

# National Disaster Resilience Competition

## Phase 2 Application for

### Minot, North Dakota

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## EXECUTIVE SUMMARY:

*“Vision without action is merely a dream; action without vision just passes time. Vision with action can change the world.*

*- Joel Barker*

The NDRC process has changed Minot. We now think holistically about how to become a more resilient region, envisioning new solutions to the recovery needs that still confront us. Our efforts to become more resilient do not stop at the U.S. border. We are working with our international partners in Canada, with the state of North Dakota, and with the communities along the Souris River basin to consider a set of flood risk reduction options that will benefit us all.

We’ve talked with the U.S. Fish and Wildlife Service, U.S. Army Corp of Engineers, and the International Souris River Board and have requested they consider implementing a one foot lower normal water level control for Lake Darling in northwest North Dakota before next spring. That single action could provide approximately 10,000 acre-feet of additional storage upstream of Minot, increasing public safety and potentially reducing flood risks for the lowest-lying areas of our city. It isn’t the total solution, but it is one layer in a more resilient vision for our region.

Minot has proposed an integrated set of NDRC projects: *reduce flood risk and improve water management, build affordable resilient neighborhoods, and foster economic resilience and diversification.* A process of inclusive and iterative thinking by city officials, residents, and partners throughout the region resulted in the development of these projects, which work together seamlessly, are interconnected, and build on our past efforts and the best available science while looking toward our future.

We are a city of almost 50,000 people that experienced a devastating flood of the Souris River (also called the Mouse River) and a simultaneous economic shock from the Bakken oil boom. These two complex conditions produced dramatically different outcomes from those most other areas have faced in flood disasters alone. The lessons we've learned from this experience can help other communities and regions reconsider strategies for multiple shocks and hazards and enhance their planning efforts. As the effects of climate change, economic globalization, transformative technologies, and other environmental and economic challenges occur more frequently around the world, other communities and regions will face concurrent disasters, hazards, and shocks that can significantly complicate recovery and resilience, as it has in Minot.

We are focused on flood risk reduction actions layered with other flood protection efforts to reduce risk and provide resilience benefits now and over time. These projects will not eliminate the need for a long-term flood protection plan, but they can provide benefits sooner to some of those most vulnerable and at risk, and will likely reduce the cost and construction timeline for long-term flood protection infrastructure.

Remember the old saying, "put your money where your mouth is?" Minot has done just that. The city has committed a minimum of \$337 million dollars over the next 30 years to fund the local cost share for the flood protection system for the entire region, border to border. For a small city, that's a pretty powerful example of region cooperation. However, Minot recognizes that resilience cannot be achieved in a vacuum, and that its environmental, social, and economic resilience is intrinsically linked to the resilience of the surrounding region.

The flood disaster and the oil boom radically changed the housing characteristics of Minot. Much of the housing that had been affordable before the flood was no longer affordable after the influx of oil workers with housing per diems. Minot has replaced, repaired, and

constructed 294 units of affordable housing with CDBG-DR funds. The Minot Housing Authority has developed 129 units of new affordable housing, and 35 more units are under construction. The Minot State University Foundation helped develop 56 units of affordable student housing. Those efforts are important, but they are not enough. Six hundred families remain on the housing authority's waiting list. Enrollment at Minot State University continues to fall well below pre-flood enrollment levels due to the lack of affordable housing for students. The Minot Air Force Base has been unable to fill 140 vacant civilian positions, primarily because potential candidates can't find quality affordable housing. Area businesses continue to face challenges in retaining and attracting essential employees because affordable housing is not available. We cannot estimate the number of residents who left the city after the flood because they could not afford repair costs, or could not afford to move out of the river valley. Minot has identified 740 homes in low-lying areas along the river where people are at the greatest risk of future flooding. Some of these areas will not be protected by the flood protection system for decades. The proposed buy-out program that will move people out of harm's way must be paired with a "buy-in" program to build affordable housing that enables these people to remain in Minot.

This is a bold proposal, but it is one that Minot and its partners are fully capable of implementing. We are submitting a waiver to extend the final NDRC expenditures for some project activities to September 30, 2022, but we are confident these projects can be completed and will produce the benefits we've described. Minot has come a long way since the historic flood in 2011, but available resources are insufficient to complete its recovery or to invest in becoming more resilient in the future. We sincerely appreciate the NDRC process and your consideration of our application for the National Disaster Resilience Competition.

## **EXHIBIT B: THRESHOLD REQUIREMENTS**

- 1. General Notice of Funding Availability (NOFA) Threshold:** The city of Minot is an eligible applicant; Minot has no outstanding civil rights matters; Minot is not an entitlement community and therefore does not have a Consolidated Plan. This application is consistent with Minot's Analysis of Impediments to Fair Housing.
- 2. Unmet Need:** The city has had many competing needs for funds related to flood recovery, and insufficient resources to pay for everything. Minot received a Community Development Block Grant-Disaster Recovery (CDBG-DR) allocation of \$67,575,964 and a second CDBG-DR allocation of \$35,056,000. These funds have been allocated to essential recovery projects. Despite this assistance, funding has not been sufficient to meet all of the city's disaster recovery needs, nor is there adequate funding available to significantly reduce the city's risk from future flood events. Additional information on the city's unmet recovery need is included in *Exhibit D: Factor 2 - Need*.

**Housing:** Minot has invested substantial CDBG-DR funding to address housing needs resulting from the flood. However, the city does not currently run a housing recovery program. The unmet housing recovery needs in Minot are further detailed in *Exhibit D: Factor 2 - Need*. In Phase 1, the city conducted a windshield survey of 20 flood-damaged properties and received surveys from the owners of 15 of those properties. Owners attested that the flood was the cause of the damage, and that they had inadequate resources from insurance, the Federal Emergency Management Agency (FEMA), and/or the Small Business Administration (SBA) for completion of necessary repairs. (Documentation link provided in *Attachment I* of the Phase 1 application).

**Economic Revitalization:** Maintaining a sustainable and diversified economy in Minot may be the greatest challenge to the region's recovery and future resilience. The disaster and subsequent economic shock created dramatic increases in housing costs, siphoned skilled employees away from non-oil businesses, and over 800 skilled workers permanently left the Minot area due to flood-related events. In its Phase 1 application, the city conducted a windshield survey of damaged commercial buildings in accordance with Exhibit B of the NOFA and documented five businesses with outstanding repair needs due to the 2011 flood – three of which have yet to secure the resources necessary to re-open. The presence of vacant businesses remains widespread in the flood inundation area. Businesses included in this survey provided letters attesting that the damage was related to the flood and that they had inadequate resources from insurance, FEMA, and/or SBA for completing the repairs. (Documentation link provided in *Attachment I* of the Phase 1 application).

**Infrastructure:** Since the flood, Minot has spent over \$25 million on critical flood-related infrastructure repairs. Projects ranged from the repair of roads, street lights, and signals to the repair of the city sewer system and the removal of debris from the city's storm drainage system. Despite this investment, essential repair needs remain unmet. Paramount to preventing future losses is repair of the existing USACE-constructed flood protection system (levees, dikes, and channelization) along the Mouse River (also called the Souris River), which was damaged in the flood. The system was in place before the flood and was designed to protect the city from a 5,000 cubic feet per second (cfs) flood (the current 100-year flood event). As a result of this damage, not only is the city highly

vulnerable to a repeat of the 27,000 cfs flood event it experienced in 2011, it is also unprotected from the comparatively modest floods it had experienced in prior years. Without these basic repairs, low-lying areas of the city are extremely vulnerable. In accordance with Exhibit G of the Phase 1 application, the city provided an engineering report for the necessary repair needs with a budget showing sources and uses for a funding gap of approximately \$5 million. (Documentation link provided in *Attachment I* of the Phase 1 application).

3. **Eligible Applicant:** The city of Minot is the applicant for this grant and is named as an eligible applicant in Appendix B of the NDRC NOFA.
4. **Eligible County:** The city of Minot is identified as an eligible applicant in the NDRC NOFA.
5. **Most Impacted and Distressed Target Area:** Minot is listed in the NOFA in *Section III. A* as an eligible applicant. Therefore, Minot already meets the threshold criteria as a most impacted and distressed county.
6. **Eligible Activity:** CDBG-NDR funds will only be used for eligible activities as stipulated in Appendix A of the CDBG-NDR NOFA.
7. **Resilience Incorporated:** The NDRC projects proposed in this application will improve the City of Minot's resilience to future threats and hazards identified in *Exhibit D: Factor 2: Needs* of the City of Minot's Phase 2 application.
8. **Meet the National Objective:** Projects will meet one of the three national objectives required of CDBG funding.
9. **Overall Benefit:** The projects proposed by the City of Minot will meet the national objective requiring at least 50 percent of the funds benefit to low-to-moderate income (LMI) persons.

**10. Establish Tie-Back:** All proposed CDBG-NDR activities will establish proper tie-back to the 2011 Mouse River Flood, the Qualified Disaster for which the city of Minot qualifies as an applicant for NDRC funding.

**11. Benefit-Cost Analysis:** Benefit-Cost Analysis is included in *Attachment F* of this Phase 2 NDRC application.

**12. Application:** The city of Minot will submit only one NDRC application.



## **EXHIBIT C: FACTOR 1 - CAPACITY**

### **City of Minot – Past Experience**

Minot has both the staff and the experience required to manage and complete the projects proposed in this Phase 2 NDRC application. It will use the systems, city staff, and consultant services that have proven very successful in implementing \$177 million in disaster recovery funding, including over \$102 million in CDBG-DR funds and \$75 million in state Recovery funds, to administer and carry out the projects proposed herein. Since the flood in June 2011, Minot has aggressively but carefully implemented its DR Action Plan, acquiring 142 properties for flood control and open space; rehabilitating and reconstructing 117 flood-damaged owner-occupied homes; repairing and improving \$38 million worth of infrastructure; launching an LMI rental rehab program resulting in the reconstruction of 21 housing units; and implementing a program enabling 394 homeowners to be reimbursed for a portion of the investments used to repair their homes. The City has also administered FEMA-PA and Hazard Mitigation programs as well as an \$18 million grant from EDA. Minot has years of experience managing and implementing federal grant programs in compliance with myriad federal regulations tied to the funding source, including civil rights and fair housing regulations and requirements. Federal grants awarded to Minot since January 2012 are listed in the table on the following page.

In the past three years Minot has successfully undertaken major infrastructure projects, including construction of a new 115,000 square foot airport terminal and related taxiways and parking to accommodate significant increases in passenger activity. Under the direction of Public Works Director Dan Jonasson, Minot has also upgraded and expanded its sewer and water infrastructure to replace the collection and treatment systems damaged in the flood and provide for more resilient new development to occur on higher ground away from places subject to

historic flooding. Minot has built two new schools and completed extensive renovations to six other schools, working within compressed construction schedules to meet the needs of area school children.

**Federal Grants Awarded to the City of Minot 2012-2015**

<b>Federal Agency</b>	<b>Description</b>	<b>Grants awarded</b>
<b>Dept. of Commerce</b>	Economic Development Administration	\$19,600,000
<b>HUD</b>	Office of Community Planning and Dev.	\$102,631,964
<b>USDOT</b>	Federal Aviation Administration	\$47,402,772
<b>Dept. of Homeland Security</b>	Transportation Security Administration	\$155,212,597
<b>Federal Transit Administration</b>	Formula Grants for Non-Urban Areas	\$2,296,655
<b>FEMA</b>	Public Assistance & Hazard Mitigation	\$13,259,775

Oak Park was destroyed by the flood, but one year after the flood the park reopened due to the heroic efforts of the community and state electric cooperatives and an unexpected gift from the people of Cincinnati. In June 2012, 11 electric cooperatives from around the state pitched in to repair and replace the park’s electrical equipment in one day. Even more remarkably, just three months after the flood a small group of community members, dubbed “Oakaholics,” rallied votes from across the nation to win the annual Coca Cola “America is Your Park” competition. The volunteers’ dedication and their portrayal of the devastation caused by the flood convinced the Cincinnati Board of Parks, also in the running for this award, to ask their residents to cast their votes for Minot. Oak Park received over 3 million votes and was awarded the \$100,000 prize, which was used to build an amphitheater that opened with a public concert on September 19, 2015. Though the City did not lead this effort, it aptly demonstrates the

enthusiasm and tenacity of the Minot community, which has been evident throughout this NDRC process and will no doubt play a significant role in the success of proposed NDRC projects.

