a 7% discount rate

Data Source

- David Suzuki Foundation, "Ontario's Wealth, Canada's Future: Appreciating the Value of the Greenbelt's Eco-Services. Vancouver, Canada. Wilson, S.J., 2008. (http://www.davidsuzuki.org/publications/downloads/2008/DSF-Greenbelt-web.pdf)

Limitations, Uncertainties, Assumptions, Sensitivities

The level of benefit is based on an estimated acreage of feature area.

Detailed Results

A summary of the improved air quality is shown in Table 28.

Table 28: Value of Improved Air Quality

Project Area	**Post Mitigation Benefits**	
	Annual Benefits	Net Total Benefits[14]
Blue Island-Calumet Park	$3,366	$46,451
Robbins	$0	$0
Riverdale	$3,958	$54,615
Dolton	$408	$5,630
Calumet City	$0	$0
TOTAL ADDED VALUE	**$7,732**	**$106,696**

Affordable Housing

Research indicates that affordable housing increases employment and spending in the surrounding economy. The availability of affordable housing attracts employers, and lower housing costs increase disposable household income. By lowering housing costs for low- and moderate-income families, affordable housing can increase residual income that households have

[14] NPV coefficient for a 50 year project useful life using a 7% discount rate

at their disposal, thus increasing spending and driving economic growth. Research indicates that low- to moderate- income households are more likely to spend additional income from rent reductions to fulfill basic needs that would otherwise not be met, such as food, clothing, healthcare, and transportation. If housing costs are kept low, families and local businesses will benefit, as families have more disposable income to contribute to the local economy.

With regard to resiliency, if these households can spend a smaller percentage of their income for housing, it can be presumed that they would have a bit more to spend in times of emergency and recovery from disaster, providing a higher level of resiliency to natural hazards such as flooding. By protecting affordable housing from future storms, the proposed projects will preserve the economic benefits that affordable housing generates. The benefit of affordable housing is estimated by the Cook County Housing Authority as $611/unit.

Data Source

- Housing Authority of Cook County

Limitations, Uncertainties, Assumptions, Sensitivities

None.

Detailed Results

A summary of the added value of affordable housing is shown in Table 29 below.

Table 29: Value of Affordable Housing

Project Area	Post Mitigation Benefits	
	Annual Benefits	Net Total Benefits[15]
Blue Island-Calumet Park	$0	$0
Robbins	$0	$0
Riverdale	$0	$0
Dolton	$18,330	$252,954
Calumet City	$88,595	$1,222,611
TOTAL ADDED VALUE	**$106,925**	**$1,475,565**

[15] NPV coefficient for a 50 year project useful life using a 7% discount rate

Phase 1 – Consultation Summary – Regional

1	2	3	4
Agency Name	*Agency Type - Target Population*	*Type of Outreach*	*- Method of Notification (if applicable) - Materials Provided*
Access Living	Civic/Non-Profit Organization – people living with disabilities	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
AECOM	Design and Engineering Professionals – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Alliance for Regional Development	Economic/Workforce/Community Development Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Alliance for the Great Lakes	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Ameresco	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
American Red Cross	Civic/Non-Profit Organization – Communities and individuals hit with disaster	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
American Planning Association	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
ArcelorMittal	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Argonne National Laboratory	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Baxter & Woodman	Design and Engineering Professionals – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Biomicry Chicago	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Blue 1647	Economic/Workforce/Community Development Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
BNSF	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Burns & McDonnell	Design and Engineering Professionals – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Candid Sustainability	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Chicago Department of Transportation – Greencorps Chicago	Local Government Agency – Workforce development program for hard-to-employ residents	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Center for Neighborhood Technology	Civic/Non-Profit Organization – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email

