Name of Exhibit: Exhibit A: Executive Summary

Name of Applicant: City of Moore, OK

Name of File that Contains the Exhibit: MooreExhibitA

The City of Moore, Oklahoma (City) is pleased to submit this Phase 1 application to the Department of Housing and Urban Development (HUD) for the National Disaster Resilience Competition (NDRC). Our needs arise from the devastating May 2013 EF5 tornado that caused over $500 million in housing, economic, public facility, and infrastructure losses—$142 million of which remains in unmet needs. We seek $50 million to implement our ideas to build a **More Resilient Moore**.

We propose a concept of resiliency that is within the context of our recovery needs, focused on threats from recurring hazards, and provides the best potential for the co-benefits shown in Figure 1. This includes economic development benefits from infrastructure construction projects, reduction of economic losses from water outages, and innovation sparked from new solution development.

Figure 1: The City's Approach to a More Resilient Moore

The biggest risks and vulnerabilities to the City are severe thunderstorms, tornadoes, and droughts, with a long history of each. The atmospheric environments that support these hazards are changing, raising additional concerns for City planners. While the Third National Climate Assessment (Walsh, *et al*., 2014) found no change in the number of the tornadoes per year, it did find that more tornadoes occur on the same day, and the number of days with multiple tornadoes has been increasing.[1]

[1] Walsh, J., D. et al. 2014. "Our Changing Climate. Climate Change Impacts in the United States: The Third National Climate Assessment," Chapter 2 in J. M. Melillo, T.C. Richmond, and G. W. Yohe, Eds., *U.S. Global Change Research Program*, pp. 19-67.

Our Phase 2 projects will invest in both physical and social resilience projects to address our unmet needs in infrastructure and environmental degradation. Our unmet need to repair damaged water infrastructure and environmental degradation is a direct result of the Qualified Disaster, which is a consequence of the severe climate patterns in our region. According to a study by the National Weather Service (NWS) Forecast Office in Norman, OK, 16 different tornadoes have struck the City in the last 122 years. Six of these hit the City in the last 16 years, with four at the EF4 or EF5 level.

This unmet need in water infrastructure provides an opportunity to rebuild in such a way to promote greater water conservation and independence, which will help mitigate the hazard impacts. The water conservation benefits against the risk of drought are clear, but we lost 7.5 million gallons of water to 1,500 leaking meters in the first day of the Qualified Disaster. It took a full week before we could shut them all off because we had to do them individually. We will propose Phase 2 projects that mitigate the loss of water in our tornado- and drought-prone region by repairing the water infrastructure, upgrading the Draper Water Treatment Plant (DWTP), installing a new smart water meter system, building a "green" hazard education center that demonstrates how sustainable technologies can mitigate our risks, and continuing efforts to raise building code standards for commercial and multi-family properties.

The City will create a new agency—the Department of Resiliency (DOR)—to oversee the implementation of the Phase 2 projects. It will be located in the City Manager's Office and consist of about 10 staff members. We will also leverage the resources and expertise of our partners—the **University of Oklahoma (OU)**, **Oklahoma City (OKC)**, and **Moore Public Schools—**via OU's research centers in climate change and water resources, their urban planning department, and the OKC Water Utilities Trust (OCWUT).

Name of Exhibit: Exhibit B: Threshold Requirements

Name of Applicant: City of Moore, OK

Name of File that Contains the Exhibit: MooreExhibitB

Eligible Applicant. HUD National Disaster Resilience Competition Fact Sheet, September 2014 declared the City of Moore, Oklahoma an eligible city, one of 67 eligible applicants for funding availability from the National Disaster Resilience Competition (FR-5800-N-29). Letters from our partners, OU and OKC, are enclosed in Appendix D.

Eligible County. Appendix A lists Cleveland County, in which the City resides, as an eligible county. It has received two disaster declarations, DR 4078 in 2012 as a result of the Freedom and Noble Wildfires, and DR 4117 in 2013 as a result of tornadoes and severe storms.

Most Impacted and Distressed Target Area. The Most Impacted and Distressed Unmet Recovery Need (MID-URN) target area that primarily benefits from our proposed activities is Cleveland County, which is listed in Appendix B as a most impacted and distressed target area.

To confirm our eligible unmet needs in infrastructure and environmental degradation, we draw from the independent assessment documented in the *City of Moore Infrastructure Recovery and Implementation Plan for May 20, 2013 Tornado Area, Volumes I & II* (IRIP).[1]

We limit our unmet needs justifications to infrastructure and environmental degradation, where we meet all of the conditions listed in Appendix G – MID-URN Summary Checklist. The infrastructure conditions are as follows:

☑ The IRIP confirms damage to permanent public infrastructure from the Qualified Disaster that has not been repaired due to inadequate resources, serving the target areas.

☑ The IRIP presents details of the damage in the target areas (see pages 10–19 for description and location of damages), and summarizes it in an Infrastructure Rating Index (IRI) score of 587 for all infrastructure (including environmental degradation). Of the $142 million of total unmet infrastructure needs, $126.32 million is the estimated cost of the non-environmental

[1] The main text of the IRIP and Volume 1 – Appendix B1 (which has Tables B1.7 and B1.9) are located in Attachment E.

degradation part of the infrastructure repairs. Only $3 million have addressed unmet infrastructure needs to date because our recovery has focused on housing first.

☑ Unfunded permanent infrastructure repair needs amount to a minimum of $400,000.

☑ The IRIP, an engineering report, shows the estimated repair amount.

☑ The IRIP Table B1.9 presents the sources and uses statement for the repairs.

☑ Existing City resources, CDBG-DR, and other post-disaster resources were only adequate to address the unmet repair needs to housing, which we prioritized first.

We also meet the following environmental degradation conditions:

☑ The IRIP confirms environmental damage from the Qualified Disaster that has not yet been addressed and cannot be addressed with existing resources.

☑ The IRIP describes the environmental degradation in the target areas (see pages 14–16 for a description and location of damages) and how it results from the Qualified Disaster. The IRIP summarizes this damage in an IRI Score of 103.36. There is significant need in the Plaza Towers, J.D. Estates, and Kings Manor Assessment Zones. While some enclosed storm sewers exist in both the Plaza Towers and Kings Manor Assessment Zones, open channels dominate much of the inventory in each area. Evidence of grate and hood damage, insufficient armoring, and ponding were noted in several areas throughout the City. AND

☑ The IRIP repair estimate of the remaining damage to the environment is $15.68 million, which is greater than $400,000, and found in the IRIP Table B1.7.

☑ The IRIP was conducted by the certified engineering firm Cardinal Engineering, Inc. at 1015 North Broadway, Suite 300, Oklahoma City, OK 73102.

Eligible Activity. The City's Phase 2 projects to repair and harden our water infrastructure projects—a Smart Water Meter System and a Joint Water Resiliency Project with

OKC—are eligible activities to be funded by CDBG-NDR funding. Building construction for the Water Resiliency & Tornado Education Center (together with OU funding) is also eligible.

Resilience Incorporated. The City is considering proposing three projects for Phase 2—a Smart Water Meter System, a Joint Water Resiliency Project (with OKC), and a Water Resiliency & Tornado Education Center (on OU's campus). Their recovery and resilience features are discussed in turn:

Smart Water Meter System: We propose to replace existing water meters with smart meters to allow the City to shut down select components or the entire water system centrally during a disaster and more closely monitor and manage water usage during times of drought. In the past three storms, we had difficulty locating and shutting down water in disaster-affected areas, resulting in the massive loss of water resources. This system-wide upgrade will improve physical resiliency and enhance our goals of water conservation.

Joint Water Resiliency Project (with OKC): Addressing Low-to-Moderate Income (LMI) area needs in partnership with OKC, we propose to locate eight clear wells in the southern parts of OKC near Moore and make improvements to OKC's Draper Water Treatment Plant (DWTP). The City gets 70% of its water from DWTP, and after the tornado, the DWTP was down for days due to damages to the plant and a lack of power to pump water into Moore. This will improve physical resiliency and enhance our goals of water independence.

Water Resiliency & Tornado Education Center (with OU): We propose to construct this Center in partnership with OU and Moore Public Schools to provide education and research on water resources, conservation, drought planning, severe thunderstorms, tornado awareness, and resiliency design. The facility will be storm hardened to 135 mph winds and have a safe room constructed to "green" standards for energy and water conservation based on ideas developed at

OU's Water Innovations Research Laboratory (WIRL). Overall, the Center will improve social resiliency, enhance hazard awareness, and promote solutions and spark innovation in addressing the region's needs.

National Objective. All activities undertaken in Phase 2 will meet at least one of the three HUD CDBG funding objectives. The Smart Water Meter System and Joint Water Resiliency Project address the unmet need related to water infrastructure damage as a direct result of the Qualified Disaster. The Joint Water project also addresses LMI vulnerabilities in Moore and southeast OKC. Many LMI households went days without water following the tornado because public water supply and wastewater systems went down. The Water Resiliency & Tornado Education Center project will address the urgent need to develop community awareness to better understand and respond to the risks and vulnerabilities associated with the primary threats to the region—severe thunderstorms, tornadoes, and droughts.

Overall Benefit. At least 50% of the CDBG-NDR grant award will be used for activities benefitting LMI persons. The Resiliency Center will be located in a low-to-moderate income area (LMA), and improvements to the DWTP delivery system and the associated clear wells will be located in an LMA service area. The IRIP Assessment Team confirmed that our proposed projects will satisfy the primary national objective for benefiting LMI persons.

Establish Tie-Back. The proposed Smart Water Meter System ties back to the Qualified Disaster because it is meant to replace an old vulnerable system damaged by the tornado. The Joint Water Resiliency Project (with OKC) ties back to the Qualified Disaster because it focuses on repairing damages to the water infrastructure managed by OCWUT and serving the City. The Resiliency Center will address the long-term need to build and maintain effective responses to the region's primary hazards.

Benefit-Cost Analysis. We will submit the benefit-cost analysis for each proposed project with our Phase 2 application.

Name of Exhibit: Exhibit C: Capacity

Name of Applicant: City of Moore, OK

Name of File that Contains the Exhibit: Moore Exhibit C

General Management

Our capacity to implement the Phase 2 projects is strong. According to a recent audit of the State of Oklahoma, *CNNMoney* highlighted the City as among the best small cities to live in for 2012 and the second most affordable suburb in the United States. No municipality achieves this level of success and national recognition by having poor capacity to deliver high quality public services.

The City has demonstrated a long history of successfully managing Federal funds as a CDBG Entitlement Community, with an average allocation of $280,000 per year. Before the tornado, the City had long realized that the foundation for good decision making is a comprehensive plan that incorporates community preferences, socio-economic impacts, and infrastructure capacity. The Moore Vision 20/20 was established as such a foundation. This was a plan of action to guide the City through the next 15 years and is the primary guide for budget decisions. This includes $5 million in water and sewage improvements and eight new wells on the southeast part of OKC near Moore. As part of this vision, the City issued a General Obligation (GO) Bond totaling $18 million, which funded five major public works projects.

As a result of the tornado, the City received $52.2 million in CDBG funding. These funds were allocated to infrastructure, housing, public facilities, and resiliency for the most impacted and distressed areas. As a recipient of ongoing Federal funding, we are well acquainted with initiating, managing, and closing projects following Federal requirements, including HUD guidance in 24 CFR and FEMA guidance in 44 CFR. The City has gained extensive experience with the Federal grant management process, managing expenditures and reimbursements correctly. For example, the City determined the cost-effectiveness of its projects using FEMA's Benefit-Cost Analysis (BCA) modules.

New Agency for Resilience. To manage the CDBG-NDR award, a new agency will be created to oversee the implementation and management of the proposed Phase 2 projects. This new department, for now called the Department of Resiliency (DOR), will be located within the City Manager's Office. Its management capacity will consist of 10 staff members: two experienced city employees that have managed CDBG funds (one being the director), planning, and local government projects; five new staff members; and three members with construction experience. The DOR's role is to handle all project management and coordinate with other City departments and our partners as necessary to draw on their technical and scientific capacity. The DOR Director will have citywide authority to work with City departments to implement the Phase 2 projects, and the Financial Analysts, Procurement Specialists, and Construction Managers will work closely with the relevant City departments and partners to facilitate a quick launch and implementation.

Application Preparation. The City contracted with IEM (Innovative Emergency Management, Inc.) to serve as the professional technical writer for this application. IEM's technical writing team joined City representatives in Kansas City for the Resilience Academy in January 2015. A knowledge management system was established, allowing City staff and IEM to share key documents and information. IEM's primary responsibility was to document, support, and elaborate on the ideas and vision established by the City at the Resilience Academy.

TECHNICAL CAPACITY

Cross-Disciplinary Technical Capacity. The City will employ an interactive interdisciplinary team model to manage our cross-disciplinary partnerships. This approach relies on collaboration and empowering team members to develop solutions to complex problems as they arise. The DOR will integrate information from partners to inform decisions on proposed

projects as appropriate. Through its construction management professionals, the DOR will possess the capability to evaluate project design for quality and long-term resilience. This capacity is not dependent on our partner's ability, but we will draw on their capacity to improve the breadth and depth of our own when necessary.

The City has extensive cross-disciplinary experience implementing large Federal grants, including the $52 million in CDBG-DR after the Qualified Disaster and $2 million in American Recovery and Reinvestment Act of 2009 (ARRA) stimulus projects. After the tornado, the City's Department of Community Development (DCD) led the data analysis on tornado recovery, and the Department of Public Works coordinated closely with the Planning Divisions (in DCD) in crafting the City's comprehensive action plan. DCD and the Department of Public Utilities (DPU) regularly evaluate the environmental quality of land and lots in their service activities. The ARRA projects were focused on energy efficiency and conservation projects, and the rehabilitation of transportation infrastructure.

The City's cross-disciplinary capacity to design and implement our proposed projects is based on the blending of our core functions with the technical and scientific capabilities of the City's partners. The City purchases most of its water from OKC's Water Utilities Trust (OCWUT), so they will be a natural partner in the water infrastructure projects. The City will also partner with OU, coordinating the scientific knowledge and capabilities across their relevant research centers, academic departments, and their two Federal partners: the US Geological Survey ((USGS), for South Central Climate Science Center (SCCSC)) and the National Oceanic and Atmospheric Administration ((NOAA), for the NWS). The City's partners helped establish the baseline science for this application.

Partners, Roles, and Expertise. As shown in Figure 2, the City's DOR will be responsible for all project management duties, activities, and coordination and oversight of partners, who will in turn coordinate the planning and implementation functions (City agencies and OCWUT) and the relevant science (OU's research centers and Federal working partners).

OU is classified as a Very High Research institution, the highest tier. Research expenditures for FY13 topped $284 million, and in 2013, OU's Research Campus was named the nation's top research park by the Association of University Research Parks. OU helped us develop our conceptual framework, and brings three research centers, and the working relationship with two coordinating Federal agencies, to the partnership. As a former governor and U.S. senator, OU President David Boren is a strong leader with knowledge of Federal programs, and he will ensure institutional support for the scientific teams.

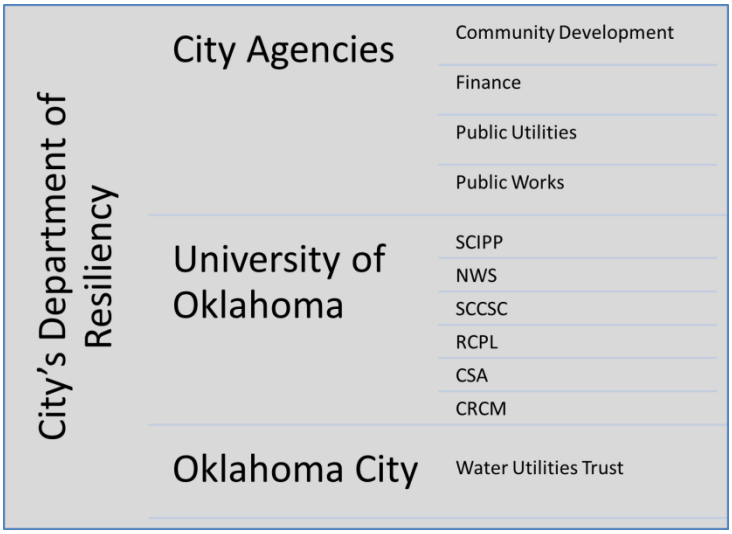

Figure 1: The City's Management Approach will have DOR coordinate all project activities across City agencies, OCWUT, and OU research centers and their Federal working partners.

The Southern Climate Impacts Planning Program (SCIPP) is a multi-disciplinary, multi-institutional program at OU that conducts analyses of natural hazards, their impact on communities, and engagement processes with communities. SCIPP leads the Southern Plains drought pilot for the National Integrated Drought Information System, a multi-million-dollar Federal initiative to lessen the impacts of drought. The City will also benefit from the working relationship SCIPP has with the Federal scientists at NOAA.

The National Weather Service (NWS) operates a $67 million research center on the OU campus, and is the largest such center of its kind in the nation, with more than 600 Federal and university employees. They work closely with SCIPP to provide operational weather forecasts, watches, warnings, and advisories. With its county warning area covering two-thirds of the state, including the City, it has had to forecast and respond to some of the state's most significant weather events.

The South Central Climate Science Center (SCCSC) is co-governed by the USGS and OU. Their research includes high-resolution global climate modeling and downscaling techniques to provide relevant climate projection output without having to duplicate the efforts within the NOAA network. Its OU leaders are Dean Berrien Moore III, Coordinating Lead Author for the Intergovernmental Panel on Climate Change Third Assessment Report (2001), and Professor Renee McPherson, Lead Author for the Great Plains chapter of the National Climate Assessment (NCA 2014). The SCCSC is leading national efforts to evaluate downscaling techniques used for climate change projections and, with its partners, will provide projections and expertise for the City in our vulnerability assessment.

The Corix Institute for Water and Sustainability (CIWS) collects, analyzes, interprets, and disseminates research-based information about water throughout the state and region. This institute includes the newly established Oklahoma Water Survey (OWS), which serves as a point of contact for the 17 agencies with jurisdictional responsibility related to water. OWS is led by Dr. Bob Puls, formerly of the Environmental Protection Agency's (EPA) Kerr Environmental Research Center, and his team synthesizes complex water data, providing a centralized location where information can be accessed through its water data portal for water information.

Other OU research centers include the Center for Spatial Analysis, the Center for Risk and Crisis Management, and the Institute for Quality Communities. These researchers will fill out our need for scientific support in their areas of expertise.

The Division of Regional and City Planning (RCPL) of the College of Architecture has been training Oklahoma's planners for 65 years through its master's program. This program serves Oklahoma communities when its faculty and students undertake various planning activities across the state.

Oklahoma City (OKC) is the capital of the State of Oklahoma, and has an established partnership with the City on the Draper Water Treatment Plant (DWTP), which is a critical component to increasing conservation and providing a reliable water supply. OKC has completed numerous large community and economic development activities that have transformed the City over the past 15 years under its Metropolitan Area Projects program.

OKC's Water Utilities Trust (OCWUT) is the policymaking body for the region on water and wastewater utilities and an important City partner on water conservation issues. OCWUT provides water to the City, OKC, and several surrounding communities. The OCWUT utilities department has an engineering staff capable of providing design and construction administration services to all water and wastewater facilities.

Civil Rights. The City contracts annually with the Metropolitan Fair Housing Council (MFHC) to investigate and mediate housing discrimination complaints and provide fair housing training. The MFHC helped us develop our Five Year Consolidated Plan, CDBG Entitlement Action Plan, and the associated Housing Needs and Impediments to Fair Housing analyses. The City works diligently to lessen the racial and economic disparity impacts identified as impediments to fair housing choice, including offering active transportation opportunities via the

City's Trails Plan for all residents, regardless of age, income, or disability status; promoting and supporting the provision of services for the homeless; and distributing information about housing rehabilitation and emergency home repair programs, as well as down payment assistance, and other area sources of funding to encourage home ownership.

Partner Dropout Plan. The City has strong commitments from its partners to remain vested throughout the life of the funded projects. OKC's commitment is strengthened by our formal agreement on the current provision of water and water conservation services. The OU commitment is strengthened by the fact that its technical and scientific capacity is perpetual, and largely state funded. When it is necessary to replace capacity due to a departing team member, resources will be used to replace that individual, or temporary contract support will be acquired to remediate the deficiency.

Benefit-Cost Analysis. In Phase 2, the DOR will analyze all potential projects for cost-effectiveness, feasibility, and CDBG compliance as a requirement of the grant. The previous awarding of Federal and state grants has equipped City staff, particularly the Department of Public Works (DPW) with experience in conducting BCA using FEMA's BCA software.

COMMUNITY ENGAGEMENT

The City's capacity to engage community stakeholders resides in the direct outreach to citizens conducted by the Mayor and City Council members, as well as the administrative outreach apparatus of the City Manager's Office and the Department of Marketing and Public Information (MPI), which is responsible for helping citizens access and understand City services and policies. MPI's capacity includes the regular network of traditional and social media outlets, the City government access channel (Channel 20), and the City's website.

Our outreach capacity helped our excellent response rate to the CDBG-DR Action Plan development following the Qualified Disaster. The City conducted two public hearings in the development of the CDBG-DR Action Plan. The first was held on January 8, 2014 to identify community needs. On February 24, 2014, the draft plan was published for a seven-day comment period, and on March 5, 2014, we held our second public hearing to consider action plan recommendations. Both public hearings were widely advertised via postings of meeting notices in select public places and via the publishing of the notices in the *Daily Oklahoman* and *Moore American* newspapers at least 14 days prior to the meeting. The proposed plan was presented to the City Council and approved on March 17, 2014.

Over the past couple of years, the City has learned a great deal about the importance of engaging its citizens in making recovery decisions. Based on this experience, we have developed a five-step consultation process that will help us formalize stakeholder consultation during the Phase 2 process: 1) develop a consultation plan, 2) use best practices to facilitate conversations, 3) incorporate citizen feedback into the plan, 4) document the conversation, and 5) report results back to the people.

Partner Engagement Capacity. SCIPP conducts regional webinars and offers a monthly newsletter that summarizes research and products, and provides web-based tools and training for assessing climate-related hazard risks. SCIPP and SCCSC also participate in community and regional meetings to provide relevant climate and climate change information for planning processes, and this includes a focus on vulnerable populations. Both groups have conducted special engagement and training with tribal communities in Oklahoma and surrounding states to discuss their vulnerabilities and needs for relevant climate and hazards information. Many of the RCPL faculty specialize their research and planning practices in the areas of planning for

vulnerable populations.

Empowerment and Harmonization. The City formally empowers its community leaders through numerous boards and commissions, which provide authority and oversight over many of the City's functions. These boards generally consist of three to nine citizens, and they include the Adjustment Board, Electrical Board, Mechanical Board, Parks Board, Plumbing Board, and the Planning Commission. Informally, the Moore Community Coalition (MCC) is a group of residents, businesses, and organizations that focuses on supporting healthy lifestyles through building partnerships, policy advocacy, and addressing community needs. OKC provides a myriad of informal opportunities to harmonize the diverse perspectives of its citizens, including the Neighborhood Alliance of Central Oklahoma, which serves as a liaison between government, business, and citizens, creates neighborhood associations, and provides a resource to which neighborhoods can turn to for expertise on neighborhood issues and local government operations.

REGIONAL CAPACITY

The City has long had cooperative and mutual aid agreements with OKC to provide water services. More recently, this relationship was extended to emergency services, primarily through the deployment of first responders. Our strategy of broadening our geographic scope to include OKC will help us address the main water infrastructure issues we face, and help reach the vulnerable populations in our region.

The City's scientific partners have also engaged with several neighboring communities to provide similar services. SCIPP performs in-depth work with selected communities that are addressing various aspects of vulnerability to hazards, sharing best practices from local, regional, and national arenas, as well as early hazard identification solutions.

Name of Exhibit: Exhibit D: Need

Name of Applicant: City of Moore, OK

Name of File that Contains the Exhibit: MooreExhibitD

Unmet Needs

On May 20, 2013, one of the most powerful tornadoes to ever hit Oklahoma carved its way through the City, leaving 24 dead and over $2 billion in damages. Thirty-five minutes later, the tornado dissipated, leaving a path of massive destruction that was eerily similar to the path taken by the May 3, 1999 tornado. The President declared the tornado a disaster (DR 4117), and the City received a CDBG-DR allocation of $52.2 million. However, according to the IRIP, the City continues to suffer $142 million in unmet infrastructure needs that could be met in part by an NDRC award (see page 58 of the IRIP).

The tornado revealed a need to strengthen our infrastructure, protect our economy, and educate our citizens on the hazards inherent to our area. Due to water infrastructure damage, we lost 7.5 million gallons of water to 1,500 leaking meters. Whole sections of water were turned off to control losses, depriving emergency services of resources to fight fires caused by the tornado, and affecting business operations across many industries. City parks were significantly damaged and will require major investments to recover.

Climate variability and change studies show five areas of concern for the City's ecosystem with regard to its weather and climate risks. These areas of concern are 1) temperature variability and changes, 2) precipitation variability and changes, 3) severe storms and tornadoes, 4) evapotranspiration, and 5) soil moisture and surface runoff. These climate drivers have long been a concern in the region, and we know they will continue to stress the environment and people of the City unless we take proactive steps to mitigate the impacts.

Infrastructure. According to the IRIP, the City continues to suffer $142 million in unmet infrastructure needs (for details, see Appendix B, Table B1.7 in the IRIP). Public water supply and wastewater systems suffered damage and loss of revenue from the reduction in the

number of homes and businesses purchasing services. The Plaza Towers Assessment Zone received the most damage to streets, sidewalks, water, and sewage infrastructure. The Baer's Westmoore and Kings Manor Assessment Zones also face significant damage to their sidewalk infrastructure, while the Little River Assessment Zone saw damage to the bike trail.

The IRIP reports significant infrastructure damage based on an Infrastructure Rating Index (IRI) score of 586 in the aggregate. This includes IRI component scores of 110 for street infrastructure, 103 for environmental degradation, 85 for sidewalks, 83 for sewage, 77 for water distribution infrastructure, 71 for bikeways and trails, and 57 for gateways and streetscapes (see IRIP, page 11).

Environmental Degradation. The IRI score of 103 suggests that there is significant remediation need in the Plaza Towers, J.D. Estates, and Kings Manor Assessment Zones. While some enclosed storm sewers exist in both the Plaza Towers and Kings Manor Assessment Zones, open channel dominates much of the inventory in each area. Grate and hood damage, insufficient armoring, evidence of ponding, and significant channel damage from erosion were noted in several areas throughout the City.

Most Impacted and Distressed

The City was identified by HUD as being Most Impacted and Distressed because of the May 20, 2013 EF5-level tornado. Strong observational evidence and climate model projections of the future indicate that the large-scale environmental conditions that are conducive to severe thunderstorm, tornado, and drought development are changing and will continue to change. The evidence shows that severe weather hazards in central Oklahoma are linked to changes in these environmental conditions. The science that supports this tie-in is discussed below.

Risk Assessment. A comprehensive risk-based approach was used to prioritize and select our projects. This approach used the IRIP to subdivide the Study Area identified in the Action Plan into eight distinct Assessment Areas. Each Assessment Area generally encompasses a distinct neighborhood or district within the City. Once all IRIs were developed for each infrastructure category, a GIS analysis was completed to identify how the IRI scores vary within the Assessment Areas and Sub-Areas, as well as across the larger Study Area. Based on this analysis, the projects that represented the greatest need for the most vulnerable population were selected. Projects with highest IRIs were weighted by vulnerability factors to determine those infrastructure projects anticipated to have a more significant impact on the City's recovery from the May 2013 tornado and resilience going forward.

Our approach incorporated the climate risks through scientific modeling and consultation with our expert partners at OKC and OU. To assess this risk, we used a mixed-method approach that blends a contextual evaluation of qualitative risks with a more rigorous quantitative assessment. This mixed method will allow us to use the climate projections from historical data to estimate the level of risks we expect to face in the future. We base our future risks on a broad range of information and the best available data, including forward-looking analyses of risks from the Great Plains United States Regional Climate Trends and Scenarios from the U.S. National Climate Assessment, and other peer-reviewed studies.

We drew on several studies and data sources to identify risks and/or vulnerabilities faced by the City, both now and in the future. They include the *2010 Regional Raw Water Supply Study for Central Oklahoma*; the *2012 Oklahoma Conservation Water Plan Update*; NOAA's Table of Tornadoes that occurred in the Oklahoma City area since 1890; NOAA's Seasonal Drought Outlook; and other studies. In order to establish trends, the data that was used covered periods

from 1890 to 2060. These sources provide the best data because they are current and focus on the immediate geographic area of the City and south central Oklahoma.

Response to Questions

Climate change is already apparent in central Oklahoma and is projected to become more pronounced during the remainder of the 21st century. These changes include increased temperatures, decreased rainfall, increased evapotranspiration, and decreased soil moisture, as well as increased frequency and severity of droughts. In addition to recovering from the 2013 tornado, much of Oklahoma is currently in the throes of a drought.

Threats/Hazards/Vulnerabilities. The threats we focus on come from three types of hazards—severe thunderstorms, tornadoes, and drought. These natural hazards are part of the region's climate because of our location in the mid-latitudes between the Gulf of Mexico and the Rocky Mountains. Tornadoes are a product of severe thunderstorms, and a growing body of research ties the increased frequency of severe weather events to a weakening of the jet stream (Francis and Vavrus, 2015).[1] We present salient aspects of these data below.

Violent tornadoes have clustered in recent times in the City. Four of the six tornadoes that have hit the City since 1999 have been EF4 or EF5. Moreover, recent climate assessments, discussed above, note that climate change will continue to have a profound effect on drought frequency and severity, negatively impacting the fresh water supply of the City and the region.

In recognition of the ongoing water supply need, the Central Oklahoma communities united to complete the Regional Raw Water Supply Study in June 2010, which confirmed that there was not enough water available from existing resources to meet the needs of the participating water providers through the year 2060. Oklahoma became the first state in the

[1] Francis, J.A., and S.J. Vavrus. 2015. "Evidence for a wavier jet stream in response to rapid Arctic warming," *Environmental Research Letters*, Volume 10.

nation to establish a bold, statewide goal of consuming no more fresh water in 2060 than is consumed today. By 2020, pipelines and waterways conveying water to central Oklahoma will be overextended. A new waterline parallel to the existing Atoka Pipeline will be needed to keep up with projected demands. By 2030 the need for water will exceed water rights and a new source will be needed. From 2030 to 2060, the City's incremental water needs continue to climb, with demand reaching a level of 101.2 million gallons per day.

Temperature Change. The Third National Climate Assessment shows that the average temperature in central and western Oklahoma for 1991 to 2012 was 0.5° to 1.5° F (1° to 3° C), warmer than the average for 1901 to 1960 (Figure 3).[2] Figure 4 shows the projected temperature change for 2071 to 2099 compared with 1970 to 1999. The higher emissions scenario leads to a 4° C (8° F) increase. Figure 5 shows how the temperature anomaly for Oklahoma changes over time based on observations and model projections for various emission scenarios. Results are similar until about 2040, and then gradually separate with up to 5° C (9° F) higher temperatures by the end of the century. Increases are largest in the panhandle and northwestern parts of the state and smallest in the southeast.

Temperature increases for the region are expected to be as great as 2.5° C (4.5° F). Figure 6 shows how, depending on the scenario, temperatures can increase from 1.7° to 1.8° C to as high as a 2.6° to 2.7° C. Increased temperatures are expected to increase evapotranspiration rates, which will reduce surface runoff even if rainfall remains the same or decreases. This will lead to a decreased supply of water and an increased demand for irrigation water.

Soil Moisture. Soil moisture affects vegetation health and serves as a reservoir for water during drought. Figure 7 shows that soil moisture near the City is projected to decrease 5 to 15% by 2041 to 2070 compared with 1971 to 2000. Cook, *et al*. (2015) reconstruct the paleo-climate

[2] All remaining maps and figures referenced in this application are located in Appendix E.

record and project soil moisture through the end of the 21st century, and find that the late 21st century will bring more severe droughts in the Central Plains than any time since 1000 AD (see Figure 8 and Figure 9).[3] Moreover, they found that there is more than an 80% chance of a decade-long drought and more than a 70% chance of multiple-decade droughts at the end of the century.

Precipitation Change. Figure 10 shows drought conditions have affected substantial portions of Oklahoma since 2000, especially since 2011, when the drought has been severe, exceptional, or extreme over large areas. Figure 11 shows that despite the drought conditions mentioned above, the precipitation averaged over 1991 to 2012 was actually 5% to 15% higher than the mean for 1901 to 1960 in the Great Plains South, where the City resides. Figure 12 shows projections of increases in precipitation in two of the three model scenarios. However, the pattern of changes in *seasonal* precipitation (Figure 13) shows that the Northeast United States will get wetter and the Southwest United States will get drier, but there is more uncertainty for regions in the middle of the country.

Despite these changing patterns, heavy precipitation events are on the rise. Figure 14 presents data that shows from 1958 to 2012, the frequency for the heaviest precipitation events increased across the United States except in Hawaii, with the area including Oklahoma experiencing a 16% increase. Figure 15 shows that if CO_2 emissions continue to increase, heavy precipitation events will become two to three times more frequent near the City by the years 2081 to 2100.

Climate Change and Tornadoes. Elsner, *et al*. (2014) found that the total number of tornadoes per year has not changed significantly and the number of days having at least one

[3] Cook, B.I., T.R. Ault, and J.E. Smerdon, 2015. "Unprecedented 21st-century drought risk in the American Southwest and Central Plains," *Science Advances*, Volume 1, Number 1.

tornado has decreased.[4] However, the net impact is that more tornadoes occur on the same day, and the number of days with multiple tornadoes has been increasing (Figure 16**).** Elsner states, "The risk of big tornado days featuring densely concentrated tornado outbreaks is on the rise." This trend indicates that the City and other communities in tornado-prone areas are facing the increasing risk of days with large tornado outbreaks.

Recent improvements in climate models now make it possible to make projections of the environments conducive to severe and tornadic thunderstorms. Gensini and Mote (2015) used a regional climate model to study proxies for severe thunderstorms (i.e., those with tornadoes, damaging wind gusts, or large hail) for the eastern United States during spring.[5] Their results indicated a statistically significant increase in severe weather over much of the eastern United States, including Oklahoma (Figure 17). Furthermore, the increases are projected to be greatest in March and April (Figure 18). Results are consistent with other studies indicating an increase in the intensity and frequency of thunderstorms in the late 21st century.

Risks, Insurance, and Recovery. Because damage from a tornado is covered by standard homeowner insurance policies, the rates for such policies have risen substantially as a result of recent severe weather. According to the president of the Insurance Information Institute, "Oklahoma, like a number of states in the Great Plains, has seen an uptick in catastrophic loss activity, particularly associated with tornadoes…this has pressured many insurers to raise rates in these particular areas to compensate for the increased risk." This means that once standard homeowner insurance is not required by the mortgagee, the mortgagor may choose not to maintain the coverage.

[4] Elsner, J.B., S.C. Elsner, and T.H. Jagger. 2014. "The increasing efficiency of tornado days in the United States," *Climate Dynamics*.
[5] Gensini, V.A. and T.L. Mote. 2014. "Downscaled estimates of late 21st century severe weather from CCSM3," *Climatic Change*, Volume 129, Issue 1-2, pp. 307-321.

Also, the tornado's impact on the City's infrastructure included damages to the publically owned utility, parks, and recreational areas, as well as buildings, including schools. The damaged schools were fully insured and are currently being rebuilt, while other damaged public buildings were insured, and much of the infrastructure owned by the utilities was insured. The City has not been subject to repeated flooding, and thus has sufficient insurance against this hazard.

Vulnerable Populations. Of course the availability of insurance has helped recovery in the housing and commercial sectors of our economy, but vulnerable populations face more unmet needs in part because of their limited access to insurance markets. For this and other reasons, the risks disproportionately fall to lower income populations. For example, a 173 unit mobile home park that provided housing for LMI residents was destroyed in the 2013 event, and it recently announced that it will be closing due to the negative impacts of the tornado.

Addressing these LMI risks is important to our community because we want to maintain income diversity in the City and be known as a community that welcomes all people regardless of their creed or economic standing. To address these vulnerabilities, the City emphasizes mixed use and mixed income redevelopment in LMI areas in our Master Plan, and we continue to work with local nonprofit organizations to meet the needs of the most vulnerable communities affected by the 2013 event. Also, the City joined OKC in implementing Progressive Water Conservation Stages. Mandatory odd/even watering is now permanently in effect.

Name of Exhibit: Exhibit E: Soundness of Approach

Name of Applicant: City of Moore, Ok

Name of File that Contains the Exhibit: Moore Exhibit E

Stakeholder Consultation

In the aftermath of the 2013 disaster, the City remained focused on the needs of all stakeholders and the MID-URN community in all our collaborative and planning efforts. We conducted numerous recovery meetings with the City Council, CDBG Advisory Committee, and citizen stakeholders. Our outreach efforts included all Internet social media forums, postcards, online survey, and City public access TV.

Based on the information we gained at the Rockefeller Foundation Resiliency Academy, we hosted an open workshop to identify the City's risks, vulnerabilities, and solutions and to give citizens the opportunity to provide their valuable input. A holistic approach to recovery and resiliency was discussed. The prevailing issues of severe thunderstorms, tornadoes, and droughts became the focus of the dialog and led to the understanding that infrastructure and education enhancements were needed to make the City more resilient. The City gave two overview presentations, and based on conversations with the public, we decided that short-term tornado recovery and long-term drought and tornado resilience should be our primary focus. This is how we developed our concept of resiliency.

Plan for Stakeholder Collaboration. Going forward, we will treat stakeholder consultation as a two-way process of dialogue between the City and its stakeholders, which include the Mayor and other members of the Moore City Council, the City Manager, the CDBG Advisory Committee, Parks and Recreation Board, Planning Commission, City Department Heads, the Oklahoma City Council, and the OKC Water Utilities Trust. We understand that, in order to implement a long-term strategic initiative that will affect citizens' lives, we need to obtain something akin to a "social license to operate."

Over the past few years, the City has learned the importance of engaging with nonprofit partners, churches, and other formal and informal institutions in the local community. Through this experience, we have learned that a good consultation process has five basic steps:

1. Develop a plan. Before beginning a stakeholder consultation session, we will develop an agenda that defines who needs to be consulted, what topics will be discussed, and the purpose of the discussion.
2. Use best practices for facilitation. The topic of consultation will drive who will be chosen to facilitate the conversation, but the general practices we will follow come from the following best practices in facilitation:
    - Begin consultation process early to identify critical issues affecting the community
    - Target those most likely to be affected by project
    - Distribute relevant information in an understandable format in advance of meeting
    - Let conversation be two-way to allow exchange of views and information
3. Incorporate feedback. This shows that the people's views have been considered, taken seriously, and included in the final project plan where appropriate.
4. Document the conversation. This is critical for effectively managing the stakeholder engagement process. We will document when and where meetings took place, who attended, what topics were discussed, and what were the results. All meeting notes will be posted online on the City's website.
5. Report back to the people. Communities often express frustration that the outreach process has no follow-up. We will provide our citizens with this common courtesy and use this as a way to sustain support for the projects in the long term.

Vulnerable Populations and Advocacy. The City is sensitive to the risks and vulnerabilities facing LMI households, disabled and/or elderly citizens, and others more vulnerable to extreme weather. For example, affordable housing is an ongoing issue for many that is exacerbated when people are made homeless by a tornado that destroys their apartment complex. Local roadways receive significant damage from tornadoes, and other infrastructure damages are prevalent in the MID-URN areas. In addition, street and sidewalk infrastructure damage decreases the ability of citizens to walk and move around safely on the street. The LMI population is adversely affected by these problems to a disproportionate degree.