Finding affordable housing is a serious challenge in Minot. In the past three years the Minot Housing Authority, with nonprofit developer Beyond Shelter, Inc., has developed four new affordable housing communities with 220 units. (Both organizations are partnering with the City of Minot for the NDRC effort.) Artspace Lofts, which opened in summer 2013, offers another 34 units of affordable living and working space for artists in downtown Minot. The project includes commercial space on the main floor and houses a gallery operated by the Turtle Mountain Tribal Arts Association, featuring work by Chippewa, Mandan, Hidatsa, Arikara, and Sioux artists. Artspace is the anchor for a growing downtown Minot arts and tourism economy.

Minot has collaborated with its regional stakeholders in the past three years, producing a new Comprehensive Plan and an Affordable Housing Action Plan, participating in the Ward County Hazard Mitigation Planning process, and contributing to other forward-thinking plans and studies as outlined in Exhibit G of our Phase 1 application. Minot completed an Analysis of Impediments to Fair Housing in 2013 and actively seeks ways to affirmatively further fair housing. The City of Minot has had no fair housing or civil rights complaints for any of the programs it has implemented.

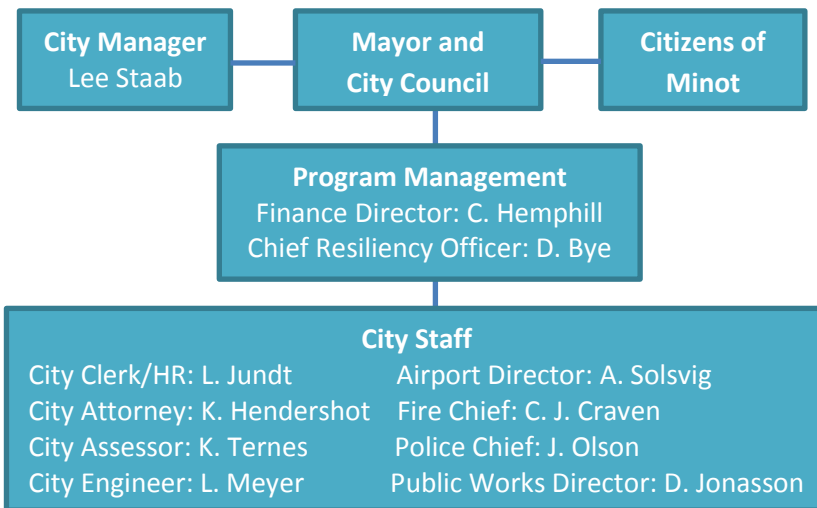
To manage its CDBG obligations, Minot has established the policies and procedures shown in the following table to formalize program oversight, quality assurance, audit, grant oversight and internal controls, program income, procurement, and other HUD requirements.

**New Policies Implemented by the City of Minot since 2011**

Citizens Participation Plan	HUD Section 3 Policy
Fair Housing Policy	Grant and Project Oversight Policy and Procedures
Vendor Monitoring Plan	Communications Policy for Sensory Impaired
Anti-Displacement Plan	Voluntary Acquisition and Relocation Policies
Procurement Policy	Anti-Fraud, Waste, and Abuse Policy and Procedures
Demolition Policy/Procedures	Internal Auditor Policy and Procedures
Complaint Policy	Internal Controls Policy and Procedures
Recapture Policy	Housing Rehabilitation and Reconstruction Policy/Procedures
EEO Compliance Policy*	Conflict of Interest Policy/Procedures
Section 504 Grievance Policy*	Small Rental Rehab and Reconstruction Policy/Procedures
Monitoring Policy/Procedures	Infrastructure Policy and Procedures
Davis Bacon Policy/Procedures	<i>*a compliance officer or coordinator was added as well.</i>

**City Of Minot Management Structure:** Minot is governed by a mayor, 14 aldermen, a city manager, and highly skilled department heads including the finance director, public works director, city attorney, city engineer, and city assessor, all of whom have been actively involved in framing this application. Lee Staab, City Manager, brings strong organization and management skills. He retired as a Colonel from the U.S. Army Corps of Engineers, serving as Executive Officer with the Assistant Secretary of the Army and Commander for the European District. He holds a B.S. and M.S. in engineering, as well as an M.A. in International Relations and an Executive Degree from Harvard Business School. He spent seven years as president of a global project management company based in the Washington, DC area that provides engineering and construction management, environmental, and professional services. Finance

Director Cindy Hemphill will be the primary contact and coordinator between the City’s NDRC program management consultant and HUD, the State of North Dakota, city department heads, and local community groups and citizens. Ms. Hemphill has successfully guided Minot’s administration of CDBG Disaster Recovery programs and other federal and state programs over the past 9.5 years. Her educational background is in finance and she has extensive experience in finance, federal regulations, and auditing federal programs. She and her staff have a firm grasp of the applicable procurement, environmental review, Davis-Bacon and related labor acts, fair housing and equal opportunity, Section 3, Section 504, and many other regulations. She has 16.5 years of federal government audit experience with the Department of Defense, Department of Energy, U.S. Attorney’s Office, and Department of Justice.



Mr. Staab and Ms. Hemphill have contributed extensively to the NDRC application process, actively participating in stakeholder and committee meetings, meeting one-on-one with the many

partners and community groups, and working with outreach efforts to solicit citizen and stakeholder ideas on how Minot can become more resilient to future disasters. The Mayor, City Manager, Finance Director, and other city leaders are all committed to continuing their hands-on roles throughout the NDRC process. The City Comptroller will have primary responsibility for reconciling the CDBG funds, as he has for the last four years. The CDBG accounting staff is experienced and is well prepared to take on the responsibility of a new program.

This NDRC opportunity also helped city leaders realize a Chief Resiliency Officer should direct its resilient approach to future development. Former city planner Donna Bye, with over 14 years of planning and grant experience, has taken this position and is committed to working toward a more resilient Minot. The organization chart depicts the city’s management structure, and the table below summarizes the roles and responsibilities of city staff who will administer and implement NDRC projects.

<b>City Staff</b>	<b>Role/responsibility</b>	<b>Capacity/relevant experience</b>
Mayor	Signatory and final approval for statutory/environmental compliance	12 years as alderman before being elected mayor of Minot
Aldermen	Active roles in public hearings, approval of action plans and contracts, and citizen input	14 aldermen with from 4 months to 24 years of governance experience
City Manager	Lead NDRC effort	28+ yrs govt & private experience
Finance Director	Primary City CDBG manager	Extensive CDBG-DR, audit, and finance experience
City Attorney	Legal responsibilities	Expert legal advice
City Engineer	Engineering	City Engineer
Public Works Director	Engineering and infrastructure, flood protection, water management	26 years of public infrastructure oversight
City Assessor	Appeals of buy-out offers	Licensed appraiser, 23+ yrs city market assessment experience
Comptroller	Financial reporting and accountability	22 years financial accounting; CDBG experience
Internal	Independent audit responsibility for CDBG	Perform independent audit

Auditors	expenditures	functions for CDBG-DR programs
Building Inspections	Permitting, coding and building inspection	Extensive experience building inspection and codes compliance
City Planner and CRO	Master planning, resiliency, zoning and development guidelines	Over 18 years planning experience

**Key Partners:** Minot has selected partners who offer the specific expertise to enhance its existing capacity to implement our proposed NDRC projects, including architectural design, economic revitalization, water management, and housing and neighborhood development. Many of these partners were described in Exhibit C of our Phase 1 application, which also presents experience in regional or multi-governmental collaboration, community engagement, cost reasonableness, and assessment of science-based risk information capacities not recounted in this Phase 2 narrative.

The City of Minot has demonstrated capacity in the following areas noted by HUD on page 38 of the Phase 2 NOFA and numbered in the table below: 1, 2, 3, 5, 6, 7, 12, 13, 16, 19, 20, 21, 23, 24, 25, 26, 27, 28. The capacity added by each partner is described on the following pages. Together the City and its capacity partners exhibit all of the skills and experience necessary to successfully manage and complete Minot’s proposed resiliency projects and activities, and to do so according to the requirements of the NDRC grant program.

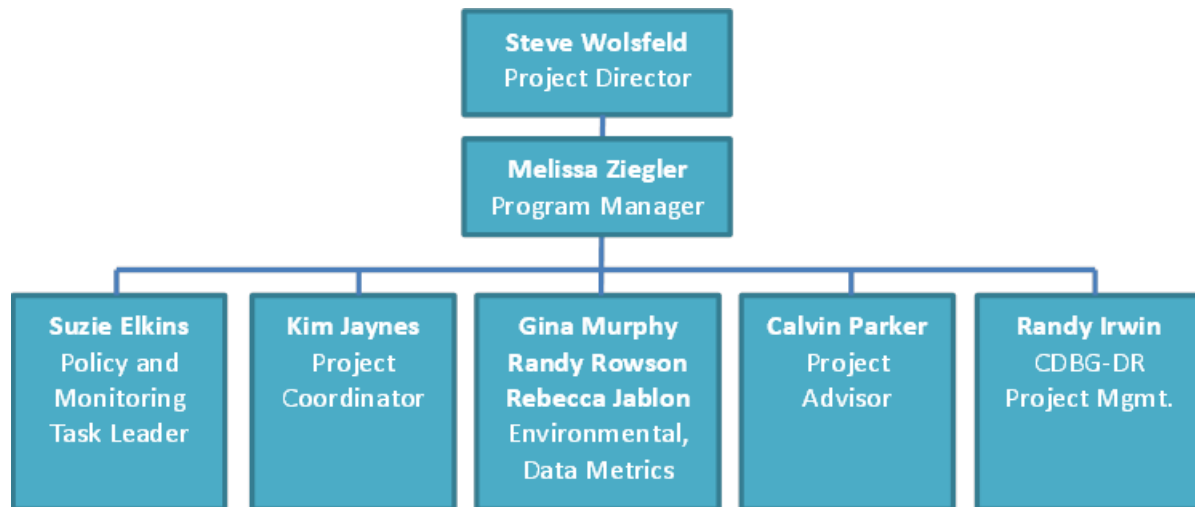
<b>General Administrative Capacity:</b>	
1. Project management and logistics	5. Procurement
2. Accountability, QA/QC, monitoring, internal audit	6. Contract management
3. Rapid program design and launch	7. Financial management

4. Determining, tracking, and evaluating outcomes	
<b>Technical Capacity:</b>	
8. Risk, impacts, and vulnerability assessment	16. Site, city, regional planning
9. Management of project design	17. Insurance industry issues
10. Flood insurance and floodplain management	18. Pre-development site prep
11. Green infrastructure planning and implementation	19. Property disposition
12. Acquisition and disposition of real estate	20. Leverage/mixed financing
13. Rehab and reconstruction of various types of structures	21. Redevelopment of property
14. Remediation of brownfields and ecological restoration	22. Accessing operating and
15. Assessing technical feasibility and value engineering	investment capital
<b>Community Engagement and Inclusiveness:</b>	
23. Cross-disciplinary collaboration	26. Regional collaboration
24. Project coordination/partnership with key stakeholders	27. Working with other orgs.
25. Consultation and stakeholder involvement during all phases of the project	28. Community engagement and outreach, esp. vulnerable pops.

**CDM Smith** (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 20, 21, 22, 23, 24, 25, 26, 27, 28) has worked with the city since 2011 as its recovery program consultant, developed the Minot Affordable Housing Supply and Demand Analysis, Affordable Housing Action Plan and Analysis of Impediments to Fair Housing, and assisted in the development of the city’s NDRC application. Steve Wolsfeld, a Vice President and client service leader, will serve as project director for implementation of NDRC projects. Steve has an MS and BS in Engineering and is a licensed professional engineer based in Minneapolis. He has over 20 years of civil engineering

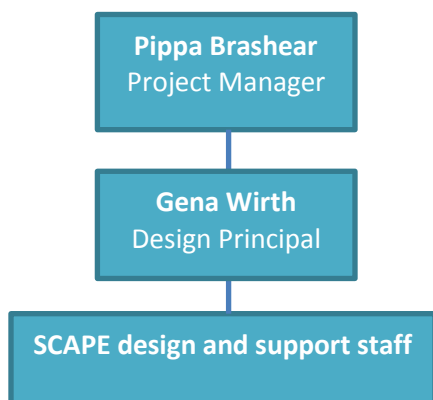


experience and has overseen CDM Smith’s disaster recovery contract with the City of Minot since 2011. Melissa Ziegler, who will serve as program manager, has more than 35 years of experience in commercial, industrial, and housing development including CDBG experience and is a Certified Economic Developer. She has led planning and development projects for CDM Smith throughout the U.S., including the Minot Affordable Housing Study, and provided program management services for the City of Pigeon Forge, Tennessee on a wide range of projects including their Master Development Plan and Tourism Development Zone. She has an MBA and a Masters of Finance and Administration. Susan Elkins has extensive expertise with CDBG and disaster recovery programs; in the past five years she has consulted with the cities of Minot and Lake Charles and the states of Illinois, New York, New Jersey, and Colorado. She retired from the State of Louisiana after serving as Executive Director of its Office of Community Development from 1981-2008. During that time she oversaw the largest supplemental appropriation in the history of disaster recovery for Hurricanes Andrew, Rita, and Katrina.