CH2MHill	Design and Engineering Professionals – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Chicago Cook Workforce Partnership	Economic/Workforce/Community Development Organization – Under-employed residents	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Chicago Community Loan Fund	Financial Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Chicago Community Trust	Philanthropic Organization – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Chicago Department of Planning & Development	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
Chicago Department of Public Health	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Chicago Department of Water Management	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
Chicago Department of Information Technology	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Chicago FIRST	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Chicago Infrastructure Trust	Financial Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Chicago Innovation Exchange	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Chicago Mayor's Office	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
Chicago Metropolitan Agency for Planning	Regional Planning Organization – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
Chicago Neighborhoods Initiatives	Economic/Workforce/Community Development Organization – Low to moderate income communities	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Chicago Office of Emergency Management & Communications	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
Chicago Parks Foundation	Philanthropic Organization – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Chicago Transit Authority	Local Government Agency – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Chicago Wilderness	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Christopher Burke Engineering	Design and Engineering Professionals – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Citizens' Climate Lobby	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
ComEd	Utility – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Conservation Design Forum	Design and Engineering Professionals – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Cook County Bureau of Asset Management	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Cook County Bureau of Economic Development	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
Cook County Bureau of Finance	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Cook County Bureau of Technology	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Cook County Department of Environmental Control	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Cook County Department of Health & Hospital System	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Cook County Department of Planning and Development	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
Cook County Department of Transportation and Highways	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Cook County Forest Preserve District	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Cook County Land Bank Authority	Economic/Workforce/Community Development Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Cook County Office of Capital Planning	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Cook County Office of Homeland Security & Emergency	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Cubic Transportation Systems	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Delta Institute	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Design for America	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
DuPage County Department of Stormwater Management	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
DuPage County Office of Homeland Security & Emergency	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
DuPage County Mayors & Managers Conference	Council of Government – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
DuPage County Forest Preserve District	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
EcoVidal Design	Design and Engineering Professionals – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Elevate Energy	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Enterprise Community Partners	Financial Institution – Affordable housing for low-income residents	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Faith in Place	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Farr & Associates	Design and Engineering Professionals – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Federal Home Loan Bank of Chicago	Financial Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Foresight Design Initiative	Civic/Non-Profit Organization – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
Fuller Park Community Development	Economic/Workforce/Community Development Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Geosyntec	Design and Engineering Professionals – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Goose Island Brewery	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Grand Victoria Foundation	Philanthropic Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Greenleaf Advisors	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Grisko	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.

Hagerty Consulting	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Health and Medicine Policy Research Group	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Hispanic Housing Development Corporation	Economic/Workforce/Community Development Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Historic Chicago Bungalow Association	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
HOK	Design and Engineering Professionals – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
HR&A Advisors	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Illinois Department of Natural Resources	State Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
Illinois Department of Public Health	State Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Illinois Environmental Protection Agency	State Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Illinois Facilities Fund	Financial Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Illinois Finance Authority	Financial Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Illinois-Indiana Sea Grant	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Intel	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
International Network for Urban Agriculture	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
JP Morgan	Financial Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Kane County Development & Community Services	Local Government Agency – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Loyola University	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
MacArthur Foundation	Philanthropic Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Mackie Consultants	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Metropolitan Planning Council	Civic/Non-Profit Organization – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
Metropolitan Water Reclamation District of Greater Cook County	Water District/Utility – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
Mikva Challenge	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Massachusetts Institute of Technology	Research Institution – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Moraine Valley Community College	Research Institution – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Morton Arboretum	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
NORR Architects	Design and Engineering Professionals – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Northern Trust	Financial Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Natural Resources Defense Council	Civic/Non-Profit Organization – N/A	Northeastern Illinois Resilience Partnership Meetings	- Definition of regional resilience partnership and draft content for Phase 1 applications - Meeting invitations via direct email
OAI	Economic/Workforce/Community Development Organization – Under-employed residents	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Office Depot	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Openlands	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Peoples Gas	Utility – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Plumbing Contractors Association of Chicago	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
PNC	Financial Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Adrian Smith & Gordon Gill	Design and Engineering Professionals – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Prince Charitable Trusts	Philanthropic Organization – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.