DOR will work with the MCC to extend its outreach efforts and advocate on behalf of vulnerable populations. Our MID areas will be the first target for project implementation, followed by those with higher than average LMI concentrations. Through workshops and education, we will seek to understand how their unique needs can be incorporated into planned projects. Through the MCC, the DOR will be able to reach all segments of the community and that a minimum of 50 percent of overall benefits assist the LMI population. The City has worked with the MCC on numerous occasions to spread the word on various initiatives—including Moore Healthy, Bike Moore, PACT360, and National Severe Weather Preparedness Week activities—and we are confident that the current endeavor will be equally successful.

Cumulative Impacts and Indirect Risks. One of the cumulative impacts that became a prevalent theme during our last workshop for this NDRC application was the issue of affordable housing. Due to significant damage from the tornado, numerous duplexes and apartment buildings were destroyed, and though redevelopment plans for approximately 125 rental units are underway, the concern over increasing rental rates was palpable, particularly from LMI

residents. We vowed to work closely with HUD to determine how these disasters affect the regional housing market and see what relief is available.

Moreover, local roadways—particularly in the MID-URN areas—received significant damage from the tornado. Citizens expressed concern about the physical risks caused by this damage and the effects on children's safety while playing on sidewalks and in damaged parks. Citizens also raised concern regarding damage to water-related infrastructure and expressed their anxiety that the City's water supply had been compromised. This concern was particularly influential in our selection of water infrastructure projects.

Results. The results of our collaboration with stakeholders and the community solidified our proposal by stressing the need for education and innovative water-resilience measures. Our recent citizen collaborative efforts culminated in development of the CDBG Action Plan and development of an NDRC outline of needs, risks, vulnerabilities, and potential solutions for this application. We look forward to implementing a similar successful process for Phase 2. For more detailed information, see the Consultation Summary form in Appendix I.

IDEAS / CONCEPT

Concept. A "More Resilient Moore" is our concept of resiliency (see Figure 18). In brief, the City seeks to enhance its critical water infrastructure, raise citizen awareness and knowledge through education, and enhance building codes to exceed national standards.

Figure 18: The City's "More Resilient Moore" concept for improving resilience is represented by the equation showing that the City's approach will reduce the impacts of common hazards to achieve our goals.

Our concept directly addresses identified unmet needs from the Qualified Disaster and forward-looking risks in ways that provide co-benefits. Such improvements would do the most to enhance resiliency against tornadoes and droughts, provide a cost-effective source of potable water, enhance institutional drivers of economic activity in the area, and maintain strong growth.

- **Infrastructure**: In partnership with OKC, the City will invest in water-systems resilience and improve water management, protection, conservation, and reuse. Solutions will incorporate alternative ideas (e.g., the U.S. Army's Net Zero Water program), harvest rainwater, recycled wastewater, and avoidance of fresh water for industrial uses.
- **Education**: Using the expertise of OU, the City will develop research and educational products to create a culture of hazard awareness and safety and water conservation among our children and citizens.
- **Codes**: The City has already raised the building code standards for single-family properties, and we will continue by raising standards for commercial and multi-family properties, creating a solid foundation for a comprehensive policy on safer buildings.

The infrastructure projects and retrofits will spur a "boomlet" of construction-driven economic activity from which LMI households will benefit disproportionately. We will advocate for hiring of Section 3 eligible persons for this new construction activity.

Our concept was developed from a broader set of ideas targeted at our most persistent and recurring threats—tornadoes and droughts. These and other ideas were evaluated for their ability to address those hazards that have high frequency and/or probability and high consequences beyond the MID target area and for their ability to manage and diversify the City's water supply, reduce psychological trauma from tornadoes, reduce environmental degradation of our community landscape, and further diversify our economy.

We will maintain flexibility in design and selection of our projects to assure that we offer the best resilient solutions feasible. To date, the concept-development process involves input from design professionals, engineers, and OU experts and was further scrutinized at the Rockefeller's Resilience Academy. We will ensure that each project is effective at supporting recovery and resilience by developing performance measures to track and monitor progress and impact. These performance measures will guide our management and enhance our flexibility by incorporating lessons learned to make operational adjustments and facilitate resilience benefits for the long term.

Actions Taken to Date. Even before this NDRC resiliency opportunity, we have made substantial investments in resiliency. Residential building codes were updated in 2014, and we implemented the Shelter Rebate Program. Other resilience activities funded by CDBG-DR include infrastructure to sidewalks and streets along 11th Street and repaving of 10th through 13th Streets. In addition, a resiliency wall is scheduled to be constructed on I-35.

Co-Benefits. Co-benefits of the Smart Water Meter Project are threefold: conservation, economic, and resilience. The conservation benefit arises from the more efficient use of the water supply and being able to channel water as needed. Economic benefits are clear: less waste means more resources dedicated to other productive uses. From a resilience standpoint, the City will be able to manage water use during emergencies, prevent extended service outages, and increase the ability to respond to disasters more effectively.

The main co-benefits of the joint water resiliency project are water independence and economic development. Though our agreement with OKC for the provision of water is stable and strong, the extent of our reliance (70% of our water comes from OKC) means that we are tied to

OKC fiscally and economically. Independence would reduce this reliance, diminish uncertainty regarding the water supply, and facilitate efforts to address needs unique to City residents.

Construction on the Draper Water Treatment Plant and water wells in southeast OKC will create economic benefits derived from earnings of those hired for the work. These direct earnings create indirect jobs and earnings through increased spending at businesses these employees frequent and induced jobs and earnings through the increased spending by the businesses themselves. These economic benefits accrue to local and state governments by taxation of new income and sales throughout the regional economic supply chain.

The economic co-benefits of the education center project are similar to the joint water resiliency project. As a construction-heavy project, its economic benefits would accrue from job creation and new earnings. These economic benefits extend well beyond the education and resiliency benefits, and are quite tangible. Co-benefits of a vulnerability assessment are limited to resiliency and preparedness.

Cross Disciplinary Idea. Our "More Resilient Moore" concept represents integrated thinking around the specific threats that have high consequences for our region. The City, through its everyday business, regularly integrates project design, launch, and management with procurement, contract and financial management, and accountability functions (e.g., internal control, quality assurance, performance monitoring, auditing).

Exhibit C describes the broad range of cross-discipline capabilities required for Phase 2 implementation and shows how the City, OU, and OKC's OCWUT have the capacity to implement these capabilities. From a technical standpoint, the City has broad experience in project management and operation of government functions, including competencies associated with property acquisition, financing, development, and environmental remediation. OU brings

scientific capacity and innovation to our partnership, while OKC's broad technical capacity is strongly linked to water resources. Thus, the vast majority of integration of our technical capacity is daily and ongoing, including our integration with OKC on water issues, and the DOR, potentially with contract support, will integrate OU's science and innovation to guarantee the City's decisions are feasible, cutting-edge, and science-based.

Project Effect on Least Resilient. All residents and business owners are included in the selection process for our projects; citizen-engagement opportunities allow the people to directly address economic security and other concerns that affect our most vulnerable citizens and businesses. Our approach improves economic outcomes via education by helping children and adults make better assessments of the risks they face and respond accordingly by changing their behavior, adjusting their insurance. We have discussed how water independence improves our economic certainty, and job creation from our construction-oriented water infrastructure and education projects will provide opportunities that tend to accrue to the most vulnerable economically. Vulnerabilities to the City are directly related to the threats. However, the ability to respond to and recover from their effects are linked to the ability to afford alternative water and protective solutions, such as those for school-aged children and LMI households that are more likely not to carry insurance or rent a dwelling with no access to a storm shelter. Our proposed water projects include OKC because of our dependence on them for water but are designed to serve populations most affected by water outages—particularly citizens and businesses at the geographic nexus of the City and OKC's southeast suburbs.

The link between climate change and the hazards faced by the City means that accounting for future and changing impacts on our lives must be a part of our normal strategic planning process that allocates the City's resources across competing demands within a given year and in

perpetuity. The vulnerability assessment project will go a long way toward providing this ongoing capability, and given its modest cost and extended use across time, we believe it to be a cost-worthy investment.

Positive and Negative Effects. The water meter and joint resiliency projects will have significant positive impacts, including greater efficiency in water distribution and conservation region wide, better ability to respond to an emergency, less overall waste and interruptions; reductions in consumption, and less water lost through meter and building leaks—all resulting in more water for downstream communities. For example, the Little River runs through the City and drains into Lake Thunderbird, and the City of Norman draws water from this lake. Thus, conservation, resiliency, and effective management of water resources in the City means more water will be available downstream for Norman.

The education work of the Resiliency Center has the potential to create positive spillover effects by spreading knowledge of tornado and drought science and creating an environment conducive to fostering resiliency ideas and innovations. The Center's efforts will be extended to the Moore Public Schools and neighboring communities and school systems in the region. The City expects to seek these types of partnerships in Phase 2.

The vulnerability assessment permits the City and the region to establish a scientific baseline for future evaluation of actions taken and actions still needed. The vulnerability assessment has the potential to create positive spillover effects in both the regional approach to resiliency and in the scientific community's understanding of how resiliency methodologies impact the region.

Interdependencies Among Sectors. The interdependencies between OKC and its neighboring communities are clearly understood among those in the region. OKC's Embark

transit system serves the northern parts of the City, and we have already discussed our interdependent relationship with OKC for water. Oklahoma Gas & Electric provides energy services to most households and businesses in our region. We are practiced at coordinating across regions and sectors because of the shared regional threats we face in tornadoes and droughts. Our partners in OU and OKC are leaders in our region, and having them on these projects as partners assures seamless coordination with their own projects that have inter-jurisdictional impacts.

Regional Support. We will work with one other Unit of General Local Government in particular, OKC, to resolve our shared water vulnerabilities regionally. We have already approached OCWUT, and they are in support of and have agreed to join our application as a partner. For the education and science, we have a formal agreement with OU—a state-funded university—to work on these projects. They too are in support of and have agreed to join our application as a partner.

We are fortunate, through our partnership with OU, to have, by extension, a partnership with two Federal agencies at the heart of climate science—NWS and SCCSC. We have worked with these entities during the heart of the emergency and appreciate the national access, cross-jurisdictional perspective, and expertise they bring. Their knowledge and understanding of the unique climate circumstances in our region make them valued advocates for our concept of reducing risks and achieving our goals.

No jurisdiction can prevent us from addressing these risks. The State of Oklahoma supports our efforts, and the leveraging of Federal dollars in support of resilience and economic development activity will benefit the state as well as the City and neighboring communities.

Resilience Now and in Future. Though the City's approach to resilience may have been uncoordinated before the tornado, we now know from experience that resiliency requires "every oar in the water rowing in the same direction." If there was one negative experience that we faced together after the tornado that we knew we could correct, it was the length of the water outages and how this impacted households and businesses in a broad manner, both in terms of daily needs and business interruption expense and forgone economic opportunity.

The concept introduced above shows how the City will integrate expertise from various disciplines to implement the proposed resilience projects. This approach emphasizes coordination by creating a new DOR that will coordinate activity across all City departments, partners, and sub-partners. By incorporating this science, the City's approach to resilience will be strongly informed by the knowledge of risks in very detailed ways. This knowledge will be disseminated broadly to the community for a more comprehensive, coordinated, and risk-based approach to resilience.

NFIP Participation. The City does not participate in any community ratings for resiliency, and no part of the City is a participant in the National Flood Insurance Program (NFIP) Community Rating System (CRS). However, our partner, OKC, is a participant in CRS and has a current rating of 8, which means that its citizens receive a 10 percent reduction in flood insurance premiums.

Name of Exhibit: Exhibit F: Leverage

Name of Applicant: City of Moore, Ok

Name of File that Contains the Exhibit: Moore Exhibit F

OUTCOMES

The ultimate outcome we seek is a better quality of life through physical and social resilience against extreme weather threats endemic to our region. Our resiliency approach contributes to these goals by strengthening buildings and water infrastructure, educating the citizens about these hazards, and creating innovation around the solutions we develop.

We are considering both large-scale and multi-phase construction projects. One of our considerations for water infrastructure upgrades is a smart meter system, which will entail a modest-scale upfront effort for installation, followed by regular maintenance at the central and home-based sites. Building code upgrades will be a large upfront effort that creates a long trail of resiliency and economic benefits.

We propose a resiliency framework that not only improves the physical and social resilience of our community but also produces co-benefits in two additional areas: water conservation and economic development. Water infrastructure projects such as the smart water meters and improvements to the Draper Water Treatment Plant (DWTP) will provide co-benefits of resiliency and conservation. Smart meters will reduce water wasted from broken water infrastructure, both in normal times and during disasters when the City will have greater control to shut down water components or the entire water system. Building code enhancements will create economic development co-benefits through the long-term and continued upgrading of building infrastructure to meet the new standards. Economic development benefits arise from the associated building and infrastructure construction projects, mitigating the loss of economic activity from water and power outages during tornadoes, and the innovation sparked from development of new solutions to water conservation and tornado risk mitigation. We expect these

projects will be implemented and completed within a 2-year timeframe, and we expect the benefits to last at least a generation.

Environmental and Financial Sustainability. The City and its partners have a deep commitment to protecting the environment in our communities, and we understand from our drought experiences how much value from agriculture and other land uses are lost during such events. We have selected OU and OKC in part because of their expertise implementing environmentally conscious projects. One project will have the City and OU work together to construct environmentally advanced buildings. These partnerships not only strengthen our shared capacity, but they also allow us to leverage resources from multiple sources in ways that should sustain the projects use into the future. The financial viability of the smart meter and joint water resiliency projects will be tied to the rates on water usage and meter maintenance, and the viability of the education center will come from fees charged by OU for the associated library and other uses of the facility by the City's schools and citizens.

Opportunities for Economic Revitalization. The projects we are considering will provide economic revitalization opportunities by creating job opportunities in water infrastructure and building construction. The persons most likely to benefit from these jobs are those LMI households who live in the southern areas of OKC near the City (in Cleveland County) where most of our projects are targeted. For example, two of the City's contractors in the recovery effort, Veolia and Silver Star, employ Section 3 residents who are predominately from Moore and southeastern OKC. The social resilience enhancements we propose with the education center will provide hazard education to all of our resident, but will target those populations who are most vulnerable to such hazards, such as the disabled and elderly.

What Success Will Look Like. When our water infrastructure improvements are finished, success will be measured by more efficiency in daily water usage and less outage times during disasters. When our new building codes are in place, success will be evident by a bustling City with construction projects for improving buildings seen throughout the City. When the new education center is completed, success will be measured through the conversations taking place in numerous communities about people working together when the next disaster strikes and about resiliency and social benefits.

LEVERAGE NARRATIVE

Implementation and Maintenance. First, the creation of a new department, the DOR, will go a long way toward securing an organization dedicated to the implementation and maintenance of our resilience projects. This new department will coordinate closely with City agencies for implementation and maintenance and rely on OU for scientific expertise and other advice. Our partner OCWUT has an engineering staff capable of providing design and construction administration services to all types of water and wastewater facilities, and together with the experts from OU and its partners at SCSCC and NWS, we will have substantial resources to draw upon to implement and maintain our projects.

Insurance. During Phase 2, we will discuss our planned resilience opportunities with local insurance companies and offer them chances to provide incentives to the community. The City partnered with the Oklahoma Insurance Department, which has created a website to provide the community with helpful information during their recovery process. Moreover, the Shelter Rebate Program afforded participating homeowners the opportunity to receive low-interest loans for the addition of a safe room, tax savings, and lower insurance premium costs.

Financing and Cost Benefits. The financing benefits of our projects accrue when they provide the conservation and economic development co-benefits. With the smart water meter system, the fees charged will likely adjust to cover some costs, and with the building code enhancements, the economic development benefits from construction will likely outweigh the costs of the new policy. OU will charge fees for certain uses of the education center that will help offset the costs of sustaining these projects for a generation or more.

Commitment and Reach. The City and its partners understand our regional threats and their consequences, and are dedicated to building disaster resilience beyond the city borders. The City, OU, and OKC will continue to implement processes identified in the Oklahoma Water Study, the 2012 Oklahoma Conservation Water Plan, and the Assessment Baseline Study. With CDBG-NDR funding, eligible projects will continue the approach by providing sustainable activities and education that benefits the MID-URN target and the region as a whole. Phase 2 will begin at the local level and end up providing the entire State with best practices in water and tornado conservation and resilience and public awareness through education.

Committed Leverage Resources. The City will obligate $300,000 toward infrastructure, including green infrastructure, and projects that will improve environmental degradation in support of disaster resilience in the MID-URN targeted areas. The City will provide $100,000, and OKC will provide $200,000. Following the Phase 2 award, this funding will be immediately available for eligible activities proposed in our CDBG-NDR application.

Name of Exhibit: Exhibit G: Long Term Commitment

Name of Applicant: City of Moore, Ok

Name of File that Contains the Exhibit: Moore Exhibit G

In addition to the City's commitment of $300,000 to this resiliency effort, since the 2013 disaster, the City has implemented the following two major resilience measures that provide stronger protection from tornado and wind events.

Storm Shelter Program. One major resiliency initiative began January 20, 2014, with the implementation of the Storm Shelter Rebate Program. For qualified homeowners, the program provided a one-time rebate of up to $2,500 for installed and inspected storm shelters that met or exceeded FEMA Publication 361 requirements. Receiving first priority for selection were those homeowners whose primary residences were in the most impacted and distressed area and were destroyed or received significant damage as a result of the declared disaster. The initial program was funded by a $3.75 million grant received from the American Red Cross, and funds were expended to rebate 1,500 individual storm shelters. A partnership with the State of Oklahoma's Office of Emergency Management facilitated quick implementation.

Building Code Resiliency. A second major resiliency initiative began on March 17, 2014, with the adoption of more stringent residential building codes. The City was lauded by the Insurance Institute for Business & Home Safety's (IBHS) chief research engineer, Dr. Tanya Brown. Among the requirements in the revised codes are the use of hurricane clips or framing anchors to tie the house together more effectively; continuous wood structural panel sheathing on all exterior walls to strengthen the home, which must be attached with ring shank nails that provide considerably stronger fastening than smooth nails or staples; and garage doors that are rated to withstand winds up to 135 miles per hour. New homes will be required to build to the adopted standard, providing a higher protection level from future tornado and wind activity.

Name of Attachment: Attachment A: Partner Document

Name of Applicant: City of Moore, Ok

Name of File that Contains the Attachment: MooreAtt1

MOORE Public Schools
LEARNING FOR LIFE
Superintendent
1500 SE 4th Street • Moore, Ok. 73160
(405)735-4249 • Fax (405)735-4392
robertromines@mooreschools.com

March 16, 2015

Re: Intent to Participate

This letter is to confirm the mutual intent of both Moore Public Schools and the City of Moore to collaborate and enter into a partner agreement upon Moore Public Schools Board approval and the contingency upon the award of funds from the United States department of Housing and Urban Development for the Community Development Block Grant National Disaster Resilience (CDBG-NDR) competition, to carry out eligible activities as provided in the City of Moore's CDBG-NDR application.

The Moore School District has been providing high quality education to students in the metropolitan area of Moore and south Oklahoma City for more than 100 years. The principles that guide this district include high student achievement, outstanding instruction, and strong community involvement. Success in these areas continues to make Moore one of the state's finest school systems.

Moore Public Schools offers Pre-K through 12th grade in the suburban areas of Moore and south Oklahoma City. With a student population of over 23,000, the system is the third largest in the state. It encompasses 34 schools in 159 square miles. Through the years, the district has maintained a tradition of high student achievement, outstanding instruction, and strong community support.

Educating our students about past, present, and future has and will always be a top priority. This endeavor and partnership will allow us to do just that.

It is understood that this is letter is only an expression of our intent and a binding partner agreement detailing the terms and conditions of the proposed partnership must be executed before the use of any CDBG-NDR funds, if awarded.

Sincerely,

Robert Romines

Dr. Robert Romines
Superintendent

The UNIVERSITY *of* OKLAHOMA®
Office of the Vice President for Research

March 24, 2015

Mayor Glenn Lewis
City of Moore
301 N. Broadway
Moore, Oklahoma 73160

Re: Intent to Participate in CDBG-NDR Competition

Dear Honorable Mayor Lewis,

This letter is to confirm the mutual intent of both the City of Moore (Oklahoma) and the Board of Regents of the University of Oklahoma, by and through the Office of the Vice President of Research, to collaborate and enter into a collaborative agreement, contingent upon the award of funds from the United States Department of Housing and Urban Development for the Community Development Block Grant National Disaster Resilience (CDBG-NDR) competition, to carry out eligible activities as provided in the City of Moore's CDBG-NDR application.

The University of Oklahoma (OU) is among the nation's top research institutions actively embracing and encouraging creativity and innovation. Because its scholarly endeavors improve the quality of life for Oklahomans, provide unique educational experiences for students, and help us understand the world in which we live, **our collaboration with the City of Moore is a natural outgrowth of the transfer of our research, technology, and knowledge to community leadership.**

At OU, the Vice President for Research is responsible for the development and/or dissemination of official policies in the research and creative activity arena, as well as the facilitation of faculty, student, and staff scholarship in all disciplines represented on the Norman campus. The Vice President for Research coordinates with other vice presidents campus-wide to identify funding for research and creative endeavors, both in and outside the University, assists with the development and enhancement of research laboratories and facilities, and formally oversees Norman Campus Core Facilities and University Strategic Organizations (e.g., South Central Climate Science Center).

In 2014, Norman campus research expenditures exceeded $93 million, with one-quarter of that amount resulting from activities in our College of Atmospheric and Geographic Sciences — home of our climate and weather programs on campus. **OU's Research Campus was named the nation's top research park for 2013 by the Association of University Research Parks**. The award recognized the OU Research Campus for excellence in innovation and placed it among such past recipients as the Research Triangle Park in North Carolina, Purdue Research Park in Indiana, and University City Science Center in Pennsylvania. The Campus strategically links 1700 persons across academic, federal, state and private sector organizations in an environment that promotes innovation, collaboration and interdisciplinary synergy.

201 Stephenson Parkway, Suite 3100, Norman, Oklahoma 73019
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WEBSITE: vpr-norman.ou.edu

Major new research centers have recently been established on the University of Oklahoma Norman campus, including the US Department of the Interior's South Central Climate Science Center, the National Oceanic and Atmospheric Administration's Southern Climate Impacts Planning Program, the Oklahoma Water Survey, and the Institute for Quality Communities. Faculty, professional staff, post-docs, and graduate students in these programs work in or with our long-established academic units, such as Regional and City Planning as well as the Department of Geography and Environmental Sustainability, to integrate research, education, and service across the University and into our state and nation. **The current opportunity with the City of Moore affords city officials experts at the cutting edge of climate, weather, and water research and affords the University access to decision makers who can bring reality into our classrooms and student projects.**

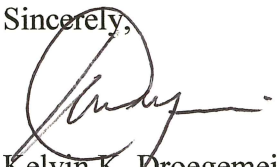
The University is highly supportive of numerous OU faculty members aiding in the development of your proposal and looks forward to its successful award and future implementation. **My office, which includes the Center for Research Program Development and Enrichment, will assist you in continuing to develop linkages to University expertise for this and future programs.** I believe firmly that OU's value to the State of Oklahoma becomes most evident with collaborations between the University research community and our local governments, businesses, and non-profit organizations.

Most exciting is the opportunity for the City of Moore and University to link our previously independent visions of building a community learning center focused on weather and water (City) and building a water innovation research laboratory focused on conducting research on the most challenging problems in water quality, availability, re-use, and policy, along with educating the next-generation of water resources leaders (University). Now, as we leverage future opportunities, OU professors and students can work both online and on-site with City officials, students, and citizens to build a learning community focused on resilience to weather and water hazards in Oklahoma.

Through my Office of Research Services, the University can serve as a grant sub-recipient or a sub-contractor to the City of Moore. It is understood that this is letter is only an expression of our intent. A binding agreement detailing the terms and conditions of the proposed collaboration must be executed before the use of any CDBG-NDR funds, if awarded.

If you have any additional questions, please call me at 405-325-3806 or email me at kkd@ou.edu, and I wish you the very best on this submission.

Sincerely,



Kelvin K. Droegemeier
Vice President for Research
Regents' Professor of Meteorology
Weathernews Chair Emeritus
Roger and Sherry Tegien Presidential Professor

Oklahoma Water Survey
University of Oklahoma
201 Stephenson Pkwy. Suite 1101
Norman, OK, 73019

Re: Intent to Participate

This letter is to confirm the mutual intent of both the city of Moore, Oklahoma and the Board of Regents of the University of Oklahoma by and through the Oklahoma Water Survey to collaborate and enter into a collaborative agreement, contingent upon the award of funds from the United States Department of Housing and Urban Development for the Community Development Block Grant National Disaster Resilience (CDBG-NDR) competition, to carry out eligible activities as provided in the CDBG-NDR application.

In January 2011, the University of Oklahoma established the Oklahoma Water Survey. The mission of the Water Survey is to study the state's water resources and to collect, analyze, interpret and disseminate research-based information about water. It serves the University research community, and acts as a catalyst to the wide and deep expertise of the University in education, research and outreach on water issues. Moreover, the Oklahoma Water Survey works with federal, state and tribal governments, organizations, businesses, communities and citizens who have interests in Oklahoma's water resources.

The Oklahoma Water Survey has served as a point of contact for these multiple agencies and stakeholders, synthesizing complex data and providing a central location where information can be accessed through its Water Data Portal. The Oklahoma Water Survey has been involved in several statewide efforts to build infrastructure for improved water monitoring and management for the state of Oklahoma. These collaborative efforts involved the Oklahoma Water Resources Board, the USGS, Regional Master Conservancy Districts, the USEPA, the USDA, the Chickasaw Nation, and private landowners. The Oklahoma Water Survey also organizes and conducts workshops for stakeholders on a variety of water related issues.

The Oklahoma Water Survey is leading an effort to create a 'Water Innovation Research Laboratory'(WIRL) on the Research Campus at the University of Oklahoma in Norman, OK, just south of Moore, OK. The WIRL is envisioned as a location on campus that could bring together water research components currently spread out among various colleges and departments into a unique location that would serve to advance public analysis, education, research, and public outreach on important water issues for Oklahoma, the nation and the world. It will not just be a research center, or a 'discovery center' or a laboratory, or a

technology-based learning center, but all those things and more. It will provide a physical location where all those could occur together in a single facility. It will facilitate partnerships with hundreds of faculty and technical experts, numerous institutes, departments and other agencies and organizations in the state.

It is proposed that the city of Moore and the Oklahoma Water Survey develop, host and disseminate workshops that specifically focus on the education of Moore residents and adjacent communities on water resilient infrastructure development strategies that address the following innovative ways to improve water resilience:

1. Incentives/policies to increase wastewater reuse for potable and other water supply needs
2. Investigate uses of brackish groundwater as opposed to fresh water for some uses
3. Education of the public on different aspects of conservation and reuse strategies
4. Improvements to reduce irrigation and storm water runoff and recharge aquifers

As a subrecipient, The Oklahoma Water Survey together with other University of Oklahoma faculty would also be available to provide technical support and research needed to further the implementation of the above strategies.

It is understood that this letter is only an expression of our intent and a binding agreement detailing the terms and conditions of the proposed partnership must be executed before the use of any CDBG-NDR funds, if awarded.

Robert W. Puls, Director

Robert W. Puls

Oklahoma Water Survey

SOUTH CENTRAL
CLIMATE SCIENCE CENTER

201 Stephenson Parkway, Suite 2100, Norman, OK 73019

Phone: 405-325-1272 • Fax: 405-325-1122 • Email: info@southcentralclimate.org • www.southcentralclimate.org

March 17, 2015

Mayor Glenn Lewis
City of Moore
301 N. Broadway
Moore, Oklahoma 73160

Re: Intent to Participate

This letter is to confirm the mutual intent of both the City of Moore (Oklahoma) and the Board of Regents of the University of Oklahoma, by and through the South Central Climate Science Center, to collaborate and enter into a collaborative agreement, contingent upon the award of funds from the United States Department of Housing and Urban Development for the Community Development Block Grant National Disaster Resilience (CDBG-NDR) competition, to carry out eligible activities as provided in the City of Moore's CDBG-NDR application.

Established in 2012, the South Central Climate Science Center (CSC) provides decision makers with the science, tools, and information they need to address the impacts of climate variability and change on their areas of responsibility. This University of Oklahoma-led center includes Texas Tech, Oklahoma State, and Louisiana State universities, The Chickasaw Nation, The Choctaw Nation of Oklahoma, and NOAA's Geophysical Fluid Dynamics Lab. With its seven sister CSCs funded by the USGS, the South Central CSC provides scientific information, tools, and techniques that resource managers and other interested parties can apply to anticipate, monitor, and adapt to climate driven responses at regional-to-local scales.

The South Central CSC is co-led by Drs. Berrien Moore III and Renee McPherson at the University of Oklahoma and Dr. Kim Winton at the U.S. Geological Survey. Dr. Winton was the former director of the USGS Oklahoma Water Science Center. Dr. McPherson is an associate professor in the Department of Geography and Environmental Sustainability, co-author of the Great Plains chapter of the Third National Climate Assessment (2014), and an official observer at the United Nations Framework Convention on Climate Change in Lima, Peru, during December 2014. Dr. Moore is the dean of the College of Atmospheric and Oceanic Sciences, Chesapeake Energy Corporation Chair in Climate Studies, Director of the National Weather Center, and Vice President for Weather and Climate Programs at the University of Oklahoma. He was the Coordinating Lead Author for the final chapter of the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), released in Spring 2001.

As one of eight regional Climate Science Centers funded by the USGS and housed at leading universities nationwide, the South Central CSC is working to build a framework for evaluation of statistical downscaling techniques, leading to the development of an ensemble of regionally downscaled climate projections and associated guidance documentation for decision makers. We plan to share our scientific expertise and downscaled datasets with the City of Moore as well as interpretation of historical observations. Currently, we support three post-doctoral associates who have expertise in global climate modeling, statistical downscaling, and atmospheric reanalysis

datasets, respectively, in the areas of hydrologic impacts, large-scale climate, and severe winter weather. We plan to aid the City in a full climate vulnerability assessment that will be a cornerstone of the resilience planning process. Through OU's Office of Research Services, the South Central CSC can serve as a grant subrecipient (preferred) or a subcontractor to the City of Moore.

It is understood that this is letter is only an expression of our intent. A binding agreement detailing the terms and conditions of the proposed collaboration must be executed before the use of any CDBG-NDR funds, if awarded.

If you have any additional questions, please call me at 405-325-1272 or email me at renee@ou.edu.

Sincerely,

Renee A. McPherson
Director of Research, South Central Climate Science Center
Associate Professor of Geography and Environmental Sustainability
University of Oklahoma

SCIPP
A NOAA RISA TEAM

Southern Climate Impacts Planning Program
LSU: 225.578.8374 | OU: 405.325.7809
scipp@mesonet.org | www.southernclimate.org

March 18, 2015

Mayor Glenn Lewis
City of Moore
301 N. Broadway
Moore, OK 73160

Dear Mayor Lewis,

This letter is to confirm the mutual interest of both The City of Moore (Oklahoma) and the Board of Regents of the University of Oklahoma, by and through the Southern Climate Impacts Planning Program (SCIPP) to collaborate and enter into a collaborative agreement, contingent upon the award of funds from the United States Department of Housing and Urban Development for the Community Development Block Grant National Disaster Resilience (CDBG-NDR) competition, to carry out eligible activities as provided in the City of Moore's CDBG-NDR application.

SCIPP is a project funded by the NOAA Regional Integrated Sciences and Assessments (RISA) Program in NOAA's Climate Program Office. SCIPP's mission is to help communities to increase resiliency and preparedness for weather and climate extremes now and in the future across the South-Central United States. SCIPP works in partnership with Louisiana State University with communities across a six-state region on challenges related to severe weather, drought, storm surge, sea-level rise, and climate adaptation. The goal of SCIPP and other RISA Teams it to more effectively integrate available climate knowledge into local, state and regional planning processes.

For this project, SCIPP will offer guidance to the project team on weather and climate-related hazards. We commit to participating in meetings and strategy sessions as appropriate and working with your other partners to identify relevant climate studies and assessments. Should additional analysis or services be required, SCIPP can serve as a grant subrecipient through the University of Oklahoma's Office or Research Services.

It is understood that this is letter is only an expression of our intent and a binding agreement detailing the terms and conditions of the proposed partnership must be executed before the use of any CDBG-NDR funds, if awarded. If you have additional questions, please call me at 405-325-3044 or email at mshafer@ou.edu.

Sincerely,

Mark A. Shafer

Mark Shafer
Director, Southern Climate Impacts Planning Program

Louisiana State University
Geography and Anthropology Dept.
Howe-Russell Building
Baton Rouge, LA 70803

The University of Oklahoma
Oklahoma Climatological Survey
120 David L. Boren Blvd. Suite 2900
Norman, OK 73072

Texas A&M University -
Dept. of Geography
University of Nebraska-Lincoln
National Drought Mitigation Center

J. D. STRONG
EXECUTIVE DIRECTOR

MARY FALLIN
GOVERNOR

STATE OF OKLAHOMA
WATER RESOURCES BOARD
www.owrb.ok.gov

March 23, 2015

Mr. Stephen Eddy, City Manager
City of Moore
300 N. Broadway
Moore, OK 73160

Re: OWRB support of the City of Moore's Application for CDBG-NDRC Grant Competition

Dear Mr. Eddy:

This letter is to express support of the Oklahoma Water Resources Board (OWRB) in both the direction and intent of the long-term initiatives set forth by the City of Moore's Phase 1 application for the Community Development Block Grant National Disaster Resilience Competition (CDBG-NDRC).

The CDBG-NDRC initiatives are in alignment with the Water for 2060 Act, applicable Priority and Supporting Recommendations of the 2012 Update of the Oklahoma Comprehensive Water Plan, and the requirements of Oklahoma's CWSRF Green Project Reserve which incentivizes green infrastructure, water or energy efficiency improvements, or other environmentally innovative projects.

The OWRB will gladly assist the City's development of this application by providing information on water resources planning, water rights, water quality data, surface and groundwater availability, as well as ways to best leverage any funding through our Drinking and Clean Water State Revolving Funds (DWSRF & CWSRF).

If you have any questions or concerns, please contact Joe Freeman, Chief, OWRB Financial Assistance Division, or Julie Cunningham, Chief, OWRB Planning and Management Division, at 405-530-8800.

Sincerely,

J. D. Strong
Executive Director

The City of
OKLAHOMA CITY

February 17, 2015

Stephen Eddy, City Manager
City of Moore
300 N Broadway
Moore, OK 73160

Re: Intent to Participate

Dear Mr. Eddy:

This letter is to confirm the mutual intent of both City of Moore and The City of Oklahoma City to collaborate and enter into a partner agreement, contingent upon the award of funds from the United States Department of Housing and Urban Development (HUD) for the Community Development Block Grant National Disaster Resilience Competition (CDBG-NDRC) to carry out eligible activities as provided in the City of Moore's CDBG-NDRC application.

The City of Moore is an eligible applicant under the CDBG-NDRC and has the responsibility of implementing long-term recovery activities with funding under the Disaster Appropriations Act of 2013 (Public Law 113-2). The City of Moore and The City of Oklahoma City sustained major damages to housing, infrastructure and community facilities during the severe storms and tornadoes that occurred May 19, 20 and 31, 2013 that resulted in FEMA Disaster Declaration DR-4117. The City of Moore and The City of Oklahoma City are both Units of General Local Government (Entitlement Communities) under HUD's Community Development Block Grant program. The City of Oklahoma City has successfully managed CDBG program funding since adoption of the Housing and Community Development Act of 1974.

The City of Oklahoma City will participate with the City of Moore as a subrecipient and provide the resources necessary to successfully prepare the application and implement the activities proposed for funding under the CDBG-NDRC program.

It is understood that this is letter is only an expression of our intent and a binding partner agreement [or other agreement] detailing the terms and conditions of the proposed partnership must be executed before the use of any CDBG-NDRC funds, if awarded.

Sincerely,

Mick Cornett
Mayor

420 West Main, Suite 900 • Oklahoma City, OK 73102 • 405.297.2576 • FAX 405.297.1631

MEMORANDUM

Council Agenda
Item No. IX.F.1&2.
2/17/2015

The City of
OKLAHOMA CITY

PUBLIC HEARING HELD.

TO: Mayor and City Council

FROM: James D. Couch, City Manager

1. Public hearing.
2. Resolution approving submission of a partner letter with the City of Moore authorizing The City of Oklahoma City to participate as a cooperative agency in submitting an application and all required certifications to the U.S. Department of Housing and Urban Development for Community Development Block Grant – National Disaster Resilience Competition funding.

Purpose

A public hearing to allow citizen comment on the proposed application and partner letter are threshold requirements for applying for National Disaster Resilience Competition funding.

Background

The Secretary of the U.S. Department of Housing and Urban Development (HUD) has issued a Notice of Funding Availability (NOFA), FR-5800-N-29, of approximately $1 billion made available from the Disaster Relief Appropriations Act, 2013 (Public Law 113-2). The funding will be awarded competitively among all states, counties and cities that received disaster recovery funding by the HUD Secretary under the Disaster Appropriations Act of 2013. Community Development Block Grant - National Disaster Resilience Competition (CDBG-NDRC) funding is considered Community Development Block Grant funding and must comply with regulations governing its use under 24 CFR part 570 as amended or alternative requirements provided in the Federal Register Notices associated with the Disaster Relief Appropriations Act of 2013.

The grant competition is a two phase process. The initial phase requires framing unmet recovery needs, vulnerabilities and community development objectives, as well as establishing preliminary partnerships among cooperating agencies. The initial submission is due March 15, 2015. The second phase is invitation only. HUD will select a shortlist that will be required to provide a more extensive application and formalization of partnerships that can move the framing exercise into project determination and implementation. The second phase will begin approximately June 2015 with estimated funding awards being issued in August or September.

Since The City of Oklahoma City did not receive a direct federal allocation, it is not an eligible applicant under CDBG-NDRC and must

apply through one of the two eligible applicants in the state of Oklahoma which are the Oklahoma Department of Commerce and the City of Moore. The City of Moore has requested that The City partner in an application for funding under the NOFA to fund resiliency improvements at the Draper Water Treatment Plant.

The Draper Treatment Plant lost power for approximately 24-hours due to the severe storms and tornadoes and is eligible by association with FEMA Major Disaster Declaration DR-4117. The loss of power resulted in greatly reduced water service to area homes, businesses and medical facilities until emergency power could be established. Much of the Moore area was impacted by the event. The City of Oklahoma City will receive from the Oklahoma Department of Commerce approximately $24 million Community Development Block Grant – Disaster Recovery (CDBG-DR) funding to upgrade the electrical systems at the facility. The CDBG-DR grant will ensure redundancy in electrical power to the plant. However, since the plant was affected by the disaster and CDBG-DR funding will be used to improve the facility, the Federal Register Notices that govern the use of these funds require the incorporation of resiliency and other improvements when rebuilding. The Draper Treatment Plant can be made more resilient by incorporating the proposed improvements outlined in the table below.

Priority	Project Name	Description	Project Cost
1.	Suction Flume Replacement	Replacement of high service pump station suction flume	$ 2,840,000
2.	North Clearwell and Filter Effluent Transmission Resiliency Improvements	Installation of two clearwells to the north of the existing site and installation of transmission pipeline from filters to new clearwells.	$27,145,440
3.	South Clearwell Storage and Resiliency Improvements	Installation of two new clearwells to the south of the existing site.	$24,225,000
Total			$54,210,440

Since the City of Moore is almost entirely dependent on The City of Oklahoma City for its public water supply, it has a vested interest in helping secure funding for the additional resiliency improvements at the Draper facility.

The Resolution and partner letter were reviewed and recommended for approval by the Council Neighborhood Conservation Committee on February 4, 2015 (Item No. 3.A.)

Review Planning Department

Recommendation: Public hearing be held and Resolution be adopted.