As an international engineering, planning and infrastructure consultant, CDM Smith has worked with communities around the world on flood protection, water management, and community development projects. The firm continues to successfully manage the CDBG-DR program for the State of Illinois for flooding in 2008 and three subsequent disaster declarations. The \$211 million in CDBG-DR funds support housing, economic development, planning, and public infrastructure projects through nine grant programs. CDM Smith’s program management role includes the duties necessary to implement and oversee grant programs from initiation to closeout. CDM Smith also designed a wetland treatment and storage system for the North Everglades Florida Lake Okeechobee Fast Track project, saving the client over \$140 million.

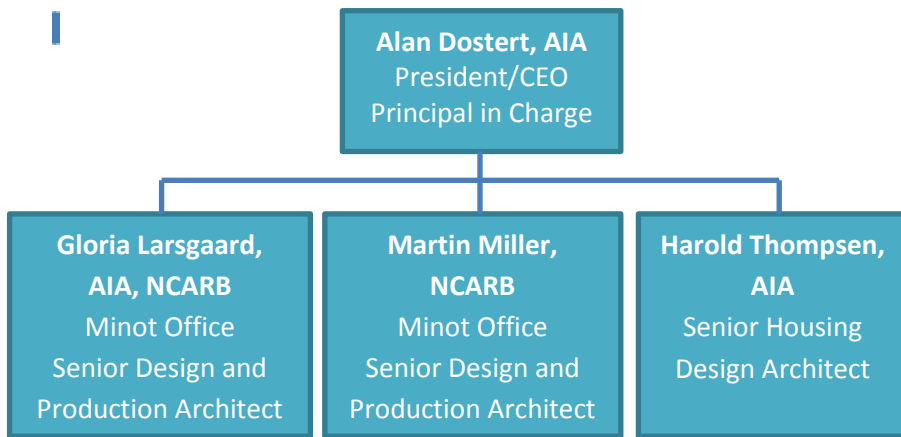
**SCAPE/Landscape Architecture PLLC** (1, 4, 8, 9, 11, 14, 15, 16, 23, 24, 25, 27, 28) designed



the Living Breakwaters project, which was awarded funding under the 2014 Rebuild by Design competition. It also won the Buckminster Fuller Challenge (socially-responsible design’s highest award), the National Planning Achievement Award for Environmental Planning, and the ACEC NY Engineering Excellence Award. Pippa Brashear, SCAPE’s

Director of Planning and Resilience and project manager for the current design phase of Living Breakwaters, contributed to the development of Minot’s NDRC proposal and will advise Minot on design and resiliency for its NDRC projects. She holds M.A. degrees in Landscape Architecture and Urban Planning from the Harvard University Graduate School of Design and a B.A. in Environmental Science and Public Policy from Harvard College. Gena Wirth, a principal with SCAPE and project manager for the Living Breakwaters concept design, will also

contribute to Minot’s proposed NDRC projects. She also has M.A. degrees in Landscape Architecture and Urban Planning from the Harvard University Graduate School of Design and a B.S. in Horticulture from the University of Delaware.

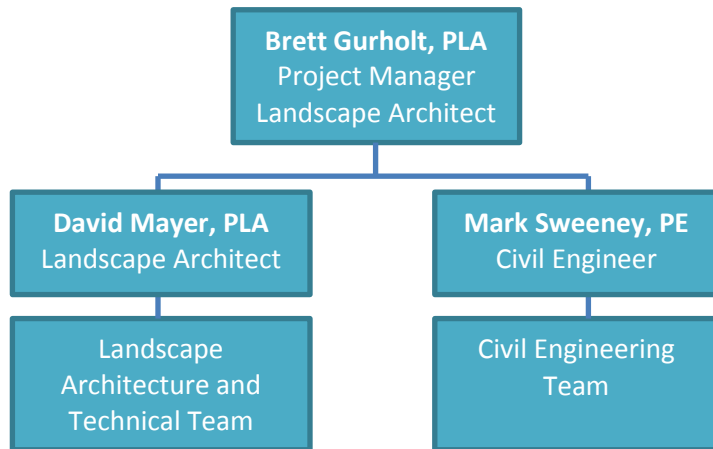


**EAPC Architects** (1, 2, 3, 5, 6, 7, 9, 11, 13, 15, 16, 21, 23, 24, 27) will lead programming and design for the proposed Minot State University Dakota College

Technical Education Center, the MSU downtown Arts Education Center, and other projects. In the last three years EAPC designed the Cook’s Court senior apartments and The Willows and Sunset Ridge affordable housing in Minot as well as the Slaaten Learning Center at MSU and the Western Star Career and Technology Center at Williston State College in North Dakota. The Minot NDRC effort will be led by Alan Dostert, President/CEO, with 34 years of experience in architecture including fast-track phasing. He has led numerous housing and university projects in Minot and elsewhere in North and South Dakota. He will be supported by Gloria Larsgaard, Minot Office Manager/Project Manager, who was AIA Young Architect of the Year for North Dakota in 2011. She has extensive experience in residential and university projects, including many for Minot State University. MP Miller, with 20 years of experience, was State Architect for Illinois and is a member of the International Code Council. Harold Thompsen is EAPC’s go-

to architect for housing including senior living developments, apartments, townhomes, and supportive housing in Minot and the Midwest.

**KLJ** (1, 3, 6, 7, 9, 11, 14, 15, 16, 21, 23, 24, 25, 27) will provide master planning and landscape



architecture for the Riverfront Greenway, new affordable housing neighborhoods, and the downtown public gathering space proposed in Minot’s NDRC grant application. KLJ has a Minot office and 23

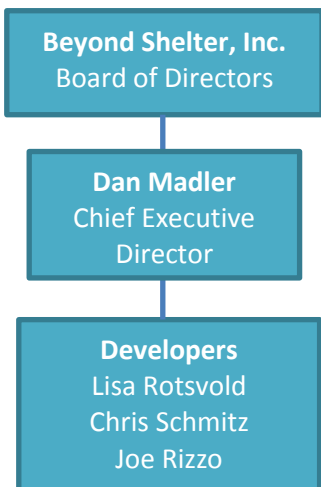
locations in six Midwestern states. Brett Gurholt will be project manager for Minot’s efforts, assisted by David Mayer, Mark Sweeney, and a staff of engineers and landscape architects. Brett and David earned BLA and BS degrees in Environmental Design from North Dakota State University, and bring 15 years of design and project management experience, respectively. Mark has more than 18 years of municipal design experience and is KLJ’s Minot office manager. He has a BS and MS in civil engineering. KLJ provided the master plan and design for Centennial Park on Minot’s western edge in 2011 before the flood, and continues to develop the project design. Other Minot projects include the Minot Park District Flood Recovery Project, MSU’s 11th Avenue Reopening, and other infrastructure for the city.

**Minot Housing Authority** (2, 5, 6, 7, 13, 23, 24, 27, 28) will work with the City of Minot and with Beyond Shelter, Inc. to develop and manage affordable housing proposed in this



application. With Beyond Shelter, Inc., MHA has developed 260 new affordable housing units since the 2011 flood including Cooks Court senior housing, Washington Townhomes, Fieldcrest Apartments, The Willows, and Sunset Ridge. MHA owns and/or manages more than 600 units of affordable housing for seniors, families, and vulnerable

populations in Minot. Tom Alexander, Executive Director of MHA, will manage this effort on behalf of MHA. Before joining MHA, Tom worked with the Minot State University North Dakota Center for Persons with Disabilities and has been involved in the National Coalition for the Homeless. Tom will be assisted by Mark Austin, Occupancy Director for MHA. Mark has been actively involved in the development of affordable housing for Minot, and has over 20 years of housing experience.

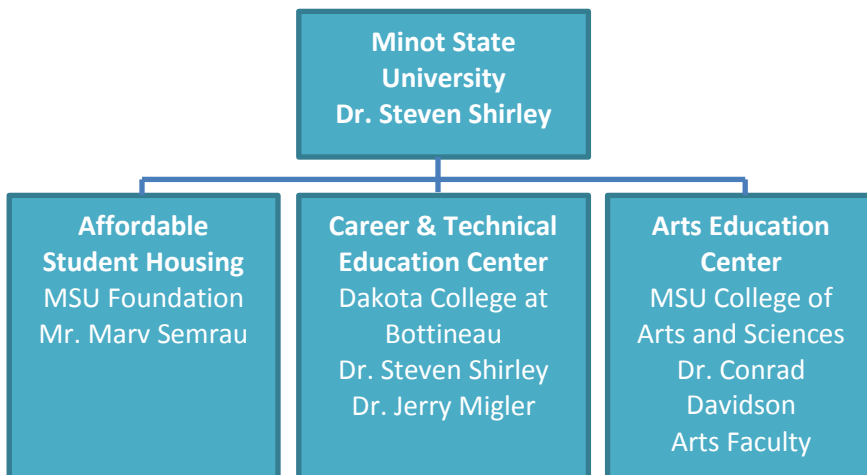


**Beyond Shelter, Inc.** (1, 3, 5, 7, 12, 18, 19, 20, 22, 24, 27) will work with the city and with the Minot Housing Authority to develop affordable housing. In all BSI has developed 33 affordable housing projects, producing 878 units/homes for seniors, families, and special needs populations including downtown mixed use developments. Dan Madler, CEO, will lead this effort, and Lisa Rotvold, Chris Schmitz, and Joe Rizzo will provide support. Dan has over 21 years of

experience in affordable housing and has participated in the design, financing, and general development of 28 such projects totaling 885 units in North and South Dakota and Minnesota. He is a certified Housing Development Finance Professional (HDFP). Lisa has 21 years of

experience from direct development to grant administration, assisting communities throughout North and South Dakota. She has helped develop over 600 units of affordable housing and holds HDFP and Housing Credit Certified Professional (HCCP) certifications. Chris is a HDFP and HCCP as well, and has more than 14 years' experience in property management and development of over 250 units of affordable housing. Joe has 19 years of experience in residential mortgage and finance and is a certified HDFP.

**Minot State University** (12, 13, 21, 23, 24, 26, 27) will play a key role in Minot's NDRC resilience projects, partnering with the city on affordable student housing and accessible

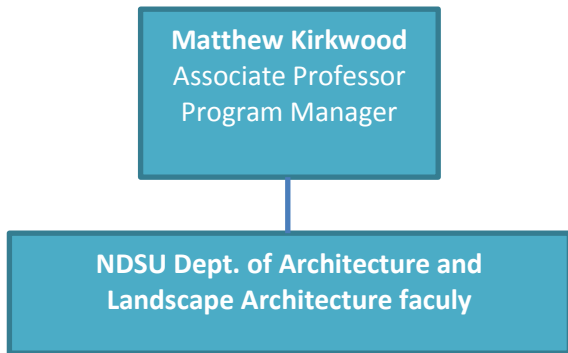


education alternatives including an Arts Education Center and Career Technical Education (CTE) Center. Dr. Steven Shirley, MSU President, will lead these efforts on behalf of the University. MSU Dean of

Arts and Sciences, Dr. Conrad Davidson, will oversee the development of the MSU Arts Education Center along with MSU's art faculty. MSU will partner with its branch campus, Dakota College at Bottineau (DCB), to develop the CTE Center. DCB has been an affiliate campus of MSU for 20 years, and the two have long cooperated to offer academic programming. Dr. Steven Shirley and DCB Campus Dean Dr. Jerry Migler will jointly lead the CTE Center development efforts. The MSU Foundation constructed and currently manages a 32-unit student

apartment complex that was completed 13 months after the 2011 flood. The Foundation also has experience with real estate and development around the MSU campus. MSU Foundation Executive Director Marv Semrau will lead the housing effort.

**North Dakota State University Department of Architecture and Landscape Architecture (8,**



11, 15, 16, 23, 27) will serve on the design review committee for the new affordable neighborhoods project and the Riverfront Greenway project, and will review the housing plan book and design standards for new energy-efficient, affordable housing in Minot using green building techniques.

Matthew Kirkwood, Associate Professor and Program Director, will lead this effort and will be supported by other Architecture and Landscape Architecture faculty.