Public Building Commission	Local Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Purdue University	Research Institution – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Robinson Engineering	Design and Engineering Professionals – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Regional Transit Authority	Regional Government Agency – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
S.B. Friedman	Economic/Workforce/Community Development Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Schneider Electric	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Skidmore, Owings & Merrill	Design and Engineering Professionals – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Sloan Valve	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Solomon Cordwell Buenz & Associates	Design and Engineering Professionals – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
South Suburban Land Bank and Development Authority	Economic/Workforce/Community Development Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Southeast Environmental Task Force	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
STR	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Studio Gang	Design and Engineering Professionals – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Sun Times	Media/Communications Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
TeamWerks	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Terry Guen Design Associates	Design and Engineering Professionals – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
The Field Museum	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
The UCI Group	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
The Water Council	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Tinley Park Economic Development Office	Economic/Workforce/Community Development Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
UI Labs	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
University of Illinois at Chicago	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
University of Illinois at Urbana-Champaign	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Urban Juncture	Economic/Workforce/Community Development Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Urban Land Institute	Research Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
UrbanLab	Design and Engineering Professionals – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
United States Department of Agriculture – Forest Service	Federal Government Agency – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
USG	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
United States Green Building Council (USGBC)	Civic/Non-Profit Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Waggonner & Ball Architects	Design and Engineering Professionals – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
Walgreens	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Waste Management	Business/Private Sector – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Wells Fargo	Financial Institution – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Wight & Company	Design and Engineering Professionals – N/A	Resilience Roundtable (Public Meeting)	- Discussion with regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) and national winners of previous Rebuild By Design competitions on key components of compelling resilience-building initiatives. - Roundtable invitations via direct email and e-newsletters.
World Business Chicago	Economic/Workforce/Community Development Organization – N/A	Expert Work Group Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

Phase 1 – Consultation Summary – Local

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Agency Name	*Agency Type - Target Population*	*Type of Outreach*	*- Method of Notification (if applicable) - Materials Provided*
Center for Neighborhood Technology	Civic/Non-Profit Organization – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Chicago Cook Workforce Partnership	Economic/Workforce/Community Development Organization – Under-employed residents	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Bureau of Economic Development	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Department of Transportation and Highways	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Department of Environmental Control	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Department of Homeland Security Emergency Management	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Department of Health & Hospital System	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.

Cook County Forest Preserves District	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Metropolitan Water Reclamation District	Local Government Agency – N/A	Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email, telephone.
City of Blue Island	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
City of Calumet City	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
City of Calumet Park	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
Village of Dolton	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
Village of Riverdale	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.

Village of Robbins	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
South Suburban Mayors and Managers Association (SSMMA)	Council of Government (COG)	Survey, General Correspondence	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
Northeast Illinois Community Organizations Active in Disasters (COAD) Long Term Recovery Committee	Leadership from local social service providers, including Red Cross, Salvation Army, and Catholic Charities, which serve vulnerable populations and respond to long-term disaster recovery cases in south suburban Cook County	Coordination Meeting, General Correspondence	- Department of Planning and Development spoke at Committee meeting, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders.
Southland Human Services Leadership Council (SHSLC)	Leadership from local social service providers which serve vulnerable populations in south suburban Cook County	Coordination Meeting	- Department of Planning and Development spoke at Council meeting, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders.
General Public	Local residents, employees, business owners, property owners, vulnerable populations	Survey, Interactive Workshops, General Correspondence	- Department of Planning and Development solicited information on unmet needs related to flooding and potential resilience strategies and received feedback. - Meeting invitations and notices related to survey availability transmitted via email blast, website posting, and hard copy flyers.

Phase 2 Regional Consultation Summary

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Agency Name	*Agency Type - Target*	*Type of Outreach*	*- Method of Notification (if applicable) - Materials Provided*
AECOM	Design and Engineering Professionals – N/A	Expert Review Session; Resilience Roundtable (Public Meeting)	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call. - Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Active Transportation Alliance	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Adler University	Research Institution – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Age With Ease	Civic/Non-Profit Organization – Elderly communities	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
AgeOptions	Civic/Non-Profit Organization – Elderly communities	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Allstate Insurance	Business/Private Sector – N/A	Industry Expert Meeting	- Prepared questions from regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) for industry experts. - Meeting invitations via direct email and phone call.
American Red Cross	Civic/Non-Profit Organization – Communities and individuals hit with disaster	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email.

ARCADIS	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Archdiocese of Chicago	Religious Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Argonne National Laboratory	Research Institution – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Arthur M. Brazier Foundation	Philanthropic Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
The Cara Program	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Center for Neighborhood Technology	Civic/Non-Profit Organization – N/A	Expert Review Session; Northeastern Illinois Resilience Partnership Meetings; Calumet Stormwater Collaborative Meeting	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email.
Century 21 S.R.G., Inc.	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
City of Chicago Mayors Office	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings; Expert Review Session	- Structure, objectives, and priority actions for long-term regional partnership. - Meeting invitations via direct email and phone calls.
Chicago Department of Planning & Development	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings	- Structure, objectives, and priority actions for long-term regional partnership. - Meeting invitations via direct email and phone calls.