RESOLUTION

RESOLUTION APPROVING SUBMISSION OF A PARTNER LETTER WITH THE CITY OF MOORE THAT AUTHORIZES THE PARTICIPATION OF THE CITY OF OKLAHOMA CITY AS A COOPERATIVE AGENCY IN THE SUBMISSION OF AN APPLICATION AND ALL REQUIRED CERTIFICATIONS TO THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD) FOR COMMUNITY DEVELOPMENT BLOCK GRANT – NATIONAL DISASTER RESILIENCE COMPETITION (CDBG-NDRC) FUNDING**.**

WHEREAS, The Disaster Relief Appropriations Act (Public Law 113-2) established funding to assist with long term disaster recovery of Hurricane Sandy and has been allocated by the Secretary of the U.S. Department of Housing and Urban Development (HUD) to aid in the long term recovery of other areas for which there is a Presidential Disaster Declaration between 2011 and 2013; and

WHEREAS, The Secretary of HUD has allocated and made available under a Notice of Funding Availability (NOFA) FR-5800-N-29 approximately $1 billion in Community Development Block Grant – National Disaster Resilience (CDBG-NDRC) funding to be awarded competitively among all states, counties and cities affected by Major Disaster Declarations between 2011 and 2013; and

WHEREAS, Disaster Relief Appropriations Act sets forth requirements governing the expenditure of CDBG-NDRC funding in compliance with the Housing and Community Development Act of 1974 or as amended by the Federal Register Notices implementing the Disaster Relief Appropriations Act funding; and

WHEREAS, The City of Moore is an eligible applicant for funding under the CDBG-NDRC and has requested The City of Oklahoma City partner in an application in response to the NOFA; and

WHEREAS, the initial requirements of the NOFA require submission of a letter agreeing to partner on implementation of eligible projects awarded funding by HUD; and

WHEREAS, improvements to the Draper Treatment Plant are unmet needs on a public facility affected by the severe storms included in FEMA Disaster Declaration DR-4117 and can qualify for funding under the CDBG-NDRC program.

NOW, THEREFORE, BE IT RESOLVED BY the Mayor and Council of The City of Oklahoma City:

The partner letter with the City of Moore and all required application documents and certifications for CDBG-NDRC funding under the FR-5800-N-29 are hereby approved.

PROVIDED that copies of the executed application and related documents are filed with the City Clerk's Office; and

PROVIDED that the Mayor will not sign any agreement or contract pursuant to such awards without first securing the specific approval of the City Council.

ADOPTED by the Council and **APPROVED** by the Mayor of the City of Oklahoma City this 17th day of February, 2015.

ATTEST:

CITY CLERK

MAYOR

REVIEWED as to form and legality.

ASSISTANT MUNICIPAL COUNSELOR

Name of Attachment: Attachment B: Leverage

Name of Applicant: City of Moore, Ok

Name of File that Contains the Attachment: MooreAtt2

City of Moore
Oklahoma
301 N. Broadway, Moore, OK 73160 | (405) 793-5000 | www.cityofmoore.com

MEMO

Date: March 16, 2015

To: City Council

From: Jared Jakubowski, Grants Manager JJ

Re: Leverage

The City of Moore is committed to create a resilience city, community, and region. We are currently implementing a more resilient water system. The City of Moore is committing approximately $275,000 of local nonfederal funding. This funding will create tie and loop the city's eastside water system to the main system in three separate tie-ins. This will create a redundant fire protection and prevention of a system failures. Attached in a cost estimate for the project.

BNK Investments, LLC
(Allied Wireline, LLC)
Domestic Water Line Extension

Cost Estimate

ITEM NO.	DESCRIPTION	QUANT	UNIT	UNIT PRICE	TOTAL PRICE
	4th Street and South of 4th Street				
1	12" Water Line (AWWA C-900 DR 14 PVC)	1,650	L.F.	$32.00	$52,800.00
2	20" Bore & Casing	180	L.F.	$200.00	$36,000.00
3	12"x12" Tee	1	EA.	$1,000.00	$1,000.00
4	12"x22-1/2° Bend	2	EA.	$500.00	$1,000.00
5	12" Gate Valve w/ Box	3	EA.	$2,500.00	$7,500.00
6	12" Dresser Coupling	2	EA.	$300.00	$600.00
7	Remove Existing 12" Plug	2	EA.	$200.00	$400.00
8	Fire Hydrant w/ Appurtenances (Includes 8"x6" Tee, 6" Gate Valve w/ Box, 6" Water Line & Riser If Required)	1	EA.	$4,000.00	$4,000.00
8	Anchor	5	EA.	$100.00	$500.00
9	Pressure and Leakage Test	1	L.S.	$500.00	$500.00
10	Disinfection	1	L.S.	$500.00	$500.00
	TOTAL CONSTRUCTION				$104,800.00
	Contingency 10%				$10,480.00
	Engineering 8%				$8,384.00
	Surveying	1,650	L.F.	$1.00	$1,650.00
	DEQ Permit				$502.35
	TOTAL ALONG 4TH STREET & SOUTH OF 4TH STREET				**$125,816.35**

ITEM NO.	DESCRIPTION	QUANT	UNIT	UNIT PRICE	TOTAL PRICE
	North of 4th Street				
1	12" Water Line (AWWA C-900 DR 14 PVC)	1,680	L.F.	$32.00	$53,760.00
2	8" Water Line (AWWA C-900 DR 14 PVC)	295	L.F.	$22.00	$6,490.00
3	20" Bore & Casing	105	L.F.	$200.00	$21,000.00
4	16" Bore & Casing	70	L.F.	$160.00	$11,200.00
5	12"x8" Tee	1	EA.	$500.00	$500.00
6	12" Gate Valve w/ Box	2	EA.	$2,500.00	$5,000.00
7	8" Gate Valve w/ Box	1	EA.	$1,400.00	$1,400.00
8	12" Plug w/ 2" Blow-Off Valve	1	EA.	$500.00	$500.00
9	8" Plug w/ 2" Blow-Off Valve	1	EA.	$400.00	$400.00
10	Fire Hydrant w/ Appurtenances (Includes 8"x6" Tee, 6" Gate Valve w/ Box, 6" Water Line & Riser If Required)	5	EA.	$4,000.00	$20,000.00
11	Gravel Drive Repair	24	S.Y.	$30.00	$720.00
12	Sand Backfill	12.2	C.Y.	$25.00	$305.00
13	Anchor	13	EA.	$100.00	$1,300.00
14	Pressure and Leakage Test	1	L.S.	$500.00	$500.00
15	Disinfection	1	L.S.	$500.00	$500.00
	TOTAL CONSTRUCTION				$123,575.00
	Contingency 10%				$12,357.50
	Engineering 8%				$9,886.00
	Surveying	1,975	L.F.	$1.00	$1,975.00
	DEQ Permit				$589.65
	TOTAL NORTH OF 4TH STREET				**$148,383.15**

Oklahoma City Water Utilities Trust

March 19, 2015

Jared Jakubowski
City of Moore
301 N Broadway
Moore, OK 73160-5130

Dear Mr. Jakubowski:

I am writing to document leverage contribution for the City of Moore's Community Development Block Grant – National Disaster Resilience Competition (CDBG-NDRC) grant application as it pertains to the Draper Water Treatment Plant. The sources of leveraged funding for disaster recovery and resiliency improvements include 5 primary sources of funds as detailed in the table below.

Draper Water Treatment Plant	Amount
CDBG-DR	$24,055,000.00
FEMA Public Assistance (Recovery)	$78,706.00
State Match FEMA Public Assistance	$13,117.00
Local Match FEMA Public Assistance	$13,117.00
Preliminary Engineering (OCWUT)	$50,000.00
Total Leverage	$24,209,940.00

Of the totals detailed above, $50,000 was funded with local resources for a consultant to provide necessary preliminary engineering to provide cost estimates and other engineering for the CDBG-DR funded through the Oklahoma Department of Commerce. The CDBG-DR funding will provide resiliency improvements that include electrical system modifications to better manage power at the Draper Water Treatment Plant and for preliminary engineering for the acquisition and installation of permanent emergency power generation to ensure 100 MGD water production during power outages.

If you need further information or details, please contact Steven Rhodes at (405) 297-2009 or steven.rhodes@okc.gov

Sincerely,

Marsha W. Slaughter, P.E.
General Manager

420 West Main, Suite 900 • Oklahoma City, OK 73102 • 405.297.2576 • FAX 405.297.1631

Name of Attachment: Attachment D: CDBG-NDR Application Certifications

Name of Applicant: City of Moore, Ok

Name of File that Contains the Attachment: MooreAtt3

Certification

Certifications waiver and alternative requirement. Sections 91.325 and 91.225 of title 24 of the Code of Federal Regulations are waived. Each State or UGLG applying for an award under this NOFA must make the following certifications with both its Phase 1 and, if invited by HUD, its Phase 2 application for CDBG-NDR funding.

a. The City of Moore, Oklahoma certifies that it will affirmatively further fair housing, which means that it will conduct an analysis to identify impediments to fair housing choice within its jurisdiction and take appropriate actions to overcome the effects of any impediments identified through that analysis, and maintain records reflecting the analysis and actions in this regard (see 24 CFR 570.487(b)(2) and 570.601(a)(2)). In addition, the grantee certifies that agreements with subrecipients will meet all civil rights related requirements pursuant to 24 CFR 570.503(b)(5).

b. The City of Moore, Oklahoma certifies that it has in effect and is following a residential anti- displacement and relocation assistance plan in connection with any activity assisted with funding under the CDBG program.

c. The City of Moore, Oklahoma certifies its compliance with restrictions on lobbying required by 24 CFR part 87, together with disclosure forms, if required by part 87.

d. The City of Moore, Oklahoma certifies that the Community Development Block Grant National Disaster Resilience application is authorized under State and local law (as applicable) and that the grantee, and any contractor, subrecipient, or designated public agency carrying out an activity with CDBG–NDR funds, possess(es) the legal authority to carry out the program for which it is seeking funding, in accordance with applicable HUD regulations and this NOFA.

e. The City of Moore, Oklahoma certifies that activities to be administered with funds under this NOFA are consistent with its Application.

f. The City of Moore, Oklahoma certifies that it will comply with the acquisition and relocation requirements of the URA, as amended, and implementing regulations at 49 CFR part 24, except where waivers or alternative requirements are provided for in this NOFA.

g. The City of Moore, Oklahoma certifies that it will comply with section 3 of the Housing and Urban Development Act of 1968 (12 U.S.C. 1701u), and implementing regulations at 24 CFR part 135.

h. The City of Moore, Oklahoma certifies that it is following a detailed citizen participation plan that satisfies the requirements of 24 CFR 91.105 or 91.115, as applicable (except as provided for in notices providing waivers and alternative requirements for this grant). The City of Moore, Oklahoma will follow a detailed citizen participation plan that satisfies the requirements of 24

CFR 570.486 (except as provided for in notices providing waivers and alternative requirements for this grant).

i. The City of Moore, Oklahoma certifies that it has consulted with affected UGLGs in counties designated in covered major disaster declarations in the non- entitlement, entitlement, and tribal areas of the State in determining the uses of funds, including method of distribution of funding, or activities carried out directly by the State.

j. The City of Moore, Oklahoma certifies that it is complying with each of the following criteria:

(1) Funds will be used solely for necessary expenses related to disaster relief, long-term recovery, restoration of infrastructure and housing, and economic revitalization in the most impacted and distressed areas for which the President declared a major disaster in the aftermath of an event occurring in 2011, 2012, 0r 2013, pursuant to the Stafford Act.

(2) With respect to activities expected to be assisted with CDBG–NDR funds, the

Application has been developed so as to give the maximum feasible priority to activities that will benefit low- and moderate-income families.

(3) The aggregate use of CDBG–NDR funds shall principally benefit low- and moderate-income families in a manner that ensures that at least 50 percent of the grant amount is expended for activities that benefit such persons, unless waived by HUD based on a finding of compelling need.

(4) The City of Moore, Oklahoma will not attempt to recover any capital costs of public improvements assisted with CDBG–NDR grant funds, by assessing any amount against properties owned and occupied by persons of low- and moderate-income, including any fee charged or assessment made as a condition of obtaining access to such public improvements, unless: (a) disaster recovery grant funds are used to pay the proportion of such fee or assessment that relates to the capital costs of such public improvements that are financed from revenue sources other than under this title; or (b) for purposes of assessing any amount against properties owned and occupied by persons of moderate income, The City of Moore, Oklahoma certifies to the Secretary that it lacks sufficient CDBG funds (in any form) to comply with the requirements of clause (a).

k. The City of Moore, Oklahoma certifies that it (and any subrecipient or recipient)) will conduct and carry out the grant in conformity with title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d) and the Fair Housing Act (42 U.S.C. 3601–3619) and implementing regulations.

(1) l. The City of Moore, Oklahoma certifies that it has adopted and is enforcing the following policies: A policy prohibiting the use of excessive force by law enforcement agencies within its jurisdiction against any individuals engaged in nonviolent civil rights demonstrations; and

(2) A policy of enforcing applicable State and local laws against physically barring entrance to or exit from a facility or location that is the subject of such nonviolent civil rights demonstrations within its jurisdiction.

m. The City of Moore, Oklahoma certifies that it (and any subrecipient or recipient) has the capacity to carry out the activities proposed in its Application in a timely manner; or will develop a plan to increase capacity where such capacity is lacking.

n. The City of Moore, Oklahoma will not use grant funds for any activity in an area delineated as a special flood hazard area or equivalent in FEMA's most recent and current data source unless it also ensures that the action is designed or modified to minimize harm to or within the floodplain in accordance with Executive Order 11988 and 24 CFR part 55. The relevant data source for this provision is the latest issued FEMA data or guidance, which includes advisory data (such as Advisory Base Flood Elevations) or preliminary and final Flood Insurance Rate Maps.

o. The City of Moore, Oklahoma certifies that its activities concerning lead-based paint will comply with the requirements of 24 CFR part 35, subparts A, B, J, K, and R.

p. The City of Moore, Oklahoma certifies that it will comply with applicable laws.

q. The City of Moore, Oklahoma certifies that it has reviewed the requirements of this NOFA and requirements of Public Law 113–2 applicable to funds allocated by this Notice, and that it has in place proficient financial controls and procurement processes and has established adequate procedures to prevent any duplication of benefits as defined by section 312 of the Stafford Act, to ensure timely expenditure of funds, to maintain comprehensive Web sites regarding all disaster recovery activities assisted with these funds, and to detect and prevent waste, fraud, and abuse of funds.

Adopted by the Mayor and Council and signed by the Mayor of the City of Moore the 16th day of March, 2015.

GLENN LEWIS, MAYOR

RESOLUTION 816(15)

RESOLUTION APPROVING SUBMISSION OF THE AN APPLICATION FOR AND ALL REQUIRED CERTIFICATIONS TO THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD) FOR COMMUNITY DEVELOPMENT BLOCK GRANT – NATIONAL DISASTER RESILIENCE COMPETITION (CDBG-NDRC) FUNDING.

RESOLUTION

WHEREAS, The Disaster Relief Appropriations Act (Public Law 113-2) established funding to assist with long term disaster recovery of Hurricane Sandy and been allocated by the Secretary of the U.S. Department of Housing and Urban Development (HUD) to aid in the long term recovery of other areas for which there is a Presidential Disaster Declaration between 2011 and 2013; and

WHEREAS, The Secretary of HUD has allocated and made available under a Notice of Funding Availability (NOFA) FR-5800-N-29 approximately $1 billion in Community Development Block Grant – National Disaster Resilience (CDBG-NDRC) funding to be awarded competitively among all states, counties and cities affected by Major Disaster Declarations between 2011 and 2013; and

WHEREAS, Disaster Relief Appropriations Act sets forth requirements governing the expenditure of CDBG-NDRC funding in compliance with the Housing and Community Development Act of 1974 or as amended by the Federal Register Notices implementing the Disaster Relief Appropriations Act funding; and

WHEREAS, the initial requirements of the NOFA require submission of a letter agreeing to partner on implementation of eligible projects awarded funding by HUD; and

NOW, THEREFORE, BE IT RESOLVED that the partner letter with the City of Oklahoma City and all required application documents and certifications for CDBG-NDRC funding under the FR-5800-N-29 are hereby approved.

ADOPTED, by the Mayor and Council and signed by the Mayor of the City of Moore the 16th day of March, 2015.

GLENN LEWIS, MAYOR

JIM CORBETT, CITY CLERK

Approved as to form and legality the 16th day of March, 2015.

RANDY BRINK, CITY ATTORNEY

Name of Attachment: Attachment D: Consultation Summary

Name of Applicant: City of Moore, Ok

Name of File that Contains the Attachment: MooreAtt4

MEMO

Date: March 16, 2015

To: City Council

From: Jared Jakubowski, Grants Manager

Re: Consultation Summary

Name	Harold Brooks, PhD
Title	Senior Scientist
Organization or Entity	NOAA - National Severe Storms Laboratory, University of Oklahoma
Phone	
E-mail	harold.brooks@noaa.gov
Role	Expert on Tornadoes and relationship to climate science
Type of Outreach / Target	Internal Meetings
Name	Greg Carbin
Title	Warning Coordination Meteorologist
Organization or Entity	NOAA – Storm Prediction Center
Phone	
E-mail	gregory.carbin@noaa.gov
Role	Tornado Education – Communication – Originator of the idea that a platform needs to built that warns of the probability of infrastructure damage to local emergency management
Type of Outreach / Target	Internal Meetings and Public Outreach
Name	Kevin Kloesel
Title	Director, Oklahoma Climatological Survey
Organization or Entity	University of Oklahoma

Phone	
E-mail	kkloesel@mesonet.org
Role	OCS is charged with providing weather and climate data, analysis and expertise to stakeholders and decision makers throughout the state, and operates the Oklahoma Mesonet weather observing network. Kevin also serves on the State of Oklahoma Hazard Mitigation Task Force.
Type of Outreach / Target	Internal Meetings
Name	Gayland Kitch
Title	Director of Emergency Management
Organization or Entity	City of Moore
Phone	(405) 793-4477
E-mail	Gkitch@cityofmoore.com
Role	Very knowledgeable on emergency management and excellent contacts in the national weather service and the associated entities
Type of Outreach / Target	Internal Meetings and Public Outreach
Name	Leehu Loon, ASLA, PLA
Title	Director of Landscape Architecture
Organization or Entity	University of Oklahoma
Phone	405-325-1519
E-mail	lloon@ou.ed
Role	Water resilient landscapes
Type of Outreach / Target	Internal Meetings
Name	Gary McManus
Title	State Climatologist - Oklahoma Mesonet -
Organization or Entity	Oklahoma Climatological Survey
Phone	Work: (405) 325-2253 Cell: (405) 823-9054
E-mail	gmcmanus@mesonet.org
Role	Expert on Oklahoma drought conditions
Type of Outreach / Target	Internal Meetings

Name	Renee McPherson, Ph.D.
Title	Director of Research
Organization or Entity	South Central Climate Science Center
Phone	405-325-1272
E-mail	renee@ou.ed
Role	Coordinating Water Science Associated with WHIRL
Type of Outreach / Target	Internal Meetings, Public Meetings, Public Hearings, Lead University Study of City of Moore's Climate
Name	Alexander "Sascha" Petersen
Title	Co-founder and executive director of Adaptation International
Organization or Entity	Adaptation International
Phone	512-585-8592
E-mail	sascha@adaptationinternational.com
Role	(www.adaptationinternational.com) is a company focused on helping communities and businesses prepare for a changing climate. Current projects include adaptation tool development with the City of Seattle and climate mitigation and adaptation planning for the City of Tucson. Sascha is also a Senior Program Officer for the Institute for Sustanable Communities (www.iscvt.org).
Type of Outreach / Target	Meetings Public Meetings
Name	Robert Pistole
Title	Project Manager
Organization or Entity	Veolia
Phone	405-793-5087 (w) 405-627-1842 (C)
E-mail	Robert.Pistole@veolia.com
Role	Contractor operating Moore's Water System – Info on damages, aftermath of tornado, Smart Meters
Type of Outreach / Target	Internal Meetings
Name	Robert W "Bob" Puls, Ph.D.

Title	Director - Associate Professor
Organization or Entity	Oklahoma Water Survey College of Atmospheric & Geographic Sciences
Phone	405-325-2826
E-mail	bpuls@ou.edu
Role	www.oklahomawatersurvey.org Assistance with water science Associated with WHIRL
Type of Outreach / Target	Meetings Low-Mod Income and General Public Awareness Meetings
Name	Steve Rhodes
Title	Urban Redevelopment Specialist
Organization or Entity	Oklahoma City
Phone	405-297-2009
E-mail	steve.rhodes@okc.gov
Role	Data specialist and CDBG-DR contact for the City – person to go to for info on Oklahoma City
Type of Outreach / Target	Public Meetings, Public Outreach, and Meetings
Name	Rick Smith
Title	Warning Coordination Meteorologist at the National Weather Service's Norman Forecast Office
Organization or Entity	National Weather Service
Phone	
E-mail	richard.smith@noaa.gov
Role	He manages NWS Norman's hazardous weather preparedness, outreach and education activities for the office's 56 county area of responsibility. Rick and the NWS Norman staff work closely with the media, emergency managers and other state, county, tribal and local government officials to ensure that communities in central and western Oklahoma and western north Texas are ready when hazardous weather threatens.
Type of Outreach / Target	Meeting Public
Name	Dr. Robert Puls, Ph.D.

Title	Director and Associate Professor, College of Atmospheric & Geographic Sciences
Organization or Entity	Oklahoma Water Survey & University of Oklahoma
Phone	405-325-2826
E-mail	bpuls@ou.edu
Role	The University of Oklahoma Regents established the Oklahoma Water Survey as an organized research unit on January 26, 2011. The mission of the Water Survey is to study the state's water resources and to collect, analyze, interpret and disseminate research-based information about water to researchers, students, teachers, citizens, governments, businesses and organizations. The Oklahoma Water Survey's mission is to serve the University research community, and act as a catalyst to the wide and deep expertise in education, research and outreach in water issues. Moreover, the Oklahoma Water Survey will work with federal, state and tribal governments, organizations, businesses, communities and citizens who have interests in Oklahoma's water resources.
Type of Outreach / Target	Meetings Low-Mod Income and General Public Awareness Meetings
Name	Dr. Robert Romines, Ph.D.
Title	Superintendent
Organization or Entity	Moore Public Schools
Phone	405-735-4249
E-mail	robertromines@mooreschools.com
Role	Serves as Superintendent of Schools for the 3rd largest school district in the State of Oklahoma.
Type of Outreach / Target	Meeting School Aged Programs
Name	City of Moore
Title	CDBG Advisory Committee
Organization or Entity	Local Government Citizen Advisory Committee
Phone	405-735-5000
E-mail	N/A
Role	Serves as the citizen advisory board that oversees the CDBG and CDBG-DR grant funding.

Type of Outreach / Target	Low Mod-Income
Name	City of Moore
Title	City of Moore City Council
Organization or Entity	Elected Official Local Government
Phone	405-735-5000
E-mail	N/A
Role	Elected official within the City of Moore.
Type of Outreach / Target	Public Hearing / Moore Citizens
Name	Lisa Krieg
Title	Cleveland County Continuum of Care
Organization or Entity	City of Norman, OK // Cleveland County Continuum of Care
Phone	405-366-5464
E-mail	Lisa.Krieg@NormanOK.gov
Role	Elected official within the City of Moore.
Type of Outreach / Target	Meeting / Low Mod Income / Homelessness
Name	Dr. Dawn F. Jourdan, esq., Ph.D.
Title	Director and Associate Professor, Regional and City Planning
Organization or Entity	University of Oklahoma
Phone	405-325-3502
E-mail	dawnjourdan@ou.edu
Role	Local City Planning School
Type of Outreach / Target	Meeting / Low Mod Income / Outreach
Name	Association of Central Oklahoma Governments
Title	Board of Directors and President
Organization or Entity	Association of Central Oklahoma Governments
Phone	405-778-6129
E-mail	

Role	Serves as the central planning origination in the Oklahoma City Metro Area related to water, transportation, active transportation, emergency operations, and the like.
Type of Outreach / Target	Meeting / Low Mod Income
Name	J.D. Strong
Title	Executive Director
Organization or Entity	Oklahoma Water Resources Board
Phone	405-530-8800
E-mail	Owen.Mills@owrb.ok.gov
Role	Serves as the State of Oklahoma Water Board
Type of Outreach / Target	Meeting / Low Mod Income / Public Outreach

Name of Attachment: Attachment E: Maps and Drawings

Name of Applicant: City of Moore, Ok

Name of File that Contains the Attachment: MooreAtt5

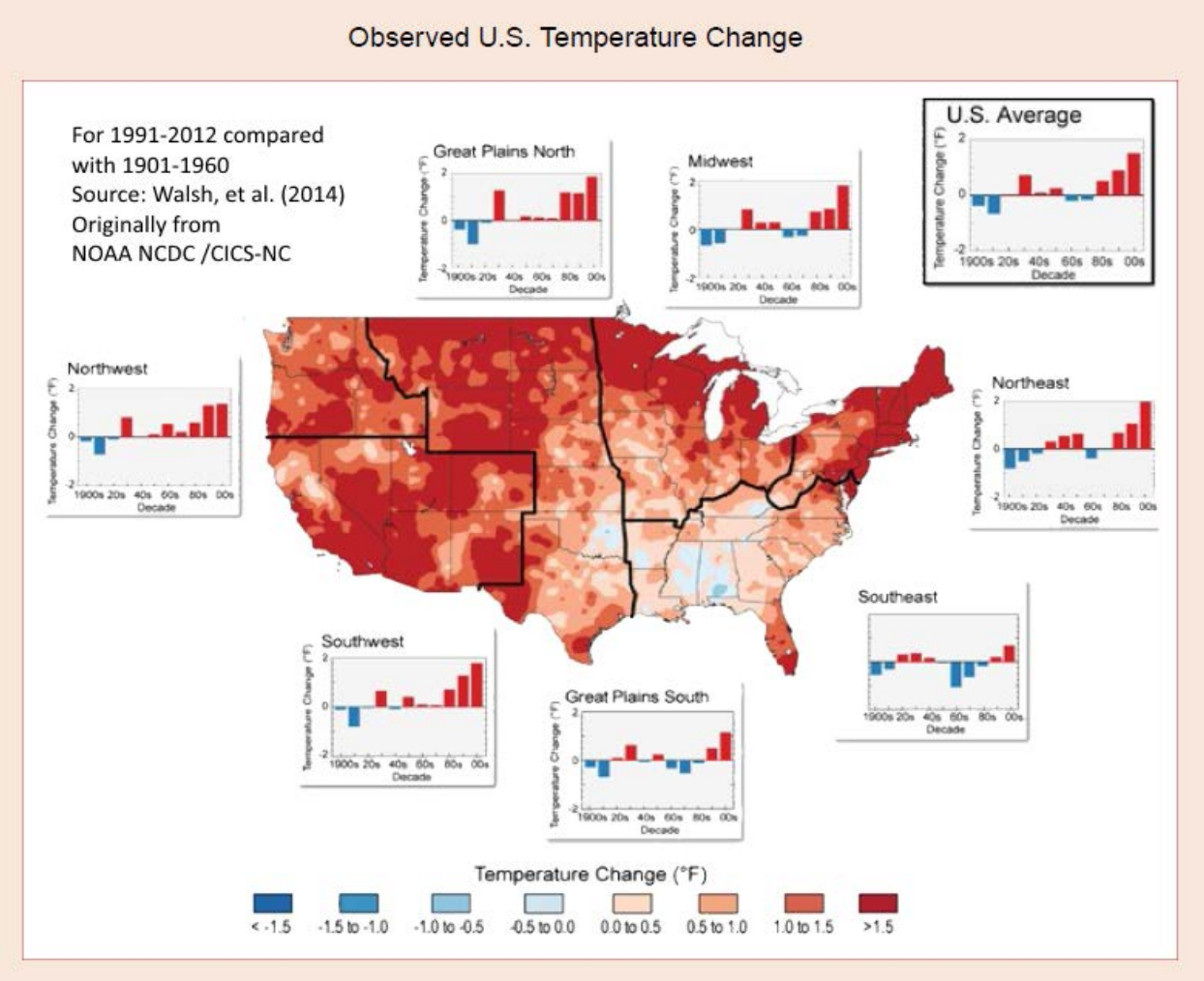


Figure 3: Temperature changes over the last 22 years (1991-2012) compared to the 1901-1960 average.

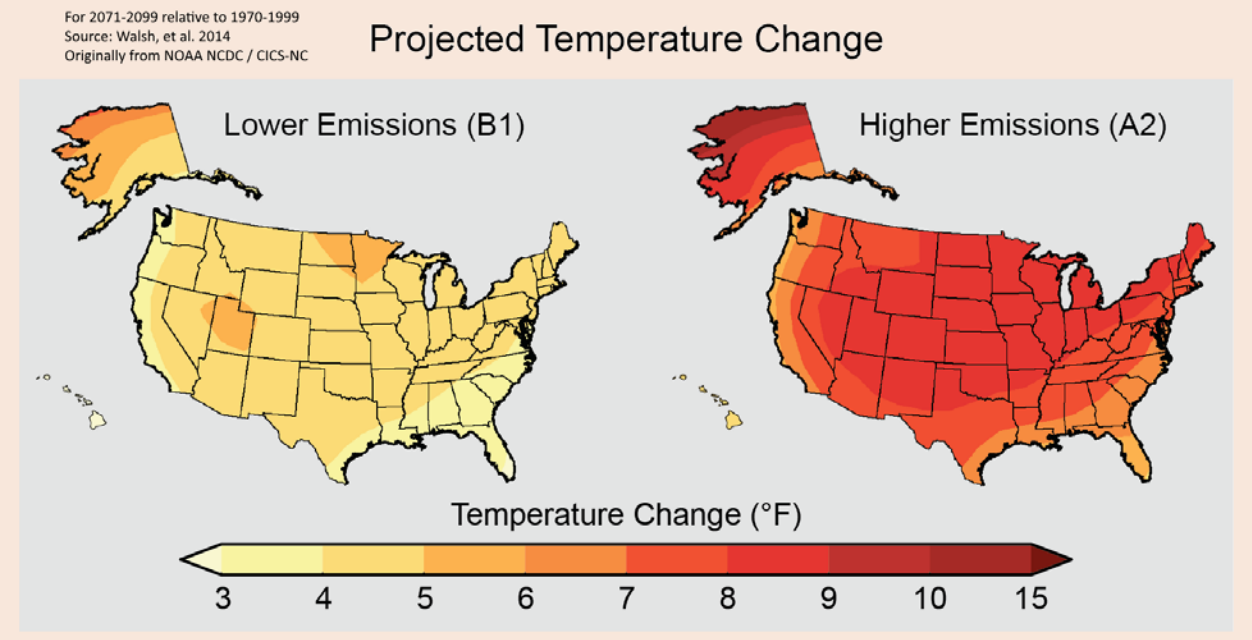


Figure 4: Projected temperature change for the latter part of this century (2071-2099) relative to the latter part of the last century (1970-1999) under lower and higher emission scenarios.

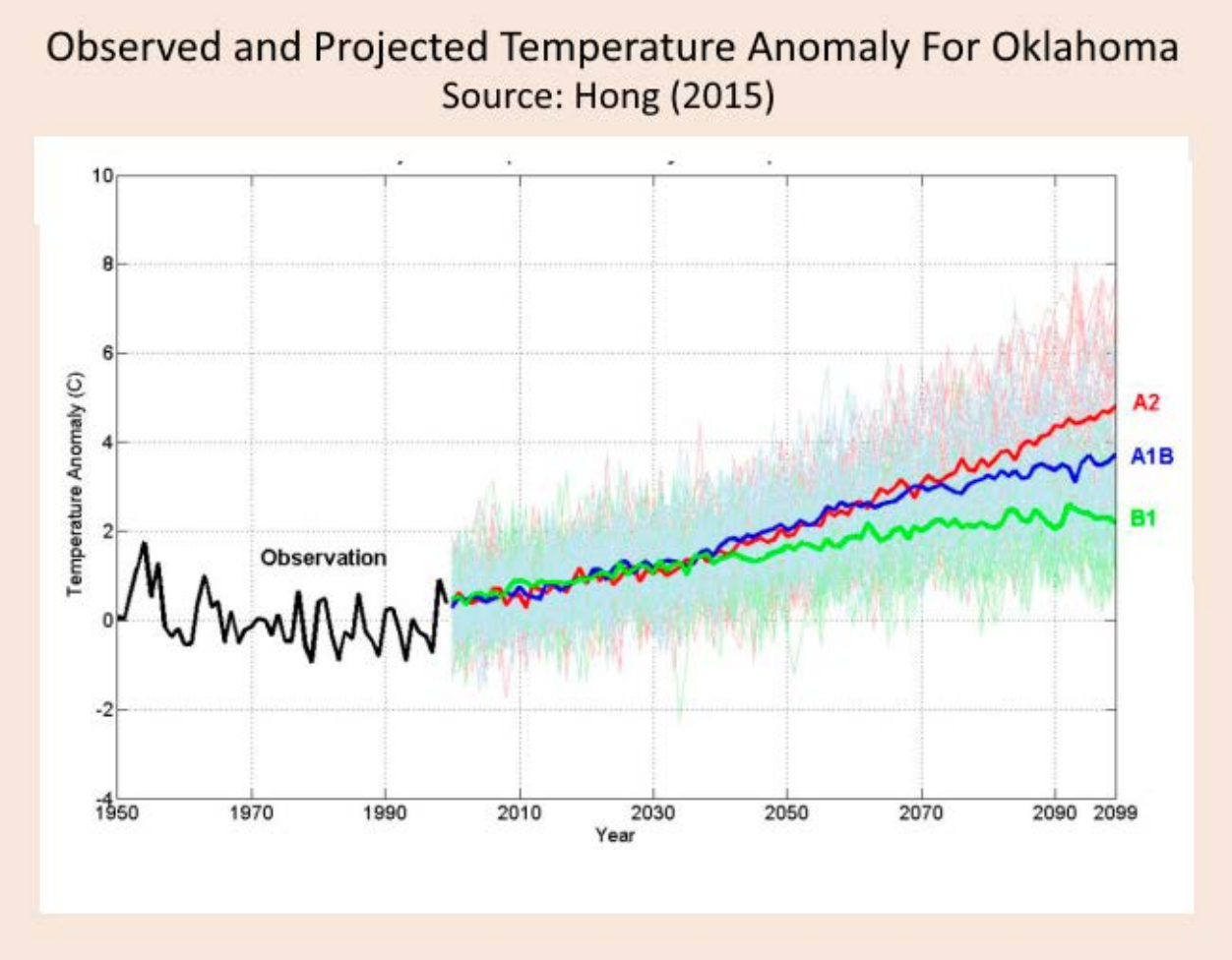


Figure 5: Historical and projected temperature anomalies for Oklahoma. Black denotes historical data, green is the B1 scenario, blue is A1B, and red is A2.

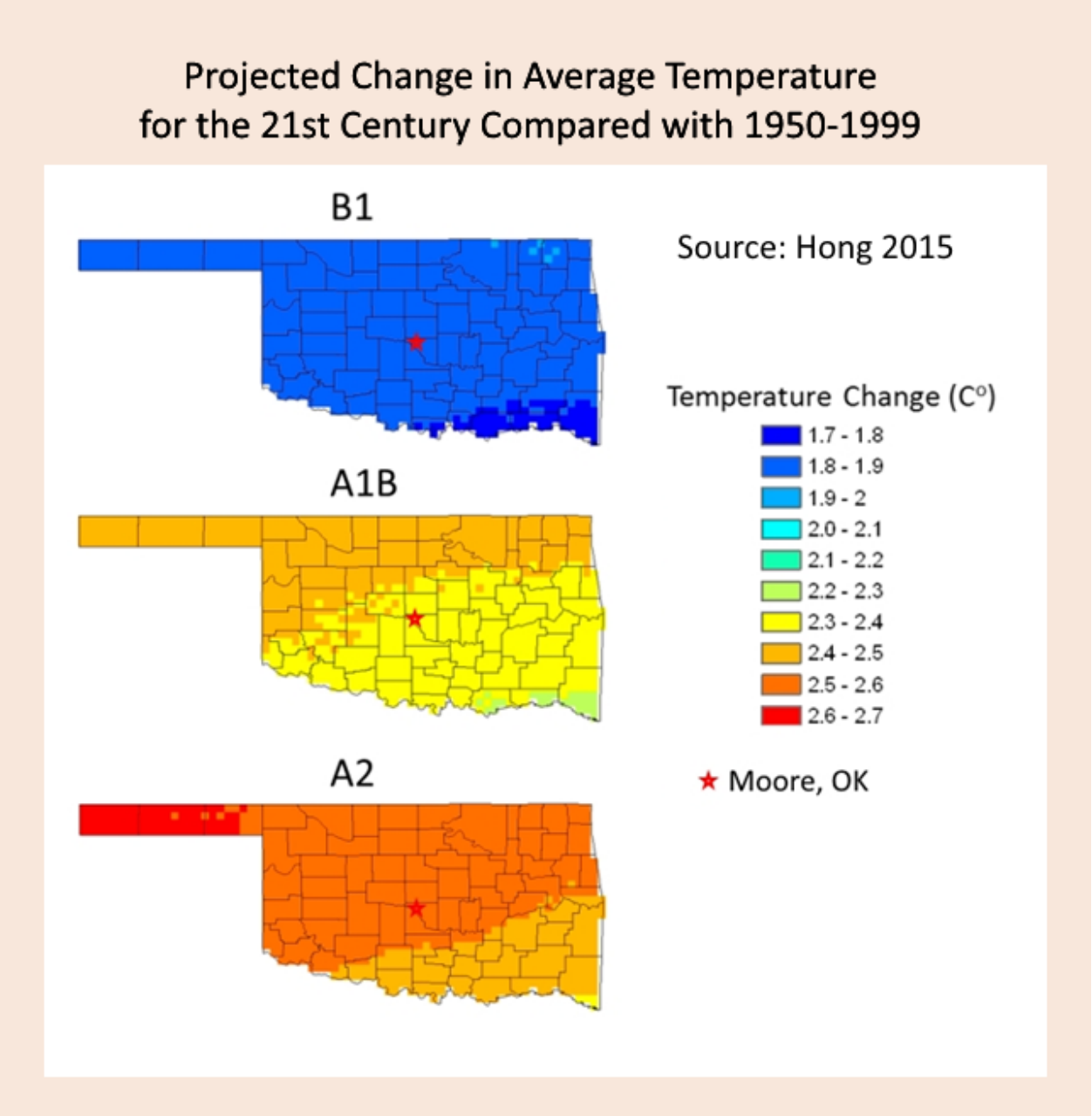


Figure 6: Average spatial variation of temperature change in Oklahoma, comparing 21st century data relative to the period of 1950-1999 under B1, A1B, and A2 scenarios.