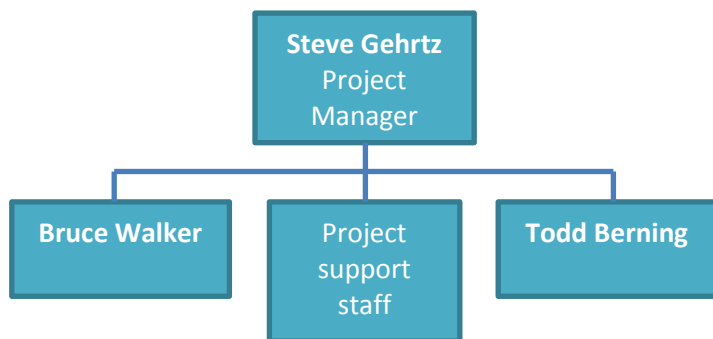
**The North Dakota Center for Regional Climate Studies (4, 8, 15, 16, 23, 26, 27)** was founded in 2014 with a National Science Foundation grant to develop and apply integrated methods to assess and predict climate change impacts on the region’s hydrology and agricultural production. CRCS focuses the expertise of its ten core research faculty on issues that surround climate change in the Northern Great Plains region. Five researchers come from the following UND departments: Atmospheric Science, Chemical Engineering, Counseling Psychology and Community Services, and Earth System Science and Policy. Three researchers are faculty in the departments of Agribusiness and Applied Economics, Civil Engineering, and Computer Science at North Dakota State University, and two researchers are with the STEM department at United



Tribes Technical College and the Science Department at Candeska Cikana Community College. Dr. Jianglong Zhang, CRCS Director, will oversee the NDRC partnership with the City of Minot. He holds a Ph.D. in Atmospheric Science, an M.S. in Computer Science, and an

M.S. in Atmospheric Science from the University of Alabama in Huntsville, and a B.S. in Atmospheric Physics from Peking University. During his dissertation research he worked extensively with scientists at U.S. Naval Research laboratory in Monterey and NASA Goddard Space Flight Center. He was a University Corporation for Atmospheric Research visiting scientist, and his recent research has focused on satellite remote sensing of atmospheric aerosols and assimilating these data in near-real time into weather forecast models.

**Essential Living, Inc.** was organized as a nonprofit to continue to manage and develop



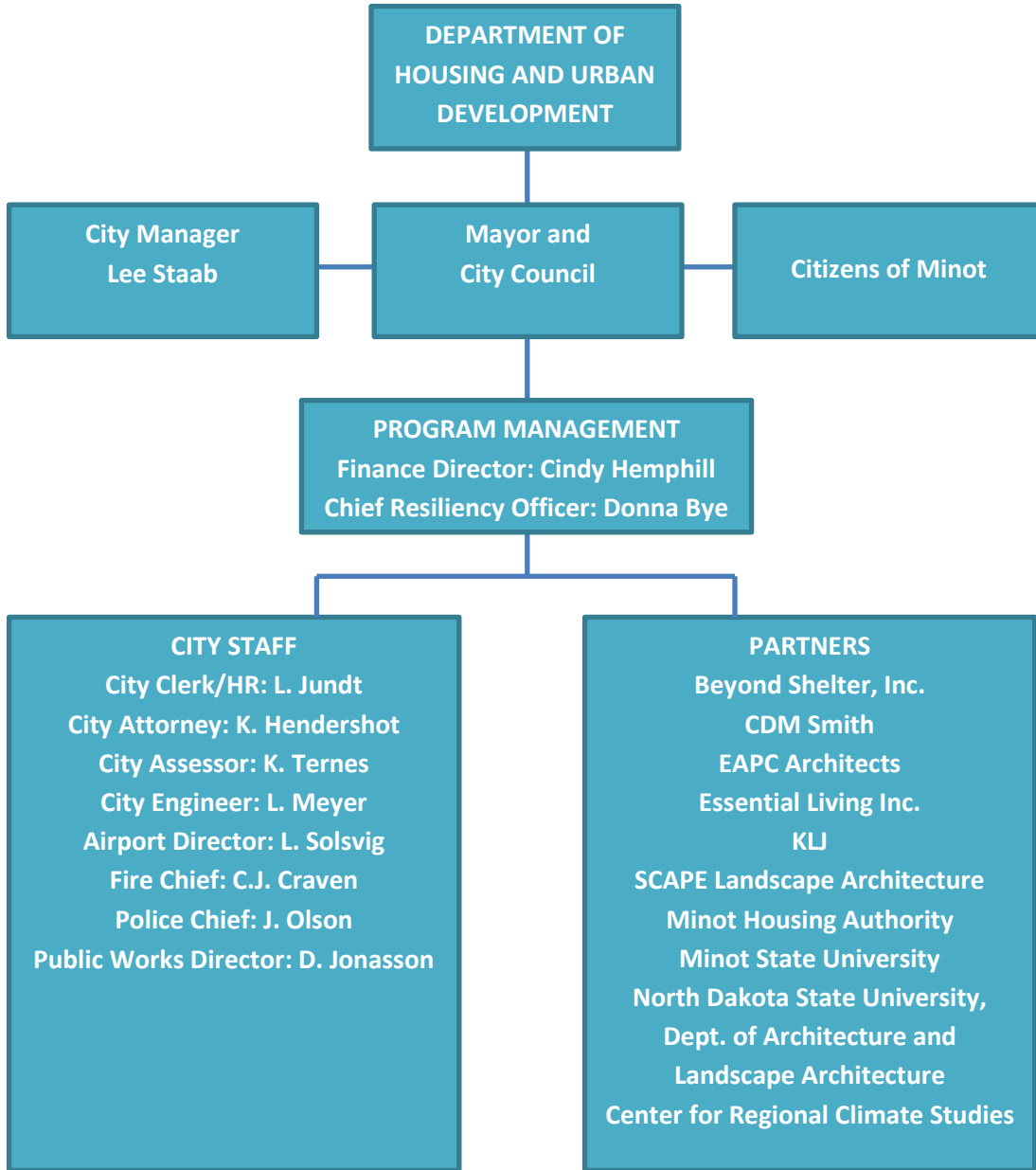
affordable housing in the Minot area. Its three directors are Bruce Walker, President; Steve Gehrtz, Vice President; and Todd Berning, Treasurer. Steve will lead the team in

developing and constructing NDRC housing projects with the City of Minot CDBG development team, supported by Bruce, Todd, and other staff. Bruce is the owner of Coldwell Banker, which



over the last 30 years has managed affordable housing projects and worked with developers of affordable housing. He is currently involved in developing affordable housing projects. Steve, owner of Gehrtz Construction Services, has built several affordable housing projects, worked with CDBG and other federal programs, and is very knowledgeable about the Minot area construction climate. Todd, a partner on several affordable housing projects, develops the financial models for these efforts in conjunction with the North Dakota Housing Finance Agency, the Bank of North Dakota, and others. His team includes Ruby Rau, with over 20 years of experience in managing affordable housing, and Blake Nybakken, with several years of experience working with GSA and other government contracts.

The overall NDRC project organization chart below shows how Minot will manage and implement the projects proposed herein.



## **EXHIBIT D: FACTOR 2 - NEED/EXTENT OF THE PROBLEM**

It was 12:57 p.m., June 22, 2011. The sirens sounded and the people of Minot knew the levees had been breached. A police sergeant working in the 911 dispatch center said, “I remember feeling a fear I’ve never experienced before. I’ve been protecting this city for twenty-eight years and this situation proved to be out of my hands. I couldn’t keep the city safe.”<sup>1</sup> Homes, businesses, schools, and parks were destroyed, families were displaced for months and years, roads and bridges were demolished, and water and sewer infrastructure had to be repaired or replaced. Economic and social costs were substantial as well, and vulnerable elderly, disabled, and low-income residents were more seriously affected than most. The people of Minot and the surrounding area pulled together, using the local, state, and federal funds at their disposal to repair what damage they could. Still, more than four years later, homes are vacant and uninhabitable, families struggle to find affordable housing, infrastructure is in disrepair, and critical needs remain unmet. Minot has come a long way in recovering from the historic flood, but available resources are insufficient to complete its recovery – much less invest in the more resilient community its residents now desire.

### **Unmet Recovery Need and Target Geography**

**Most Impacted and Distressed Target Geography** - As demonstrated in Minot’s Phase 1 *Exhibit B*, the City of Minot meets the threshold for the most impacted and distressed (MID) geography. Minot’s Phase 2 MID geography is identical to the MID area identified in Phase 1 and includes census tracts 101, 102, 103.01, 103.02, 104-108, 112 and 113. The projects and programs outlined in this NDRC Phase 2 proposal will be implemented within the City of Minot; additional non-NDRC resources will be used to fund flood risk reduction, water management

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<sup>1</sup> “One Minute of the Flood Minot Remembers,” stories compiled by Rachel Maxfield, winner of the 2013 North Dakota State Fair Heritage Contest.

projects, and other resilience activities in the broader Souris River basin. The 2011 floods had an impact on a number of counties along the Souris River, and while the most significant damage occurred within the city, other small towns and farmlands were affected as well.

To achieve its resilience and recovery goals, the city has chosen to actively collaborate with a much larger geographic region including the counties along the Souris River and the upper Souris River basin in Canada, as outlined in our Phase 2 Factor 3 narrative (Exhibit E).

**Unmet Recovery Need Update** – The city’s unmet needs assessment in August 2012 determined unmet recovery need in Minot was \$1,510,623,270.<sup>2</sup> Since that time Minot received an additional \$35,056,000 in CDBG-DR funding, reducing the unmet recovery need to \$1.475 billion. The URNs facing Minot are exceptional, however, because the city was affected by both a disaster and an economic shock. As more places face the effects of climate change, economic globalization, transformative technologies, and other environmental and economic challenges, there is every reason to anticipate more frequent situations where other complex conditions compound disaster outcomes, similar to what has occurred in Minot.

Although driven primarily by the 2011 flood disaster, the unmet recovery need in Minot has been significantly affected by a major economic shock that hit the region during essentially the same period: the Bakken oil boom. This combined disaster and economic shock in the Minot MID area changed the city, affecting the availability and cost of housing, contributing to the loss of at least 800 skilled workers who left the city, and subsequently affected the community’s social cohesion as well as local and regional employers and businesses. Some workers who left the area did so to take higher-paying oil industry jobs, and others could not find housing they

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<sup>2</sup> City of Minot Unmet Needs Assessment: Helping the City of Minot Recover from the Mouse River Flood of 2011, August 31, 2012.

could afford.<sup>3</sup> This situation continues and threatens to significantly weaken Minot's economic diversity and resilience.

Minot is the regional trading center for northwestern North Dakota and southern Saskatchewan. As such, it has historically seen higher employment concentrations in retail, trade, professional services, and health care. Jobs in these sectors often have lower wages, but these employees are essential to the economic well-being of Minot and the larger region. Retail sales per capita in Minot are 70% higher than the statewide average, evidence of its important role as the center of commerce for northwest North Dakota.<sup>4</sup> People throughout northwestern North Dakota and southwestern Canada come to Minot to buy essential goods including food, building materials, agricultural equipment and products, fuel, and heating oil; they also come to Minot for hospitals, medical specialists, and other critical services. In 2014, 69% of Ward County employment was concentrated in five business sectors: construction, wholesale and retail trade, health care and social services, transportation and warehousing, and accommodation and food. Nationally only 53.7% of total employment is concentrated in these five sectors.<sup>5</sup> As the region's trade center, any decline in Minot's economic diversity and sustainability puts the entire region at risk.