Chicago Department of Water Management	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings; Calumet Stormwater Collaborative Meeting	- Structure, objectives, and priority actions for long-term regional partnership. - Meeting invitations via direct email and phone calls.
Chicago Metropolitan Agency for Planning	Metropolitan Planning Organization– N/A	Expert Review Session; Northeastern Illinois Resilience Partnership Meetings; Calumet Stormwater Collaborative Meeting	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email.
Chicago Park District	Civic/Non-Profit Organization – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email.
Chicago Parks Foundation	Philanthropic Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Chicago Rehab Network	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Chicago Wilderness	Civic/Non-Profit Organization – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email.
City of Blue Island	Civic/Non-Profit Organization – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email.
Claretian Associates	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Cook County Bureau of Community Development	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings; Calumet Stormwater Collaborative Meeting; Expert Review Session	- Structure, objectives, and priority actions for long-term regional partnership. - Meeting invitations via direct email and phone calls.

Cook County Department of Environmental Control	Local Government Agency – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email.
Cook County Department of Planning and Development	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings; Expert Review Session	- Structure, objectives, and priority actions for long-term regional partnership. - Meeting invitations via direct email and phone calls.
Cook County Office of Homeland Security & Emergency	Local Government Agency – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email.
Conservation Design Forum	Design and Engineering Professionals – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email.
Crown Family Philanthropies	Philanthropic Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
d'Escoto, Inc.	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Delta Institute	Civic/Non-Profit Organization – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email.
DuPage County Department of Stormwater Management	Local Government Agency – N/A	Northeastern Illinois Resilience Partnership Meetings; Expert Review Session	- Structure, objectives, and priority actions for long-term regional partnership. - Meeting invitations via direct email and phone calls.
Elevate Energy	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Farr Associates	Design and Engineering Professionals – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email.

FEMA – Region 5	Federal Government Agency – Communities and individuals hit with disaster	Industry Expert Meeting	- Prepared questions from regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) for industry experts. - Meeting invitations via direct email and phone call.
Forest Preserve District of Cook County	Civic/Non-Profit Organization – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email.
Foresight Design Initiative	Civic/Non-Profit Organization – N/A	Expert Review Session; Northeastern Illinois Resilience Partnership Meetings; Calumet Stormwater Collaborative Meeting	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email.
Geosyntec Consultants	Design and Engineering Professionals – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email.
Gorman & Company, Inc.	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Harma Enterprises	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Historic Chicago Bungalow Association	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Illinois Department of Insurance	State Government Agency – N/A	Industry Expert Meeting	- Prepared questions from regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) for industry experts. - Meeting invitations via direct email and phone call.
Illinois Department of Natural Resources	State Government Agency – N/A	Expert Review Session; Northeastern Illinois Resilience Partnership Meetings; Calumet Stormwater Collaborative Meeting	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email.

Illinois Environmental Protection Agency	State Government Agency – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email.
Illinois-Indiana Sea Grant	Research Institution – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional action. - Meeting invitations via direct email.
Landmarks Illinois	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
LL Consulting	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Metro Strategies, Inc.	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Metropolitan Mayors Caucus	Civic/Non-Profit Organization – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional action. - Meeting invitations via direct email.
Metropolitan Planning Council	Civic/Non-Profit Organization – N/A	Expert Review Session; Calumet Stormwater Collaborative Meeting; Northeastern Illinois Resilience Partnership Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email and phone call.
Metropolitan Water Reclamation District of Greater Cook County	Civic/Non-Profit Organization – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email.
NAACP	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Natural Resource Defense Council	Civic/Non-Profit Organization – N/A	Expert Review Session & Northeastern Illinois Resilience Partnership Meetings	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.

North Central Illinois Council of Governments	Civic/Non-Profit Organization – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email.
OAI, Inc.	Economic/Workforce /Community Development Organization – Vulnerable, difficult to employ populations	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional actions. - Meeting invitations via direct email.
Office of Commissioner Bridget Gainer	Local Government – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Openlands	Civic/Non-Profit Organization – N/A	Expert Review Session; Calumet Stormwater Collaborative Meeting	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional action. - Meeting invitations via direct email.
Pepper Construction Company	Business/Private Sector – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email.
PolicyLink	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Preservation of Affordable Housing	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
RESUSstudio	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.