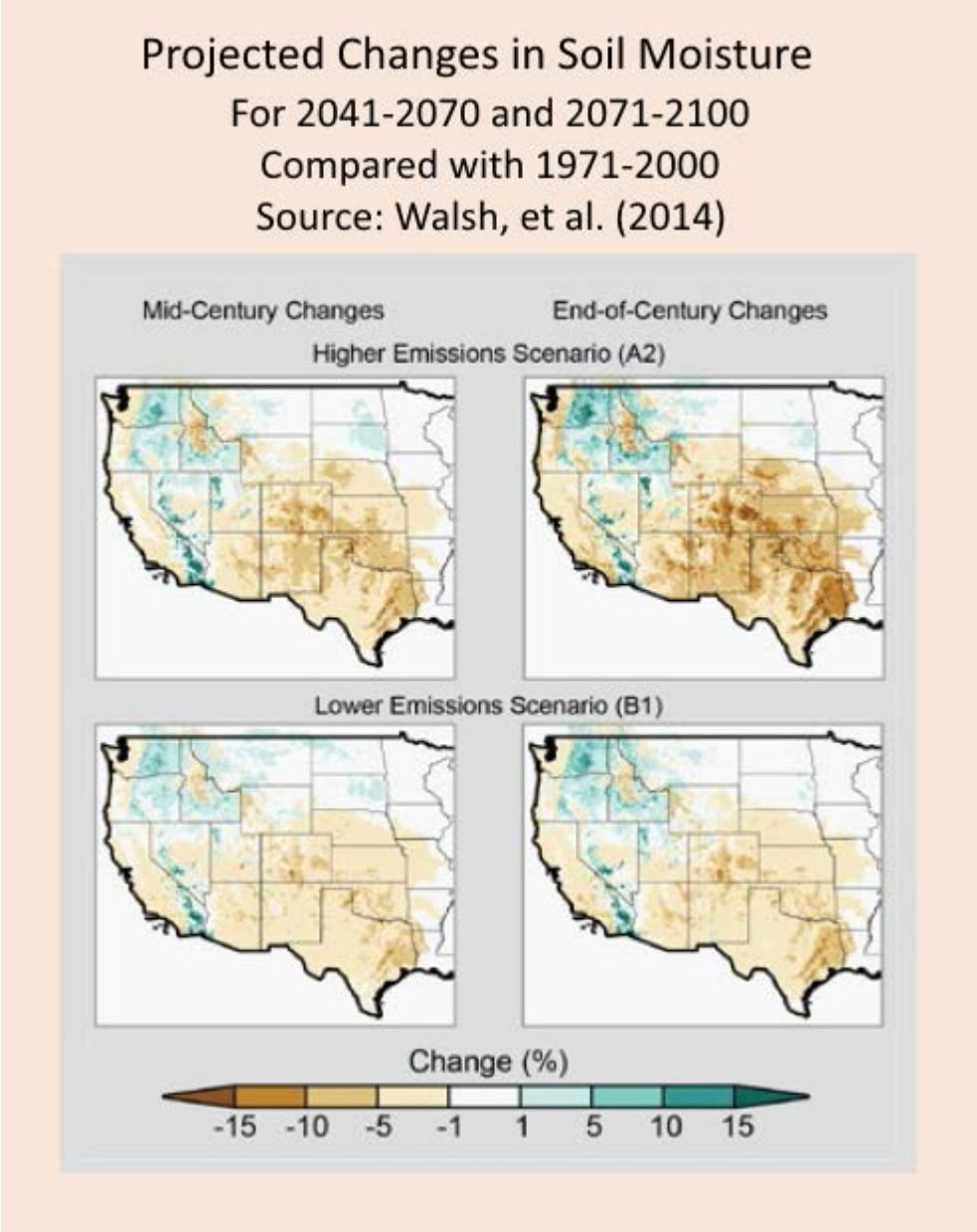


Figure 7: Projected changes in soil moisture to decrease 5-15% by 2041-2070 compared to 1971-2000.

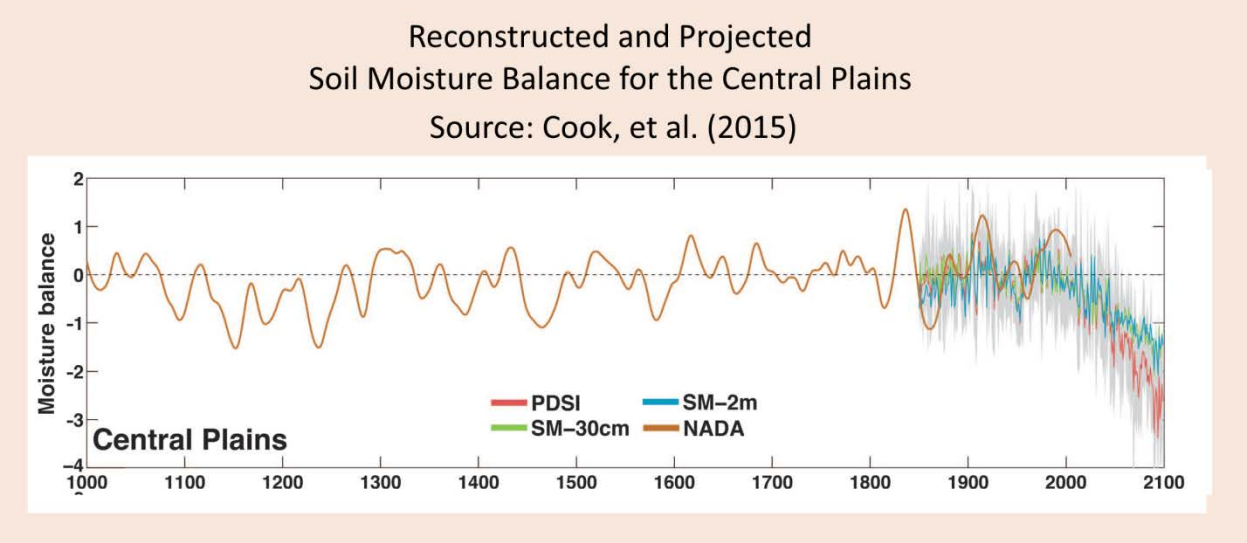


Figure 8: Reconstructed and Projected Soil Moisture Balance for Central Plains.

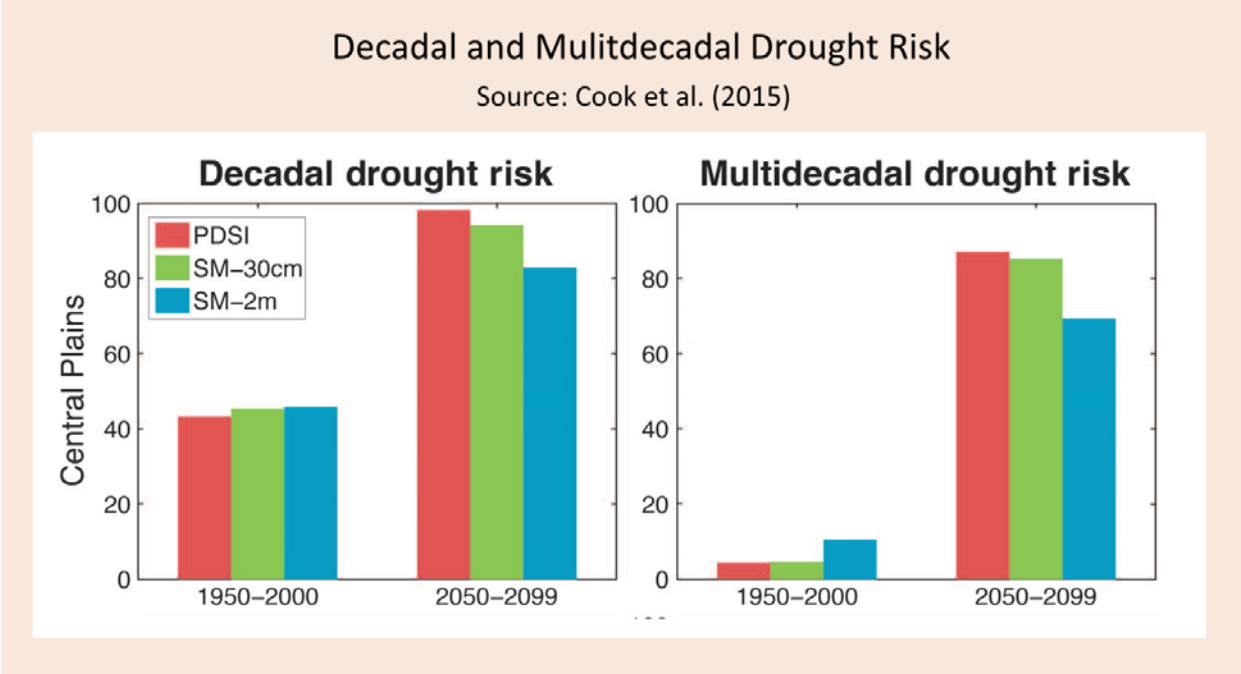


Figure 9: Decadal and Multidecadal Drought Risk.

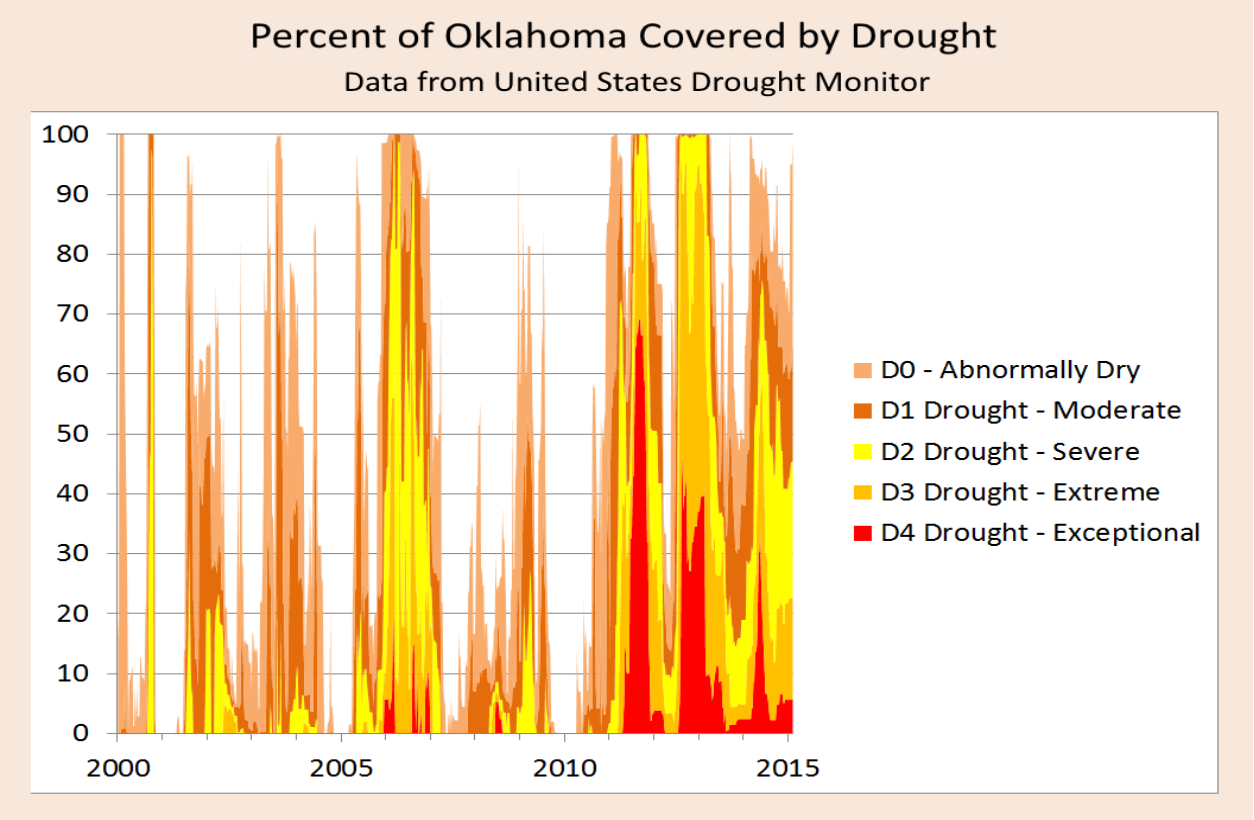


Figure 10: Percent of Oklahoma covered by drought from 2000 t0 2015.

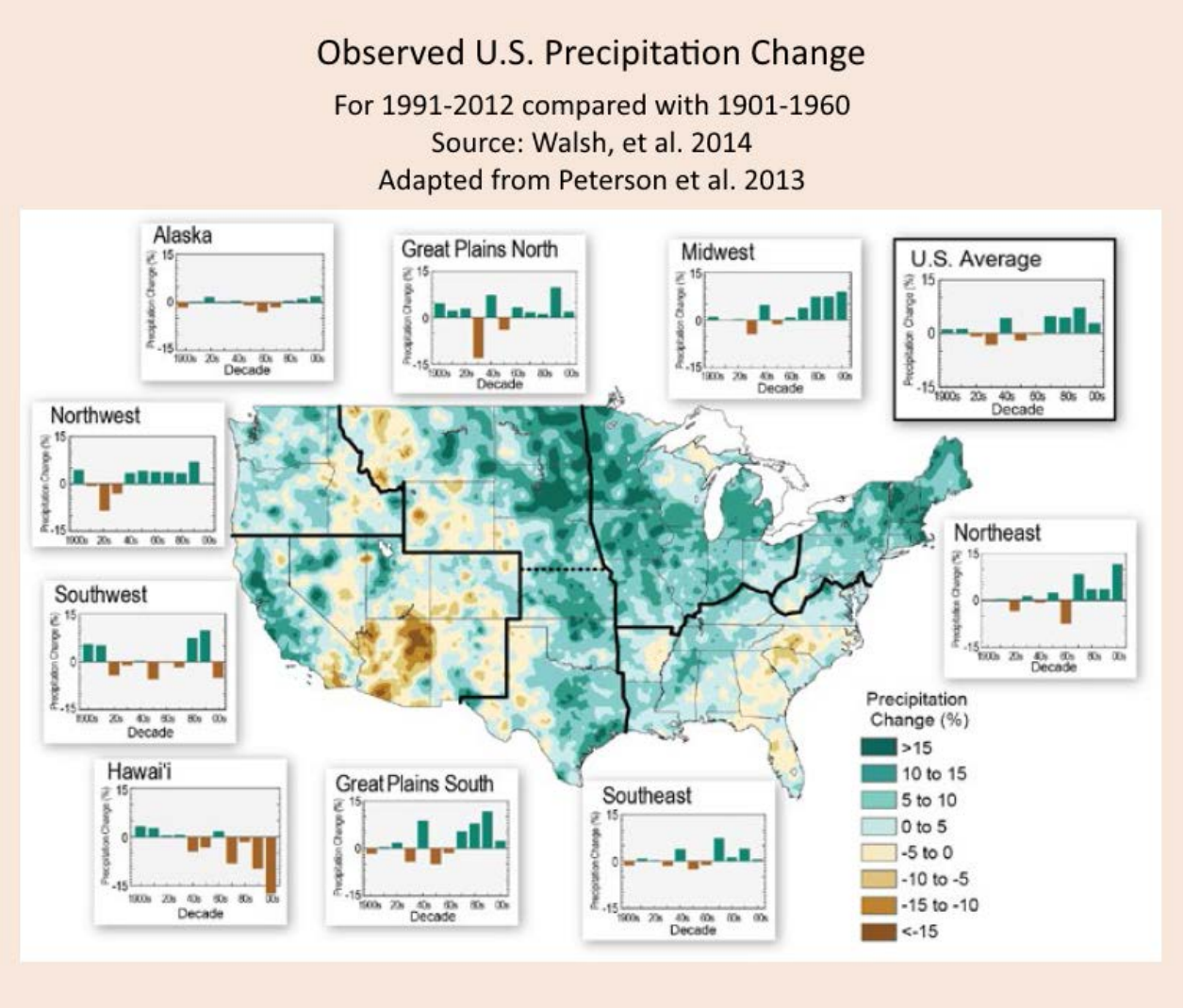


Figure 11: Observed average change in annual precipitation for 1991-2012 compared to the 1901-1960 average change.

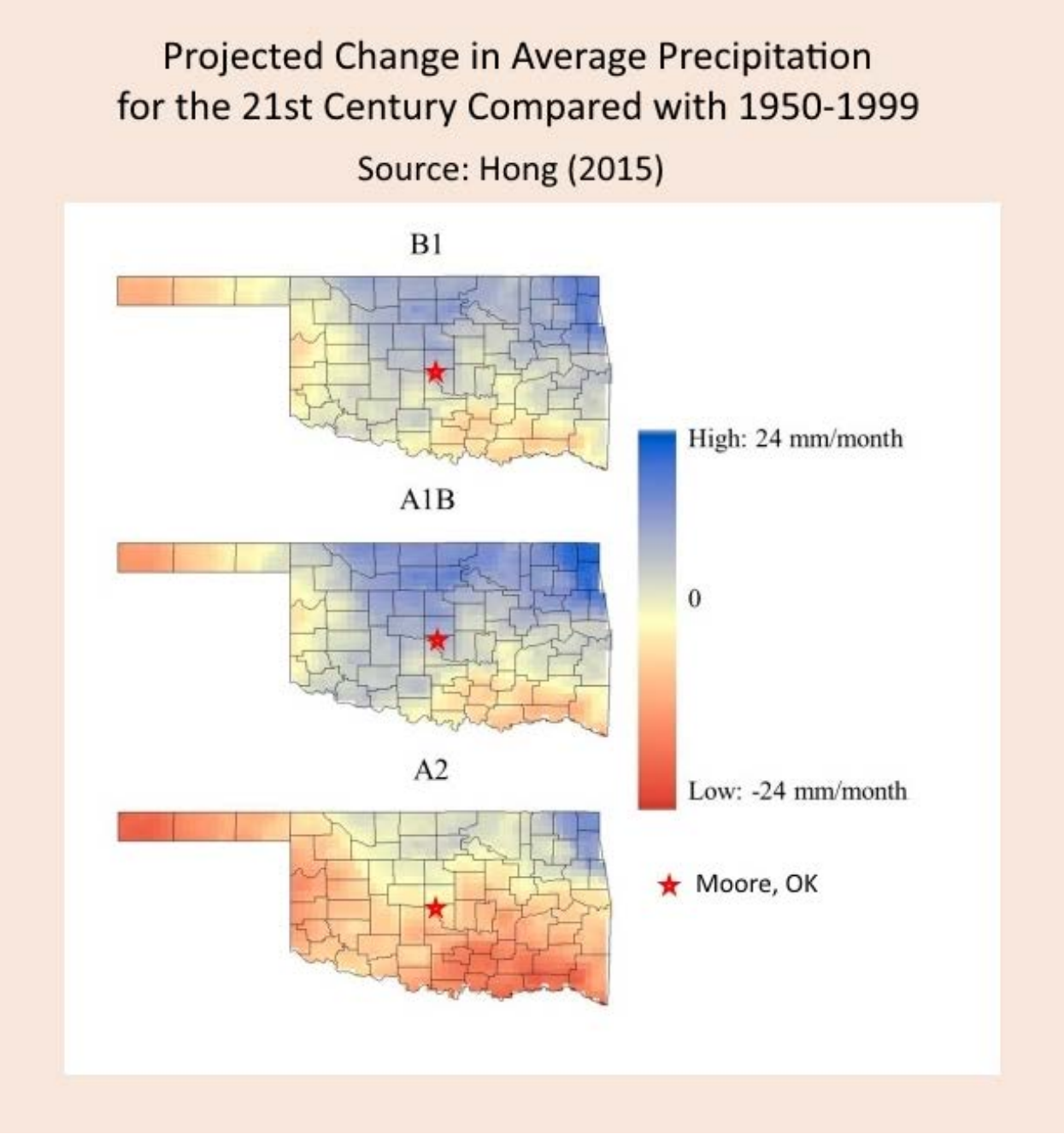


Figure 12: Spatial variation of precipitation change of Oklahoma for the period of 2000-2099 under B1, A1B, and A2 scenario.

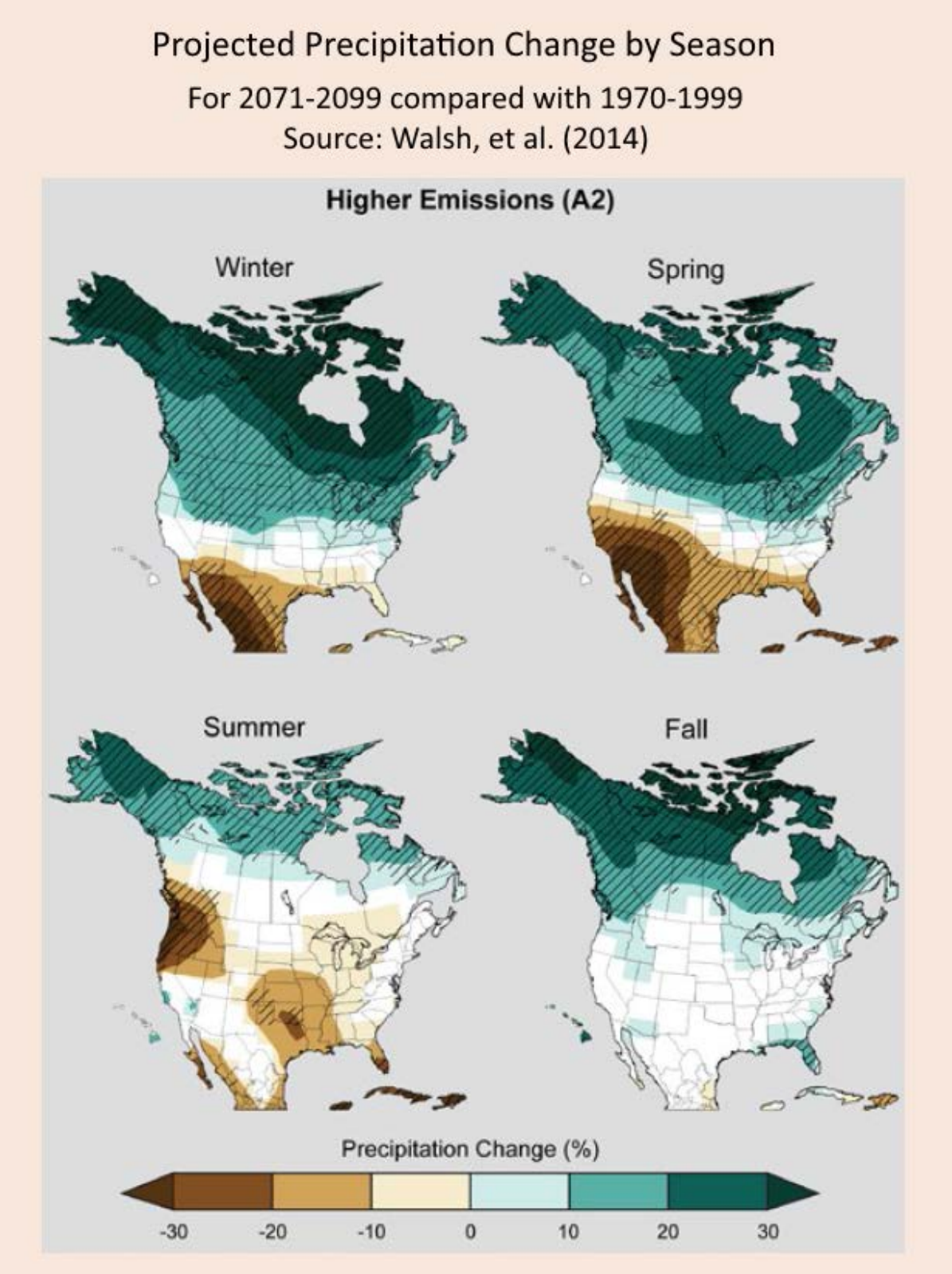


Figure 13: Projected change in seasonal precipitation for 2071-2099 compared to 1970–1999 for the higher emissions (A2) scenario.

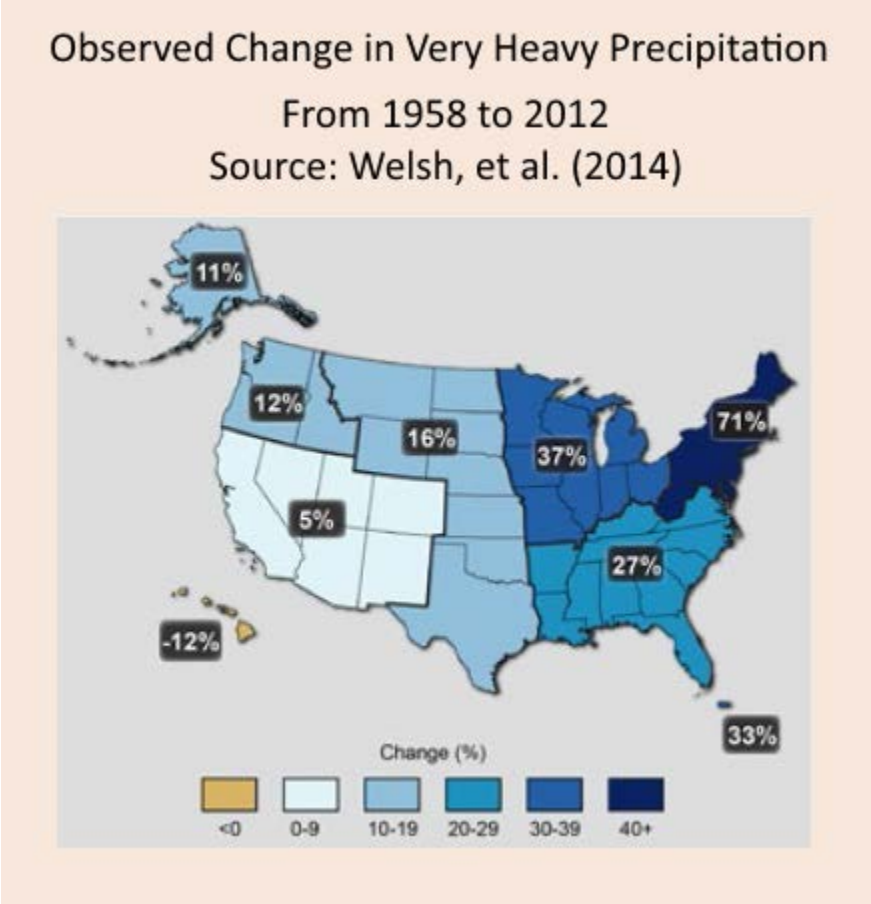


Figure 14: Observed change in very heavy precipitation events from 1958 to 2012.

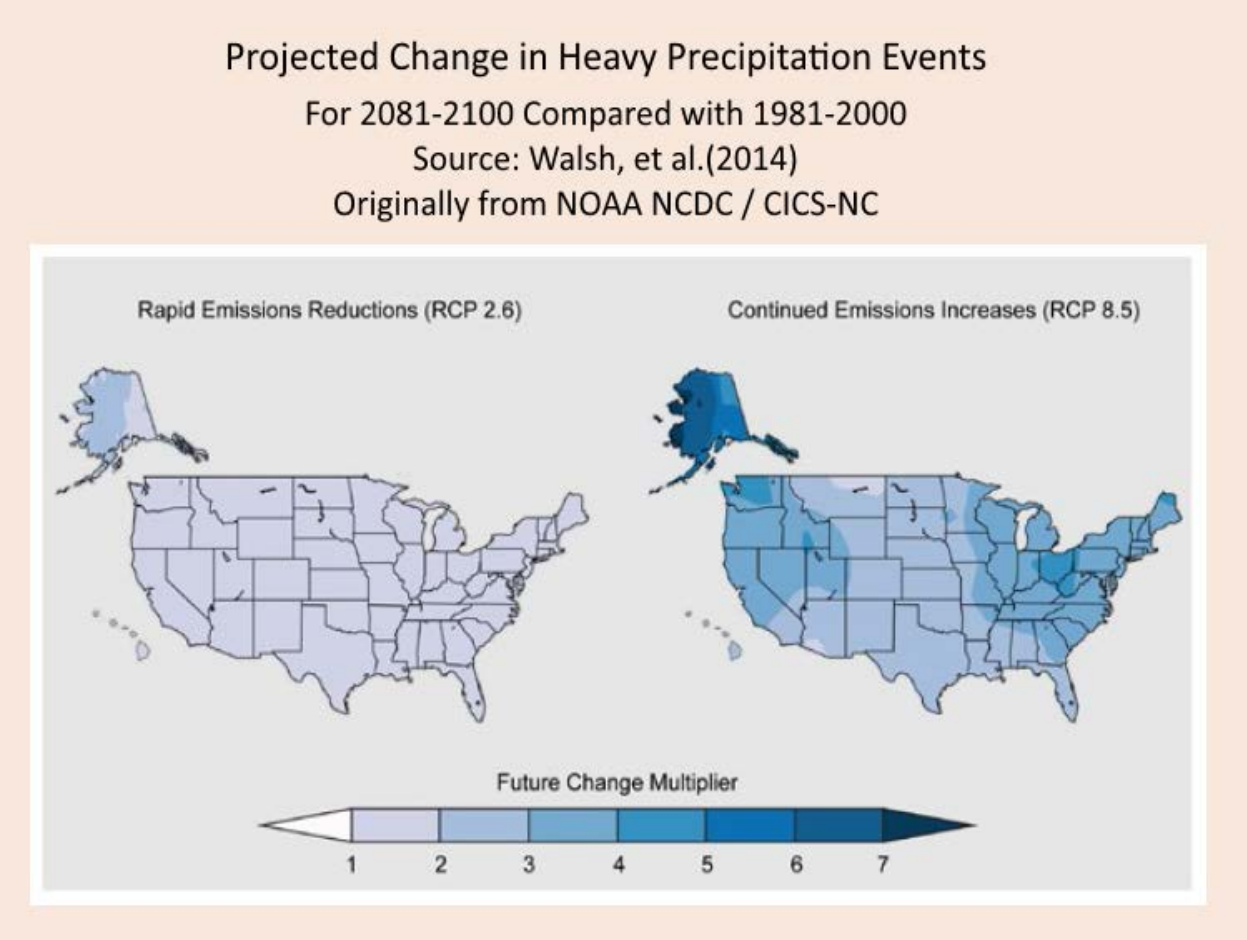


Figure 15: Projected change in heavy precipitation events for 2081-2100 compared to 1981-2000.

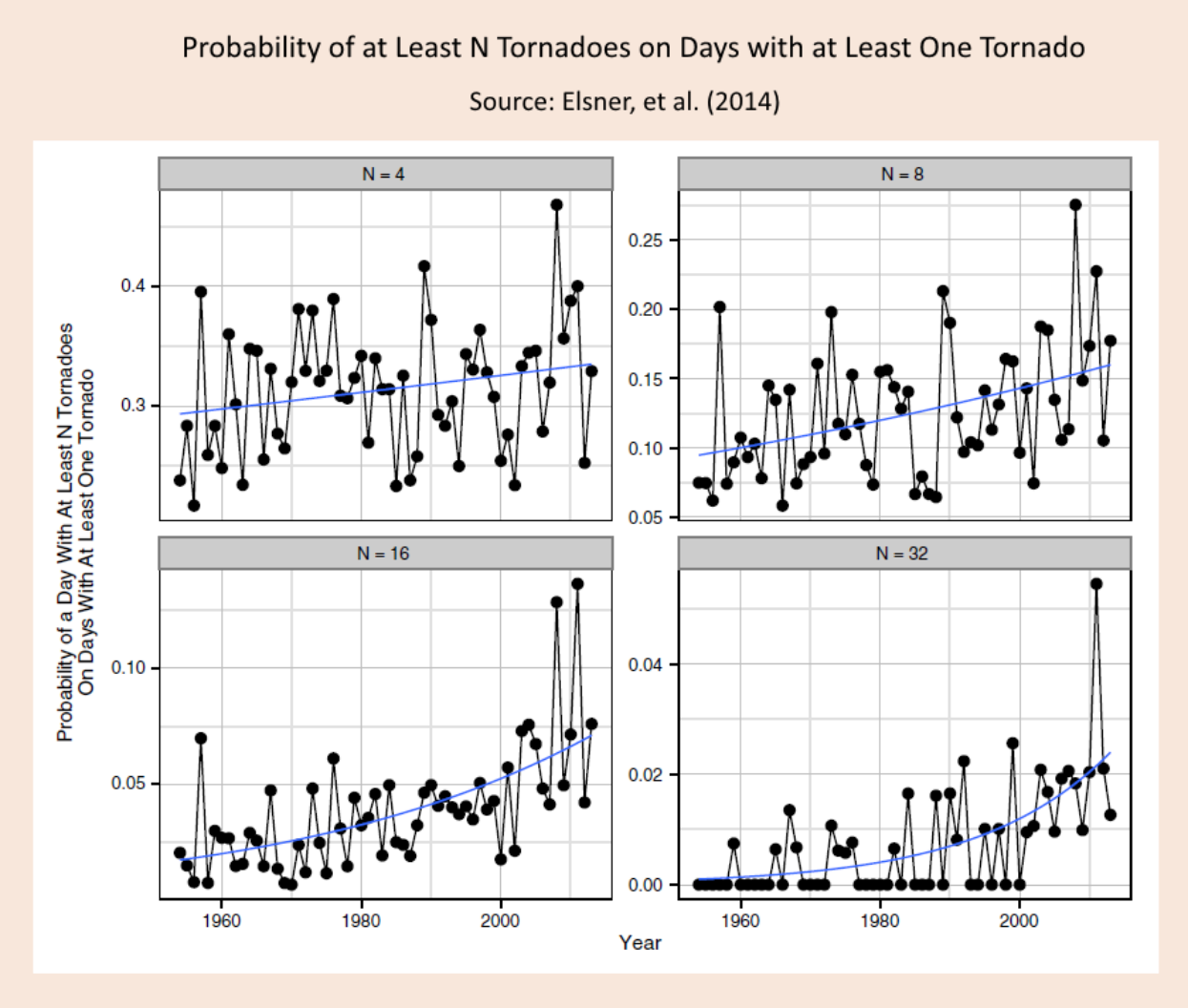


Figure 16: Probability of at least N tornadoes on days with at least one tornado.

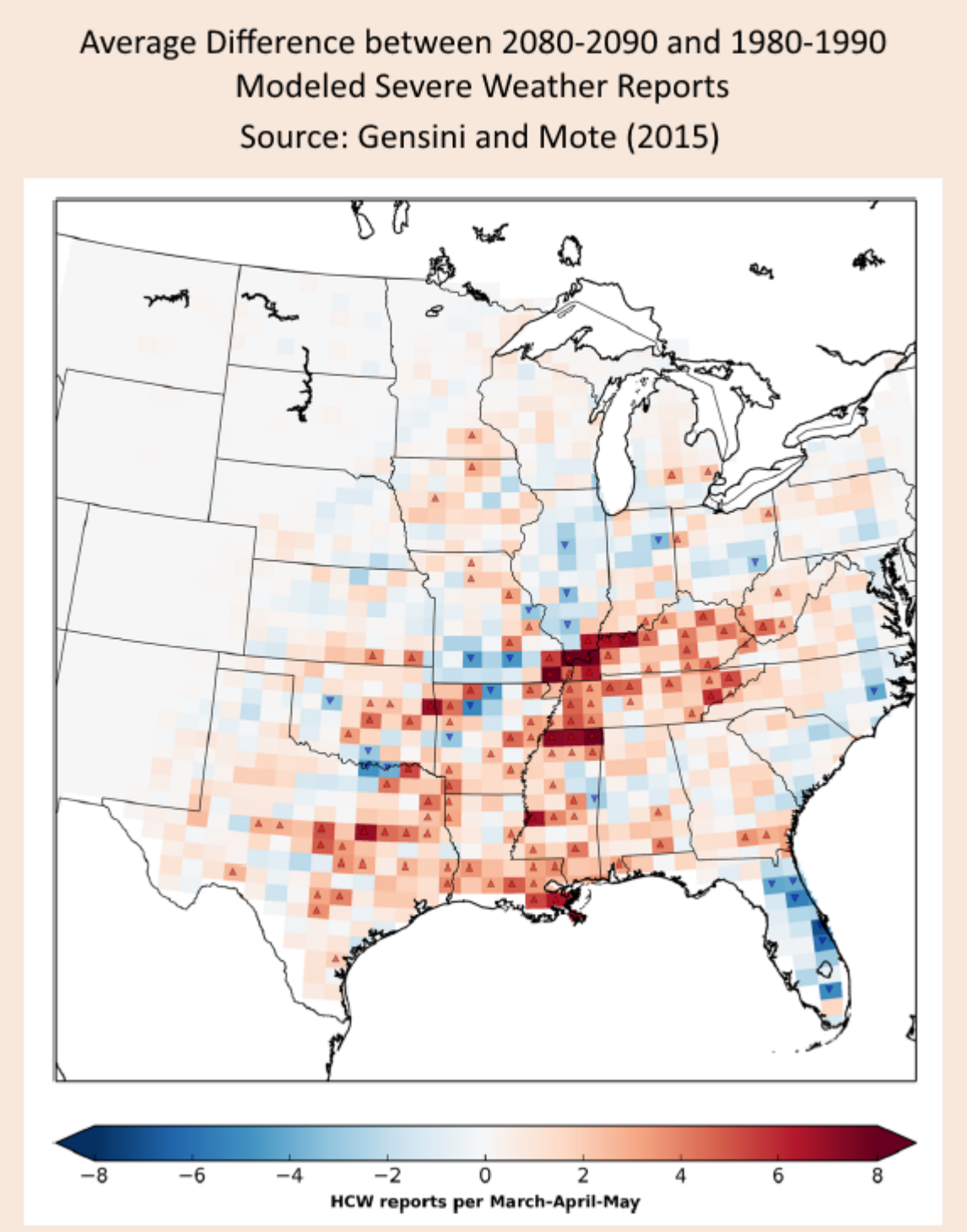


Figure 17: Average difference between 2080-2090 and 1980-1990 modeled severe weather reports.

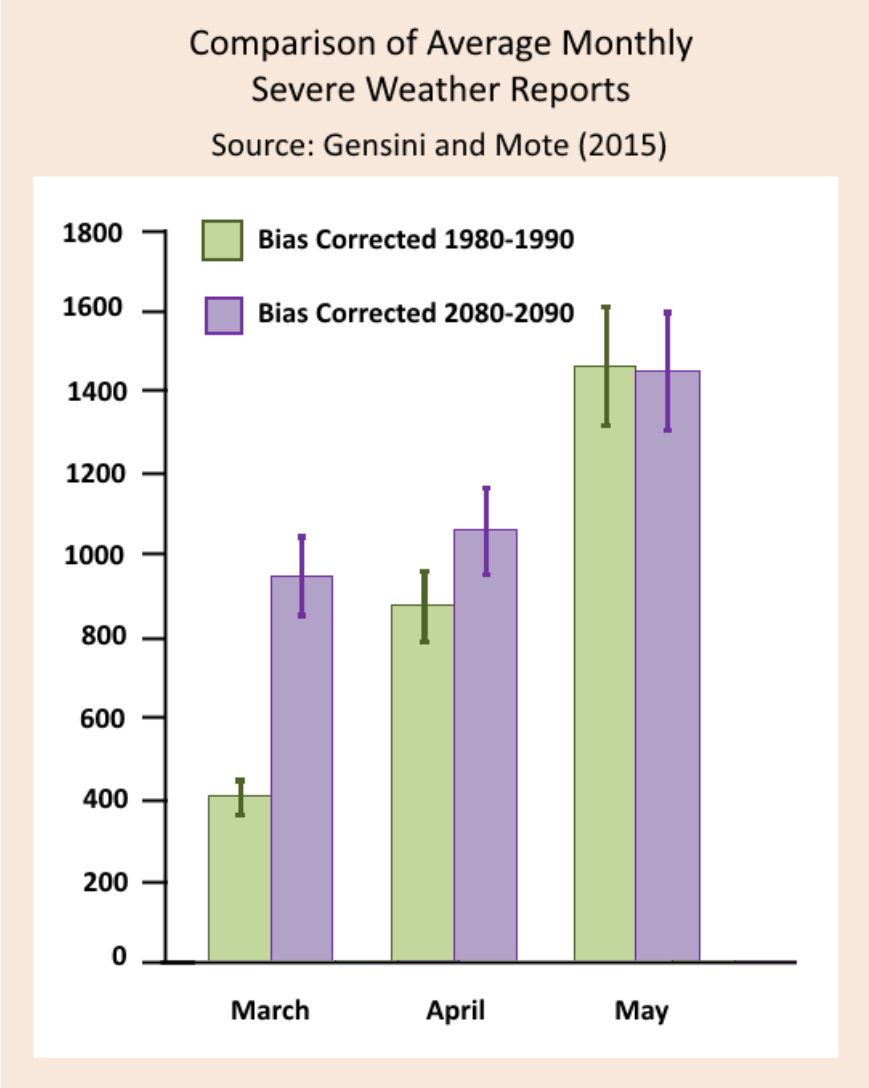


Figure 18: Comparison of average monthly severe weather reports.