Nearly 4,200 homes were damaged or destroyed by the 2011 flood; 27% of Minot's housing stock and much of its older and most affordable housing was in the flood inundation area. Insurance payouts in Minot would have been much higher, but fewer than one in ten homes in the flood inundation area had flood insurance<sup>6</sup> because in 2000 FEMA revised its flood maps based on flood control measures implemented since the last flood in 1969, and most

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<sup>3</sup> Ondracek and Witwer, Minot North Dakota Business Recovery Survey Final Report, Sept. 16, 2011, for the Minot Chamber

<sup>4</sup> US Department of Commerce, Bureau of Economic Analysis, North Dakota

<sup>5</sup> Department of Labor, Bureau of Labor Statistics, Quarterly Census for Employment and Wages, 2014

<sup>6</sup> Sulzberger, A.G. They Dropped Their Flood Insurance, Then the 'Mouse' Roared. The New York Times, June 23, 2011.

residents along the river were no longer required to purchase federal flood insurance. FEMA costs for repairing damage from the flood to Souris Valley residents exceeded \$90 million.<sup>7</sup> CDBG-DR funds provided \$32.9 million and leveraged an additional \$88 million to support the rehabilitation and replacement of affordable housing.<sup>8</sup>

During this same period, the oil industry brought hundreds of people to Minot. Some came because of their employment in the oil industry, and others came in search of jobs. Minot is the fourth largest city in North Dakota. It contains two thirds of the population in Ward County and 57% of the regional population in the counties adjacent to the Souris River north of Minot.<sup>9</sup> It had a population of 47,997 in 2014,<sup>10</sup> an increase of 17.2% since 2010.<sup>11</sup> A number of data sources support much higher population growth. While the Bakken boom helped some business sectors in the region (such as hotels, construction, restaurants, and professional services) to recover more quickly from the flood, the dramatic loss of housing coupled with a substantial increase in housing demand created an unprecedented affordable housing crisis that continues to plague Minot and the region today. In short, the flood and the impacts of the oil boom have created serious workforce and economic resilience issues for Minot and the region.

**Affordable Housing** - The flood and the oil boom completely changed the housing demographics in Minot, as shown in the maps in Attachment E which illustrate the assessed value of single family homes in 2010, 2012, and 2015. As a result of the flood 2,400 homes sustained extensive damage and 805 homes were damaged beyond repair.<sup>12</sup> A recent neighborhood assessment by the city found 150 blighted and vacant flood-damaged homes

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<sup>7</sup> FEMA Souris Valley Housing Mission Comes to a Close, September 25, 2013. Accessed at <https://www.fema.gov/news-release/2013/09/25>.

<sup>8</sup> CDBG-DR Current Period Status Report, Sept 2015, Randy Irwin, Director

<sup>9</sup> U.S. Census 2010 American Fact Finds. Souris River Counties include Ward, Bottineau, Renville, McHenry Counties

<sup>10</sup> U.S. Census July 1, 2014 Population Estimates

<sup>11</sup> U.S. Census 2015 Population Estimates

<sup>12</sup> FEMA

remain in the flood inundation area (see Phase 1 Exhibit B). The flood and the economic shock, together with the population growth precipitated by the Bakken oil boom, caused dramatic escalations in housing costs. Rents for two-bedroom apartments grew from an average of \$600 before the flood to as high as \$3,950 post-flood.<sup>13</sup> The average sale price of a single family home in Minot in 2008 was \$145,062; in 2014 the average sale price had increased to \$241,174.<sup>14</sup> From 2010 to 2015 the number of homes in Minot valued over \$400,000 increased 359% and the number of homes valued between \$300,000 and \$400,000 increased 327%. Based on 2013 census estimates, Minot’s homeownership rate is 61.4%, which is significantly lower than the statewide rate of 66.1%. Housing costs skyrocketed due to the loss of housing inventory and the increased housing demand due to rapid population increases in the region, as shown in the table below.<sup>15</sup>

<b>Housing Values</b>	<b>% of Housing in 2010</b>	<b>% of Housing in 2015</b>
\$0-\$150,000	62.9%	28.9%
\$150,001 - \$250,000	30.3%	47.2%
\$250,001 - \$350,000	5.3%	18.3%
Above \$350,001	1.5%	5.6%

Homes and apartments that had been affordable for students, seniors, and low and moderate income families before the flood were rehabilitated or replaced, then rented or sold at substantially higher prices – leaving many vulnerable people facing a serious housing crisis. Over 250 Minot households purchased FEMA trailers in order to have a place to live.

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<sup>13</sup> Minot Affordable Housing Strategy: Supply and Demand Analysis, December 2012.

<sup>14</sup> Statistical Analysis Minot MLS Data, Bruce Walker, Coldwell Banker 1<sup>st</sup> Commercial Realty, September 2015

<sup>15</sup> City of Minot Assessor Data, Single Family Housing Assessed Valuations 2010 and 2015

The lack of available affordable housing seriously threatens Minot's social cohesion, economic sustainability, and diversity and reduces the ability of businesses to retain and attract a crucial workforce including healthcare workers, police and fire personnel, and teachers, all of whom are essential to the city's quality of life. Minot businesses are also vital to the region's agricultural economy; they sell the equipment and raw materials essential to agricultural production including seed, fertilizer, and feed. In short, people who move away from Minot because of the lack of affordable housing are depleting the community's workforce, changing long-held social relationships, and jeopardizing the its non-oil economy.

The lack of available affordable housing also threatens efforts to reduce flood risk and improve water management. In evaluating the need to protect people living in the lowest-lying areas along the river that face the greatest risk (due to elevation and the time required to complete the flood protection projects that would safeguard these neighborhoods), the city identified 338 single family homes and 322 multi-family and mobile homes that should be bought out in order to move people out of harm's way. But finding affordable housing to relocate these households will be nearly impossible. Minot already faces a serious affordable housing crisis, and helping those at greatest risk of future flooding only exacerbates the problem.

Minot's CDBG-DR program has invested over \$120.9 million in affordable housing, including leveraged funds. But while the CDBG-DR program rehabilitated, replaced, or developed 294 units of affordable housing, some property owners did not qualify for assistance because of their income and some property owners would not agree to affordability requirements. Minot Housing Authority faced a similar challenge with its Section 8 program



when many property owners cancelled Section 8 contracts as soon as they could to charge much higher rents.<sup>16</sup>

To analyze present-day conditions that document underlying unmet needs caused by the flood disaster and complicated by the Bakken economic shock, the information that follows demonstrates the impacts caused by the lack of affordable housing since June 2011 on Minot Housing Authority, Minot State University, and the Minot Air Force Base. Similar conditions permeate the entire community, but are far more difficult to document. However, local social service agencies continue to report people are leaving Minot to relocate to other, more affordable areas; students and military personnel are “couch surfing” for months while trying to find affordable housing; people are living in overcrowded housing; and the number of working homeless in the community is on the rise. It is impossible to verify the number of individuals and families who left Minot after the flood, other than the 800 employees documented in a 2011 business survey.<sup>17</sup> Four years later, local food banks continue to report an increase in working families who rely on such provisions to feed their families through the end of the month because they are cost burdened due to housing.

**Minot Housing Authority (MHA)** - In 2009, 200 families were on the MHA waiting list. In 2011 that number increased to over 600 families, and although it has fluctuated since the flood, today over 600 families remain on MHA’s waiting list for housing assistance. The amount of assistance required based on the area’s median rent has soared. In 2008 the average Section 8 assistance per family was about \$300 per month; in 2015 the average subsidy has increased to \$610 per month, which means MHA is able to assist half as many families.<sup>18</sup> Although MHA

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<sup>16</sup> Tom Alexander, Minot Housing Authority Executive Director

<sup>17</sup> Ondracek and Witwer, Minot North Dakota Business Recovery Survey Final Report, September 16, 2011.

<sup>18</sup> Minot Housing Authority, Tom Alexander, Executive Director

and Beyond Shelter, Inc., a nonprofit developer, have developed 129 units of new affordable housing since the flood with an additional 35 units currently under construction, they must use a lottery system when new or existing housing becomes available because the demand for affordable housing far outstrips the supply. The North Dakota Housing Finance Agency only had \$2,635,000 in housing tax credits in 2014 to address affordable housing need throughout the state. At this level, NDHFA can only support between 150 and 200 units of affordable housing annually. Clearly Minot must find other options to finance additional affordable housing.

**Minot State University (MSU):** The flood displaced 567 MSU students in 2011, and enrollment fell 7.3%.<sup>19</sup> The loss of affordable student housing continues to impact MSU enrollment, as many prospective students are unable to afford the available housing in Minot and ultimately choose to attend other schools with more reasonably priced housing. The MSU Foundation developed 32 units of student housing and participated in the development of an additional 24 units of student housing in 2015 – a good start, but not nearly enough to meet the need. The lack of available and affordable student housing has prevented many students from returning to MSU, and the decline in student population has had a negative impact on Minot’s economy. A recent North Dakota University System study of the economic impact of Minot State University found that each MSU student contributes \$9,781 to the Minot area economy annually.<sup>20</sup> In 2013 students contributed over \$26.7 million to the local economy, and the loss of over 456 students<sup>21</sup> has reduced Minot’s local economy by \$4.46 million in the 2014-2015 school year alone.

**Minot Air Force Base (MAFB) -** Located just seven miles north of the city, MAFB is the region’s largest employer with 6,487 military and civilian personnel. Over 47% of active duty

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<sup>19</sup> Economic Impact of the North Dakota University System in 2013, NDSU Applied Economics

<sup>20</sup> Ibid.

<sup>21</sup> MSU Institutional Research, accessed at <http://www.minotstateu.edu/instplan/cds.html>

military and their dependents (2,794 families) and 100% of the 1,017 civilian employees live off base, primarily in Minot and Ward County.<sup>22</sup> Although active duty military personnel receive a housing allowance, many advise the MAFB housing office they are priced out of the homeownership market in Minot and the surrounding region. At present 140 civilian positions at the base are vacant, and each of these positions is critical to the base mission.<sup>23</sup> Surveys of eligible civilian personnel indicate their primary reason for declining a position at MAFB was the limited availability of affordable off-base housing. The economic impact of Minot Air Force Base exceeds \$577.8 million annually, and it is one of the state's largest economic drivers.

**Economic Revitalization** - Maintaining a sustainable, diverse economy in Minot may be the greatest challenge to the region's resilience and recovery. Of Minot's residents, 93% have graduated from high school but only 27% have a bachelor's degree or higher, similar to the state as a whole. The flood disaster and the economic shock of the oil boom caused dramatic increases in housing costs, and low skill/high wage jobs in the oil industry have siphoned employees away from non-oil businesses. These jobs are often short-lived, but high housing costs have made it impossible for some people not to take these more lucrative jobs to provide for their families. The loss of skilled and semi-skilled workers continues to seriously impact non-oil businesses, affecting the sustainability and diversity of Minot's long-term economy. Minot is not alone; the boom-bust cycles of the oil industry have a destabilizing effect on economies in many parts of the country where oil is extracted. Though Minot has enjoyed a relatively stable and diverse economy (driven by Minot State University, the Minot Air Force Base, Trinity Hospital, Cognizant, and Marketplace Foods), both small and large businesses report significant challenges in attracting and retaining a skilled and stable workforce. Business

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<sup>22</sup> Economic Impact Analysis Minot Air Force Base, December 2014, prepared by Budget Office 5<sup>th</sup> Bomb Wing Comptroller

<sup>23</sup> Renetta Pearson, MAFB POC assigned to assist City of Minot with NDRC Phase 2 MAFB data

surveys conducted by the Minot Chamber of Commerce, interviews of large employers, and comments in stakeholder and public meetings document the continuing challenges to the city's economy and future resilience due to underlying unmet needs caused by the flood and the economic shock.<sup>24</sup>

The 2011 flood continues to impact many businesses in Minot. In early August 2011 area business owners were surveyed to determine the extent of damage, needs, and intent of Minot's business community after the flood.<sup>25</sup> Results indicated that over 40% of Minot businesses sustained facility or building damage. Only 2% reported clear intentions to close their business. Businesses also faced loss of revenue, additional costs, and employee shortages following the flood. Together Minot's businesses incurred over \$300 million in losses and costs and, as mentioned previously, over 800 employees permanently left the Minot area in the aftermath of the flood. A second survey was conducted in June 2012 to assess on-going effects of the flood on the business community.<sup>26</sup> Results from the second survey indicated that, thanks in part to the oil boom, almost 97% of the businesses in Minot were operating and only 3% had closed. More recent business surveys, interviews, and stakeholder and public comments indicate Minot still faces serious challenges in diversifying its economy, however, including retaining and attracting the skilled workforce required to operate the many types of businesses in the area.

**Infrastructure:** Since the flood, the City of Minot has spent more than \$45 million on critical infrastructure including repairs to streets, street lights and signals, sewer systems, parks and trails, and a pedestrian bridge across the Souris River, as well as removal of debris from the stormwater management system. Despite these investments, essential infrastructure repair needs

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<sup>24</sup> Minot NDRC Public Meetings and Community Advisory Committee Meetings. See Attachment D: Consultation Summary for dates

<sup>25</sup> Ondracek and Witwer. Minot, North Dakota Business Recovery Survey Final Report, September 16, 2011.

<sup>26</sup> Ondracek and Witwer. Minot, North Dakota Business Recovery Survey II Final Report, June 27, 2012.

remain unmet as documented in Phase 1 Exhibit B. In fact, the actual unmet need for infrastructure is more than \$250 million.