RW Ventures, LLC	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Skidmore, Owings & Merrill	Design and Engineering Professionals – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
SmithGroupJJR	Business/Private Sector – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
South Suburban Mayors and Managers Association	Civic/Non-Profit Organization – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional action. - Meeting invitations via direct email.
Spanish Coalition for Housing	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
Stanhope Consulting	Business/Private Sector – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Terry Guen Design Associates	Design and Engineering Professionals – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email.
Transportation Land Use Associations	Civic/Non-Profit Organization – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.
UI Labs	Research Institution – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
University of Chicago	Research Institution – N/A	Resilience Roundtable (Public Meeting)	- Roundtable discussion with regional experts and applicants (City of Chicago, Cook County, DuPage County, State of Illinois) on addressing social vulnerabilities and strategies for building resilience. - Roundtable invitations via direct email and e-newsletters.

Building Resilience Against Climate Effects, University of Illinois at Chicago	Research Institution – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
US Army Corps of Engineers	Federal Government Agency – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional action. - Meeting invitations via direct email.
US Environmental Protection Agency – Region 5	Federal Government Agency – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional action. - Meeting invitations via direct email.
US Green Buildings Council – Illinois Chapter	Design and Engineering Professionals – N/A	Expert Review Session	- Regional applicants (City of Chicago, Cook County, DuPage County, State of Illinois) presented on respective needs and approaches to solicit input, ideas, and feedback from regional experts. - Meeting invitations via direct email and phone call.
Village of Homewood	Local Government – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional action. - Meeting invitations via direct email.
Village of Midlothian	Local Government – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional action. - Meeting invitations via direct email.
Village of Park Forest	Local Government – N/A	Calumet Stormwater Collaborative Meeting	- Invited input on regional priorities for collaborative actions at Calumet Stormwater Collaborative meeting, presented a matrix of potential regional action. - Meeting invitations via direct email.

Phase 2 – Consultation Summary – Local

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Agency Name	*Agency Type - Target Population*	*Type of Outreach*	*- Method of Notification (if applicable) - Materials Provided*
Center for Neighborhood Technology	Civic/Non-Profit Organization – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Chicago Cook Workforce Partnership	Economic/Workforce/Community Development Organization – Under-employed residents	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Bureau of Economic Development	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Department of Transportation and Highways	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Department of Environmental Control	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Department of Homeland Security Emergency Management	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Department of Health & Hospital System	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.

Cook County Forest Preserves District	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Human Rights Commission	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Housing Authority of Cook County (HACC)	Local Government Agency – N/A	Internal Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
South Suburban Land Bank and Development Authority	Local Government Agency – N/A	Conference Calls, Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
Cook County Land Bank Authority	Local Government Agency – N/A	Conference Calls, Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email.
FEMA – Region 5 Grants Workshop	Federal Government Agency – Communities and individuals hit with disaster	Cook County west Suburban municipal leaders – workshop	FEMA invited many municipal leaders primarily in western Cook County
Metropolitan Water Reclamation District	Local Government Agency – N/A	Coordination Meetings	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies and received feedback from local experts. - Meeting invitations via email, telephone.

City of Blue Island	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
City of Calumet City	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
City of Calumet Park	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
Village of Dolton	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
Village of Riverdale	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
Village of Robbins	Local Government Agency – N/A	Coordination Meetings, Survey, General Correspondence	- Department of Planning and Development met with key representatives, shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.

South Suburban Mayors and Managers Association (SSMMA)	Council of Government (COG)	Meetings, General Correspondence	- Department of Planning and Development shared information regarding Resilience Competition and potential application approach/related strategies, and received feedback from local leaders. Received assistance in distributing electronic survey. - Meeting invitations via letter, email, telephone.
General Public	Local residents, employees, business owners, property owners, vulnerable populations	Survey, Interactive Charrettes, General Correspondence	- Department of Planning and Development solicited information on unmet needs related to flooding and potential resilience strategies and received feedback. - Meeting invitations and notices related to survey availability transmitted via email blast, website posting, and hard copy flyers.