Name of Attachment: Attachment E: Maps ,Drawings, Renderings (IRIP Documents)

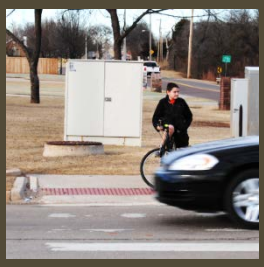
Name of Applicant: City of Moore, Ok

Name of File that Contains the Attachment: MooreAtt5

City of Moore
Infrastructure Recovery and Implementation Plan (IRIP) for May 20, 2013 Tornado Area







March 2015

Volume I of II

CARDINAL ENGINEERING
An ENVIROCLEAN Company

TDA Consulting

TAP ARCHITECTURE

CITY of MOORE • OKLAHOMA • INCORPORATED 1893

THE CITY OF MOORE

APPROVAL SHEET

INFRASTRUCTURE RECOVERY AND IMPLEMENTATION PLAN (IRIP) FOR MAY 20, 2013 TORNADO AREA

PREPARED BY

CARDINAL ENGINEERING, INC.
1015 North Broadway, Suite 300
Oklahoma City, Oklahoma 73102
Phone 405.842.1066 | Fax 405.843.4687

Jason R. Cotton, P.E.
Project Manager

Elizabeth Jones
Director of Community Development

Steve Eddy
City Manager

APPROVED by the Council of the City of Moore this _____ day of _____, 2013.

ATTEST:

THE CITY OF MOORE

City Clerk

Mayor

TABLE OF CONTENTS

Volume I

Volume II

1.0 Executive Summary

The following Infrastructure Recovery and Implementation Plan (IRIP) for the May 20, 2013 Tornado has been prepared and submitted by Cardinal Engineering (Cardinal, Engineer) as the final deliverable from Contract #1314-007. This IRIP serves to further refine infrastructure-related data presented in the City of Moore Disaster Recovery Program Action Plan (Action Plan) submitted to the United States Department of Housing and Urban Development on March 22, 2014. This Action Plan was submitted by the City of Moore as a condition of its receipt of $26.3-million in federal funding under the Community Development Block Grant – Disaster Recovery (CDBG-DR) Program (Allocation No. 1). Based on the limited information available to the City of Moore as of March 2014, total public infrastructure damages related to the May 20, 2013 Tornado were estimated at $110.3-million. Of this $110-million, the City of Moore estimated that no funding source was available for approximately $32.4-million of these damages. Only $3-million of the CDBG-DR funds are currently allocated to addressing these unmet needs. The primary objectives of this IRIP are to (1) further refine the originally provided infrastructure damage estimates, (2) identify public infrastructure improvements which will improve the future resiliency of the City of Moore as well as the quality of life for its citizens, (3) combine the identified public infrastructure improvements (or sub-projects) into logical, coordinated projects, and (4) develop a funding strategy and implementation schedule for these projects.

To aid in further refining the originally provided public infrastructure damage estimates, an infrastructure assessment methodology was developed and applied across the area impacted by the May 20, 2013 Tornado (Study Area). The foundation of this methodology subdivides public infrastructure into seven (7) distinct categories: Streets, Sidewalks, Sanitary Sewer, Environmental Degradation, Water Distribution, Bikeways/Trails, and Gateway/Streetscapes. The Study Area was partitioned into seventy-seven (77) distinct Assessment Sub-Areas and each Infrastructure Category was assessed within each Assessment Sub-Area. Each assessment included a field inspection, photographic documentation, and development of data considered critical to the condition, significance, performance, and long-term resiliency of the subject infrastructure. Weighting factors were assigned to each piece of developed data and a total Infrastructure Rating Index (IRI) was assigned to each Infrastructure Category within each Assessment Sub-Area. All field assessments were performed via wireless cellular devices with data transmitted to a central Geographic Information System (GIS) database hosted by Cardinal during the project. To help aid in subsequent analysis, data models were developed to calculate IRI scores with the final result and associated data being exported to an external database for assessment form preparation.

In conjunction with public infrastructure assessment activities, as well as the concurrently completed Walkability Audit in the areas surrounding Plaza Towers Elementary School and Highland East Junior High School, Cardinal has identified 158 potential sub-projects which should be considered by the City of Moore during future recovery efforts.

Development of this list of potential sub-projects was based on the previously described field assessment activities (and subsequent analysis thereof), as well as the Visual Preference Survey and Walkability Audits completed in conjunction with the IRIP Scope of Work. These 158 sub-projects span all seven (7) infrastructure categories and occur in various locations across the Study Area. Construction cost-estimates prepared by Cardinal based on publicly available bid tabulations have indicated approximately $162-million will be required to complete all identified public improvements. By way of this IRIP, Cardinal has recommended that all identified sub-projects be combined or grouped into 47 larger projects to develop logical, manageable scopes of work that can realistically be utilized by the City of Moore during future recovery activities. Construction cost-estimates presented in the IRIP for these 47-projects represent the aggregate of construction cost-estimates prepared at the sub-project level.

Of the $162-million in public infrastructure improvements identified in the IRIP, it is anticipated that approximately $20-million will be funded through the CDBG-DR Program, $0.2-million will be funded through an existing City of Moore Park Tax, and $0.6-million will be funded through the City of Moore's General Road Maintenance Fund. Use of these funds leaves approximately $142-million in public infrastructure projects remaining to be funded. Based on the Assessment Team's analysis, this balance represent the City of Moore's unmet need as it relates to public infrastructure projects.

Based on this funding approach, the developed Project Implementation Schedule has indicated that design and construction of the proposed projects could potentially begin in May 2015 with the construction of the final project ending in May 2023. Projects funded through CDBG-DR Funds are currently anticipated to be completed concurrent with this date, approximately 9-years and 9-months from CDBG-DR Allocation No. 1 which was provided to the City of Moore in August 2013. This proposed schedule does not adhere to the 5-year limit imposed on the use of CDBG-DR funds and as a result, modifications to the Project Implementation schedule, reconsideration of projects identified for CDBG-DR funding, or a formal extension request, may be required.

2.0 Introduction

The City of Moore is a medium-sized city in the Oklahoma City MSA with a population of approximately 55,081. Although the Moore Housing Market Area can be described in general terms as upper middle-class, research has shown that approximately 23% of all households in Moore are considered to be of moderate to very low income. As of 2008, Moore had an estimated 4,500 households who fall into the income bracket of $34,999 or less and about 2,000 households are on varying degrees of public assistance. In 2010, the City of Moore became a Community Development Block Grant Entitlement Community, with an average allocation of $280,000 per year.

On Monday, May 20, 2013 a massive, mile-wide F-5 tornado with winds up to 200 mph killed 24 people during 35 terrifying minutes of destruction across the City of Moore. In this short time frame, Moore saw two schools, a school administration building, a regional hospital, 90-businesses and over 2,400-housing units damaged or destroyed.

In January 2013 Congress passed, and the President signed into law, The Disaster Relief Appropriations Act, also known as Public Law 113-2 (the "Act"), which appropriated approximately $50 billion for recovery efforts related to Hurricane Sandy and other natural disasters specified in the Act as well as disasters occurring in the remaining months of Fiscal Year 2013. Of those funds, approximately $16 billion was set aside for the Community Development Block Grant - Disaster Recovery Program (the "CDBG-DR Program") to be administered by the United States Department of Housing and Urban Development ("HUD"). The Moore tornado and other tornadoes affecting Oklahoma during the period April 19th through May 31st, 2013 were included by HUD in the allocation created by the Act. On August 30th, 2013 HUD announced an initial allocation of $26.3 million in CDBG-DR funds for the City of Moore (HUD Allocation No. 1).

On December 16, 2013, HUD released its initial CDBG-DR Program allocations and program requirements in the Federal Register at Vol. 78, No. 241, Page 76154 in a notice entitled: "Allocations, Waivers, and Alternative Requirements for Grantees Receiving Community Development Block Grant Disaster Recovery Funds in Response to Disasters Occurring in 2013". HUD's allocation of CDBG-DR Program funds was based on its initial estimate of critical unmet needs for repairing and rebuilding housing, public facilities, and infrastructure and economic revitalization in the most impacted areas, primarily using data provided by FEMA.

In February 2014, the City of Moore submitted an Action Plan which focused on Moore's proposed use of the Funding specifically the immediate unmet needs of individuals and families for housing that was affected by the Moore tornado as well as the assistance required by local government in repairing, rebuilding and making more resilient the infrastructure and public facilities within the city limits of Moore. Allocations proposed by the Action Plan were as follows:

Table 2A

Activity	Allocation
Housing (Owner-Occupied and Multi-family Housing)	$16,000,000
Infrastructure	$3,000,000

Activity	Allocation
Public Facilities	$0
Economic & Commercial Revitalization	$0
Resiliency	$2,040,000
Administration	$1,315,000
Planning	$3,945,000
Total	$26,300,000

As also identified in the Action Plan, estimates of total infrastructure damage were based on limited information and were not intended to be comprehensive as of February 2014. These initial estimates indicated approximately $110.3-million in total public infrastructure damages. Of this $110.3-million, the City of Moore estimated that no funding source was available for approximately $32.4-million of these damages. Only $3-million of HUD Allocation No. 1 are currently earmarked to address these unmet needs.

In April 2014, the City of Moore released RFP #1314-007 to retain a consultant team to assist the City of Moore in developing a coordinated evaluation of public infrastructure needs within the defined 2013 Tornado Area and to develop coordinated improvement packages as separate projects to be prioritized, and implemented cost-effectively. To this end, the primary objectives of this IRIP are to (1) further refine previous infrastructure damage estimates, (2) identify public infrastructure projects which will improve the future resiliency of the City of Moore as well as the quality of life for its citizens, and (3) develop a funding strategy and implementation schedule for these identified projects.

3.0 Public Infrastructure Assessment

3.1. Assessment Methodology

3.1.1. Objectives

Before assessment of the public infrastructure within the Study Area could be completed, it was first necessary to develop a consistent, robust methodology that could be used across the entire Study Area, as

well as all types of public infrastructure included within the scope of the IRIP. Primary goals considered during development of this methodology were as follows:

1. Realistic: While there are a multitude of approaches which might be utilized in assessing public infrastructure, it was paramount that the developed methodology provide a realistic picture of the current condition of public infrastructure within the Study Area. This primary goal was considered critical in ensuring that the results and recommendations developed by the IRIP are both meaningful and useful to the City of Moore, as well as other agencies which may utilize the resulting data.

2. Risk-Based: Per the requirements of Federal Reserve Notice Volume 79, No. 106[1] (Docket 5696-N-09, Part V.3(d), it was critical that the selected assessment methodology consider not only the current condition of public infrastructure within the Study Area, but also what it's future condition and performance might be based on future risks. In addition to the risks represented by future storm events, the methodology should address other risks including the need for future maintenance and investment as well the ability of the infrastructure to meet future needs.

3. Consistent: The methodology should be fundamentally consistent across all types of public infrastructure. For example, the basic approach used in assessing public water lines should not be fundamentally different than the method used to assess public sidewalks. This consistency was envisioned to be critical in developing a comprehensive data set that could be reviewed and evaluated in the same manner following assessment activities.

4. Flexibile: While developing an approach that was fundamentally consistent was critical, it was also important that the structure of the methodology allowed for slight adjustments as necessary to develop a complete and realistic picture of the subject public infrastructure. All types of public infrastructure are not the same. The methodology should respond to this without deviating from the overlying framework discussed above.

5. Scalable: Given the relatively large inventory of public infrastructure within the Study Area, it was critical that the methodology be developed in a manner which would enable the assessment team to process relatively large amounts of assessment data, as well as generate assessment results

[1] Docket 5696-N-09, Department of Housing and Urban Development, Page 31967, Part V.3(d)

and other deliverables, while minimizing the need to manipulate or handle discrete assessment data points.

6. Quantitative: As also identified in Federal Reserve Notice Volume 79, No. 106[2] the methodology should be quantitative in nature. This characteristic should include not only the factors considered in assessing the public infrastructure, but also the subsequent results generated by the assessment approach.

7. Integrated: Given the amount and type of data anticipated to be managed, the methodology should be managed on a robust, integrated platform. Photographic documentation, field assessment data, spatial data, cost data, as well as several other data types, are all anticipated to ultimately be interrelated. As a result, the methodology should be able to accommodate each type of data anticipated, while minimizing the need to import, export, or translate data. A Geographic Information System (GIS) was envisioned to be the most appropriate platform in addressing this need. Digital data collection of data through wireless devices and real-time data access through a robust web interface were considered appropriate components of this platform.

3.1.2. System Architecture

Prior to determining any specific assessment methodology, development of a general architecture for the overall assessment platform was necessary. In meeting the preceding objectives, a GIS Database was created in the Norman Office of Cardinal Engineering. As developed, this GIS Database was created to serve as the central repository for all assessment data collected in conjunction with the IRIP. The foundation of this GIS Database was developed based on primarily planimetric data, as well as pre and post-storm aerial photography provided by the City of Moore. Additional layers of publicly available data were also incorporated from the U.S. Census Bureau and the Association of Central Oklahoma Governments (ACOG).

As part of the GIS Database architecture, functionality was also included for (1) digital data collection via cellular devices and other wireless devices, and (2) real-time data access via a robust web interface. These two facets of the system were included to allow for efficient data collection, as well as quick access to current data by both the Assessment Team and the City of Moore. In an effort to provide additional efficiencies, analysis of collected data was completed using ArcGIS Data Models to allow for the ability to quickly update queries and geo-spatial analysis across the entire data set without the need to manually extract and re-analyze data from specific data tables.

[2] Docket 5696-N-09, Department of Housing and Urban Development, Page 31968, Part V.3(d)

3.1.3. Geographic Structure

Once the overall system architecture was determined, the 5.32-mi^2 Study Area (Appendix A2, Exhibit A2.1) was sub-divided into 25 distinct Assessment Zones. Arterial roadways and other significant boundaries (e.g., Interstate 35, Burlington-Northern Santa Fe Railway) were used as the primary delineator in developing Assessment Zones across the Study Area. Each Assessment Zone was named according to the predominant district, neighborhood, or feature contained within the zone. The final Assessment Zone configuration, as well as the associated Assessment Zone Names are depicted at Appendix A2, Exhibit A2.2.

As each Assessment Zone was comprised of various land-use types, the type and degree of public infrastructure present, as well as needed, within each Assessment Zone varies considerably across each zone. In response to this, Cardinal further divided each Assessment Zone into 77 distinct Assessment Sub-Areas. Delineation of Assessment sub-areas within each Assessment Zone was performed according to predominant land-use types as well as both official (i.e., plat) and unofficial neighborhood boundaries within each zone. The final Assessment Sub-Area configuration, as well as the associated Assessment Sub-Area identifiers are depicted at Appendix A2, Exhibit A2.3.

3.1.4. Infrastructure Categories

The term *public infrastructure* is comprehensive in nature and represents the aggregate of several discrete systems within a geographic area which generally serve the public. While the demand on and performance of these systems are frequently interrelated, the systems (or layers) can be used as a basis to conceptually reduce *public infrastructure* to its most basic components. As these infrastructure layers (1) simplify the assessment process, and (2) ensure assessment activities are comprehensive in nature, public infrastructure within the Study Area has been divided into seven (7) separate categories: Streets, Sidewalks, Sanitary Sewer, Environmental Degradation, Water Distribution, Bikeways/Trails, and Gateway/Streetscape. A summary table providing further descriptions of what is specifically contained within each infrastructure category has been provided at Appendix B1, Table B1.1.

These infrastructure categories are a foundational component of the assessment methodology and closely follow infrastructure systems identified in City of Moore RFP #1314-007. Use of these infrastructure categories, together with information presented in Section 3.1.3 (Geographic Structure), result in a total of 539 distinct public infrastructure assessment data points (77 Assessment Sub-Areas x 7 Infrastructure Categories). As some Infrastructure Categories do not currently exist within some Assessment Sub-Areas, this gross number was anticipated to be reduced significantly during completion of assessment activities.

3.2. Assessment Structure

In meeting the previously described objectives (Section 3.1.1), a weighted point system was utilized to complete the assessment of each infrastructure category within each Assessment Sub-Area. In concept, this system scores infrastructure based on data collected and developed in response to a list of pre-defined Score Factors. The relative significance of each Score Factor within each Infrastructure Category is established via weighting coefficients which are applied to each respective Score Factor prior to the resultant scores being summed to create an Infrastructure Rating Index (IRI).

Score factors generally fall into one of two categories: quantitative and qualitative. Quantitative Score Factors pertain to data regarding the infrastructure category which are spatially based and can easily be determined via GIS platforms and other similar methods. Collection of data regarding Quantitative Score Factors can typically be automated and does not require manual review of the infrastructure within the assessment area in order to develop the associated score (e.g., length of water line within the Assessment Sub-Area). Qualitative Score Factors are generally more detailed in nature and require a more in-depth study or assessment of the subject infrastructure before a score can be assigned. Responses to Qualitative Score Factors frequently require professional judgment or interpretation of available data before a response can be developed (e.g., is the subject infrastructure deterring reinvestment in the area). As a result, Qualitative Score Factors are not typically good candidates for automation via GIS or other similar data platforms.

As each infrastructure category is fundamentally different, it was necessary for Score Factors to vary between infrastructure categories in order to ensure the most appropriate data was collected and developed for each Infrastructure Category during assessment activities. For example, within the Sidewalks Infrastructure Category, the location of a public park might be considered an important factor in determining the need or demand for new infrastructure. The location of this same park might also be considered relatively insignificant relative to the Water Distribution Infrastructure Category for this same area. Following development of the pertinent Score Factors for each Infrastructure Category, it was observed that Score Factors generally fell within one of nine (9) Score Factor Categories: Background, Proximity, Damage, LMI, Health/Safety, Long Term Recovery/Economic Revitalization, Sustainability, Condition, and Opportunity. A summary table providing further descriptions of each Score Factor Category has been provided at Appendix B1, Table B1.2. Tables providing comprehensive lists of all Score Factors used in the assessment of each Infrastructure Category, as well as the associated Score Factor weighting coefficients, have been provided at Appendix B2, Tables B2.1 through B2.7. Given a specific Infrastructure Category and a specific Assessment Sub-Area, the associated IRI is determined based on

responses to all included Score Factors, application of the associated weighting coefficients, and summation of all resultant values.

Based on the configuration of the selected Score Factors and the developed methodology, the following relationships exist between the IRI and the associated public infrastructure:

Table 3A

Score Factor Category	Relationship to IRI	Example
Background	proportional	Higher IRI for Assessment Sub-Areas with larger or older infrastructure inventories
Damage	proportional	Higher IRI for Assessment Sub-Areas with larger fraction of total infrastructure inventory within footprint of FEMA Damage Path
Proximity	proportional	Higher IRI for Assessment Sub-Areas with larger fraction of inventory within close proximity to facilities or destinations the subject infrastructure category is critical to
LMI	proportional	Higher IRI for Assessment Sub-Areas which have infrastructure benefitting, or within, LMI
Health and Safety	proportional	Higher IRI for Assessment Sub-Areas which have infrastructure that can be hardened against future disasters
Long Term Recovery	proportional	Higher IRI for Assessment Sub-Areas which have infrastructure that can be leveraged to encourage future development or recovery
Sustainability	proportional	Higher IRI for Assessment Sub-Areas which have infrastructure that can be reconstructed or modified to introduce sustainable design concepts
Opportunity	proportional	Higher IRI for Assessment Sub-Areas which contain specific, needed infrastructure improvements identified by City of Moore or Assessment Team
Condition	proportional	Higher IRI for Assessment Sub-Areas which have infrastructure that has field-observed damage and/or need for repair or reconstruction

3.3. Assessment Scope

While the initial scope of the IRIP included the entire Study Area (see Appendix A2, Exhibit A2.1), it was quickly determined that calculating IRIs for all seven Infrastructure Categories across all 77 Assessment sub-areas would not be possible given the budget and schedule limitations associated with Contract #1314-007. In addition, proof-in-concept work across the Plaza Towers Assessment Zone (presented to the City of Moore Staff via Workshop 02 on October 6, 2014) quickly identified that effects from the May 20, 2013 Tornado appeared to decline almost exponentially with distance from the arterial roads surrounding the FEMA Damage Path increased. Based on these items, the scope of assessment activities was reduced in October 2014 to capture only those Assessment Sub-Areas where significant damage and/or the need for the reconstruction of public infrastructure was anticipated. Exhibits indicating the reduced scope of assessment activities within Infrastructure Category have been provided at Appendix A2, Exhibits A2.17 through A2.23.

3.4. Assessment Results

Based on the presented methodology, IRI values for each Assessment Sub-Area included in the Assessment Scope of each Infrastructure Category are presented at Appendix A2, Exhibits A2.24 through A2.30. An exhibit indicating the Aggregate IRI for each Assessment Sub-Area has also been provided at Appendix A2, Exhibit A2.31a and A2.31b. This Aggregate IRI is equivalent to the summation of all IRIs for each Assessment Sub-Area. A tabular summary of all presented data has been provided at Appendix B1, Table B1.4. This tabular summary provides the IRI Rank of each Assessment Sub-Area within each Infrastructure Category, as well as an IRI Rank based on the Aggregate IRI.

It should be noted that the presented rankings are not intended to be indicative of *priority*, which is anticipated to ultimately be based on strategies and guidelines established by the City of Moore subsequent to this report. Rather, the presented IRI rankings are intended to be interpreted as where improvements to each Infrastructure Category may be most and least warranted across the Study Area. As data considered in this analysis is not exhaustive, additional consideration should also be given to data and background information not captured by the Assessment Team in conjunction with the IRIP Scope. The collective institutional knowledge of City of Moore Staff, as well as other guiding principles, should be utilized as a key tool in establishing priorities within the Study Area.

Also of note is that IRI Scores within one Infrastructure Category cannot be compared to IRI Scores within another Infrastructure Category. Score Factors utilized within each Infrastructure Category vary, and as a result, so to do the resultant IRIs. Put another way, the Ranked IRI list should not be used to draw conclusions about

the relative need or importance of one type of public infrastructure over another. As an example, Assessment Sub-Area PT3 received the following IRIs (Appendix B1, Table B1.4):

Table 3B

IRI Category	IRI Value
Streets	109.91
Sidewalks	85.01
Sanitary Sewer	82.68
Environmental Degradation	103.36
Water Distribution	76.97
Bikeways/Trails	71.44
Gateway/Streetscape	57.55
Aggregate	586.92

Based on these values, it cannot be concluded that improvements to Streets within Assessment Sub-Area PT3 are more or less warranted than analogous improvements to the existing public sidewalk infrastructure within Assessment Sub-Area PT3. This limitation in the methodology also proves true across Assessment Sub-Areas. For example, the Street IRI of Assessment Sub-Area PT3 could not be utilized to determine whether roadway improvements within Assessment Sub-Area PT3 are more or less warranted than Water Distribution improvements in Assessment Sub-Area EJ2. Rather, the provided IRIs should only be utilized to inform the City of Moore where improvements within a single Infrastructure Category may be more or less warranted across the Study Area.

Based on these qualifying statements, additional observations and conclusions for each Infrastructure Category are provided below:

3.4.1. Streets

Within the Streets Infrastructure Category, the Plaza Towers Assessment Zone appears to have received the most significant damage as a result of the May 20, 2013 Tornado. Assessment Sub-Areas PT3 (Street IRI 109.91), PT5 (Street IRI 109.86), and PT2 (Street IRI 108.53) received the three highest Street IRIs

across all 30 Assessment Sub-Areas which were included in the scope of the assessment. Based on field observation, as well as subsequent analysis, it appears that this district within the Study Area likely received the most significant damage to street infrastructure as a result of the age of the infrastructure at the time of the May 20, 2013 Tornado. As indicated at Appendix A2, Exhibit A2.6, plats across the Plaza Towers Assessment Zone appear to indicate that street infrastructure across the Assessment Zone varies from 36 to 52-years in age. Coupled with the significant amount of direct damage, subsequent activities associated with debris removal, and a lack of sufficient draiange, the already aged street infrastructure within the Plaza Towers Assessment Zone is in need of significant repair work and/or reconstruction.

Assessment Sub-Area EJ5 (Street IRI 105.17) also ranked high relative to all Assessment Sub-Areas considered. As with the Plaza Towers Assessment Zone, the approximate age of streets within EJ5 (36-years) appear to have had a significant impact on the subject infrastructure to stand up to the damage of the May 20, 2013 Tornado and the subsequent debris removal activities. In contrast to the Plaza Towers Assessment Zone, the majority of the J.D. Estates Assessment Zone appears to have adequate drainage based on review by the Assessment Team. However, unlike the Plaza Towers Assessment Zone, it appears that significant portions of the streets within the J.D. Estates Assessment Zone have not aged as well as might be expected. Sub-standard concrete appears to be the most likely cause for the inability of streets within EJ5 to withstand impacts created by the May 20, 2013 Tornado.

Assessment Sub-Areas EJ2 (Street IRI 100.76), KM3 (Street IRI 98.64), TP1 (Street IRI 88.95), BW2 (Street IRI 84.60), SM2 (Street IRI 79.72), and KM2 (Street IRI 79.01) round out the top ten Assessment Sub-Areas within the Streets Infrastructure Category. Assessment Sub-Area SF1 (Street IRI 32.04), LR1 (Street IRI 30.31), TD3 (Street IRI 28.75), MH1 (Street IRI 25.07), and EJ1 (Street IRI 18.51) represent the 5 lowest Street IRI Scores across all Assessment Sub-Areas.

3.4.2. Sidewalks

Within the Sidewalks Infrastructure Category, the Baer's Westmoore, Plaza Towers, and King's Manor Assessment Zones all appear to be areas where improvements to existing sidewalk infrastructure may be most warranted. Assessment Sub-Area BW2 (Sidewalk IRI 121.43) received the highest score, with PT2 (Sidewalk IRI 91.43) and KM3 (Sidewalk IRI 88.12) receiving Sidewalk IRI Ranks 2 and 3, respectively. In reviewing and interpreting assessment data, it appears that the BW2 ranking is likely a result of the significant inventory of sub-standard sidewalks across the subject Assessment Sub-Area. Joint deflection, lack of curb ramps in most intersections, and excessive cross slopes all appear to have increased the Condition Score above and beyond other Assessment Sub-Areas which do not currently contain sidewalks

at all. This condition should be considered by the City of Moore in establishing priorities for sidewalk improvements across the Study Area.

The Plaza Towers Assessment Zone appears to be far and away the area within the City of Moore where sidewalk improvements may be most warranted, relative to other Assessment Zones considered as a part of sidewalk assessment activities. Assessment Sub-Areas PT2 (Sidewalk IRI 91.43), PT4 (Sidewalk IRI 87.17), and PT3 (Sidewalk IRI 85.01) represent Sidewalk IRI Ranks of 2, 4, and 6, respectively. A relatively large inventory of sidewalks within the footprint of the published FEMA damage path, coupled with the close proximity of Plaza Towers Elementary School, as well as the continued redevelopment of residential properties within the area all play a part in the subject Assessment Sub-Areas appearing near the top of the ranked Sidewalk IRI list.

Also of note within the Sidewalk Infrastructure Category are scores received within the J.D. Estates Assessment Zone. Assessment Sub-Area EJ2 (Sidewalk IRI 85.90) and EJ5 (Sidewalk IRI 76.61) received and IRI Rank of 5 and 7, respectively. As these Assessment Sub-Areas (1) contain a relatively large inventory of sidewalk infrastructure, and (2) are in close proximity to Highland East Junior High, Apple Creek Elementary, as well as Veteran's Park, the City of Moore should likely consider the sidewalks within the J.D. Estates Assessment Zone excellent candidates for possible improvements and/or reconstruction.

Assessment Sub-Areas MH2 (Sidewalk IRI 69.20), KM2 (Sidewalk IRI 69.05), and PT5 (Sidewalk IRI 63.93) round out the top ten Assessment Sub-Areas within the Sidewalks Infrastructure Category. Assessment Sub-Area LR3 (Sidewalk IRI 9.60), PT1 (Sidewalk IRI 5.10), PT6 (Sidewalk IRI 4.85), RC2 (Sidewalk IRI 4.60), and TD2 (Sidewalk IRI 4.60) represent the 5 lowest Sidewalk IRI Scores across all Assessment Sub-Areas. Based on the review of the Assessment Team, it does not appear that improvements to public sidewalk infrastructure within these Assessment Sub-Areas may be needed or warranted.

3.4.3. Sanitary Sewer

Within the Sanitary Sewer Infrastructure Category, the Plaza Towers Assessment Zone represents the area within the City of Moore where improvements to existing public sanitary sewer infrastructure may be most necessary. Assessment Sub-Areas PT2 (Sanitary Sewer IRI 95.93), PT4 (Sanitary Sewer IRI 92.37), and PT3 (Sanitary Sewer IRI 82.68) represent Sanitary Sewer IRI Rankings 1, 2, and 4, respectively. In reviewing developed assessment data, it appears that the high scores received within this Infrastructure Category across the Plaza Towers Assessment Zone are most closely related to the following Score Factors:

1. Infrastructure Age: Plats provided to the Assessment Team by the City of Moore have indicated that the majority of sanitary sewer infrastructure across the Plaza Towers Assessment Zone is likely between 36 and 52-years in age.
2. Anticipated Future Connections: While significant reconstruction of homes within the Plaza Towers Assessment Zone has occurred since May 20, 2013, a significant amount of future construction is anticipated. This future construction will likely necessitate additional service connections to already compromised sanitary sewer infrastructure. These service connections will likely result in additional impacts and damage to the existing sanitary sewer infrastructure which is already nearing the end of its design life.

Assessment Sub-Area KM3 (Sanitary Sewer IRI 84.24), as well as Assessment Sub-Areas EJ5 (Sanitary Sewer IRI 81.76) and EJ2 (Sanitary Sewer IRI 78.07) also received high IRI Scores relative to all 36 Assessment Sub-Areas considered within the Sanitary Sewer Infrastructure Category. These three Assessment Sub-Areas received Sanitary Sewer IRI Ranks 3, 5, and 6, respectively. In the case of KM3, it appears that this ranking is closely related to additional points assigned to KM3 as a result of its location within a Low to Moderate Income (LMI) Area. For the two noted Assessment Sub-Areas within the J.D. Estates Assessment Zone, significant points appear to have been assigned within the Condition Score Factor Category. Maintenance Events between 2004 and 2014, as well as future service connections which are anticipated as a result of continued recovery in these areas, are both significant components of the Condition Score each of the subject Assessment Sub-Areas received.

Assessment Sub-Areas SM2 (Sanitary Sewer IRI 73.28), PT5 (Sanitary Sewer IRI 65.28), KM2 (Sanitary Sewer IRI 65.05), and MH2 (Sanitary Sewer IRI 61.96) round out the top ten Assessment Sub-Areas within the Sanitary Sewers Infrastructure Category. Assessment Sub-Area PT6 (Sanitary IRI 25.00), PT1 (Sanitary IRI 24.35), HW1 (Sanitary IRI 23.96), BA2 (Sanitary Sewer IRI 23.03), and N4B (Sanitary Sewer IRI 19.08) represent the 5 lowest Sanitary Sewer IRI Scores across all Assessment Sub-Areas considered. Based on the review of the Assessment Team, it does not appear that improvements to public sanitary sewer infrastructure within these Assessment Sub-Areas may be needed or warranted.

3.4.4. Environmental Degradation

Within the Environmental Degradation Infrastructure Category the Plaza Towers and King's Manor Assessment Zones took four of the top five positions in the ranked Environmental Degradation IRI list. Assessment Sub-Areas PT2 (Environmental Degradation IRI 118.58), PT3 (Environmental Degradation IRI 103.36), and PT5 (Environmental Degradation IRI 101.40) received rankings 1, 2, and 3, respectively, while

Assessment Sub-Area KM3 (Environmental Degradation IRI 100.16) and Assessment Sub-Area SM2 (Environmental Degradation IRI 93.73) finished at Environmental Degradation IRI Ranking 4 and 5. In reviewing data developed in conjunction with Environmental Degradation Infrastructure assessment, it appears that the primary Score Factor Categories attributable to the rankings of the subject Assessment Sub-Areas are as follows:

1. Background: As in other Infrastructure Categories, the Plaza Towers and Kings Manor Assessment Zones contain a relatively large inventory of Environmental Degradation Infrastructure. While some enclosed storm sewer exists in both the Plaza Towers and Kings Manor Assessment Zones, open-channel dominates much of the inventory in each area. Given the location and extents of the subject Assessment Zones relative to the footprint of the published FEMA Damage Path, it follows that Background Scores across each of the noted zones should be elevated relative to other Assessment Sub-Areas within the Study Area.
2. Condition: With the exception of Assessment Sub-Area KM3, Condition Scores across the subject Assessment Sub-Areas are somewhat larger than those noted across the other 35 Assessment Sub-Areas included within the scope of environmental degradation assessment activities. Grate and hood damage, insufficient armoring, evidence of ponding, as well as significant channel damage from erosion were noted in several areas.
3. Opportunity: As the scope of the IRIP allowed for limited hydrologic and hydraulic analysis of existing Environmental Degradation Infrastructure, it was critical that institutional knowledge collected by the City of Moore be captured in the environmental degradation assessment effort. To this end, the assessment team spent considerable time with City of Moore Staff discussing various Environmental Degradation issues across the Study Area which were in need of mitigation. Opportunity Scores across the 35 Assessment Sub-Areas capture this data and inform each Assessment Sub-Area Environmental Degradation IRI as appropriate. The Plaza Towers, Southmoore, and King's Manor Assessment Zones contain approximately 17 potential Environmental Degradation improvements. These potential improvements have served to increase the Environmental Degradation IRI Rankings of Assessment Sub-Areas contained within the noted Assessment Zones.

Of particular note are Assessment Sub-Areas SG4 (Environmental Degradation IRI 91.77), SG3 (Environmental Degradation IRI 86.38), and SG5 (Environmental Degradation IRI 45.87). While these Assessment Sub-Areas received Environmental Degradation IRI Ranks 7, 8, and 19, respectively, City of Moore Staff have indicated that significant design and capacity issues exist relative to public Environmental Degradation Infrastructure within the subject Assessment Sub-Areas. This information should be taken into

consideration by the City of Moore in determining final priorities for any proposed Environmental Degradation Infrastructure improvements across the Study Area.

3.4.5. Water Distribution

Within the Water Distribution Infrastructure Category, the Plaza Towers Assessment Zone again tops the ranked IRI list with Assessment Sub-Areas PT2 (Water IRI 92.31), PT4 (Water IRI 87.59), PT5 (Water IRI 80.22), and PT3 (Water IRI 76.97) receiving Water IRI Ranks 1, 2, 4, and 5, respectively. Assessment Sub-Area KM3 (Water IRI 86.32) received Water IRI Rank 3, with two areas within the J.D. Estates Assessment Zone coming in at 6 and 7 (EJ2 Water IRI 75.97, EJ5 Water IRI 70.77). In reviewing and interpreting Water IRI scores across all 31 Assessment Sub-Areas included in the scope of the project, it appears that increased Water IRI Scores in the subject areas are primarily associated with the following Score Factor Categories:

1. Damage: Based on the published FEMA Damage Path of the May 20, 2013 Tornado, a large percentage of the Plaza Towers Assessment Zone (based on simply land area) was within the limits of EF0 to EF5 damage. As the Assessment Zone contains a relatively large amount of public water distribution infrastructure, it follows that Damage Scores associated with public water infrastructure assessment activities are also high, relative to other Assessment Zones within the Study Area.
2. Condition: Based on the assessment team's review of developed data, it appears that elevated Condition Scores across the subject Assessment Sub-Areas within the Plaza Towers Assessment Zone are primarily related to the frequency of water line maintenance events from 2004 to 2014 and anticipated, as well as the quantity of future service connections which are anticipated. While significant reconstruction of homes within the Plaza Towers Assessment Zone has occurred since May 20, 2013, a significant amount of future construction is still anticipated. This future construction will likely necessitate additional service connections to already compromised water distribution infrastructure. These service connections will likely result in additional impacts and damage to existing water distribution infrastructure which is already nearing the end of its design life. Comments by City of Moore staff have also confirmed that corrosive soils within the Plaza Towers Assessment Zone (see Appendix A2, Exhibit A2.13) have had significant impacts on water distribution infrastructure within the area. As a result, the City of Moore anticipates that maintenance and repair of the subject infrastructure will continue to be an issue for the City of Moore during future recovery activities.

Assessment Sub-Area KM3 (Water IRI 86.32), as well as Assessment Sub-Areas EJ2 (Water IRI 75.97) and EJ5 (Water IRI 70.77) also received high IRI Scores relative to all 31 Assessment Sub-Areas considered

within the Water Distribution Infrastructure Category. These three Assessment Sub-Areas received Water IRI Ranks 3, 6, and 7, respectively. While Damage and Condition Scores in the subject Assessment Sub-Areas are slightly less, elevated scores in the subject areas appear to be primarily related to the Score Factor Categories discussed above.

Assessment Sub-Areas WT1 (Water IRI 68.05), SM2 (Water IRI 65.58), and KM2 (Water IRI 64.57), round out the top ten Assessment Sub-Areas within the Water Infrastructure Category. Assessment Sub-Area BA1 (Water IRI 33.43), EJ6 (Water IRI 31.71), EJ4 (Water IRI 25.09), N4D (Water IRI 23.49), and BA2 (Water IRI 20.77) represent the 5 lowest Water IRI Scores across all Assessment Sub-Areas considered. Based on the review of the Assessment Team, it does not appear that improvements to public water distribution infrastructure within these Assessment Sub-Areas may be needed or warranted.

3.4.6. Bikeways/Trails

Within the Bikeways/Trails Infrastructure Category, Assessment Sub-Area LR1 (Trail IRI 90.44) within the Little River Assessment Zone received a significantly higher Trail IRI than any other Assessment Sub-Area within the scope of assessment activities. In reviewing assessment data developed in conjunction with bikeway/trail assessment activities, it appears that the significantly higher Trail IRI for Assessment Sub-Area LR1 is primarily related to the multitude of potential trail improvements that have been identified by the Assessment Team and City of Moore Staff within this Assessment Sub-Area. Review of the associated data indicates a total of six (6) Bikeway/Trail improvements are currently identified, equating to an Opportunity Score of 30.00 for Assessment Sub-Area LR1. This score serves to reiterate the importance of Bikeways/Trails Infrastructure Category not only within the context of this particular Assessment Sub-Area, but also in terms of how potential Bikeway/Trail improvements might serve to connect other Assessment Sub-Areas within the Study Area to the associated Little River Park.

Also appearing near the top of the ranked Trail IRI list are Assessment Sub-Areas within the Kings Manor and Plaza Towers Assessment Zones. Assessment Sub-Area KM3 (Trail IRI 75.31) and KM2 (Trail IRI 69.33) received Trail IRI Rankings 2 and 4, respectively, while Assessment Sub-Areas PT3 (Trail IRI 71.44), PT2 (Trail IRI 64.11), and PT5 (Trail IRI 62.56), took rankings 3, 5, and 6. Also appearing in the top 10 are Assessment Sub-Areas TP1 (Trail IRI 53.90), TW1 (Trail IRI 52.68), BW2 (Trail IRI 52.33), and EJ2 (Trail IRI 51.71) at Trail IRI Rankings 7 through 10.

Assessment Sub-Area PT6 (Trail IRI 10.50), LR2 (Trail IRI 9.60), LR3 (Trail IRI 9.60), PT1 (Trail IRI 5.50) and EJ4 (Trail IRI 1.00) represent the 5 lowest Trail IRI Scores across all Assessment Sub-Areas

considered. Based on the review of the Assessment Team, it does not appear that improvements to public Bikeway/Trails infrastructure within these Assessment Sub-Areas may be needed or warranted.