### **Resilience Needs within Recovery Needs and Unmet Resilience Needs**

What is the value of becoming a more resilient city? To test the value of resilience within the city's recover needs, Minot created two "what if" scenarios and utilized HAZUS modeling analysis to evaluate how conditions after the 2011 flood event might have been different if policies or alternatives had been different. The first scenario tested is as follows: 1) a policy is negotiated with the US Fish and Wildlife Service, the US Army Corp of Engineers, and the International Souris River Board to reduce the normal water level in Lake Darling by 2.5 feet to create additional water storage capacity. This lake is 20 miles northwest of Minot in Ward County. In accordance with agreed upon protocols including those put in place to protect habitat and wildlife in the Upper Souris National Wildlife Refuge, the normal water level is the lake is lowered. Unusually high rain fall and rapid warming in early spring creates conditions like those in the upper Souris basin in Canada in May 2011. A 2011 level flood will arrive in Minot however, because of the actions to lower normal water levels in Lake Darling additional storage is available. As a result of this policy the damages in Minot are reduced by \$126 million.

Scenario 2: The City of Minot complete construction of the first 4 phases of their flood protection system that protects the water treatment plant and a number of the structures on the north side of the river that flooded in 2011. Minot decided to offer buy-outs to residents in the lowest lying areas along the river that would not be protected by the flood protection system for at least 15 years. This action not only allow residents to move out of harms ways in the event of another flood but a co-benefit this project also moved these families away from the rail line and hazards from future train derailments and spills and enable these families to avoid costly flood

insurance payments. Extremely weather events produced numerous blizzards and significant spring rains, Minot braced for another 2011 flood. With the 4 phases of flood protection in place and a successful buy-out program completed, the flood damages in Minot were reduced by \$478,340,000, nearly 70% below the damages from the 2011 flood.

**Vulnerable Populations in MID-URN Target Area** - In 2011, 42.9% of Minot's population had incomes below 80% of the median income and 31% of Minot's LMI population lived within the flood inundation area.<sup>27</sup> By 2015 the population with incomes below 80% of AMI had fallen slightly to 41.45%.<sup>28</sup> In Minot, 10.3% of the population is below the poverty level compared with 9.1% in Ward County and 11.9% in North Dakota. Since the flood the Minot Homeless Coalition and other providers of services to the homeless have seen a growing number of individuals and families seeking assistance with basic food and shelter. CDBG-DR provided funds to relocate the Domestic Violence Center after the flood, the Men's Winter Refuge shelter has been opened, and the YWCA now operates a women's homeless shelter in Minot. These resources are still not sufficient to provide for Minot's growing homeless population, however. According to Mac McLeod, Executive Director of the Minot Homeless Coalition, there are 125 to 150 homeless people in Ward County, and half of these are working homeless.

In the 2010 Census, 14.8% of Minot's population was over the age of 65.<sup>29</sup> By 2013, 13.6% of Minot residents were elderly. This is a significant decrease in the elderly population in just three years.<sup>30</sup> Those over the age of 65 represent 12.2% of Ward County's population compared with 13.6% statewide. Approximately 1,477 elderly people lived in the flood inundation area in 2011. Some of these residents left the community after the flood to live with

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<sup>27</sup> US Census 2010

<sup>28</sup> American Community Survey for 2010 and 2015

<sup>29</sup> US Census 2010

<sup>30</sup> American Community Survey 2013 Population Estimates

family or find more affordable housing options. Minot also has a larger percent of the population with disabilities (11.5%) compared to the Ward County (10.3%) and the State of North Dakota (10.6%).<sup>31</sup>

**Why Unmet Need Exists** – Minot has many competing needs for funds related to flood recovery, and insufficient resources to address all of these needs. The unmet needs assessment prepared in August 2012<sup>32</sup> documented over \$1.475 billion in unmet recovery needs after the receipt of \$102,631,964 in CDBG-DR funds. These unmet needs included flood protection measures for the water treatment plant to prevent disruptions to the public drinking water supply - \$33.8 million; relocation of critical utilities out of the flood hazard zones - \$19.5 million; upgrades to existing storm water facilities to reduce future impacts from flooding - \$29 million; and flood protection for critical public utility infrastructure - \$328 million. The estimated cost of the regional Mouse River Enhanced Flood Protection Project is over \$1 billion, and Minot’s local cost share is estimated at \$337 million.(The Souris River is also called the Mouse River in Minot.) These unmet needs total over \$1.413 billion, and this does not include additional needs for affordable housing, road and bridge repairs, rehabilitation and reconstruction of parks and trails, and other essential public facilities. It is also important to recognize that demand for resources in Minot has been compounded by a population surge requiring additional public services, schools, roads, and utilities. While it might seem that local governments should be flush with cash as a result of the oil boom, oil taxes flow directly to the state. Local governments receive oil funds through a series of formulas and grants, but most of the money goes into the

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<sup>31</sup> American Community Survey 2013

<sup>32</sup> City of Minot Unmet Needs Assessment: Helping the City of Minot Recover from the Mouse River Flood of 2011, August 31, 2012.

state's general fund. A county typically receives about 10% of the oil tax revenues that originate within its borders.<sup>33</sup>

Minot successfully used foundations and volunteer efforts to help address its needs after the flood. Hope Village, which was recognized at a FEMA Best Practices conference, provided a model for bringing local leaders, businesses, national faith-based disaster response organizations, and local, state, and federal government agencies together to deliver a one-stop disaster response service to people in need. This organization provided \$3.6 million in volunteer labor, helped repair 549 homes, and created the mechanism to feed, house, manage, and supply tools for 160 volunteers per day. Minot has made excellent use of its existing resources in the aftermath of the flood, but does not have sufficient funds to meet all of the needs created by this disaster or to address its goal of becoming more resilient in the future.

**Appropriate Approaches** - A new vision emerged from our NDRC Phase 1 consultation with stakeholders, the public, local leaders, and regional and national experts. The Phase 1 concepts *preservation of a protective open space network to build greater resilience; livable and resilient neighborhoods, and reinforcing strong leadership and resources* have evolved throughout Phase 2 using an iterative process that evaluated vulnerabilities, risks, and opportunities. Information about the areas most at risk was integrated with ideas about sustainable and livable development outside of the floodplain areas. Vulnerabilities resulting from the loss of young people, due to eroding economic diversification that affects the quality of economic opportunities and the high cost of living in Minot, were coupled with information from design charrettes for affordable housing and new ideas for more resilient entrepreneurial employment options.

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<sup>33</sup> Association of Oil and Gas Producing Counties and Governing Magazine, August 2011



This thinking was supported by a community-driven engagement, planning, and design process that integrated recovery thinking with resilience goals. How could Minot achieve long-term social and economic viability, improve the resilience of vulnerable people, sustain the city and the broader region, and drive future resilience? How could we integrate Minot's assets, hazard exposures, and vulnerabilities with opportunities generated by our NDRC Phase 2 approach?

Drilling down into our unmet needs, we recognized the flood disaster from which we were trying to recover was just one layer of a much more complex environment. Minot was trying to recover from a disastrous flood while responding to an economic tsunami, the Bakken oil boom. Together these two events created conditions that resulted in an entirely different set of unmet recovery needs from what Minot would have experienced without the economic boom. Without the oil boom, homes and apartments would have been repaired and rebuilt, people would have moved back home, most businesses would have recovered, and Minot would have a population of around 40,000 people. But conditions in Minot after the flood disaster made it impossible for the city to return to what its residents and leaders once saw as normal.

Our Phase 1 concept *preservation of a protective open space network to build great resilience* has evolved to incorporate not only protective open space, but implementation of structural and non-structural **flood risk reduction measures and improved water management**. Our Phase 1 concept *livable and resilient neighborhoods* expanded as we thought about flood risk reduction, livable and resilient neighborhoods, and the unmet needs Minot faces. Our Phase 2 concept is focused on **affordable, resilient neighborhoods** of varying types and densities that are interconnected by transit and walking and biking trails, and include common areas to foster social cohesion and bring together new and old residents of Minot. Our Phase 1 concept *strong leadership and resources* must be interwoven throughout the recovery and

resilience process, connecting people, agencies, counties, and even countries to strengthen the region's understanding of risks and make our communities and our people safer. Through our Phase 2 journey we recognized the economic vulnerabilities and risks that Minot and the region face because of Minot's role as the region's trading center. Minot must **foster economic resilience and diversification**, creating an environment where small and larger non-oil businesses continue to prosper, stable non-oil job creation continues, and workforce skills are enhanced to ensure opportunities for entrepreneurship remain and long-term economic opportunities help vulnerable people to stay in the city they call home.

This NDRC process has helped Minot consider a more holistic approach to recovery and resilience. The U.S. National Climate Assessment<sup>34</sup> predicts the northern Great Plains will experience increases in annual temperatures; winter and spring precipitation and very heavy precipitation events are also projected to increase, leading to increased runoff and flooding. Increased snowfall, rapid spring warming, and intense rainfall can combine to produce devastating floods. Climate change will create positive and negative impacts for agriculture – extending the growing season and potentially allowing a second annual crop – but increases in precipitation may require changes in the primary crops produced in the state.<sup>35</sup> Minot's new City Manager, Lee Staab, made a profound observation in the first Phase 2 Community Advisory Committee meeting: "Twenty-five years from now we hope to complete the flood protection system that will keep everyone in our community safe, but between now and then we must do everything we can to become a more resilient community so that people here don't fear every spring rain event."

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<sup>34</sup> 2014 National Climate Assessment, accessed at <http://nca2014.globalchange.gov/highlights/regions/great-plains#intro-section-2>.

<sup>35</sup> "Climate Change Impacts on the US", "Climate Change and US Agriculture: The impact of Warming and Extreme Weather Events", Center for Health and the Global Environment, Harvard Medical School, and US Geological Survey, North Dakota Water Science Center

Minot's recovery and resilience approaches are designed to address our most compelling unmet recovery needs and increase the region's resilience so we can adapt to environmental, social, and economic changes, be prepared to respond to risks, and thrive in the future. Our resilient approaches are ***reduce flood risk and improve water management, build affordable, resilient neighborhoods, and foster economic resilience and diversification.*** Our Phase 1 proposal called for identifying and preserving land that can increase flood storage capacity and provide green space to enhance community health and quality of life. Our Phase 2 approach includes the development of a prioritization process to identify the lowest-lying areas along the river at the greatest risk for flooding, where realistic options for flood storage and eco-restoration exist. Activities to improve recovery and resilience include buy-outs, resilient open space, and creation of eco-restoration areas that provide educational opportunities and trails. These will be combined with "buy-in" opportunities outside the flood hazard area to create outstanding new neighborhoods with affordable housing and convenient connections to jobs and services.

In Phase 1 we proposed building livable, resilient neighborhoods that would facilitate new affordable housing, mixed-use developments, and commercial areas. Our Phase 2 approach builds on the Phase 1 concept, expanding it to include affordable student housing for MSU as well as affordable housing in multiple neighborhood types integrated with expanded transit services and transportation for vulnerable residents. The design team partnerships have been expanded to include innovative thinking from the Rebuild by Design process by SCAPE LLC, local architects and landscape architects, and the North Dakota State University School of Architecture and Landscape Architecture, which will be involved in creating design standards, an affordable housing plan book, disaster resistant construction specifications, and quality neighborhoods that reflect what stakeholders and the public told us when we asked them, "What

are the neighborhood qualities you want? What type and style of housing do you want to live in? Which amenities are important? What kind of outdoor gathering spaces should be included?”

In Phase 1 our final concept was *reinforce strong leadership and resources*. We realize now that these principles will be critical to the success of all of our recovery and resilience actions, and our outcome measures will reflect that. The iterative process we followed in Phase 2 helped us see that the economic well-being of the entire region is built on the economic resilience and diversification of Minot. The boom-bust cycles of the oil industry require we pay very careful attention to preserving the region’s economic diversity and fostering greater economic resilience. It is up to Minot to lead this response. Our final Phase 2 recovery and resilience approach, ***foster economic resilience and diversification***, addresses critical workforce skills training, helps Minot State University regain enrollment and expand programs of study that also foster economic entrepreneurship, and brings anchor businesses and people back into the center of the region: downtown Minot.