3.4.7. Gateway/Streetscape

Within the Gateway/Streetscape Infrastructure Category, Assessment Sub-Areas receiving the highest scores are somewhat distributed across the Study Area rather than being contained within any particular Assessment Zone, or district. Assessment Sub-Area EJ2 (Gateway IRI 99.85), N4C (Gateway IRI 92.13), and TP1 (Gateway IRI 90.25) received Gateway IRI Ranks 1, 2, and 3, respectively across all 30 Assessment Sub-Areas included within the scope of assessment activities. Assessment Sub-Areas KM3 (Gateway IRI 77.98) and PT2 (Gateway IRI 77.80) round out the top 5 with Gateway IRI Ranks 4 and 5, respectively. Upon further review of developed Gateway/Streetscape assessment data, the following Score Factor Categories appear to be the differentiator between all considered Assessment Sub-Areas:

1. Background: Background Scores for the subject Assessment Sub-Areas were consistently higher than other Assessment Sub-Areas considered within the scope of gateway/streetscape assessment activities. This appears to be directly related to two primary characteristics: (1) quantity and significance of roadway inventory within the Assessment Sub-Area, and (2) arterial roadway frontage adjacent to, or associated with, the Assessment Sub-Area. As EJ2 has both a significant public roadway inventory within it, as well as a notable length of arterial roadway frontage, its Background Score is significantly higher than other Assessment Sub-Areas included within the scope of gateway/streetscape assessment activities. This general characteristic was observed in all Assessment Sub-Areas appearing near the top of the Gateway IRI Ranking list.

2. Opportunity: As the Opportunity Score Factor captures potential pubic improvements perceived or contemplated by the Assessment Team or City of Moore Staff, it follows that Assessment Sub-Areas with more potential public improvements should receive higher Opportunity Scores. The majority of Assessment Sub-Areas appearing near the top of the Gateway IRI Ranking List all have multiple potential public improvements within, or adjacent to their boundaries. As gateways naturally occur near primary roadway entrances, and these entrances are frequently associated with an arterial roadway corridor, it would follow that Assessment Sub-Areas which encompass primary, arterial roadway corridors would capture, or benefit, from otherwise unrelated gateway/streetscape improvements. The presence of Assessment Sub-Area N4C (Gateway IRI 92.13), TP1 (Gateway IRI 90.25), and SF2 (Gateway IRI 75.09) near the top of the ranked Gateway IRI List reflect this relationship in the data. This occurrence also speak to the fact that these primary, arterial roadway corridors should be

considered critically by the City of Moore when prioritizing Gateway/Streetscape improvements across the Study Area.

Assessment Sub-Areas EJ5 (Gateway IRI 76.72), PT5 (Gateway IRI 71.64), N4A (Gateway IRI 70.30), and BR1 (Gateway IRI 67.22) round out the top ten Assessment Sub-Areas within the Gateway Infrastructure Category. Assessment Sub-Area EJ1 (Gateway IRI 32.98), WT1 (Gateway IRI 31.33), TD3 (Gateway IRI 24.78), MH1 (Gateway IRI 23.49), and WT3 (Gateway IRI 5.49) represent the 5 lowest Gateway IRI Scores across all Assessment Sub-Areas considered. Based on the review of the Assessment Team, it does not appear that improvements to public Gateway/Streetscape improvements within these Assessment Sub-Areas may be needed or warranted.

3.4.8. Aggregate

Per Aggregate IRI Calculations, the Plaza Towers, Kings Manor, and J.D. Estates Assessment Zones capture 8 of the top 10 Aggregate IRI Rankings (Appendix B1, Table B1.4):

Table 3C

Assessment Zone	Assessment Sub-Area	Aggregate IRI	Aggregate IRI Rank
Plaza Towers	PT2	643.69	1
King's Manor	KM3	610.77	2
Plaza Towers	PT3	586.92	3
J.D. Estates	EJ2	567.38	4
Plaza Towers	PT5	554.89	5
Baer's Westmoore	BW2	507.67	6
King's Manor	KM2	506.02	7
J.D. Estates	EJ5	501.17	8
SouthMoore	SM2	464.63	9
Plaza Towers	PT4	455.91	10

As this data captures IRI Scores from each Infrastructure Category, it can also be inferred that the subject Assessment Zones, and in particular, the noted Assessment Sub-Areas, represent portions of the Study Area which might most benefit from over-arching public infrastructure improvement programs. As previously

discussed, these programs should take into consideration policies and guidelines established by the City of Moore, as well as the collective institutional knowledge of City of Moore Staff.

In presenting the other end of the spectrum, the following Assessment Sub-Areas represent the 10 lowest Aggregate IRI Scores across all Assessment Sub-Area included within the scope of work:

Table 3D

Assessment Zone	Assessment Sub-Area	Aggregate IRI	Aggregate IRI Rank
Southgate	SG4	91.77	35
Southgate	SG3	86.38	36
Plaza Towers	PT6	78.90	37
J.D. Estates	EJ4	57.42	38
Tower Drive	TD2	50.60	39
Rock Creek	RC2	46.25	40
Southgate	SG5	45.87	41
Carriage Park	CP1	35.35	42
Little River	LR2	29.68	43
Little River	LR3	25.34	44

Review of this list, as well as Appendix A2, Exhibit A2.31a suggests that these low Aggregate IRI Scores are primarily related to the relatively low inventory of public infrastructure within the subject Assessment Sub-Areas. The majority of Assessment Sub-Areas shown on Table 3D are in fact commercial, or private development areas, where little room or opportunity for public infrastructure programs currently exist.

4.0 Walkability Audit

4.1. Audit Approach

The walkability audit focused on the neighborhoods surrounding Plaza Towers Elementary School and Highland East Junior High School with the goal of improving neighborhood walkability to schools and increasing physical activity. Two public walkability workshops were conducted; one at each school. Attendees learned what makes

a neighborhood walkable, the many benefits of a walkable neighborhood and received a walkability check list and instructions to conduct their own walkability audit in their neighborhood and submit their results to the City.

In addition to neighborhood residents performing a walkability audit, Cardinal Engineering conducted two audits for each neighborhood - one each approaching the schools from the west and east. For this audit, it is presumed that children that have a longer walk than 20 minutes will not walk or bike to school so the routes chosen did not exceed a 20 minute walk.

4.2. Plaza Towers West Neighborhood: 2:00 – 4:00 PM

Observations – Walking

Continuous 4 ft. sidewalks on both sides of the street throughout most of the neighborhood provide a sufficient walkable environment. The 4 ft. width is sufficient but feels narrow. The absence of sidewalk on Penn Lane north of SW 11th Street forces pedestrians to walk in the street for the remainder of the walk to school. A pedestrian connection or connecting SW 11th Street across the drainage channel could cut walk time in half.

Observations – Crossing

eIntersections do not have any ADA accessible curb ramps. Anyone using a wheelchair or mobility scooter must use the nearest driveway to cross. The only marked crosswalk on Penn Lane occurred mid-block and there were no curb ramps. There are a couple of curbed drainage flumes that cross the sidewalk and there are no curb ramps or steel plates over the flumes. Pedestrians can cross but again, wheelchairs and scooters must use driveways and the street to navigate around these flumes.

Observations – Drivers

Approximately 75 percent of the drivers observed drove the posted speed limit of 25 mph in the neighborhood. Most drivers were aware of pedestrians and two drivers waved. The biggest issue observed was driveways being over parked. Most setbacks for garages only allow for a single parked vehicle between the sidewalk and garage. Many driveways had a second vehicle parked behind the first, obstructing the sidewalk.

Observations – Safety

While the walking environment may not be ideal, the neighborhood does not feel unsafe. There were many construction and lawn crews active in the neighborhood creating ‘eyes on the street’. However, no other walkers were observed in the neighborhood leading up to school dismissing. Around the school, traffic starts picking up

around 3 pm, peaks around 3:30 and is mostly dispersed by 4 pm. Eagle drive is very congested with vehicles parked on both sides of the street. Thru traffic trying to navigate this 'cattle chute' and children walking and bicycling in the street because of the absence of sidewalks create an unsafe environment.

Observations – Environment

The neighborhood consisted of a mix of well-maintained properties and other that could use some improvement. The substantial amount of recovery construction and traffic, vacant lots, lack of shade trees and portions of missing sidewalk make for an unpleasant walking environment. However, people are friendly and the hand painted stars on utility poles show people care about the neighborhood.

4.3. Plaza Towers East Neighborhood: 8:00 – 10:00 AM

Observations – Walking

The only portion of this route that had sidewalk was SW 14th Street from Janeway to MacAlpine. The 4 ft. walk is sufficient but feels narrow. The absence of sidewalk forces pedestrians to walk in the street for their walk to school. A pedestrian connection or connecting SW 14th Street between MacAlpine and Ridgeway Dr. could reduce walk time by 5 minutes. Without a way to cross the drainage channel at Janeway and SW 14th, pedestrians must walk an extra 5 minutes south to SW 17th, then back up the other side of Janeway to SW 14th Street.

Observations – Crossing

Intersections do not have any ADA accessible curb ramps or marked crosswalks. Anyone using a wheelchair or mobility scooter must use the nearest driveway to cross. A pedestrian bridge to cross the drainage channel at Janeway and SW 14th would reduce the walk time by 5 minutes.

Observations – Drivers

Very few vehicles were observed in the neighborhood other than the school traffic on Eagle Drive. The intersection of SW 11th and Eagle Dr. is a 4-way stop that during pickup and dropoff is a real bottle neck. This would be a good location for a roundabout or traffic circle. Some driveways had a second vehicle parked behind the first, obstructing the sidewalk.

Observations – Safety

No other walkers were observed in the neighborhood leading up to school starting outside of Eagle Drive. Eagle Drive sees a lot of pedestrian and bicycle traffic. Around the school, traffic starts picking up around 8:45 am. Majority of traffic circulates north on Eagle Dr., then left on SW 11th and left into the school dropoff. Eagle drive is very congested with vehicles parked on both sides of the street. Thru traffic trying to navigate this 'cattle chute' and children walking and bicycling in the street because of the absence of sidewalks create an unsafe environment.

Observations – Environment

The neighborhood consisted of a mix of well-maintained properties and other that could use some improvement. The recovery construction and traffic, vacant lots, lack of shade trees and portions of missing sidewalk make for an unpleasant walking environment. Vacant parcels, sidewalks overgrown with vegetation and trash and debris on SW 14th between MacAlpine and Janeway contribute to a neglected and abandoned feel to that part of the neighborhood. However, people are friendly. A mailman stopped to inquire if the vacant parcels along SW 14th were being redeveloped. Hand painted stars on utility poles throughout the neighborhood show people care about the neighborhood.

4.4. J.D. Estates West Neighborhood: 8:00 – 10:00 AM

Observations – Walking

This neighborhood is a pleasant neighborhood to walk through. There are continuous four foot concrete sidewalks throughout the neighborhood. There was a speed monitoring device up and Police patrolling the area. It felt like a safe neighborhood.

Observations – Crossing

The West Neighborhood did not have any ADA accessible ramps, nor did it have any marked street crossings. There are several drainage flumes that interrupt the sidewalk and you must walk around them in the street.

Observations – Drivers

Traffic appeared to move fast on SE 4th Street. The drivers seemed to be driving the speed limit and were respectful of walkers in general. Some driveways had cars blocking the sidewalk making it necessary to walk around.

Observations – Safety

The neighborhood felt safe. Construction and lawn crews created lots of activity in the neighborhood. However, very few pedestrians were observed in the neighborhood; it seemed to be pretty vacant after kids start school. Traffic picked up around 2:30-3:30 as school let out.

Observations – Environment

The neighborhood had many mature trees and well-tended lawns and houses. It was big trash pick-up week in the neighborhood, so there was a lot of discarded household trash items on the curb. There is also some new home construction and several empty lots with old foundations still remaining.

4.5. J.D. Estates East Neighborhood: 2:00 – 4:00 PM

Observations – Walking

The east side of the neighborhood was a pleasant neighborhood to walk through. There are continuous 4 ft. concrete sidewalks throughout the neighborhood. There were many sections of sidewalk missing due to housing construction activities. Walking along SE 4th Street was not enjoyable due to the lack of sidewalk on either side of the street and the fast moving traffic.

Observations – Crossing

The neighborhood does not have any ADA accessible ramps or marked crosswalks. The only marked crosswalk is located on SE 4th Street with a crossing guard that allows crossing from the neighborhoods to the north of the school in the morning and afternoon. There are several drainage flumes that interrupt the sidewalk and pedestrians must walk around them in the street.

Observations – Drivers

With the exception of SE 4th Street, drivers seemed to be driving the speed limit and were respectful of walkers in general. Some of the cars in driveways obstructed the sidewalk, making pedestrians in the street to walk around them.

Observations – Safety

The neighborhood felt safe. I observed many construction crews and lawn crews. However, I did not see any other walkers; the neighborhood seemed to be pretty vacant after kids start school. Traffic picked up around 2:30-3:30 as school was letting out.

Observations – Environment

The neighborhood contains many well-tended homes and lawns. There is a lot of construction and recovery activity and people were friendly. The lack of tree canopies especially along Whispering Oaks Boulevard made the walk a hot and a little uncomfortable.

4.6. Recommendations

Based on the preceding results of the Walkability Audit, the Assessment Team has the following recommendations for the areas surrounding Plaza Towers Elementary School and Highland East Junior High School:

Plaza Towers Elementary School

- Construct street connection for SW 11th Street between Penn Lane and Eagle Drive with 6-ft on south sides of street.
- Construct mini-traffic circle at Eagle Drive and SW 11th Street to improve school traffic flow.
- Widen Eagle Drive to the west from SW 14th Street to SW 11th Street to allow for dedicated parallel parking and on-street bike lane at Plaza Towers Elementary.
- Construct 6 ft. sidewalk on west side of Eagle Drive from SW 14th Street to SW 11th Street and south side of SW 11th Street from Eagle Drive to new SW 11th Street connection.
- Construct pedestrian bridge over draiange channel at South Janeway Avenue and SW 12th Street.
- General recommendation: Install street trees to provide shade and create a pedestrian friendly environment.

Highland East Junior High School

- Acquire vacant single family parcel at SE 6th Street and Sweetgum Street abutting east side of school property to construct pocket park and pedestrian connection.
- Acquire vacant single family parcel on South Bouziden Drive abutting west side of school property to construct pocket park and pedestrian connection.
- Construct 8-ft sidewalks on north and south sides of SE 4th Street from Eastern Avenue to Bryant Avenue.
- Construct signalized intersection and pedestrian crossing at SE 4th Street and South Bouziden Drive.
- General recommendation: Install street trees to provide shade and create a pedestrian friendly environment.

By following these recommendations, the Assessment Team believes that the walkability of the areas surrounding Plaza Towers Elementary School and Highland East Junior High School can be significantly improved.

5.0 Visual Preference Survey

5.1. Survey Approach

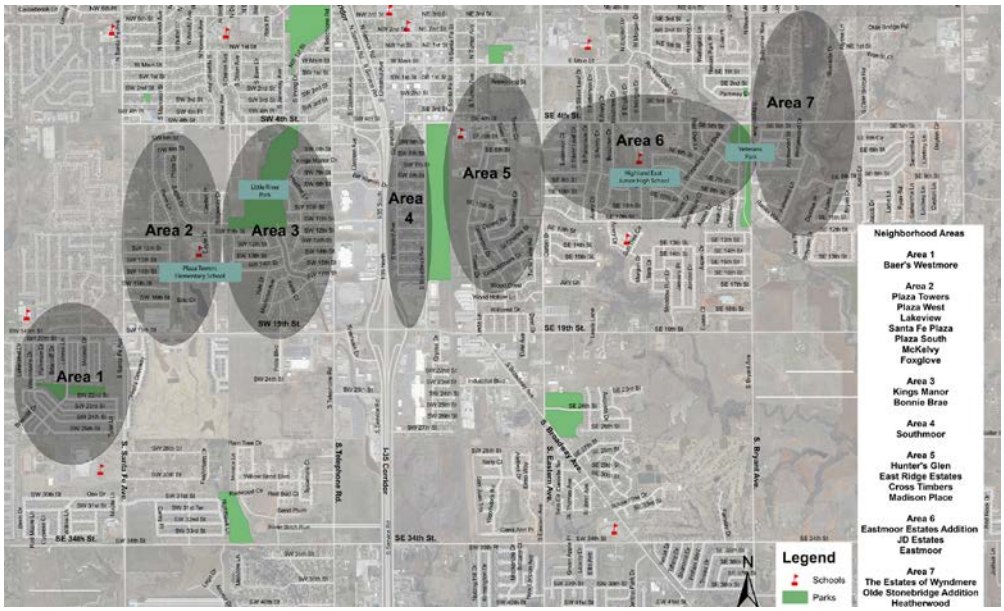
The purpose of the Visual Preference Survey (VPS) was to understand visually what elements of design the residents of the neighborhoods affected by the May 20, 2013 tornado preferred to see in the rebuilding of their community. There were a total of 52 images in the survey, organized by the following topic areas:

1. Active Transportation
2. Crosswalks & Intersections
3. Environmental Degradation
4. Gateways
5. Landscaping & Streetscapes
6. Traffic Calming

The survey was conducted online at envisionmoore.org and ran for a period of four weeks (January 23, 2015 to February 23, 2015). Survey users were asked to register in order to complete the survey and to self-select in which neighborhood they reside. Participants were shown images in the above categories and asked to select their preferred image. A complete copy of the VPS Survey has been provided in Appendix D.

5.2. Survey Results

A total of 912 responses were gathered during the four week time period that the survey was open on envisionmoore.org. Respondents were asked to view the map below and select which part of the tornado path with which they felt most associated.



About one-quarter of respondents self-identified with Area 2 (Plaza Towers, Plaza West, Lakeview, Santa Fe Plaza, Plaza South, McKelvy, Foxglove), and 21% with Area 6. A breakdown of respondents by area is summarized below.

Table 5A

Area Number and Name	Number of Respondents	Percent of Total
Area 1 – Baer's Westmore	61	7
Area 2 – Plaza Towers, Plaza West, Lakeview, Santa Fe Plaza, Plaza South, McKelvy, Foxglove	222	24
Area 3 – Kings Manor, Bonnie Brae	61	7
Area 4 – Southmoor	102	11
Area 5 – Hunter's Glen, East Ridge Estates, Cross Timbers, Madison Place	91	10
Area 6 – Eastmoor Estates Addition, JD Estates, Eastmoor	187	21
Area 7 – The Estates of Wyndmere, Olde Stonebridge Addition, Heatherwood	155	17

Participants were asked why they chose the particular tornado area and were given the following options (with the ability to select all that apply):

- Live in the tornado area
- Work in the tornado area
- Go to school or church in the tornado area
- Visit friends/family in the tornado area
- Other

Many 'Other' responses were given (14%), but nearly half (49%) of respondents chose 'Live in tornado area'. 'Visit friends/family in the tornado area' was the next most chosen at 17%, six percent (6%) chose 'Work in the tornado area', and 2% chose 'Go to school or church in the tornado area'. Since respondents were able to select multiple options, 79 of those surveyed (9%) selected some combination of the Live, Work, Go to school/church, Visit Friends/Family options.

Those surveyed were asked to select, from a list, the top three improvements or amenities they would like to see in the area they selected. Sidewalks (18%), Landscaping (15%) and Decorative Street Lights (12%) were the top three selected improvements/amenities, with Trails (11%) a close fourth behind. On street parking was the lowest scoring amenity with 38 (1%) responses. Full results are tabulated below:

Table 5B

Improvement/Amenity	Number of Respondents	Percent of Total
Sidewalks	479	18
Landscaping	404	15
Decorative Street Lights	333	12
Trails	305	11
Bike Lanes	216	8
Pedestrian Friendly Crosswalks	204	7
Street Furniture (benches, planters, etc.)	177	6
Pocket Parks	173	6
Decorative Fencing (along arterial roads)	140	5

Improvement/Amenity	Number of Respondents	Percent of Total
Subdivision Signs	139	5
Decorative Street Pavement	128	5
On Street Parking	38	1

5.2.1. Active Transportation

The first section of the VPS dealt with preferences related to Active Transportation. Active Transportation includes items such as sidewalks, bikeways and multi-use trails. Respondents were shown four sets of images and asked to select only one, their preferred image. In the first set of images the majority of respondents preferred the 'Wide Shoulders' image to the 'Marked/Dedicated Bike Lanes' image. Only one of the specific areas preferred the 'Marked/Dedicated Bike Lanes more than the 'Wide Shoulders' image – Area 3 (Kings Manor and Bonnie Brae neighborhoods). Summary results are provided below. Majority preferences have been shown in bold:

Table 5C: Active Transportation Set 1

Marked/Dedicated Bike Lanes

Area 1: 45 (48%)
Area 2: 106 (48%)
Area 3: 31 (51%)
Area 4: 48 (47%)
Area 5: 37 (41%)
Area 6: 86 (46%)
Area 7: 70 (45%)

TOTAL 423 (46%)

Wide Shoulders

Area 1: 49 (52%)
Area 2: 116 (52%)
Area 3: 30 (49%)
Area 4: 54 (53%)
Area 5: 54 (59%)
Area 6: 101 (54%)
Area 7: 85 (55%)

TOTAL 489 (54%)

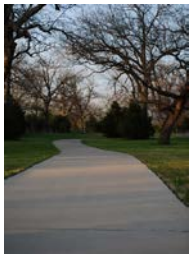
In the second set of images in the Active Transportation section respondents overwhelming preferred the image showing sidewalks over the image of rollover curbs without sidewalks. See responses tabulated below (majority preferences are shown in bold).

Table 5D: Active Transportation Set 2

Rollover Curbs, No Sidewalks		Sidewalks	
	Area 1: 3 (3%) Area 2: 10 (5%) Area 3: 2 (3%) Area 4: 2 (2%) Area 5: 3 (3%) Area 6: 2 (1%) Area 7: 7 (5%)		Area 1: 91 (97%) Area 2: 212 (95%) Area 3: 59 (97%) Area 4: 100 (98%) Area 5: 88 (97%) Area 6: 185 (99%) Area 7: 148 (95%)
TOTAL 29 (3%)		TOTAL 883 (97%)	

The third set of images in Active Transportation asked survey takers to choose between three images of trails showing different materials – asphalt, concrete and natural compacted earth. The majority of survey participants chose Concrete (51%), with Asphalt being second choice (25%), and the Natural trail coming in at 19% preference. See the table below for all results for Active Transportation Set 3 images.

Table 5E: Active Transportation Set 3

Asphalt Trail	Concrete Trail	Natural Trail
		
TOTAL 277 (25%)	TOTAL 461 (51%)	TOTAL 174 (19%)
Area 1: 33 (35%)	Area 1: 46 (49%)	Area 1: 15 (16%)
Area 2: 59 (27%)	Area 2: 119 (54%)	Area 2: 44 (20%)
Area 3: 23 (38%)	Area 3: 27 (44%)	Area 3: 11(18%)
Area 4: 29 (28%)	Area 4: 51 (50%)	Area 4: 22 (22%)
Area 5: 31 (34%)	Area 5: 50 (55%)	Area 5: 10 (11%)
Area 6: 58 (31%)	Area 6: 87 (47%)	Area 6: 42 (22%)
Area 7: 44 (28%)	Area 7: 81 (52%)	Area 7: 30 (19%)

The final set of images in the Active Transportation Section asked respondents to choose between a trail adjacent to the road, and a trail completely separated from the roadway. The trail adjacent to the road was the least popular choice (15%). Complete results are summarized below:

Table 5F: Active Transportation Set 4

Trail Adjacent to Road

Area 1: 11 (12%)
Area 2: 32 (14%)
Area 3: 13 (21%)
Area 4: 18 (18%)
Area 5: 15 (16%)
Area 6: 25 (13%)
Area 7: 19 (12%)

TOTAL 133 (15%)

Trail Completely Separate from Road

Area 1: 83 (88%)
Area 2: 190 (86%)
Area 3: 48 (79%)
Area 4: 84 (82%)
Area 5: 76 (84%)
Area 6: 162 (87%)
Area 7: 136 (95%)

TOTAL 779 (85%)

5.2.2. Crosswalks and Intersections

The next section of the Visual Preference Survey dealt with Crosswalks and Intersections. This includes street striping, stamped pavement, and landscaping elements. Crosswalks and Intersection design are extremely important factors in areas of high pedestrian activity, such as major roadways and around parks and schools. Survey takers were shown a series of three sets of images and asked to select their preferred image out of each set.

The first set of images asked respondents to choose between images of a marked and signaled crosswalk, and a signaled crosswalk with no markings. Overall, and in each of the areas those surveyed overwhelmingly chose the image of a marked and signaled crosswalk, see table below.

Table 5G: Crosswalks and Intersections Set 1

Marked and Signaled Crosswalk

Area 1: 89 (95%)
Area 2: 202 (91%)
Area 3: 58 (95%)
Area 4: 80 (78%)
Area 5: 85 (93%)
Area 6: 174 (93%)
Area 7: 141 (91%)

TOTAL 829 (91%)

Signaled Crosswalk, No Markings

Area 1: 5 (5%)
Area 2: 20 (9%)
Area 3: 3 (5%)
Area 4: 22 (22%)
Area 5: 6 (7%)
Area 6: 13 (7%)
Area 7: 14 (9%)

TOTAL 83 (9%)

The second set of images asked respondents to choose between images of colored crosswalks with ramps, or striped and signed crosswalk with landscaping. Overall, about one-third of respondents preferred the striped and signed crosswalk with plantings (34%) to the colored crosswalk with ramps (66%), see table below for complete results.

Table 5H: Crosswalks and Intersections Set 2

Colored Crosswalk with Ramps		Striped & Signed Crosswalk with Plantings	
	Area 1: 63 (67%) Area 2: 144 (65%) Area 3: 39 (65%) Area 4: 71 (70%) Area 5: 55 (60%) Area 6: 121 (65%) Area 7: 106 (68%)		Area 1: 31 (33%) Area 2: 78 (35%) Area 3: 22 (36%) Area 4: 31 (30%) Area 5: 36 (40%) Area 6: 66 (35%) Area 7: 49 (32%)
TOTAL 599 (66%)		TOTAL 313 (34%)	

The final set of images in this section of the VPS asked participants chose between colored, textured and striped crossing with plantings or an image of textured crossing with plantings. The majority of survey takers (84%) preferred the image of colored, textured and striped crossing with plantings. See complete results in the table below.

Table 5I: Crosswalks and Intersections Set 3

Colored, Textured and Striped Crossing with Plantings		Textured Crossing with Plantings	
	Area 1: 71 (76%) Area 2: 195 (88%) Area 3: 48 (79%) Area 4: 88 (86%) Area 5: 77 (85%) Area 6: 161 (86%) Area 7: 125 (81%)		Area 1: 23 (24%) Area 2: 27 (12%) Area 3: 13 (21%) Area 4: 14 (14%) Area 5: 14 (15%) Area 6: 26 (14%) Area 7: 30 (19%)
TOTAL 765 (84%)		TOTAL 147 (16%)	

5.2.3. Environmental Degradation

The third section of the VPS asked respondents to evaluate five sets of images of Environmental Degradation features in the public realm. This includes open channels, bridge boxes, detention ponds, street drains. Environmental Degradation features with comparable functionality were grouped together. The first set of images dealt with bridges over waterways, see table below for a complete breakdown of preferences.

Table 5J: Environmental Degradation Set 1

Concrete Bridge	Stone and Metal Bridge
	
Area 1: 6 (6%) Area 2: 20 (9%) Area 3: 5 (8%) Area 4: 3 (3%) Area 5: 11 (12%) Area 6: 20 (11%) Area 7: 16 (10%)	Area 1: 88 (94%) Area 2: 202 (91%) Area 3: 56 (92%) Area 4: 99 (97%) Area 5: 80 (88%) Area 6: 167 (89%) Area 7: 139 (90%)
TOTAL 81 (9%)	TOTAL 831 (91%)

The second set of images asked those surveyed to evaluate and choose between a concrete lined Environmental Degradation channel and a natural, planted Environmental Degradation channel. The table below presents all the survey responses. Over three-quarters of respondents preferred the image of the natural, planted Environmental Degradation channel image, see complete results below:

Table 5K: Environmental Degradation Set 2

Concrete Lined Environmental Degradation Channel	Natural, Planted Environmental Degradation Channel
	
Area 1: 16 (17%) Area 2: 26 (12%) Area 3: 3 (5%) Area 4: 18 (18%) Area 5: 20 (22%) Area 6: 30 (16%) Area 7: 19 (12%)	Area 1: 78 (83%) Area 2: 196 (88%) Area 3: 58 (95%) Area 4: 84 (82%) Area 5: 71 (78%) Area 6: 157 (84%) Area 7: 136 (88%)
TOTAL 132 (14%)	TOTAL 780 (86%)

In the third set of images survey takers were asked to pick which image of stormwater management they preferred: bio-retention, rain garden or underground storm sewer. Nearly half (47%) preferred the bio-retention image, followed by 35% choosing the rain garden, and 18% underground storm sewer.

Table 5L: Environmental Degradation Set 3

Bioretention	Rain Garden	Underground Stormsewer
		
TOTAL 428 (47%)	TOTAL 320 (35%)	TOTAL 164 (18%)
Area 1: 49 (52%)	Area 1: 27 (29%)	Area 1: 18 (19%)
Area 2: 99 (45%)	Area 2: 87 (39%)	Area 2: 36 (16%)
Area 3: 25 (41%)	Area 3: 29 (48%)	Area 3: 7(11%)
Area 4: 54 (53%)	Area 4: 34 (33%)	Area 4: 14 (14%)
Area 5: 43 (47%)	Area 5: 27 (30%)	Area 5: 21 (23%)
Area 6: 83 (44%)	Area 6: 65 (35%)	Area 6: 39 (21%)
Area 7: 75 (48%)	Area 7: 51 (33%)	Area 7: 29 (19%)

The fourth set of images focused on ponds for stormwater management and asked participants to choose between Retention pond (stormwater stored indefinitely), Detention pond (runoff is stored temporarily), and Bioretention pond (stormwater is filtered through vegetation and either stored indefinitely or temporarily). With the exception of Area 4, the majority of respondents chose the Retention pond image as their preferred. Those that identified with Area 4 chose the Bioretention pond (48%), over the Retention pond (42%), and Detention pond (10%). A full summary of the survey results for the third set of Environmental Degradation images can be seen below.

Table 5M: Environmental Degradation Set 4

Bioretention Pond	Detention Pond	Retention Pond
		
TOTAL 326 (36%)	TOTAL 73 (8%)	TOTAL 515 (56%)
Area 1: 34 (36%)	Area 1: 9 (10%)	Area 1: 51 (54%)
Area 2: 72 (32%)	Area 2: 13 (6%)	Area 2: 137 (62%)
Area 3: 28 (46%)	Area 3: 3 (5%)	Area 3: 30(49%)
Area 4: 49 (48%)	Area 4: 10 (10%)	Area 4: 43 (42%)
Area 5: 28 (31%)	Area 5: 5 (5%)	Area 5: 58 (64%)
Area 6: 62 (33%)	Area 6: 20 (11%)	Area 6: 105 (56%)
Area 7: 51 (33%)	Area 7: 13 (8%)	Area 7: 91 (59%)

The fifth and final set of images in the Environmental Degradation section dealt with ponds as well. Those surveyed were asked to pick between an image of a pond surrounded by mown grass and a pond surrounded by various vegetation types (grasses, forbes, trees). Nearly three-quarters of respondents chose the image of the pond surrounded by mown grass (72%). Full results for the fifth set of images in the Environmental Degradation section can be viewed in the table below.

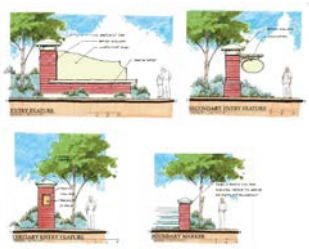
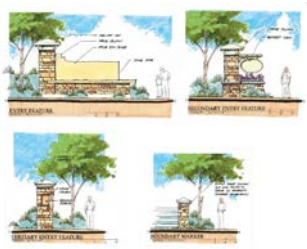
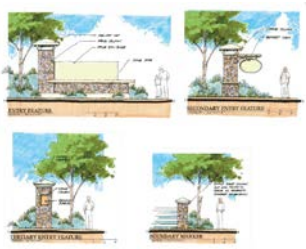
Table 5N: Environmental Degradation Set 5

Grass Pond		Natural, Planted Pond	
	Area 1: 65 (69%) Area 2: 162 (73%) Area 3: 42 (69%) Area 4: 71 (70%) Area 5: 68 (75%) Area 6: 142 (76%) Area 7: 109 (70%)		Area 1: 29 (31%) Area 2: 60 (27%) Area 3: 19 (31%) Area 4: 31 (30%) Area 5: 23 (25%) Area 6: 45 (24%) Area 7: 46 (30%)
TOTAL 659 (72%)		TOTAL 253 (28%)	

5.2.4. Gateways

The fourth section of VPS dealt with neighborhood Gateways. Gateways include signage and other decorative elements that signals the entry into a specific neighborhood. Participants were asked to evaluate 4 sets of images. The first was a serious of three drawings showing different materials – Brick, Stacked Stone, and Stone. Preferences were almost evenly split between Stacked Stone and Stone images, with a slight majority preferring the Stacked Stone, except in Area 3, see the table below:

Table 5O: Gateways Set 1

Brick	Stacked Stone	Stone
		
TOTAL 60 (7%)	TOTAL 478 (52%)	TOTAL 374 (41%)
Area 1: 4 (4%)	Area 1: 51 (55%)	Area 1: 39 (41%)
Area 2: 13 (6%)	Area 2: 113 (51%)	Area 2: 96 (43%)
Area 3: 1 (2%)	Area 3: 26 (43%)	Area 3: 34 (56%)
Area 4: 13 (13%)	Area 4: 60 (59%)	Area 4: 29 (28%)
Area 5: 10 (11%)	Area 5: 48 (53%)	Area 5: 33 (36%)
Area 6: 14 (7%)	Area 6: 95 (51%)	Area 6: 78 (42%)
Area 7: 5 (3%)	Area 7: 85 (55%)	Area 7: 65 (42%)

The second set of images asked survey takers for the preferences in regards to gateway signage in medians. About two-thirds of respondents preferred the stone gateway (65%) to the brick (35%). See full results in the table below.

Table 5P: Gateways Set 2

Brick	Stone

Table 5P: Gateways Set 2

Area 1: 33 (35%)
Area 2: 73 (33%)
Area 3: 21 (34%)
Area 4: 43 (42%)
Area 5: 33 (36%)
Area 6: 64 (34%)
Area 7: 56 (36%)

TOTAL 323 (35%)

Area 1: 61 (65%)
Area 2: 149 (67%)
Area 3: 40 (66%)
Area 4: 59 (58%)
Area 5: 58 (64%)
Area 6: 123 (66%)
Area 7: 99 (64%)

TOTAL 589 (65%)

The third set of images dealt with gateways along pedestrian corridors and asked participants to choose between an image of a brick column on either side of a sidewalk, or a stacked stone column on one side of the walkway. There was overwhelming preference for the image of stone on one side of the sidewalk, see results in the following table:

Table 5Q: Gateways Set 3

Brick on either side

Area 1: 23 (24%)
Area 2: 60 (27%)
Area 3: 14 (23%)
Area 4: 27 (26%)
Area 5: 17 (19%)
Area 6: 41 (22%)
Area 7: 43 (28%)

TOTAL 225 (25%)

Stone on one side

Area 1: 71 (76%)
Area 2: 162 (73%)
Area 3: 47 (77%)
Area 4: 75 (74%)
Area 5: 74 (81%)
Area 6: 146 (78%)
Area 7: 112 (72%)

TOTAL 687 (75%)

The final set of Gateway images asked for preferences between a brick or stucco gateway sign set in green or landscaped area.

Table 5R: Gateways Set 4

Brick

Stucco

Table 5R: Gateways Set 4

Area 1: 72 (77%)
Area 2: 155 (70%)
Area 3: 41 (67%)
Area 4: 76 (75%)
Area 5: 61 (67%)
Area 6: 139 (74%)
Area 7: 124 (80%)

TOTAL 668 (73%)

Area 1: 22 (23%)
Area 2: 67 (30%)
Area 3: 20 (33%)
Area 4: 26 (25%)
Area 5: 30 (33%)
Area 6: 48 (26%)
Area 7: 31 (20%)

TOTAL 244 (27%)

Overall, when it comes to materials choices for gateways respondents greatly favored stone, except when asked to pick between brick and stucco. Then brick was the preferred material of choice.

5.2.5. Landscaping/Streetscapes

The next section of the Visual Preference Survey featured four sets of images dealing with landscaping and streetscapes. This includes trees and other plant materials, benches and decorative lighting within the street right-of-way (ROW). Respondents were shown an image of streetscape with banners, and planters on the sidewalk, as well as an image with hanging planters, benches and textured paving. The majority (74%) chose the latter.

Table 5S: Landscaping/Streetscapes Set 1

Banners, Planters on Sidewalk

Area 1: 19 (20%)
Area 2: 70 (32%)
Area 3: 17 (28%)
Area 4: 26 (25%)
Area 5: 15 (16%)
Area 6: 49 (26%)
Area 7: 37 (24%)

TOTAL 233 (26%)

Hanging Planters, Benches, Textured Paving

Area 1: 75 (80%)
Area 2: 152 (68%)
Area 3: 44 (72%)
Area 4: 76 (75%)
Area 5: 76 (84%)
Area 6: 138 (74%)
Area 7: 118 (76%)

TOTAL 679 (74%)

The second set of images in the Landscaping and Streetscapes section dealt with streets. Participants were asked to choose between the following images. A slight majority (59%) chose the image with planted median and mailboxes.

Table 5T: Landscaping/Streetscapes Set 2

Banners, Planters on Sidewalk

Area 1: 59 (63%)
Area 2: 119 (54%)
Area 3: 36 (59%)
Area 4: 59 (58%)
Area 5: 51 (56%)
Area 6: 113 (60%)
Area 7: 103 (66%)
TOTAL 540 (59%)

Tree Lawn & Sidewalks (no median)

Area 1: 35 (37%)
Area 2: 103 (46%)
Area 3: 25 (41%)
Area 4: 43 (42%)
Area 5: 40 (44%)
Area 6: 74 (40%)
Area 7: 52 (34%)
TOTAL 372 (41%)

In the third set of images those surveyed were asked to choose between an image of a street with planted median and street trees, and an image of a street with a tree lawn, sidewalk and vinyl fence. Again, respondents almost overwhelmingly chose the image with a planted median (78%).

Table 5U: Landscaping/Streetscapes Set 3

Planted Median, Street Trees

Area 1: 79 (84%)
Area 2: 162 (73%)
Area 3: 47 (77%)
Area 4: 80 (78%)
Area 5: 75 (82%)
Area 6: 139 (74%)
Area 7: 131 (85%)
TOTAL 713 (78%)

Tree Lawn, Sidewalk, Vinyl Fence

Area 1: 15 (16%)
Area 2: 60 (27%)
Area 3: 14 (23%)
Area 4: 22 (22%)
Area 5: 16 (18%)
Area 6: 48 (26%)
Area 7: 24 (15%)
TOTAL 199 (22%)

In the final set of images in this section participants were asked to choose between an image of a street with banners, hanging planters, street lights and sidewalks and one with a wide right-of-way planted with grass and no sidewalks. Nearly all of respondents chose the former (96%), see table below for a full summary:

Table 5V: Landscaping/Streetscapes Set 4

Banners, Hanging Planters, Street Lights & Sidewalks

Wide ROW planted with grass, no sidewalks

Table 5V: Landscaping/Streetscapes Set 4

Area 1: 93 (99%)
Area 2: 211 (95%)
Area 3: 60 (98%)
Area 4: 98 (96%)
Area 5: 86 (95%)
Area 6: 177 (95%)
Area 7: 148 (95%)

TOTAL 873 (96%)

Area 1: 1 (1%)
Area 2: 11 (5%)
Area 3: 1 (2%)
Area 4: 4 (4%)
Area 5: 5 (5%)
Area 6: 10 (5%)
Area 7: 7 (5%)

TOTAL 39 (4%)

5.2.6. Traffic Calming

The last section of the Visual Preference Survey dealt with Traffic Calming. Traffic Calming can include things such as speed humps, speed tables, rumble strips, roundabouts, center islands, and curb extensions (or blub-outs). In the first set of images those surveyed were asked to choose between an illustration of a mini traffic circle and that of a roundabout. The majority chose the mini traffic circle (59%), with 41% selecting the roundabout. One exception is in Area 3 where the majority selected the roundabout image (51%). A full summary of the findings can be found below.