## **EXHIBIT E: FACTOR 3 - SOUNDNESS OF APPROACH**

**Introduction and overview** - The NDRC process has changed how we think about addressing the unmet recovery needs from the flood and the collateral challenges of the oil boom, and what we must do to become more resilient so we will be able to recover more quickly from future disruptions. Because of this process, the community has begun to look differently at its unmet needs as well as future risks. Thinking holistically about resilient flood protection led us to envision different solutions for our affordable housing crisis and evaluate transformative options to foster long-term economic diversity. Minot's economic resilience is critical to the economy of the broader region, including northern and western North Dakota and southern Saskatchewan and Manitoba. The city must be financially sustainable and resilient to the ups and downs of the oil industry that dominates our region's economy. Inclusive and iterative thinking by city officials, residents, and partners throughout the region have moved us away from the silos we have been comfortable with in the past, and have enabled us to develop an integrated set of projects that work together seamlessly, building on our past efforts and grounded in the best available science but looking toward our future.

**Consulting with other jurisdictions** - Throughout both phases of this process Minot has worked closely with Ward and McHenry counties, the Souris River Joint Board (SRJB), the State of North Dakota, and a newly formed committee representing vulnerable people in Minot and Ward County to ensure we have a comprehensive understanding of disaster impacts, recovery needs, and future risks across the Souris River Basin. For example, many people and businesses in the Basin depend on agriculture. The 2011 floods, plus increased climate change impacts including floods and droughts, will significantly affect the livelihood of farmers along the Souris River and the businesses in Minot that support the agricultural industry. Farmers may need to plant

different crops, such as rice or cranberries. We also realize decisions about flood risk reduction and the city's economic resilience don't occur in a vacuum; the choices we make in Minot influence our neighbors, and vice versa. Minot now serves on the board of the International Souris River Board and Assiniboine River Basin Initiative, a bi-national organization. The City of Minot has agreed to pay the local cost share for the flood protection system from border to border along the Souris River.

Minot's efforts to become resilient do not stop at the U.S. border. Approximately 80 percent of the upstream watershed is in Saskatchewan. The team's review of bi-national Souris River basin conditions and data from the United States Geological Survey determined 66 percent of the watershed in the upper Souris River basin is considered non-contributory under normal conditions. However, these areas appear to have contributed to the 2011 flood for several reasons. These includes historic rainfall and snowmelt and, based on our review, it appears that increasing agricultural activities include cutting ditches in historic wetland sloughs, which may be short-circuiting the significant storage in the Souris River basin. Wetlands are often drained through these ditches, which reduces groundwater storage that more efficiently drains surface water from rainfall and stormwater runoff. Overall, this practice reduces surface storage and increases downstream flows, and may have been a factor in the historic 2011 floods. Given these conditions, it is prudent to consider restoring upstream surface storage, water conservation, storm water harvesting, and aquifer recharge practices in the upper basin to offset this increase in flow and conserve water. This is especially critical as changing climate conditions may increase temperatures, resulting in more rapid snow melt during spring rains.

With this analysis in hand, and after discussions with the U.S. Fish and Wildlife Service (USFWS) and the U.S. Army Corp of Engineers (USACE), Minot officials met with the North Dakota Water Commission (NDWC) and the International Souris River Board (ISRB). Minot

requested these agencies consider environmental opportunities to enhance or restore wetlands and lakes; evaluate declining or depleted aquifer zones to determine if they will benefit from increased water recharge; identify industrial, oil exploration, and agricultural activities that are significant water users and might be considered in discussions of harvesting increased flows; and consider options to further expand low or high level dams in Canada, including a cascading system. Minot officials have also requested the USFWS and the ISRB adopt and implement a one foot lower normal water level (NWL) control for Lake Darling before next spring, and requested the USFWS, USACE, and ISRB adopt and implement additional flood release operation protocols as soon as possible. The one foot reduction in NWL would provide approximately 10,000 acre-feet of additional water storage, increasing public safety and reducing potential flood mitigation costs. To put this in perspective, another 1.5 feet of storage across Lake Darling in advance of flood events could reduce flood damage in Minot by millions of dollars. These numbers will be further refined through activities described in this proposal. (See Resilience Need within Recovery Needs analysis in Exhibit C, Factor 2 for HAZUS analysis of the lower NWL.)

Minot officials are aggressively working with ISRB in Canada, USFWS, USACE, NDWC, SRJB, and the counties along the Souris River to facilitate a more resilient bi-national region to benefit Minot and all of the communities bordering the river. Minot City Manager Lee Staab met recently with both co-chairs of ISRB to continue these discussions and address trans-boundary water management issues, economic challenges, and safety for people and property.

Development of the Souris River Flood Decision Support Tool model proposed in this application will help decision-makers in Minot and the region evaluate operational protocols for Lake Darling in the event of flooding. The tool will also identify the implications of other

changes in upstream water management that might allow additional release of water in advance of predicted flood events that threaten the basin, the City of Minot, and other downstream stakeholders.

**Consistency with other planning documents** - Although Minot is not a CDBG entitlement community and as such does not develop a consolidated plan, the proposed approaches and projects outlined in this application are consistent with existing plans including the 2012 Comprehensive Plan, 2035 Transportation Plan, and Ward County Hazard Mitigation Plan. The three key areas proposed in this NDRC application are addressed in the city's planning and policy documents:

- *Reduce flood risk and improve water management* - The Comprehensive Plan (Chapter 7, Water Resources) and Ward County Hazard Mitigation Plan (Section 12.5 Mitigation Strategy) both include flood protection as a key issue.
- *Build affordable, resilient neighborhoods* is woven throughout chapters 4, 5, and 8 of the Minot Comprehensive Plan, which cover neighborhood resilience, parks and trails, housing and community character, aesthetics, and facilities. The Transportation Plan also enhances resilient neighborhoods by improving mobility.
- *Foster economic resilience and diversification* - The Minot Comprehensive Plan (Chapter 6, Economic Development) provides for reducing or eliminating economic setbacks described in the Hazard Mitigation Plan to foster a robust, resilient economy.



## **Minot NDRC Phase 2 Projects**

Minot's proposed NDRC projects address the three areas outlined on the previous page. Each contains multiple activities, which are described in detail in the following sections.

### **Project 1: Reduce flood risk and improve water management**

Our flood risk reduction and water management projects incorporate scientific, hydrologic, hydraulic, and decision support modeling and technical and experiential input from community members and partners who have been actively engaged in this process since the beginning. Minot's leaders have met with more than 14 community groups and participated in public meetings, Community Advisory Committee meetings, and Vulnerable Populations Committee meetings to discuss the NDRC Phase 2 process and get their thoughts and ideas on projects and performance. We have worked diligently with vulnerable populations groups to ensure their resilient recovery needs are reflected in this proposal.

Our activities to address flood risks and water management are based on sound environmental science, hydrology, hydraulics, and innovation. Our approach looks at the city's flood risk in the context of the entire Souris River watershed, considering historic and future climate and environmental conditions and using robust, data-based flood and risk modeling software and benefit-cost assessment tools such as the Federal Emergency Management Agency (FEMA) Hazard US (HAZUS) tool. The NDRC process has been the catalyst for a new perspective and approach to flood risk reduction.

The Mouse River Enhanced Flood Protection Plan (MREFPP) is designed to protect Minot and the region from future floods. The system was designed based on the peak flow rate experienced in 2011 (27,400 cfs) plus an allowance of three feet for risk, uncertainty, and system

resiliency. The first three phases of design are underway and construction will begin in 2017. These initial phases are designed to protect critical utility infrastructure including the regional water treatment plant. The remaining phases are not currently funded and a number of households will remain at risk until the protection system is completed.

During Phase 1 of the NDRC process the city, stakeholders, and residents realized several important factors about Minot's flood risks:

- Much of the area inundated in 2011 was not within the FEMA 1% flood area mapped at that time. The upcoming release of revised FEMA flood insurance rate maps, which are anticipated to dramatically increase the number of homes in the floodplain, coupled with anticipated increases in flood insurance rates, will make it difficult for many residents of low-lying areas to afford to remain in their current homes in the interim period before flood protection is in place.
- The city must consider what happens if a flood event occurs before the flood protection system is in place. While the 2011 flood was the largest on record, and is perceived by some to be an anomaly, changes in climate and upstream land and water management suggest similar events may indeed occur in the years to come.
- Discussions with regional partners, as well as the science-based risk analysis undertaken for this NDRC proposal, indicate options for upstream and basin-wide changes in water management that can be considered to reduce risks. These options include operations at Lake Darling, actions within Saskatchewan to restore water storage, and beneficial use of excess stormwater and snowmelt.

The proposed NDRC projects focus on actions that can be layered with ongoing local and regional flood protection efforts to reduce risk and provide resiliency benefits that begin now and

extend over time. The set of flood risk reduction projects proposed below, coupled with regional water management initiatives developed as a result of the regional collaboration undertaken in preparing this NDRC application, help to reframe Minot's approach to flood risk reduction, transforming it from an infrastructure-based approach to a layered strategy of grey, green, and non-structural techniques that can help reduce risks and costs as the city and region adapt to changing climate and economic conditions. These projects will not eliminate the need for flood walls and levees, but they will begin to provide benefits sooner to some of those most vulnerable and at risk. They may also reduce the cost and construction timeline for long-term flood protection while providing co-benefits including ecosystem restoration, educational and recreational opportunities, improved connectivity, and economic enhancements.

**The Souris River Decision Support Tool** continues the science-based risk analysis and regional collaboration initiated as part of the NDRC process. Often climate and watershed analysis and planning is constrained by jurisdictional boundaries that are ignored by the climate, geologic, hydrologic, and even economic conditions that drive hazards. In developing the most resilient and cost-effective approach to flood risk reduction for Minot, a variety of local and watershed-wide strategies must be considered and evaluated. Discussions with regional watershed management agencies, coupled with the high-level modeling undertaken in the application process, have revealed measures that could be considered to strategically manage water flows. Minot has already engaged in discussions with state, federal, and bi-national entities to promote consideration of these measures, and several promising opportunities for storage and operations have been identified.

This communication is important, but access to a data-driven tool that will help Minot readily evaluate flood risk reduction and water management strategies and share that information

with its regional partners will facilitate the evaluation of additional options. This decision support tool will build on existing river models and data, providing additional analysis and creating a comprehensive, basin-wide model of the river's hydrology that can dynamically test and analyze the real implications of the measures under consideration. It will enable the city to develop and test initiatives in combination across the entire river basin in order to understand their cumulative effect, inform decision-making, and prioritize initiatives for funding and implementation. This information can also be shared with state, federal, and international partners.

**Strategic buy-out program** - Many Minot residents live in low-lying areas at risk of future flooding. They remain in the neighborhoods where they lived before the flood, often because it is not financially feasible for them to purchase or rent a new home. As a result of the oil boom, housing prices in Minot are well above the national average for a city of its size. With the scarcity of affordable housing in Minot, individuals in areas at risk of flooding have few options. When the new flood maps are released and flood insurance is required, and the cost of that insurance increases, some may be forced to relocate. This jeopardizes the health and well-being of these residents as well as the economic and social health of the city and the region. These residents must have other choices besides leaving Minot. A buy-out program targeted to the most vulnerable areas, coupled with the affordable and resilient neighborhood projects also included in our proposal, will enable residents to move out of harm's way but remain in Minot.

An analysis of the lowest-lying areas along the river revealed many homes, including a number of mobile home parks, at greater risk for flooding. Many of these locations will not be protected by the previously discussed flood protection plan for many years, as its initial focus is to protect critical infrastructure. Some of these neighborhoods are also at risk from the Class I

rail lines that run along the river in several areas. Some of these areas may offer effective flood storage, potentially reducing the required height of adjacent floodwalls and levees.

Prioritization filters were developed, with input from experts and stakeholders, for use in a process to identify areas for the proposed buy-out program. These filters include:

- Analyze the city's light detection and ranging (LiDAR) topographic maps to determine the lowest-lying areas within the flood inundation area at greatest risk for flooding, even in smaller events.
- Review the construction timeline for the planned flood protection system to determine areas where the levees and floodwalls will not be constructed until later phases of the project.
- Review potential flood storage areas within the city (other flood storage areas upstream were identified but are not included in these prioritization filters).

Six sites were identified by hydrologic engineers and reviewed by the city's Public Works Director and Mouse River Flood Protection System Chief Engineer (see map in Attachment E). The proposed buy-out activity includes the potential relocation of 400 mobile homes and the acquisition and relocation of an additional 340 homes.

**Develop flood resilient open space** - Enhancing the ability of open space upstream and within Minot to store and manage water is a critical strategy for reducing flood risk. Additional flood storage can avert some flood events by increasing the capacity to store or absorb flood waters before vulnerable areas are inundated. It may also reduce the height, and thus the cost, of downstream floodwalls and levees. Simply put, flood storage is about creating more space to hold water in the event of a flood. Flood storage areas are compatible with land uses that are resilient to flooding. If envisioned and implemented creatively, they will also benefit the city and

the region by creating open space, recreation, and ecological restoration. This proposal identifies two categories of these projects: regional flood storage and management projects (to be funded by others) and local open space improvement projects within Minot that increase flood storage, improve water management, and increase the city's ability to resist or recover from floods and other shocks and stresses.