Table 5W: Traffic Calming Set 1

Mini Traffic Circle

Area 1: 49 (52%)
Area 2: 135 (61%)
Area 3: 30 (49%)
Area 4: 62 (61%)
Area 5: 56 (65%)
Area 6: 107 (57%)
Area 7: 99 (64%)

TOTAL 538 (59%)

Roundabout

Area 1: 45 (48%)
Area 2: 87 (39%)
Area 3: 31 (51%)
Area 4: 40 (39%)
Area 5: 35 (38%)
Area 6: 80 (43%)
Area 7: 56 (36%)

TOTAL 374 (41%)

The second set of images in Traffic Calming had participants choose between curb bump outs at pedestrian crossings – one with landscaping and one with lighted bollards. The majority, as a whole and in each area, chose the image with landscaping. See below for full results.

Table 5X: Traffic Calming Set 2

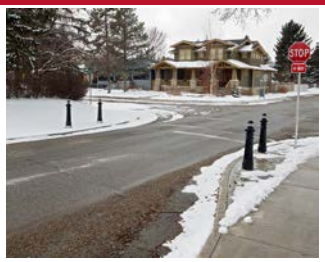
Curb Bump Outs with Landscaping

Curb Bump Outs with Lighted Bollards

Table 5X: Traffic Calming Set 2

Area 1: 49 (52%)
Area 2: 139 (63%)
Area 3: 35 (57%)
Area 4: 67 (66%)
Area 5: 64 (70%)
Area 6: 115 (61%)
Area 7: 86 (55%)

TOTAL 555 (61%)



Area 1: 45 (48%)
Area 2: 83 (37%)
Area 3: 26 (42%)
Area 4: 35 (34%)
Area 5: 27 (30%)
Area 6: 72 (39%)
Area 7: 69 (45%)

TOTAL 357 (39%)

The third set of images in this section asked survey takers to choose between an image of a mini traffic circle with landscaping and a planted median. Nearly two-thirds chose the mini traffic circle with landscaping, see table below:

Table 5Y: Traffic Calming Set 3

Mini Traffic Circle with Landscaping

Area 1: 70 (74%)
Area 2: 144 (65%)
Area 3: 42 (69%)
Area 4: 74 (73%)
Area 5: 55 (60%)
Area 6: 126 (67%)
Area 7: 115 (74%)

TOTAL 626 (69%)

Planted Median

Area 1: 24 (26%)
Area 2: 78 (35%)
Area 3: 19 (31%)
Area 4: 28 (27%)
Area 5: 36 (40%)
Area 6: 61 (33%)
Area 7: 40 (26%)

TOTAL 286 (31%)

The final set of images in the visual preference survey asked users to select which image they preferred, one showing textured paving and one showing transverse rumble strips. And overwhelming majority chose the textured paving (86%).

Table 5Z: Traffic Calming Set 4

Textured Paving

Transverse Rumble Strips

Table 5Z: Traffic Calming Set 4

Area 1: 82 (87%)
Area 2: 185 (83%)
Area 3: 55 (90%)
Area 4: 94 (92%)
Area 5: 76 (84%)
Area 6: 158 (84%)
Area 7: 138 (89%)
TOTAL 788 (86%)

Area 1: 12 (13%)
Area 2: 37 (17%)
Area 3: 6 (10%)
Area 4: 8 (8%)
Area 5: 15 (16%)
Area 6: 29 (16%)
Area 7: 17 (11%)
TOTAL 124 (14%)

6.0 Public Infrastructure Projects

6.1. Identified Improvements

As discussed previously, a significant portion of the assessment effort included identification of potential public infrastructure improvements identified by City of Moore Staff and/or the Assessment Team during development of the IRIP. Improvements identified, and ultimately utilized in assigning IRI values within each Infrastructure Category for each Assessment Sub-Area, are the result of not only field observations and professional judgment on the part of the Assessment Team, but also significant institutional knowledge possessed by City of Moore Staff. This IRIP is envisioned as the primary mechanism by which these otherwise disparate public infrastructure improvements might be brought together in a coordinated effort.

For the purposes of the IRIP, public infrastructure improvements included in the IRIP database have been termed *sub-projects* in anticipation of (1) the need to group otherwise unrelated public improvements which are in separate Infrastructure Categories but in the same Assessment Sub-Area (e.g., water improvements and street improvements in Assessment Sub-Area PT5), (2) the need to group potential public improvements which are in separate Infrastructure Categories, but have need of being completed in a coordinated sequence, and (2) the need to refine or simplify the list of potential public improvements into a more concise list which can realistically be bid, constructed, and managed by City of Moore Staff moving forward. A graphical as well as tabular representation of the comprehensive list of all 158 potential sub-projects have been provided at Appendix B1, Table B1.5, and Appendix A2, Exhibit A2.32, respectively.

6.2. Project Scope Development

In combining the previously discussed sub-projects into logical scopes of work, appropriate sequence of construction, geographical location, and trades or disciplines involved, were all taken into consideration. Based

on this criteria, sub-projects identified by City of Moore Staff and the Assessment Team were generally assembled into the following types of projects:

Table 6A

Project Type	Infrastructure Categories Included	Scope Description
Neighborhood Roadway Corridor	Streets Environmental Degradation Water Distribution Sidewalks Gateway/Streetscape	Projects include removal and replacement of existing roadway, sidewalks, and Environmental Degradation Infrastructure contained within public roadway corridors.
Sanitary Sewer	Sanitary Sewer	Rehabilitation of public sanitary sewer infrastructure, based on geographical area. Rehabilitation projects are considered a separate project type than those which are extending new sanitary sewer infrastructure.
Neighborhood Gateway	Gateway/Streetscape	Include site clearing and demolition at neighborhood entrances and construction of new gateway improvements. Anticipated to include monument construction, fence construction, irrigation system installation, landscaping and related items. Excludes streetscape work within neighborhoods or districts.
Environmental Degradation	Environmental Degradation	Includes relatively large Environmental Degradation improvements which are not associated with a specific district or area. Project scope typically located away from public roadway corridors and other areas where coordinated work within other Infrastructure Categories is required.
Arterial Roadway Projects	Streets	Includes removal and reconstruction of arterial roadways. Project scopes have been developed to begin and terminate at major intersections or intersections with other arterial roads. Scope of project likely includes significant traffic control as well as traffic improvements.
Trail Projects	Bikeways/Trails	Includes construction, or removal and construction of new trailway projects. Projects are typically located away from public roadway corridors and therefore do not require coordination with an adjacent street project.

Using these general project types, all 158 sub-projects were grouped into a total of 47 larger projects. A summary table indicating the various sub-projects included in each larger project is provided at Appendix B1,

Table B1.6. It is anticipated, that various components of each project may in fact be removed from each respective project scope depending on final funding levels as well as priorities developed by the City of Moore following completion of the IRIP.

6.3. Construction Cost-Estimates

In order to provide maximum flexibility moving forward, construction cost-estimates for the previously described public infrastructure projects were developed at the sub-project level. Using this approach, sub-projects may be added to, removed from, or moved between each project scope as required to respond to new policies, procedures, and priorities established by the City of Moore following completion of the IRIP. Sub-Project construction cost-estimates have been organized by Infrastructure Category and are presented at Appendix B2, Tables B2.8 through B2.14. Sub-project construction cost-estimates have also been translated to By Project and By Infrastructure Category summary tables at Appendix B1, Tables B1.7 and B1.8, respectively. Each of these summary tables indicate approximately $162-million dollars in potential public infrastructure projects currently exit across the Study Area. Select project renderings have been provided at Appendix A2, Exhibits A2.33 through A2.38.

As the detailed sub-project estimates suggest, cost-saving realized by the combination of otherwise unrelated sub-project scopes has been acknowledged in development of the sub-project cost-estimates. Should the City of Moore divide the proposed scopes of work into significantly more projects, additional costs will likely result. Bid items relating to activities such as mobilization, demolition and clearing activities, and site restoration are good examples of costs which will decrease for the City of Moore in proportion to the number of projects into which the aggregate scope across the Study Area is divided into. Also of note, a small number of *soft-costs* have also been included in the sub-project cost-estimates. Design and documentation, as well as testing and inspection are included in the provided figures. As the cost-estimates indicate, a 10% contingency has also been accounted for.

7.0 Funding Analysis

In addition to identifying potential public infrastructure improvements, the Assessment Team examined possible approaches to funding those projects. Of primary concern is the extent to which identified improvements can be undertaken with disaster recovery funding and related funding sources. This funding includes grants awarded to the City from the U.S. Department of HUD under the Community Development Block Grant – Disaster Recovery Program (CDBG-DR) totaling $52.3 Million. The City of Moore has also received charitable donations/gifts and committed existing revenues to address disaster recovery. Despite Federal grant awards, generous donations, and the City of Moore's plans to contribute toward its recovery, significant infrastructure needs remain unmet. Consequently, the

City of Moore is considering other sources of funding including an application for additional Federal funding under the National Disaster Resiliency Competition (described below) as well as longer-term funding strategies. This section of the IRIP analyzes funding sources and discusses a strategic approach to both utilizing identified funds and considering those additional funding opportunities.

A sound approach for funding the City of Moore's infrastructure improvement needs raises several questions:

- Among the many necessary improvement projects, what projects meet CDBG-DR guidelines for funding?
- How does the total cost of those projects compare to available Federal funding already received by the City of Moore
- Are there projects that could compete for possible resiliency grant funding?
- Can the City of Moore apply other sources of funding to the unmet needs?
- What is the estimated cost of the remaining unmet need?

In order to answer these questions and provide the basis of a recommendation, the Assessment Team conducted a funding analysis designed to accomplish the following: (1) Confirm eligibility and identified sources of funding (CDBG-DR and other funding), (2) Relate costs to available amounts of funding, and (3) Determine the resulting unmet needs.

7.1. Guidelines

To be eligible for CDBG-DR funding, a project and its underlying activities must connect to the impact that the covered disaster had on the area and demonstrate that it will contribute to the community's recovery. Because CDBG-DR can only fund projects that are directly related to the effects of the disaster, the connection between the project and community recovery must be documented. This documentation needs to demonstrate an explicit connection and/or result from third party damage assessments and reporting. Forms of documentation include, but are not limited to, time-stamped photographs, certified appraisals, and post-disaster economic or housing market impact assessments such as this IRIP.

Project eligibility also hinges on being able to meet one of the three major national objectives under the CDBG program. The national objectives are: (1) Benefiting Low and Moderate Income Persons, (2) Preventing or Eliminating Slums and Blight, and (3) Meeting Urgent Needs. This analysis necessarily included an evaluation of whether each project met one or more of the national objectives.

Another increasingly important consideration of the CDBG-DR program is the topic of resiliency. Resiliency is the capacity for a community to survive a disaster and return to normal quickly, with minimal damage to their economic, social and physical infrastructure. It is a holistic approach that considers how various systems work together to strengthen the fabric of the community. Each activity, in and of itself, is not a resilient strategy. It is multiple activities that leverage and strengthen each other's functions that make for a resiliency strategy. The CDBG-DR program encourages grantees to consider how their projects work together and coalesce around a strategy to create places that can better withstand the onslaught of natural disasters. The analysis took into account how projects and their activities could be interlinked to promote resiliency.

As indicated above, the City is also considering an application for additional Federal funding under the National Disaster Resiliency Competition (NRDC). This competition seeks to allocate nearly $1 Billion to eligible grantees around the country. All grantees have been recipients of CDBG-DR funds for disasters occurring in 2011, 2012 and 2013. The premise of the competition is to encourage communities to not only recover faster, but to prepare in such a way that they avoid disaster losses. Proposals must tie-back to the declared disaster and demonstrate how they will reduce future risks and advance broader community development goals.

7.2. Analysis

The Assessment Team applied CDBG-DR program funding guidelines and the resiliency factors described above to a listing of potential projects completed in the earlier phase of this study. The Project Listing features 47 groupings of projects with sub-projects or activities (the term activities is used in this analysis because it better conforms to the CDBG-DR guidelines explained above) using the seven Infrastructure Categories: Streets, Sidewalks, Sanitary Sewer, Environmental Degradation, Water Distribution, Bikeways/Trails, and Gateway/Streetscape. The analysis examined 158 project activities estimated to cost $162 Million.

To perform the analysis, the Assessment Team took two passes through the Project Listing:

Pass #1 – Confirmed Eligibility

Using a description of the activities, this filter first determined that each potential activity responds to the effects of the disaster, is located in the disaster impacted area, and otherwise is an eligible use of CDBG funding. Both a map of the disaster area and Google Satellite Images were referenced along with a list of eligible activities. The Assessment Team then evaluated what benefit an activity would provide to the effected neighborhood(s). Would the activity only respond to an urgent need created by the disaster or would it also benefit low- and moderate-income residents? Referencing a LMI Benefit Area Map, the Assessment Team noted those activities that would satisfy the primary national objective of the CDBG

program, that is, benefiting LMI persons. As eligibility was confirmed, the Assessment Team also considered appropriate sources of funding (i.e., CDBG-DR versus other funding).

Pass # 2 – Related to Available Funding

The second filter examined the activity cost, its place in a grouping of activities or sub-projects, and available amounts of funding to determine what, if any, additional funding sources might be available to finance each project. This part of the analysis was informed by City of Moore Staff indicating a priority or sense of urgency in addressing certain infrastructure needs. Because almost all activities in the first pass appeared to be eligible, the Assessment Team considered the City of Moore's priorities and determined how the most urgent activities could be funded. The Assessment Team reviewed the City of Moore's CDBG-DR Action Plan budget that allocates $3 Million for infrastructure improvements and planning estimates that suggest that at least an additional $15 Million in CDBG-DR could be allocated for a total of $18 Million in available funding. Additionally, the Assessment Team examined other funding sources available to the City, both locally and from the Federal Government, particularly through the NRDC.

Knowing how projects costs relate to available funding begins to identify where gaps exist in available funding for the full range of rebuilding projects. The result of the analysis is a list of projects that can be funded with CDBG-DR and a cost estimate of projects that are still necessary for recovery but for which there is no funding currently available – thus the unmet need to improve infrastructure in the City of Moore.

7.3. Findings

Based on the above analysis, the Assessment Team has determined that all the potential project activities appear to be eligible for funding under the CDBG-DR program. The prioritization of eligible projects enables the City to fund activities in the geographical areas most impacted by the disaster. While this funding approach meets many of the City of Moore's most pressing infrastructure needs, significant unmet needs remain. The assessment's specific findings with respect to the funding analysis include:

1. Potential projects and activities eligibility - Of the 158 activities, all are considered eligible at this time. However, questions were raised regarding 25 activities. The questions arose when examining these activities with respect to such factors as activity scope, cost reasonableness, and duplication of benefit. Special attention was given to whether the proposed activity addressed the goal of rebuilding a disaster-affected area and how much of the scope benefited people of low- and moderate-incomes. Whether the activity's cost would be seen as reasonable – as per comparable activities' cost estimates and per Federal Office of Management and Budget Cost reasonableness standards prompted

questions. The analysts also asked whether the activity could be construed as normal wear and tear, and therefore, would be more appropriately funded from other sources. Upon further review, City of Moore Staff provided sufficient explanations to confirm each activity's apparent eligibility. (A record of this first pass of the analysis appears as Appendix B1, Table B1.9).

2. Availability of funding for priority projects and activities – Twenty-five priority projects consisting of 41 activities propose infrastructure improvements for the most impacted disaster area in a manner that balances attention West of Interstate 35 and East of Interstate 35. The total estimated cost of all projects is just under $20-million. The potential public infrastructure projects include:

   - Five (5) projects serving the Plaza Towers area: improvements to access, traffic circulation and Environmental Degradation
   - Four (4) projects at the Little River Park area: enhancements to the park and improvements to the Environmental Degradation system
   - Two (2) projects in the Kings Manor area: improvements to access and addition of trails along a Environmental Degradation channel
   - Other major projects: reconstruction of S. Eastern Ave., creation of gateway at S.W. 4th and S. Broadway and relocation of a sanitary sewer interceptor at Little River Park (which benefits both the Kings Manor and Plaza Towers neighborhoods).

   As stated earlier, the priority projects were also evaluated with respect to their need, urgency, and benefit. Those projects addressing the most urgent needs were identified for funding from the first CDBG grant allocation of $3-million. Other priority projects were identified for funding from the second allocation of CDBG funding. This aspect of the analysis suggests an order in which all priority projects might be completed. It also takes into account a CDBG-DR program requirement that 50% of the grant allocations must be spent to benefit LMI persons. It was determined that if the City of Moore were to undertake all priority projects, it would cost approximately $20-million. Because the City currently has $18 million available in CDBG-DR funds for these projects, $2-million would have to be reallocated (probably from the housing components) to infrastructure improvements. This means the City of Moore would have to make a substantial amendment to the HUD approved Action Plan as the expected change would be greater than 10% of the total budgeted. (A record of this second pass of the analysis appears as Appendix B1, Table B1.10).

3. Unmet Needs Determination: Despite the likelihood that the most urgent infrastructure projects could be funded presently with available Federal grant funds, the assessment concludes that over $142-million in unmet needs remain. This calculation results from subtracting from the grand total cost of $162-million, the approximately $20-million that would eventually be allocated from CDBG-DR and applying sources of other funding that can be identified at this time. (A record of this part of the analysis appears as Appendix B1, Table B1.11).

   Two additional sources were identified and estimated for planning purposes only:

   - Park Tax Funding - $161,272 that could be applied to Little River Park improvements
   - Road Maintenance - $575,000 that could be apportioned for partial funding of the S. Eastern Ave. reconstruction project

   Identification of the actual amount of additional resources will be necessary in order to perform a required review of potentially duplicative forms of assistance to each project. Per CDBG-DR guidelines, a project cannot receive CDBG-DR dollars if funding is available from another source. This is not to say that a project cannot be partially funded by CDBG-DR; it can. The City of Moore Staff simply need to ensure that if, for example, $100,000 of a $300,000 project is available from another source, the full $300,000 will not be funded out of CDBG-DR; only $200,000 will be allocated. In the context of CDBG-DR, this is termed Duplication of Benefit (DOB).

   The assessment of a DOB will occur at a point-in-time when the City would actually commit CDBG-DR funding to the above projects and would be based on the information available at that time. This portion of the funding analysis, and specifically the estimates used above, do not limit the City's choices nor commit the City to a specific set of actions. Applying the two additional sources of funding simply informs the City of the potential duplicative assistance and enables the City to more accurately identify the unmet need.

   The unmet need calculation is particularly important at this time because it is one of the rating factors of the National Disaster Resiliency Competition. The competition has two phases. In the first phase, applicants will be required to frame an idea for a strategy that they have determined necessary for resilient recovery and that, despite commitment for implementation and leverage, still has unmet need. While only one of the 12 rating factors, the unmet need calculation in this analysis will inform the next step in the application for NDRC.

Because the Assessment Team concludes that significant unmet needs remain, the City is encouraged to make application under the NRDC. This opportunity would not only demonstrate how the City of Moore will reduce future risks and advance broader community development goals, but close part of the gap in funding to restore the City of Moore's public infrastructure throughout the Study Area. The City is also urged to continue to identify and use other sources of funding similar to the additional sources noted above.

A longer-term strategy, however, will be necessary to incrementally fund infrastructure improvements into the future. A thoughtful plan of capital improvements or Capital Improvements Plan (CIP) is also recommended. The CIP could favor consideration of other projects that do not receive priority attention under the CDBG-DR program or other funding sources but would contribute to the City of Moore's overall economic recovery in years to come. Therefore, the funding approach offered by this study combines careful use of existing CDBG-DR funding, selective application of additional sources of funding and incremental approval of CIP projects to build back the City of Moore better and stronger.

8.0 Implementation Schedule

8.1. Schedule Development

In addition to public infrastructure assessment across the Study Area and the preceding funding analysis, a significant goal of this IRIP is to determine how the resultant public infrastructure projects might be assembled into a logical sequence of activities so as to minimize construction effort as well as associated costs and time to completion. In developing this sequence, or schedule, the Assessment Team has utilized the following guiding principles and assumptions:

1. Project Delivery Method: All public infrastructure projects included within the scope of the Implementation Schedule have been assumed to follow a standard Design-Bid-Build delivery method. As a result, time has been provided in the schedule for all three phases of delivery for each Sub-project. For Sub-projects and Projects which are anticipated to be completed by the City of Moore via existing on-call contracts or agreements (i.e., Bid-Build Delivery Method), it is anticipated that the Bidding Phase will be replaced via quantity estimation and pricing activities as appropriate.

2. Design Team Selection: As it cannot be determined at this time which Sub-Projects and Projects will follow a Design-Bid-Build Delivery Method and which will follow a Bid-Build Delivery Method, provisions have not been included in the schedule for the design team interview and selection process. For specific sub-projects and projects which will be designed and documented through consultant agreement(s), the Assessment

Team would recommend that approximately 2-months be added to the beginning of the earliest Sub-Project Design Phase.

3. Design Rate: The length of the Design Phase for each Sub-project has been approximated based on the associated construction cost-estimate. The Assessment Team has assumed for the purposes of schedule development that the general rate of design is approximately 1-month of design time per $400,000 of construction budget. Fractions of a month have been rounded up to the next whole month. The total length of the Design Phase of each Project is defined as the difference between the end of the latest design activity and the start of the earliest design activity. It is anticipated that some Sub-projects and Projects may be self-performed by the Owner through existing on-call contracts and pricing agreements. As it is not possible to determine at this time which specific Sub-projects and/or Projects will follow this Bid-Build delivery method, associated adjustments in the schedule have not been made.

4. Bid Activities: With the exception of water distribution and sanitary sewer Sub-projects, design schedules have been adjusted so as to make the Bidding Phases of each Sub-project coincide with one another for a given Project. Approximately 6-weeks has been provided in the schedule for the bidding of each Sub-project. The total length of the Bidding Phase of each Project is defined as the difference between the end of the latest bidding activity and the start of the earliest bidding activity.

5. Construction Rate: The length of the Construction Phase for each sub-project has been approximated based on the associated construction cost-estimate. The Assessment Team has assumed for the purposes of schedule development that the general rate of construction is approximately 1-month of construction time per $300,000 of construction budget. Fractions of a month have been rounded up to the next whole month. The total length of the Construction Phase of each Project is defined as the difference between the end of the latest construction activity and the start of the earliest construction activity.

6. Sequence of Construction: For the purposes of schedule development, the desired sequence of construction has been assumed. This sequence includes the following key characteristics:

    a. Construction activities associated with the Sanitary Sewer Infrastructure Category should be completed prior to work on any other Infrastructure Categories within a given Assessment Sub-Area.

b. Construction activities associated with the Water Distribution Infrastructure Category should start at the completion of construction activities associated with the Sanitary Sewer Infrastructure Category within a given Assessment Sub-Area

c. Construction activities associated with Environmental Degradation, Streets, Sidewalks, and Trails Infrastructure Categories should precede construction activities associated with the Water Distribution Infrastructure Category by approximately 1-month. This overlap provides time in the schedule for preliminary site clearing activities to start in advance of water line installation.

d. Construction activities associated with Gateway and Streetscape improvements should occur subsequent to construct activities associated with all other Infrastructure Categories within a given Assessment Sub-Area. This guiding principle will help to preclude damage to landscaping, decorative paving, and other similar items installed as part of Gateway and Streetscape Projects.

7. Assessment Zone Considerations: To the degree possible, schedule development should preclude significant construction activities occurring simultaneously in more than one Assessment Sub-Area within a given Assessment Zone. This guiding principle will help to minimize disruptions to citizens within the area, as well as ensure adequate emergency vehicle access for the duration of the schedule.

8. Other Geographic Considerations: In addition to attempting to preclude significant construction activities occurring simultaneously in two separate Assessment Sub-Areas within a given Assessment Zone, projects should also be sequenced so that work within each Assessment Zone begins with sub-surface utility work near the center of the Assessment Zone and finishes with Gateway and Streetscape improvements at the perimeter. Using this approach, arterial roadway construction and other similar projects should generally occur near the end of the schedule.

In addition to the preceding principles and assumptions, there is also a facet of schedule development that is effected by *priority*. While the Assessment Team has made every effort to identify where public improvements may be most and least warranted (i.e., via the IRI of each Infrastructure Category), it is anticipated that project priorities will ultimately be established by the City of Moore subsequent to acceptance of the IRIP. As it is difficult to anticipate at this point what these priorities might be, the Assessment Team has allowed the Aggregate IRI of each Assessment Sub-Area to generally guide schedule development. In other words, Projects occurring within an Assessment Sub-Area having a larger Aggregate IRI should generally precede projects occurring within an Assessment Sub-Area having a lower Aggregate IRI.

8.2. Schedule Highlights

Based on the guiding principles and assumptions presented above, a Gantt Chart of the proposed Implementation Schedule has been developed by the Assessment Team and is provided at Appendix F. Highlights relative to major Assessment Zones include the following:

1. Plaza Towers: Public Infrastructure Projects within the Plaza Towers Assessment Zone occur near the front of the Implementation Schedule. In general, these improvements begin with Environmental Degradation improvements associated with Project 038 in September 2015 and end with reconstruction of public infrastructure within Assessment Sub-Area PT5 (Project 011) in September 2018. Work in the Plaza Towers Assessment Zone is indicated to start with Assessment Sub-Area PT3, followed in order by PT2, PT4, and PT5.

2. King's Manor: In an attempt to sequence construction appropriately, the proposed Implementation Schedule attempts to stagger projects from those occurring in the Plaza Towers Assessment Zone. While these are in fact separate districts within the Study Area, they are relatively close to one another in geographic terms. As a result, public improvement projects in the King's Manor Assessment Zone have been proposed subsequent to the completion of construction activities within Assessment Sub-Area PT4 in August 2017. As indicated by the proposed Implementation Schedule, work within the King's Manor Assessment Zone begins with Assessment Sub-Area KM2 (Project 017) in September 2017 and subsequently moves to Assessment Sub-Area KM3 (Project 019) in May 2018. Work in the King's Manor Assessment Zone is indicated to be complete in November 2018.

3. J.D. Estates: Within the J.D. Estates Assessment Zone, the Implementation Schedule indicates for work to begin within Assessment Sub-Area EJ5 (Project 026). As indicated by the schedule, significant work within EJ5 is proposed to occur from November 2016 to July 2018. Public Infrastructure Projects in Assessment Sub-Areas EJ2 (Project 013) are proposed to begin subsequent to this date in September 2018. Of critical importance will be the completion of Project 031, which is replacement of a significant Environmental Degradation structure near the intersection of S.E. 4th Street and Bryant Avenue. As indicated by the proposed Implementation Schedule, this work is shown to complete in September 2018, immediately before work in EJ2 begins. Work in the J.D. Estate Assessment Zone is shown to finish with Assessment Sub-Area EJ6 (Project 032 and 033). Work in the noted Assessment Sub-Area is proposed to occur October 2018 to February 2019.

4. Baer's Westmoore: Work with Assessment Sub-Area BW2 (Project 001) has been moved towards the front of the Implementation Schedule. While this Assessment Sub-Area received a somewhat lower Aggregate IRI, completion of Gateway and Streetscape work near the entrances into Assessment Sub-Area BW2 (Project 002) has been identified as a priority by the City of Moore. As work associated with Project 001 should ultimately precede work associated with Project 002, Project 001 has been moved towards the front of the Implementation Schedule. As indicated by the Implementation Schedule, work across the Baer's Westmoore Assessment Zone is proposed to begin in May 2015 with Project 001 and end in March 2017 with Project 002.

5. Little River: Based on comments from the City of Moore, public infrastructure improvements within the Little River Assessment Zone (Project 020) have been moved towards the front of the Implementation Schedule. As indicated on the schedule, work within the Assessment Sub-Area is proposed to begin December 2015 with Project 046 and end with Project 020 in July 2016. The position of this work within the overall Implementation Schedule has been selected so as to occur near the beginning of construction activities in the Plaza Towers Assessment Zone. As the over-arching goal would be to have improvements within the Little River Assessment Zone completed prior to the start of significant construction activities within the King's Manor Assessment Zone (Project 017, September 2017), improvements to Little Park may be moved back slightly without any detriment to the overall schedule.

6. Southmoore: Almost all public infrastructure projects occurring within the Southmoore Assessment Zone occur in Assessment Sub-Area SM2. While the noted Assessment Sub-Area received significant damage, improvements to public infrastructure in the area has only minor implications to work across the remainder of the Study Area. As a result, improvements within Assessment Sub-Area SM2 can be positioned almost anywhere within the overall Implementation Schedule. As the Aggregate IRI for the subject Assessment Sub-Area was high relative to several other Assessment Sub-Areas in the Study Area, public improvements within Assessment Sub-Area SM2 (Project 035) have been moved towards the front of the Implementation Schedule. As indicated on the schedule, significant construction activities within the Assessment Sub-Area are proposed to occur from June 2016 to February 2017.

7. Broadway: As construction of Central Moore Park is currently underway, the timely completion of improvements in the Broadway Assessment Zone will ultimately be critical. Project 037 represents key elements in establishing adequate vehicular and pedestrian access to this new facility. As a result, the noted Project has been moved towards the front of the proposed Implementation Schedule. Construction activities for the noted Project are indicated to occur from April to May of 2015. Construction of a significant gateway

at S.E. 4th Street and Broadway Avenue is currently scheduled from March 2017 to June 2017, subsequent to completion of construction activities within the Southmoore Assessment Zone and following the anticipated opening of the new community center and park.

As also noted in the Implementation Schedule, construction activities associated with proposed arterial roadway projects occur near the end of the schedule. These projects have been sequenced in series so as to avoid construction activities occurring across multiple arterial roadway corridors at the same time. Project 040 (S.E. 4th Street, South Bryant Avenue to South Eastern Avenue) appears near the front of this subset of Projects with construction activities occurring March 2019 to June 2020. Construction activities associated with Project 041 (S.E. 4th Street, South Eastern Avenue to South Telephone Road) start subsequently in July 2020 and end in April 2021. Projects 042 (S.E. 4th Street, South Telephone Road to South Santa Fe Avenue) and 043 (South Eastern Avenue, S.E. 4th Street to South 19th Street) follow suit and end construction in July 2022 and May 2023, respectively.

8.3. Schedule Summary

As the Implementation Schedule suggests, the Assessment Team anticipates that the completion of all proposed public infrastructure projects across the Study Area may require as much as 97-months. Assuming a start date of May 2015, final construction activities would likely end sometime near May 2023. Of critical importance will be schedule requirements associated with CDBG-DR funds received by the City of Moore from HUD. These requirements stipulate that funds must be utilized within 5-years of the date they are granted. Using the Allocation No. 1 date of August 2013, this requirement indicates that all portions of the CDBG-DR funds allocated to public infrastructure must be utilized no later than August 2018 unless an extension is requested from HUD by the City of Moore and subsequently granted.

Based on the developed cost-estimates and Implementation Schedule, the Assessment Team anticipates that approximately $83-million in eligible public infrastructure project may be capable of being completed prior to the August 2018 deadline. The remaining $77.1-million in public infrastructure projects would likely be completed after this date, and as a result, would necessitate alternate financing and/or a request for schedule extension from the Department of Housing and Urban Development. While this suggests no issues in terms of implementation, of the 41 sub-projects, or activites, identified for CDBG-DR funding, construction of each of the following sub-projects is currently shown to end after the August 2018 deadline:

Table 8A

Project Number	Sub-Project ID	Infrastructure Category	Scope Description	Anticipated Completion Date
013	9609	Environmental Degradation	EJ2: Environmental Degradation improvements @ SE 8th and Patterson Drive	September 2018
021	10025	Gateway/Streetscape	Gateway: S. Telephone Rd. & SW 11th St.	March 2019
028	50855	Environmental Degradation	BA2: channel maintenance and improvements, east side of S Bryant Ave	April 2019
029	12891	Bikeway/Trail	BA2: 10-ft multi-use trail, Veteran's Park to Main Street	April 2019
030	10012	Environmental Degradation	MH1: Environmental Degradation channel improvements, east of Hunter's Glenn area	April 2021
031	50854	Bikeway/Trail	N4D: 10-ft multi-use trail, south side of SE 4th Street	September 2018
040	10408	Gateway/Streetscape	N4C: pedestrian crossing with gateway at Highland East Junior High	May 2019
043	53607	Street	EA1: reconstruction of S. Eastern Avenue	May 2023
044	10405	Street	TP1: signalization at SW 17th Street and Telephone Road	December 2018
045	10805	Street	WT1: mill and overlay, SW 11th Street from South Service Road to Telephone Road	December 2018

Adhering to CDBG-DR Guidelines will require an adjustment in priorities on the part of City of Moore Staff, or a formal request for extension from HUD in order to complete the above noted projects with CDBG-DR Funds.

9.0 Recommendations

In summary, the Assessment Team would like to provide the following formal recommendations to the City of Moore:

1. Establishment of Priorities: While the presented public infrastructure assessment, funding analysis, and implementation schedule are all intended to inform the establishment of priorities for the City of Moore, the

Assessment Team anticipates that final priorities will ultimately be the product of policies and guidelines established by the City of Moore Staff as well as Moore City Council. As these priorities will ultimately drive both funding decisions and project schedules, the Assessment Team recommends that these priorities be clearly identified and documented as soon as possible. Further, the Assessment Team would recommend that the priorities be as specific as possible. While this require additional effort on the part of the City of Moore, it will likely enable City of Moore Staff to get projects into design and construction stages as efficiently as possible, thereby increasing the rate at which recovery can occur across the Study Area.

2. Zones of Focus: While there are several portions of the Study Area in need of public infrastructure work, the Assessment Team recommends that the City of Moore focus recovery activities within the Plaza Towers, King's Manor, and J.D. Estates Assessment Zones. Based on all field review and subsequent documentation and analysis, it appears that these areas were among the most impacted from the May 20, 2013 Tornado. Completing improvements to public infrastructure in these Assessment Zones will help to ensure that recovery across the central portion of the Study Area occurs as quickly as possible. Further, the Assessment Team anticipates that improvements in these key areas will also serve to encourage current residents and citizens, as well as potential property owners, that recovery within the City of Moore is occurring in a deliberate and tangible way.

3. Categories of Infrastructure Focus: With the exception of water distribution and sanitary sewer infrastructure in the west half of the study area, the Assessment Team recommends that focus be placed primarily on the following Infrastructure Categories: Environmental Degradation, Streets, Sidewalks, Trails, and Gateway/Streetscape. These Infrastructure Categories are anticipated to have the biggest impact on community aesthetic, as well as quality of life for residents within the Study Area. As a result, focused efforts within these Infrastructure Categories will likely pay the largest dividends in terms of perceptible improvements to the Study Area that current citizens and business owners can appreciate and associate with.

4. Use of Visual Preference Survey: The Assessment Team recommends that results from the Visual Preference Survey be utilized to guide public infrastructure improvements across the Study Area. This study has identified public aesthetic preferences for various Infrastructure Categories including Sidewalks, Bikeways/Trails, Gateways/Streetscapes, and Environmental Degradation. When developing specific public infrastructure project scopes, the City of Moore should utilize these findings to guide design decisions such as types of materials, form, and overall appearance.

5. Walkability Audit: The Walkability Audit completed by the Assessment Team has identified that sub-standard pedestrian access, specifically as it relates to ADA design guidelines, exists within both the Plaza Towers and J.D. Estates Assessment Zones. For the J.D. Estates Assessment Zone, Veteran's Park and Highland East Junior High School represent primary destinations for a large amount of pedestrian traffic. Within the Plaza Towers Assessment Zone, Little River Park and Plaza Towers Elementary School represent analogous destinations. As a result of these significant pedestrian destinations, the Assessment Team recommends that focused effort be applied to sidewalk infrastructure within each of the noted Assessment Zones. Further, the Assessment Team recommends that this effort be applied in a specific and deliberate manner so as to establish safe, accessible pedestrian connectivity to each of the noted destinations.

6. Environmental Degradation Master Plan: As the City of Moore is currently in the process of completing a Environmental Degradation Master Plan (City of Moore RFP #1415-005), it will be important that public Environmental Degradation improvements stemming from this IRIP and CDBG-DR funds be designed and constructed in consideration of studies and analysis completed by the Environmental Degradation Master Plan consultant team. Detailed hydrologic and hydraulic analyses were considered outside the scope of this IRIP. As a result, the Environmental Degradation Master Plan should be utilized to further refine improvements proposed to the Environmental Degradation Infrastructure Category by the Assessment Team.

7. NRDC Application: As the preceding cost-estimates and funding analysis indicate, the Assessment Team anticipates that there are currently far more necessary public infrastructure projects within the Study Area than can be funded by current allocations for public infrastructure within the CDBG-DR Program. As a result, it will be necessary for the City of Moore to secure additional funding for projects identified within this IRIP which are currently noted as unfunded. Given the $142-million in unmet need previously identified, the Assessment Team recommends that the City of Moore be as aggressive as possible in pursuit of NDRC funds. This pursuit should be deliberate and should include sub-projects and projects which offer compelling examples of how the City of Moore intends to integrate resiliency as a part of its recovery from the May 20, 2013 Tornado. The Assessment Team suggests that Streets and Environmental Degradation be Infrastructure Categories of focus in applying for NDRC funds.

8. Capital Improvement Program: As funding levels through the NDRC cannot be guaranteed, the Assessment Team also recommends that the City of Moore undertake a long-term Capital Improvement Program to help in the complete recovery of public infrastructure throughout the Study Area. This CIP should be broad

enough in scope to capture all Infrastructure Categories considered as a part of the IRIP and should also be considered across a time frame which provides a reasonable length of time to complete all necessary projects. Based on information developed as a part of this IRIP, it appears that such a CIP might involve the financing of up to $142-million in public infrastructure projects, the majority of which could be carried out in approximately 8-years.

Without doubt, full and complete recovery from the May 20, 2013 Tornado will be a process that will likely take the City of Moore several years to navigate. The Assessment Team sincerely believes that by following the recommendations above, a significant step in the right direction can occur. Refinement in this plan will undoubtedly be necessary as the City of Moore continues to rebuild public infrastructure throughout the Study Area. Continued diligence will be required on the part of City of Moore Staff, as well as design teams involved in the rebuilding process, to ensure improvements to public infrastructure throughout the Study Area are designed and constructed in a thoughtful, coordinated manner.

Appendix A1

Potential enhancements to an existing intersection of 50' ROWs include the construction of a roundabout with an exterior curb diameter of 84 feet and an interior curb diameter of 40' Decorative color concrete paving helps define vehicular circluation and interior landscape creates a focal feature. Accessible curb ramps and striped crosswalks improve pedestrian crossing safety. Street trees, decorative light fixtures and traffic signs add to the aesthetics of the intersection.

Potential enhancements to an existing intersection of 50' ROWs include the construction of a mini traffic circle with curb diameter of 17 feet. A 4 foot decorative concrete edge on the traffic circle allows for larger vehicles to traverse the interior curb in needed. Accessible curb ramps and decorative color concrete crosswalks improve pedestrian crossing safety. Street trees, decorative light fixtures and traffic signs add to the aesthetics of the intersection.

Potential enhancements to an existing intersection of 50' ROWs include accessbile curb ramps and striped crosswalks that improve pedestrian safety. Street trees, decorative light fixtures and traffic signs add to the aesthetics of the intersection.

Potential streetscape enhancements to existing 50' ROWs that are used as a neighborhood collector streets include a dedicated 5' wide on-street bike lane and generous 6' sidewalks on both sides of the street that allow two pedestrians to walk side by side comfortably. On-street parking with landscape islands on one side of the street allow for sufficient travel lanes for two way traffic. Street trees in landscape islands and a 5' tree lawn along with large and small scale decorative light fixtures with banners define the street and help slow traffic to help improve pedestrian safety.

Potential streetscape enhancements to existing 50' ROW includes constructing stormwater bioretention swales in the space between the curb and sidewalk. 5 feet wide sidewalks on both sides of the street allow two pedestrians to walk side by side comfortably. Street trees and decorative light fixtures define the street and help slow traffic.

Potential streetscape enhancements to existing 50' ROW includes 5 feet wide sidewalks on both sides of the street allow two pedestrians to walk side by side comfortably. Street trees in a 5 feet tree lawn and decorative light fixtures define the street and help slow traffic. On-street parking on one side of the street still allows for 2-way traffic.

Name of Attachment: Attachment H: Crosswalk Checklist

Name of Applicant: City of Moore, Ok

Name of File that Contains the Attachment: MooreAtt6

Appendix J: CDBG-RDR Crosswalk Checklist (Table of Contents)

Applicant Name: City of Moore, OK

Primary Responsible Agency: Moore

Competition Phase: Phase 1

Exhibit	PHASE 1	Document/filename	Page
	Crosswalk Checklist/ Table of Contents	MooreAtt6	1-3
A	Executive Summary	MooreExhibitB	2-3
B	Threshold Narrative	MooreExhibitB	5-9
	General Section	MooreExhibitB	5
	Eligible Applicant	MooreExhibitB	5
	Eligible County	MooreExhibitB	5
	Most Impacted and Distressed Target Area	MooreExhibitB	5-6
	Eligible Activity	MooreExhibitB	6-7
	Proposal Incorporates Resilience	MooreExhibitB	7-8
	National Objective	MooreExhibitB	8
	Overall Benefit	MooreExhibitB	8
	Tie-back	MooreExhibitB	8
	Certifications	MooreAtt3	1-9
C	Factor 1- Capacity	MooreExhibitC	10-19
D	Factor 2 – Need / Extent of	MooreExhibitD	20-28
	Subfactor:Unmet needs	MooreExhibitD	21-22
	Subfactor: Most Impacted	MooreExhibitD	22-28
E	Factor 3 – Soundness of Approach	MooreExhibitE	29-40
	Subfactor: Stakeholder consultation	MooreExhibitE	30-33
	Subfactor: Idea and co-benefits	MooreExhibitE	33-37
	Subfactor: Addresses vulnerable populations	MooreExhibitE	37-40

F	Factor 4 – Leverage and outcomes	MooreExhibitF	41-45
G	Factor 5- Long-Term Commitment	MooreExhibitG	46-47
No page limit	Partner Documentation for Each Partner	MooreAtt1	1-16
	Leverage Documentation	MooreAtt2	1-4
	Consultation Summary	MooreAtt4	1-8
	Optional Maps, Drawings, Renderings	MooreAtt5	1-91
	Waiver Requests	n/a	n/a
	Crosswalk Checklist	MooreAtt6	1-3
	SF-424	MooreAtt7	1-9
	Comment Summary by Topic, List of Comments, and Applicant Response	MooreAtt8	1-7

Name of Attachment: Attachment I: Standard Forms

Name of Applicant: City of Moore, Ok

Name of File that Contains the Attachment: MooreAtt7

OMB Number: 4040-0004
Expiration Date: 8/31/2016

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received:

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: City of Moore

* b. Employer/Taxpayer Identification Number (EIN/TIN): 73-6005334

* c. Organizational DUNS: 0550991880000

d. Address:

* Street1: 301 N. Broadway Avenue

Street2:

* City: Moore

County/Parish:

* State: OK: Oklahoma

Province:

* Country: USA: UNITED STATES

* Zip / Postal Code: 73160-5103

e. Organizational Unit:

Department Name: Management

Division Name: Resiliency

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Mr.

* First Name: Jared

Middle Name:

* Last Name: Jakubowski

Suffix:

Title: Grants Manager

Organizational Affiliation:

* Telephone Number: 405-793-4571

Fax Number: 405-793-5057

* Email: jjakubowski@cityofmoore.com

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

C: City or Township Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

U.S. Department of Housing and Urban Development

11. Catalog of Federal Domestic Assistance Number:

14.272

CFDA Title:

National Resilient Disaster Recovery Competition

*** 12. Funding Opportunity Number:**

FR-5800-N-29

* Title:

National Disaster Resilience Competition

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Moore, Oklahoma National Disaster Resilience Competition Application

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: OK-4 | * b. Program/Project: OK-4

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 01/01/2016 | * b. End Date: 01/20/2019

18. Estimated Funding ($):

* a. Federal	50,000,000.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	300,000.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	50,300,000.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: Mr. | * First Name: Glenn

Middle Name:

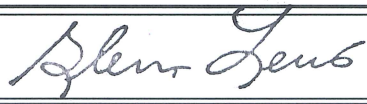
* Last Name: Lewis

Suffix:

* Title: Mayor

* Telephone Number: 405-793-5200 | Fax Number: 405-793-5107

* Email: jjakubowski@cityofmoore.com

* Signature of Authorized Representative:  | * Date Signed: 03/16/2015

DISCLOSURE OF LOBBYING ACTIVITIES

Approved by OMB
0348-0046

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure.)

1. Type of Federal Action:
[b] a. contract
b. grant
c. cooperative agreement
d. loan
e. loan guarantee
f. loan insurance

2. Status of Federal Action:
[a] a. bid/offer/application
b. initial award
c. post-award

3. Report Type:
[a] a. initial filing
b. material change
For Material Change Only:
year _____ quarter _____
date of last report _____

4. Name and Address of Reporting Entity:
[x] **Prime** [ ] **Subawardee**
Tier _____, *if known*:

Congressional District, *if known*: OK-4

5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime:

Congressional District, *if known*:

6. Federal Department/Agency:
U.S. Department of Housing and Urban Development

7. Federal Program Name/Description:
National Resilient Disaster Recovery Competition
CFDA Number, *if applicable*: 14.272

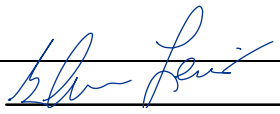
8. Federal Action Number, *if known*:

9. Award Amount, *if known*:
$

10. a. Name and Address of Lobbying Registrant
(*if individual, last name, first name, MI*):

b. Individuals Performing Services (*including address if different from No. 10a*)
(*last name, first name, MI*):

11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Signature: 
Print Name: Glenn Lewis
Title: Mayor
Telephone No.: 405-793-5200 Date: 3/16/2015

Federal Use Only:

Authorized for Local Reproduction
Standard Form LLL (Rev. 7-97)

PRINT

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employeeof a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.

2. Identify the status of the covered Federal action.

3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.

4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.

5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.

6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizationallevel below agency name, if known. For example, Department of Transportation, United States Coast Guard.

7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.

8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."

9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.

10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

    (b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).

11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

Applicant/Recipient Disclosure/Update Report

U.S. Department of Housing and Urban Development

OMB Approval No. 2510-0011 (exp. 12/31/2015)

Instructions. (See Public Reporting Statement and Privacy Act Statement and detailed instructions on page 2.)

Applicant/Recipient Information

Indicate whether this is an Initial Report ☐ **or an Update Report** ☐

1. Applicant/Recipient Name, Address, and Phone (include area code):	2. Social Security Number or Employer ID Number:
City of Moore 301 N. Broadway, Moore, OK 73160 405-793-4571	73-6005334
3. HUD Program Name	**4. Amount of HUD Assistance Requested/Received**
Community Planning & Development, Community Development Block Grant-Disaster Recovery, National Disaster Resilience Competition	

5. State the name and location (street address, City and State) of the project or activity:
Moore, Oklahoma

Part I Threshold Determinations

1. Are you applying for assistance for a specific project or activity? These terms do not include formula grants, such as public housing operating subsidy or CDBG block grants. (For further information see 24 CFR Sec. 4.3).
☐ **Yes** ☐ **No**

2. Have you received or do you expect to receive assistance within the jurisdiction of the Department (HUD) , involving the project or activity in this application, in excess of $200,000 during this fiscal year (Oct. 1 - Sep. 30)? For further information, see 24 CFR Sec. 4.9
☐ **Yes** ☐ **No**.

If you answered "**No**" to either question 1 or 2, **Stop**! You do not need to complete the remainder of this form.
However, you must sign the certification at the end of the report.

Part II Other Government Assistance Provided or Requested / Expected Sources and Use of Funds.

Such assistance includes, but is not limited to, any grant, loan, subsidy, guarantee, insurance, payment, credit, or tax benefit.

Department/State/Local Agency Name and Address	Type of Assistance	Amount Requested/Provided	Expected Uses of the Funds

(**Note**: Use Additional pages if necessary.)

Part III Interested Parties. You must disclose:

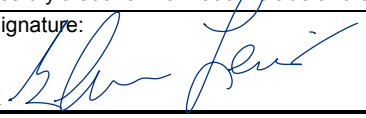
1. All developers, contractors, or consultants involved in the application for the assistance or in the planning, development, or implementation of the project or activity and
2. any other person who has a financial interest in the project or activity for which the assistance is sought that exceeds $50,000 or 10 percent of the assistance (whichever is lower).

Alphabetical list of all persons with a reportable financial interest in the project or activity (For individuals, give the last name first)	Social Security No. or Employee ID No.	Type of Participation in Project/Activity	Financial Interest in Project/Activity ($ and %)
Innovative Emergency Management (IEM)	72-1045884	Application Preparation	$96,734.02

(**Note**: Use Additional pages if necessary.)

Certification

Warning: If you knowingly make a false statement on this form, you may be subject to civil or criminal penalties under Section 1001 of Title 18 of the United States Code. In addition, any person who knowingly and materially violates any required disclosures of information, including intentional non-disclosure, is subject to civil money penalty not to exceed $10,000 for each violation.
I certify that this information is true and complete.

Signature:	Date: (mm/dd/yyyy)
X 	03/16/2015

Public reporting burden for this collection of information is estimated to average 2.0 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. This agency may not conduct or sponsor, and a person is not required to respond to, a collection information unless that collection displays a valid OMB control number.

Privacy Act Statement. Except for Social Security Numbers (SSNs) and Employer Identification Numbers (EINs), the Department of Housing and Urban Development (HUD) is authorized to collect all the information required by this form under section 102 of the Department of Housing and Urban Development Reform Act of 1989, 42 U.S.C. 3531. Disclosure of SSNs and EINs is voluntary. HUD is authorized to collect this information under the Housing and Community Development Act of 1987 42 U.S.C.3543 (a). The SSN or EIN is used as a unique identifier. The information you provide will enable HUD to carry out its responsibilities under Sections 102(b), (c), and (d) of the Department of Housing and Urban Development Reform Act of 1989, Pub. L. 101-235, approved December 15, 1989. These provisions will help ensure greater accountability and integrity in the provision of certain types of assistance administered by HUD. They will also help ensure that HUD assistance for a specific housing project under Section 102(d) is not more than is necessary to make the project feasible after taking account of other government assistance. HUD will make available to the public all applicant disclosure reports for five years in the case of applications for competitive assistance, and for generally three years in the case of other applications. Update reports will be made available along with the disclosure reports, but in no case for a period generally less than three years. All reports, both initial reports and update reports, will be made available in accordance with the Freedom of Information Act (5 U.S.C. §552) and HUD's implementing regulations at 24 CFR Part 15. HUD will use the information in evaluating individual assistance applications and in performing internal administrative analyses to assist in the management of specific HUD programs. The information will also be used in making the determination under Section 102(d) whether HUD assistance for a specific housing project is more than is necessary to make the project feasible after taking account of other government assistance. You must provide all the required information. Failure to provide any required information may delay the processing of your application, and may result in sanctions and penalties, including imposition of the administrative and civil money penalties specified under 24 CFR §4.38.

Note: This form only covers assistance made available by the Department. States and units of general local government that carry out responsibilities under Sections 102(b) and (c) of the Reform Act must develop their own procedures for complying with the Act.

Instructions

Overview.

A. Coverage. You must complete this report if:
(1) You are applying for assistance from HUD for a specific project or activity **and** you have received, or expect to receive, assistance from HUD in excess of $200,000 during the during the fiscal year;
(2) You are updating a prior report as discussed below; or
(3) You are submitting an application for assistance to an entity other than HUD, a State or local government if the application is required by statute or regulation to be submitted to HUD for approval or for any other purpose.

B. Update reports (filed by "Recipients" of HUD Assistance): General. All recipients of covered assistance must submit update reports to the Department to reflect substantial changes to the initial applicant disclosure reports.

Line-by-Line Instructions.

Applicant/Recipient Information.
All applicants for HUD competitive assistance, must complete the information required in blocks 1-5 of form HUD-2880:

1. Enter the full name, address, city, State, zip code, and telephone number (including area code) of the applicant/recipient. Where the applicant/recipient is an individual, the last name, first name, and middle initial must be entered.
2. Entry of the applicant/recipient's SSN or EIN, as appropriate, is optional.
3. Applicants enter the HUD program name under which the assistance is being requested.
4. Applicants enter the amount of HUD assistance that is being requested. Recipients enter the amount of HUD assistance that has been provided and to which the update report relates. The amounts are those stated in the application or award documentation. NOTE: In the case of assistance that is provided pursuant to contract over a period of time (such as project-based assistance under section 8 of the United States Housing Act of 1937), the amount of assistance to be reported includes all amounts that are to be provided over the term of the contract, irrespective of when they are to be received.
5. Applicants enter the name and full address of the project or activity for which the HUD assistance is sought. Recipients enter the name and full address of the HUD-assisted project or activity to which the update report relates. The most appropriate government identifying number must be used (e.g., RFP No.; IFB No.; grant announcement No.; or contract, grant, or loan No.) Include prefixes.

Part I. Threshold Determinations - Applicants Only

Part I contains information to help the applicant determine whether the remainder of the form must be completed. **Recipients filing Update Reports should not complete this Part.**

If the answer to ***either*** questions 1 or 2 is No, the applicant need not complete Parts II and III of the report, but must sign the certification at the end of the form.

Part II. Other Government Assistance and Expected Sources and Uses of Funds.

A. Other Government Assistance. This Part is to be completed by both applicants and recipients for assistance and recipients filing update reports. Applicants and recipients must report any other government assistance involved in the project or activity for which assistance is sought. Applicants and recipients must report any other government assistance involved in the project or activity. Other government assistance is defined in note 4 on the last page. For purposes of this definition, other government assistance is expected to be made available if, based on an assessment of all the circumstances involved, there are reasonable grounds to anticipate that the assistance will be forthcoming.

Both applicant and recipient disclosures must include all other government assistance involved with the HUD assistance, as well as any other government assistance that was made available before the request, but that has continuing vitality at the time of the request. Examples of this latter category include tax credits that provide for a number of years of tax benefits, and grant assistance that continues to benefit the project at the time of the assistance request.

The following information must be provided:

1. Enter the name and address, city, State, and zip code of the government agency making the assistance available.
2. State the type of other government assistance (e.g., loan, grant, loan insurance).
3. Enter the dollar amount of the other government assistance that is, or is expected to be, made available with respect to the project or activities for which the HUD assistance is sought (applicants) or has been provided (recipients).
4. Uses of funds. Each reportable use of funds must clearly identify the purpose to which they are to be put. Reasonable aggregations may be used, such as "total structure" to include a number of structural costs, such as roof, elevators, exterior masonry, etc.

B. Non-Government Assistance. Note that the applicant and recipient disclosure report must specify all expected sources and uses of funds - both from HUD ***and any other source*** - that have been or are to be, made available for the project or activity. Non-government sources of

funds typically include (but are not limited to) foundations and private contributors.

Part III. Interested Parties.

This Part is to be completed by both applicants and recipients filing update reports. Applicants must provide information on:

1. All developers, contractors, or consultants involved in the application for the assistance or in the planning, development, or implementation of the project or activity and
2. any other person who has a financial interest in the project or activity for which the assistance is sought that exceeds $50,000 or 10 percent of the assistance (whichever is lower).
   Note: A financial interest means any financial involvement in the project or activity, including (but not limited to) situations in which an individual or entity has an equity interest in the project or activity, shares in any profit on resale or any distribution of surplus cash or other assets of the project or activity, or receives compensation for any goods or services provided in connection with the project or activity. Residency of an individual in housing for which assistance is being sought is not, by itself, considered a covered financial interest.

The information required below must be provided.

1. Enter the full names and addresses. If the person is an entity, the listing must include the full name and address of the entity as well as the CEO. Please list all names alphabetically.
2. Entry of the Social Security Number (SSN) or Employee Identification Number (EIN), as appropriate, for each person listed is optional.
3. Enter the type of participation in the project or activity for each person listed: i.e., the person's specific role in the project (e.g., contractor, consultant, planner, investor).
4. Enter the financial interest in the project or activity for each person listed. The interest must be expressed both as a dollar amount and as a percentage of the amount of the HUD assistance involved.

Note that if any of the source/use information required by this report has been provided elsewhere in this application package, the applicant need not repeat the information, but need only refer to the form and location to incorporate it into this report. (It is likely that some of the information required by this report has been provided on SF 424A, and on various budget forms accompanying the application.) If this report requires information beyond that provided elsewhere in the application package, the applicant must include in this report all the additional information required.

Recipients must submit an update report for any change in previously disclosed sources and uses of funds as provided in Section I.D.5., above.

Notes:

1. All citations are to 24 CFR Part 4, which was published in the Federal Register. [April 1, 1996, at 63 Fed. Reg. 14448.]
2. Assistance means any contract, grant, loan, cooperative agreement, or other form of assistance, including the insurance or guarantee of a loan or mortgage, that is provided with respect to a specific project or activity under a program administered by the Department. The term does not include contracts, such as procurements contracts, that are subject to the Fed. Acquisition Regulation (FAR) (48 CFR Chapter 1).
3. See 24 CFR §4.9 for detailed guidance on how the threshold is calculated.
4. "Other government assistance" is defined to include any loan, grant, guarantee, insurance, payment, rebate, subsidy, credit, tax benefit, or any other form of direct or indirect assistance from the Federal government (other than that requested from HUD in the application), a State, or a unit of general local government, or any agency or instrumentality thereof, that is, or is expected to be made, available with respect to the project or activities for which the assistance is sought.
5. For the purpose of this form and 24 CFR Part 4, “person” means an individual (including a consultant, lobbyist, or lawyer); corporation; company; association; authority; firm; partnership; society; State, unit of general local government, or other government entity, or agency thereof (including a public housing agency); Indian tribe; and any other organization or group of people.

Name of Attachment: Attachment J: Comment Summary

Name of Applicant: City of Moore, Ok

Name of File that Contains the Attachment: MooreAtt8

The City of Moore Phase 1 application for the National Disaster Resiliency Competition was released for public comment on February 26, 2015. The public comment period for the document ran from February 26, 2015-March 16, 2015. The posting of the application was hosted on the city of website and media advisory was distributed for publication. The City of CDBG Advisory Committee Meeting/Workshop held a workshop on March 5, 2015 at 5:30 pm and a public hearing on March 16, 2015 at 6:30 pm. All meetings were held at The Moore City Hall, 301 N. Broadway. Comments on the application were accepted on the Department's website at the public hearing held on March 16, via email at to Jared Jakubowski, Grants Manager, at (405) 793-4571 or 301 N. Broadway, Moore, Oklahoma, 73160 or email Kahley Gilbert at kgilbert@cityofmoore.com.

There were no comments received by The City of Moore concerning the Phase 1 application. For more information on the public comments received on the Phase 1 application or, contact Jared Jakubowski, Grants Manager, at (405) 793-4571 or 301 N. Broadway, Moore, Oklahoma, 73160 or email at jjakubowski@cityofmoore.com. Attached is a copy of the public hearing announcement and minutes from the community Development Block Grant Advisory Committee.

PUBLIC NOTICE

Public Hearing for the National Disaster Resiliency Competition (NDRC) Application

CDBG Advisory Committee Meeting/Workshop: March 5, 2015 at 5:30 pm, Moore City Hall, 301 N. Broadway.
Public Hearing: March 16, 2015 at 6:30pm, Moore City Hall, 301 N. Broadway

The City of Moore is an eligible applicant for the National Disaster Resiliency Competition. Eligible applicants are those who received Community Development Block Grant Disaster Recovery (CDBG-DR) funds under the 2011-2013 Presidentially Declared Disasters.

The City of Moore has scheduled a Community-Wide public hearing to obtain citizen input and explain the NDRC Application and process.

The Public Hearing is open to all residents of Moore and any persons or organizations desiring to speak on this matter will be afforded an opportunity to be heard. The City of Moore encourages participation from all its citizens. If participation at any public hearing is not possible due to a disability (such as a hearing or speech disability) or language barrier, notification to the City Clerk at least forty-eight (48) hours prior to the scheduled public hearing is encouraged to allow the City to make the necessary accommodations.

Any questions or comments regarding the CDBG Program or NDRC Application may be directed to Jared Jakubowski, Grants Manager, at (405) 793-4571 or 301 N. Broadway, Moore, Oklahoma, 73160 or email Kahley Gilbert at kgilbert@cityofmoore.com.

This notice is posted at the following locations: Moore City Hall, 301 N. Broadway; Moore Public Library, 225 S. Howard; Moore Senior Center, 501 E. Main; and www.cityofmoore.com.

Publish Date: Thursday, February 26, 2015

MINUTES OF THE
COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)
ADVISORY COMMITTEE WORKSHOP
March 5, 2015

The Community Development Block Grant Advisory Committee of the City of Moore, Oklahoma held a workshop on March 5, 2015 in the City Manager's Conference Room, Moore City Hall, 301 North Broadway, Moore, Oklahoma.

Agenda Item No. 1: ROLL CALL

Jared Jakubowski, Grants Manager, started the workshop by introducing Todd Jenson, Assistant City Manager.
Todd Jenson thanks the committee for their time serving on the CDBG Advisory Committee.

Present:	Louie Williams	Joe Ann Randall	Mark Hamm
	Nick Shiplett	Leslie Van Buskirk	
Absent:	Robert Krows	Jeff Peters	Sheila Tillery
	Sjonna Paulson	Damon Smuzynski	Kelley Mattocks
	Ralph Sherrard	Janie Milum	

Staff: Todd Jenson, Assistant City Manager; Elizabeth Jones, Community Development Director; Jared Jakubowski, Grants Manager; Kahley Gilbert, Recording Secretary

Agenda Item No. 2: INFRASTRUCTURE RECOVERY AND IMPLEMENTATION PLAN (IRIP) OVERVIEW

Elizabeth Jones explains that the Infrastructure Recovery and Implementation Plan (IRIP) is our scientific approach in identifying the City's needs for infrastructure repair, which is also a HUD requirement. Ms. Jones explains the methodology behind the IRIP. The disaster area was broken down into 77 subareas that were given a classification code. Survey crews looked at every street, looked at every sewer inlet, etc. and these categories were created: streets, sidewalks, water lines, sewer lines, drainage, gateways, trails, and opportunity. Each subarea was given an infrastructure rating index for each category. The category opportunity gives city staff and stakeholders a chance to evaluate and give historical information about a specific subarea that may need to be included in the infrastructure rating index.
The plan has grouped together projects within subareas that will include not just one of the categories but multiple ones such as streets with water and sewer lines. One project may address three or four categories instead of each category for one area being one project.
The prioritization and distribution of funds tasks are almost complete. There is only $18 million allocated for infrastructure with $155 million in projects identified, so some projects will need to be prioritized.
City staff would like the advisory committee's input on the distribution of the funds to make sure each area

of the disaster is benefited. An assessment of the total homes lost has been done, and staff found that of the total number of homes destroyed in the tornado, 65% were west of the interstate and 35% were east of the interstate. Staff proposes that funds be distributed to reflect the number of homes destroyed, 65% of funds be used on the west side and 35% of funds be used on the east side.
City plans to replace water lines with every street replacement. Staff has determined the order of priority to be as follows: 1. Streets, water lines, and sewer lines, 2. Storm drainage, 3. Trails. 4. Sidewalks, 5. Gateways.
Staff had a meeting to go over funding eligibility for all projects identified in the IRIP. All projects identified are eligible.
The public hearing for citizens to post comments and questions on the IRIP will be April 6, 2015 at the city council meeting.
Ms. Jones would like input of the committee on the recommendation from staff on the distribution of funds and the priority ranking for each infrastructure category.
Nick Shiplett asks what trails are. Ms. Jones explained trails are amenities to neighborhoods, they are planned for Little River Park and along the lake in the Foxglove Addition. They are usually about 10 foot wide concrete trails for biking, walking, roller blading.
Mark Hamm asks if this funding is including both the first and second rounds. Ms. Jones and Mr. Jakubowski both replied yes. Ms. Jones explained that if there is any funding left from other funding categories such as administration, planning, housing, those funds can be re-allocated to infrastructure in the committee, along with city council, agrees to do that with left over funds.
Louie Williams asks about Gateways. He would like to know the vision of staff and what all gateways will include. Ms. Jones explains that new gateways for older neighborhoods have been built after past tornados. Gateways are a way to brand a neighborhood and give them a sense of community. Gateways are the lowest priority on the list. Staff and Cardinal Engineering have been working on making the Plaza Towers Elementary school the focal point of that neighborhood. Staff is planning on doing some streetscaping along SW 11th Street and Eagle Drive close to the school and will hopefully help brand the neighborhood.
Mark Hamm asks about the branding of neighborhoods. Who is deciding what that brand is going to be? A visual preference survey was available for residents to participate for four weeks. The questions were centered on neighborhood amenities such as gateways. Each participant chose the neighborhood they associate with so we can break the answers down by neighborhood to get what is truly important for each particular neighborhood. Questions asked if they like rock or brink neighborhood signs or landscaping along the street or at crosswalks. Staff was able to get a good feel of what residents really want.
Mark Hamm recommends decorative lighting to dress up neighborhoods and help give it an identity. Ms. Jones states that in the survey results showed that decorative lighting, landscaping, and sidewalks were residents' top priorities.
Ms. Jones asks how the committee feels about the distribution of the funds. Ms. Buskirk asks if the percentages were statistically determined. Ms. Jones replied yes.
Louie Williams asks if the percentages were based on the amount of actual houses destroyed or the amount of monetary damages each side received. Mr. Jakubowski replied it is based on the number of rooftops destroyed on each side.
Ms. Buskirk asks if neighborhoods could fund neighborhood signs on their own. Ms. Jones states that the boundary for neighborhood signs would be nothing on the north side of 4th street. The neighborhoods on the north side of 4th street do not meet the requirements of a HUD grant. The neighborhoods that do not have homeowner associations will be the target neighborhoods for these projects.
Mr. Williams states that residents will want to see visual projects. He knows water and sewer lines and street replacements are necessary but residents will want to see actual visible projects. Ms. Jones says

that some street replacement will include streetscape.
Committee agrees with the funding distribution and the ranking of the priorities.
The final plan will be presented to the committee before going to council on April 6.

Agenda Item No. 3 NATIONAL DISASTER RESILIENCY COMPETITION GRANT

Mr. Jakubowski explains how HUD came up with the National Disaster Resiliency Competition. Instead of HUD giving a third round of funding to cities for unmet needs they decided to hold a competition based on making your city more resilient for future disasters. Government entities that received CDBG_DR funds from the Sandy allocations are eligible to apply, Moore is one of eleven cities that are eligible. It is a two phase competition. The phase I application is due March 27, 2015 and will have a 60 day review period and an announcement will be made for those who have made it to phase II will be made in June or July. Phase I will focus on the big idea and the overall picture without any specific projects. Phase II will consist of specific projects and implementation plan to help the overall picture become a reality. This funding will still have the time limits as the CDBG-DR funds, all funds must be expended by September of 2019. HUD will be focused on five factors. Number one is capacity. The University of Oklahoma has partnered with the City of Moore and will be conducting all the science and date needed to support the application. The City of Oklahoma City and the Water Resource Board are also partners. Number two is the needs and the extent of the problems. The focus should be on future risks and vulnerabilities when it comes to future disasters based on the last disaster. The third factor is the soundness of the approach. The fourth factor is leveraging and outcomes. What sort of leveraging dollars does the City have to make this approach successful? The City of Oklahoma City will be putting in $50,000, the City of Moore will have around $260,000, and the University of Oklahoma has not committed anything yet, but if we are invited to phase II, there are some projects that the University will be interested in and will help fund. The last factor is the long term commitment to the approach.
In order to participate, the entity must meet one of the listed thresholds. Those are infrastructure, environmental degradation, housing, and economic development. The City of Moore only qualified with infrastructure and environmental degradation.
The Rockefeller Foundation has teamed up with HUD. Rockefeller has made up a list of 100 resilient cities and has invited 66 of those cities to apply for these funds. They have invited these cities to a “resiliency academy” that Jared and Elizabeth attended that provided them with a framework for making our city resilient. There are four major components that make up a resilient community: people, organization, place, and knowledge. Mr. Jakubowski states the city has seen some stresses and shocks after each disaster. The key is how the city prepares ahead of time for these stresses and shocks.
Mr. Jakubowski asks the committee to place stickers on the Resilience Wheel, red stickers indicate weaknesses within the city and green stickers indicate strengths.
The negative that received the most votes was “safeguards to human life and health” and the positive that received the most votes was “effective leadership and management.”
Louie Williams feels the city can improve the capacity in which people build in a way that will withstand storms/tornado, stronger building codes, requiring storm shelters or safe rooms.
Mark Hamm feels that city staff works very well with city leaders. The city has been able to bounce back from several tornados. City staff and leadership knows their roles and completes their tasks well in the midst of a disaster.
Joe Ann Randall states that any business she has done with the city whether it be at the police department or filing for her storm shelter permit, everyone is very helpful and very pleasant.
Jared Jakubowski explains that shocks are the actual events and hazards such as storms, tornados, or droughts and stresses are the aftermath of those shocks such as employment, health, crime, or housing.

Vulnerabilities are not just physical things but can be people too.
The committee participates in the Shocks and Stresses Exercise. City staff has asked the committee to take a list of shocks and stresses and decide if they have a high or low frequency and a high or low consequences. The results of this exercise were tornado, severe storms, drought, and aging infrastructure were the highest in frequency and consequence according to the committee.
The shocks that the NDRC application focuses on are tornados, severe storms, and drought. The City is proposing a public education piece on tornados, severe storms, and the water usage in efforts to help with the drought. Public policy, improved building codes, and improved infrastructure are components for a more sustainable and resilient Moore. The goals of this application is to secure a future for the City of Moore and increase the quality of life for its residents.
Mark Hamm asks what the vision in regard to water is. Jared Jakubowski states that city wells we be researched in terms of rehabbing them and getting them to a functional status again. Partnering with Oklahoma City may secure future water rates.
Mark Hamm asks about adding new committee members. Sean Evans, Director of Serve Moore, was interested in serving on the committee. Jared Jakubowski says he will look at the attendance record of current members and see if we need to make some changes and he will let the committee know at the next meeting if the City would like to receive applications for new members.

Meeting adjourned.

RECORDED FROM NOTES & TRANSCRIBED BY_____Kahley Gilbert, Administrative Assistant

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-7000

OFFICE OF COMMUNITY PLANNING
AND DEVELOPMENT

APR 17 2015

Notice of 2014 National Disaster Resilience Competition (NDRC) Threshold Deficiency

HUD Sent via Email

Dear Mr. Jakubowski:

SUBJECT: Threshold Review- Application No. NRDR15000059 (City of Moore)

The Department has completed a threshold review of the application that the State of X submitted in accordance with the Notice of Funding Availability (NOFA) for the National Disaster Resilience Competition (NDRC) that was published on September 17, 2014, in accordance with the applicable provisions of the General Section to HUD's FY2014 NOFAs for Discretionary Programs that was published on February 19, 2014.

The following forms or documents are required for submission . HUD has indicated below with an 'X' which form(s) are missing:

Threshold Requirements in General Section of the FY2014 NOFA for Discretionary Programs & NDRC NOFA	Missing Information
The applicant has submitted and signed the required 'Disclosure of Lobbying Activities' (form SF-LLL), and has indicated that it will not use any federally-appropriated funds towards the lobbying of the executive or legislative branches of the federal government, in connection with the specific contract, grant, or loan.	
Application for Federal Assistance (form SF-424) is signed by the authorizing official	
Applicant/Recipient/Disclosure/Update Report (form HUD 2880)	
Certifications that are required of the applicant, as called for in Appendix F of the NDRC NOFA	
Links to Data or Dropbox Instructions. Specifically:	
MID-URN (Most Impacted & Distressed – Unmet Recovery Needs) Summary Checklist	X

Submission Instructions:

Any clarifications or cure items must be submitted electronically using the HUD-96011 Fax Transmittal Form located in your Application Package as a cover page. You must use the exact form HUD-96011 that came with your application as the fax cover page so your cure document(s) can be matched to your application.

Send faxes to the toll-free number 1-800-HUD-1010. If you cannot access the toll-free number or experience problems using that number you may use 1-215-825-8798 (this is not a toll-free number). If your fax machine automatically creates a cover page, please turn this feature off before faxing information to the Department.

To facilitate document matching, please place in the box labeled —*Name of Document Submitting* in form HUD 96011 the following information: Technical Cure plus [the name of the document]. If the name of the document is long and you need space to fit the document name, just label the Technical Cure as TC followed by the document name.

When submitting a facsimile, applicants must follow the facsimile requirements found in the General Section Notice. Respond within 5 calendar days of the date of this notice. If the deficiency is not fully corrected within 14 calendar days, HUD will reject the application as incomplete, and it will not be considered for funding.

The Department appreciates your interest in the NDRC and remains committed to assisting in the recovery from major disasters by helping communities like yours to rebuild and increase resilience to future disasters. If you or any members of your staff have questions, please email the NDRC Team at ResilientRecovery@hud.gov.

Sincerely,

Stanley Gimont
Director
Office of Block Grant Assistance

WorkCentre Pro 123
Transmission Report

G3 ID 1 405 793 5057 Date/Time:04/22/2015;12:07PM
Page:1 (Last Page)

Local Name CITY OF MOORE
Logo

Document has been sent.
Document Size 8.5X11"SEF

Facsimile Transmittal

1427326783-8920

U. S. Department of Housing and Urban Development
Office of Department Grants Management and Oversight

OMB Number: 2535-0118
Expiration Date: 12/31/2018

Name of Document Transmitting: Technical Cure MID-URN Summary Checklist

1. Applicant Information:

Legal Name: City of Moore

Address:

Street1: 301 N. Broadway Avenue
Street2:
City: Moore
County: Cleveland
State: OK: Oklahoma
Zip Code: 73160-5130 Country: USA: UNITED STATES

2. Catalog of Federal Domestic Assistance Number:

Organizational DUNS: 055699180000 CFDA No.: 14.272
Title: National Resilient Disaster Recovery Competition
Program Component:

3. Facsimile Contact Information:

Department: Management
Division: Resiliency

4. Name and telephone number of person to be contacted on matters involving this facsimile.

Prefix: Mr. First Name: Jared
Middle Name:
Last Name: Jakubowski
Suffix:
Phone Number: 405-793-5053
Fax Number: 405-793-5057

5. Email: jjakubowski@cityofmoore.com

6. What is your Transmittal? (Check one box per fax)

☐ a. Certification ☒ b. Document ☐ c. Match/Leverage Letter ☐ d. Other

7. How many pages (including cover) are being faxed? 3

Form HUD-96011 (10/12/2004)

Total Pages Scanned: 3 Total Pages Sent : 3

No.	Doc.	Remote Station	Start Time	Duration	Pages	Mode	Contents	Status
1	1576	HUD	4-22;12:05PM	1m43s	3/ 3	SG3		CP

Note:
RE: Resend MB: Send to Mailbox BC: Broadcast MP: Multi Polling RV: Remote Service
PG: Polling RB: Relay Broadcast RS: Relay Send BF: Box Fax Forward CP: Completed
SA: Send Again EN: Engaged AS: Auto Send TM: Terminated

Facsimile Transmittal

1427326783 - 8920

U. S. Department of Housing and Urban Development
Office of Department Grants Management and Oversight

OMB Number: 2535-0118
Expiration Date: 12/01/2016

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1. Applicant Information:

Legal Name: City of Moore

Address:

Street1: 301 N. Broadway Avenue
Street2:
City: Moore
County: Cleveland
State: OK: Oklahoma
Zip Code: 73160-5130 Country: USA: UNITED STATES

2. Catalog of Federal Domestic Assistance Number:

Organizational DUNS: 0550991880000 CFDA No.: 14.272

Title: National Resilient Disaster Recovery Competition

Program Component:

3. Facsimile Contact Information:

Department: Management
Division: Resiliency

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Prefix: Mr. First Name: Jared
Middle Name:
Last Name: Jakubowski
Suffix:
Phone Number: 405-793-5053
Fax Number: 405-793-5057

5. Email: jjakubowski@cityofmoore.com

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7. How many pages (including cover) are being faxed? 3

MID-URN SUMMARY CHECKLIST B

Target Area is a Sub County Area (such as a place name, census designated place, tribal area, or census tract) within a county or county equivalent declared by the President to be a major disaster area under the Stafford Act for a disaster event occurring in calendar years 2011, 2012, or 2013

UNMET RECOVERY NEED - *Response must include at least one criterion* - *For each criteria category selected, the corresponding data source and data documentation response must be provided*		
Target Area Name: City Of Moore, Ok		
Criteria	**Data Source**	**Data Documentation**
Infrastructure: ☑ There is damage to permanent public infrastructure from the qualifying disaster (i.e. FEMA Category C to G) that has not been repaired due to inadequate resources, in or serving the most impacted and distressed target area(s) ***AND*** ☑ Describe the damage, location of the damage to permanent public infrastructure relative to the most impacted and distressed target area(s), the amount of funding required to complete repairs, and the reason there are inadequate funds ***AND*** ☑ A minimum $400,000 in unfunded permanent infrastructure repair needs	☑ An engineering report ***OR*** ☐ a FEMA Project Worksheet(s) with an estimated repair amount ***AND*** ☑ A sources and uses statement for the repairs showing the funding shortfall (total repair costs may include the extra cost to repair this infrastructure resiliently) ***AND*** ☑ Your explanation of why existing CDBG-DR resources, together with other funding sources, are inadequate to meet this repair need	☐ Link: ☑ Page number(s) in application: Exhibit B, pages 5 – 6.

MID-URN SUMMARY CHECKLIST B

Target Area is a Sub County Area (such as a place name, census designated place, tribal area, or census tract) within a county or county equivalent declared by the President to be a major disaster area under the Stafford Act for a disaster event occurring in calendar years 2011, 2012, or 2013

UNMET RECOVERY NEED - *Response must include at least one criterion* - *For each criteria category selected, the corresponding data source and data documentation response must be provided*		
Target Area Name: City Of Moore, Ok		
Criteria	**Data Source**	**Data Documentation**
Environmental Degradation: ☑ There is environmental damage from the qualifying disaster that has not yet been addressed and cannot be addressed with existing resources ***AND*** ☑ Describe the remaining damage and how the damage is connected with the qualifying disaster and the most impacted and distressed sub-county target area ***AND*** ☑ Describe the remaining damage to the environment with a cost estimate for making repairs or reconstruction that is $400,000 or greater and support with references to any studies supporting them	☑ A detailed report from a reputable public or private organization completed since June 2013 describing the remaining damage with a certification date after March 2014 indicating that there is remaining damage of $400,000 or more	☐ Link: ☑ Page number(s) in application: Exhibit B, pages 5 – 6.