**Regional projects** - The greatest potential to reduce flood risk through diversion and storage lies upstream. Through the NDRC process, Minot has been collaborating with state, federal, and international partners to identify projects that can increase the storage capacity or manage the release of floodwaters upstream of Minot in the U.S. and Canada. While NDRC funding is not requested for these projects, they are critical to our overall flood risk reduction strategy. Most of them also contribute to plans for restoring regional ecologies, expanding and improving the connectivity of regional recreation and open space networks, and adapting regional agricultural practices to be physically and economically resilient to the influence of climate change. (See Factor 2: Needs for information on these efforts.)

Any one of these initiatives alone will reduce flood risk to Minot. Taken together, the impact will be dramatic. This is an unprecedented opportunity to create a new model for bi-national cooperation to improve resilience that others working across national or state lines can follow in the future.

**Local projects** - A series of projects throughout Minot will establish an open space network to increase the city's resilience and reconnect Minot with the Souris River by providing additional flood storage to reduce overall flood risk; raising awareness and understanding of the river, its hydrology, and its ecosystems; engaging residents in the management and stewardship of the river; ensuring productive public use of waterfront spaces so they add to, rather than detract

from, the city's economy, social life, and overall resilience; and adapting public open space to reduce the city's vulnerability and ability to respond to shocks and stresses beyond flooding.

Buy-outs are proposed for one proposed neighborhood, in a low-lying area along the river, to allow homeowners to relocate out of harm's way. This area can potentially provide flood storage. It also presents an opportunity to develop an ecological restoration area where residents can reconnect with the river and its ecosystems. The proposed project would restore 1.2 acres of forest and 10 acres of prairie with trails and opportunities for educational programming. Restoring riparian habitat to this stretch of river will enhance the function and connectivity of the regional ecosystem by providing critical habitat at the urban edge, and will also enhance the ability of this stretch of river to absorb and adapt to periodic flooding. Coupled with the buy-out program, which would remove residents from this highly dynamic and vulnerable stretch of river, this effort would restore the river's historic water management and ecosystem function while offering an educational space for residents, particularly children, to connect with the riverfront and understand the physical and ecological function of the river. Strategically located at the connection point for the regional North Dakota trail network, this area is also less than half a mile from the Perkett Elementary School and the Magic City Campus of Minot High School - an ideal location for engaging the city's students in stewardship of the watershed.

**Waterfront greenway, Oak Park improvements, and eco-restoration area** - Some open space along the river does not offer significant flood storage, but will remain within floodable areas. Many of these sites do not need to be "protected" from flooding – meaning they do not need to resist floodwaters – but they do need to be made physically resilient and put to productive public use in order to support, rather than hinder, Minot's overall social and economic resilience. Designating these open spaces for a productive public purpose also eliminates the risk

of them being redeveloped in the future, or becoming blighted and harming Minot's social and economic potential. The proposed projects, to establish a greenway along the river and connect existing parks that flooded in the 2011 disaster, will improve pedestrian connections in Minot's neighborhoods and establish resilient activities and facilities in its core public spaces. These efforts will ensure this public land contributes to the city's social, economic, and physical resilience in the face of future shocks and stresses.

The Souris River cuts through the center of Minot, as do most of the region's rail lines; in fact, Minot exists because it was for a time the terminus of the Great Northern Railway. While the river and the rail lines do represent potential hazards, namely floods and train incidents, these corridors are critical to the cultural identity, economic history, and economic success of Minot. Flood risk reduction cannot be achieved at the expense of the city's cultural, economic, and ecological resilience.

We propose to invest in resilient land uses within Minot's floodplain by constructing a waterfront greenway and public park enhancements that will provide non-motorized transportation connections and create space for social interactions, both of which the city needs. While many people use private transportation to get around, some lower income residents, Minot State University students, and active residents rely on walking, biking, and public transportation. Our public outreach efforts continue to reveal a strong desire to enhance local and regional trail networks. A waterfront greenway from Roosevelt Park to Oak Park will provide pedestrian and bike trails between neighborhoods north and south of the river and downtown. Eventually plans are to extend these trails to communities outside Minot, as well. This project will create recreational opportunities and establish productive uses for space along the river, bolstering connectivity and increasing livability.



Connecting neighborhoods, parks, and trails to downtown may be the key to Minot's long-term sustainable and resilient development. As it continues to be transformed in the years leading up to the next census, a robust public open space network and walkable streets and trails will help ensure downtown Minot is a desirable place to live and work. Many of Minot's historic and developing neighborhoods are only a short distance from downtown, but they lack convenient access. Downtown residents and visitors also lack access to other parts of the city. The proposed greenway would connect Roosevelt Park to Oak Park and the neighborhoods in between, including downtown and the Minot State University campus.

We proposed to make strategic investments in programs and facilities in Oak Park, as well. This park has playgrounds and areas for passive recreation and picnicking, and is a landmark for city residents. In addition to connecting the park via the new greenway, we propose to expand social programs to connect the park to the river, surrounding neighborhoods, and city initiatives. We plan to construct a flood-resilient 40 foot square shelter to house the city's summer feeding program, which provides healthy free meals to children and low-cost meals for adults who otherwise lack dependable access to nutritious food. (The program is an extension of the city's school-term meals program, but has outgrown its existing shelter.) We will also build a sensory playground to serve Minot's most disabled and at-risk youth, and will provide access and parking facilities on three or four sites adjacent to existing park access roads.

**Implement Mouse River Enhanced Flood Protection Project, including resilience projects and findings of the decision support tool** - Minot will fund the Mouse River Enhanced Flood Protection Project using non-NDRC resources, but this plan and subsequent resilience projects incorporated in the plan are necessary to create a resilient future for Minot and the region and protect our critical infrastructure, historic neighborhoods, and vital facilities. Once the initiatives

described above are completed, and armed with a tool to effectively measure flood reduction impacts, we are confident that the cost and timeline of the currently proposed flood protection project will be dramatically reduced. The efforts outlined above will also enable us to develop and implement the proposed plan in a way that supplements, complements, and enhances our city's economic and social resilience. These projects offer a realistic opportunity to address Minot's flood risk while embracing its connection to the riverfront.

**A model for collaboration and resilience** - These projects will bring real benefits to Minot, and we hope they can also serve as a model for cities and regions like us. While Minot might be an extreme case – our flood was devastating, and the rapid economic change created by the oil industry and the related impacts on population and housing are extreme as well – more cities in the U.S. will face such dual disasters because of the changing global climate and volatile economy. Minot is like many small cities across the U.S., but there are lessons we can share with much larger cities and regions as well. It took dramatic shocks (the flood and the oil boom) and a well-timed opportunity (this competition) to prompt our city to think and plan resiliently. The projects proposed here and the process of local and regional collaboration that has led to them can, we hope, be a model for other communities and regions.

**Improving community resilience** - These projects increase our resilience and our resistance to flooding. By combining flood storage and water management strategies as well as non-structural solutions like buy-outs with the already-planned long-term flood protection plan, we can create a layered approach to flood risk reduction for the city that also benefits adjacent towns and the region, converts the river and open space to amenities, and lowers the overall price tag of the proposed protection plan. This will allow some of those funds to be reinvested in making Minot more resilient. While floodwalls and levees represent a critical layer in our strategy to reduce

flood risk, the projects for local and regional flood storage will address some risks more quickly and generate restoration opportunities that will establish habitat, help farmers adapt agricultural practices to climate change, and offer land- and water-based recreation.

**Addressing unmet recovery needs** - Both individually and as a comprehensive set, our flood risk reduction projects help us meet our unmet recovery need. The buy-out program targets homes in areas most prone to flooding. In many instances the individuals and families who live in the proposed buy-out areas are still struggling to recover from the 2011 flood. Similarly, the public open space projects connecting Oak Park and Roosevelt Park address structural needs in these parks that have not yet been repaired following the flood, as well as the needs of vulnerable people who rely on services and social connections at these parks to improve their quality of life.

**Alternatives considered** - Variations of the proposed projects were evaluated, and the selected flood risk reduction projects were chosen because they clearly and significantly reduce costs while increasing benefits and resilience to current and future disasters in the most impacted and distressed areas and beyond. The primary alternative considered, to which these newer scenarios were compared, is reducing flood risk entirely through floodwalls and levees. Preliminary analysis has revealed that our proposed projects, when layered with resilient flood protection options, will reduce provide the same level of protection at a lower cost, while offering a number of additional benefits.

**Benefiting vulnerable populations** – These flood risk reduction and water management projects benefit vulnerable populations by layering multi-purpose landscape infrastructure with non-structural programs to lower the risk of future floods and foster resilience to other shocks and stresses. The buy-out program provides families and individuals at the greatest risk for flooding,

and least able to afford to relocate out of harm's way, the financial ability to do so. This project must be coupled with the development of resilient, affordable neighborhoods (described later in this section) to truly serve the needs of our most vulnerable populations. The open space strategies link flood storage and improved water management with productive uses that bolster the overall resilience of all residents. Parks and open space, while floodable, will not always be flooded. By providing alternative transportation modes (the greenway) and new facilities for programs serving some of our most vulnerable populations (a feeding program for youth and families unable to afford three healthy meals a day), these parks and open spaces will become even more vital to our city. During floods these spaces will help keep our vulnerable residents safe, but day to day they will support social interaction and connections between residents, jobs, and services. This will reduce their vulnerability to the social and economic stresses our community faces. Finally, we anticipate these layered strategies will reduce the overall timeline and cost of providing the flood risk reduction benefits the flood protection plan will bring to everyone in Minot, but particularly to those who lack the resources to relocate or make their own living situation more resilient.

**Feasibility of the project** – The City of Minot and its partners are fully capable of implementing this flood risk reduction project and its associated activities to deliver the proposed benefits and meet the expected national objectives. The city and its engineers have experience in designing and constructing major infrastructure projects and have successfully completed similar projects on time and within budget. Although not proposed for NDRC funding, the Mouse River Flood Enhanced Protection Plan design is based on the peak flow rate experienced in 2011 (27,000 cfs) plus an allowance of three feet for risk, uncertainty, and system resiliency. The project will be designed in accordance with USACE guidelines and procedures. Since it will replace an existing

USACE project, each segment requires permission from the Secretary of the Army under 33 USC 408. An environmental impact statement is being prepared for the project to comply with the National Environmental Policy Act. Once constructed, the system will be certified in accordance with 44 CFR 65.10 to achieve FEMA accreditation.

The Mouse River Enhanced Flood Protection Project design team has prepared preliminary engineering reports incorporating input from state officials and ongoing public outreach efforts. Representatives from Minot's flood inundation area met with city staff and officials in Grand Forks ND, which experienced the Red River flood disaster in 1997, to discuss the challenges and features of their flood protection project and obtain recommendations for Minot and the region based on their experiences. Extensive public outreach and engagement will continue throughout the design and construction of the long-term flood protection project.

Our proposed projects work together to increase the overall feasibility of flood risk reduction in Minot. Prior to the NDRC process, we were pursuing a single infrastructure solution to reduce flood risk, relying solely on a system of floodwalls and levees. Its cost was estimated at \$1 billion and construction is anticipated to take more than 25 years to complete. While more detailed analysis is required to accurately price the savings, we anticipate our proposed projects, layered together, will reduce the overall cost of a floodwall and levee system, yet provide the same level of flood risk reduction in a more resilient manner. While the regional projects require coordination at a state and international scale, this collaboration is already happening. In preparing this application Minot worked with the International Souris River Board, the Souris River Joint Board, USFWS, and USACE to evaluate opportunities to lower normal water levels in Lake Darling and consider the other flood risk reduction strategies and opportunities for water management outlined in Factor 2: Need.

## **Project 2: Build affordable, resilient neighborhoods**

Affordable housing is essential to Minot's disaster recovery. It is even more important to the city's future resilience and its ability to respond to future risks and hazards. Minot is already taking steps to reduce current and future flooding risks. However, our long-term vitality and economic well-being also require an aggressive response to our affordable housing needs. The lack of available affordable housing in Minot has most seriously affected our vulnerable populations. It has also created significant workforce stresses in our business community and for the major institutions critical to maintaining a stable economic balance in the region so we do not become an oil-dominated economy.

Prior to the flood some of the most affordable housing in Minot was located in the valley north and south of the Souris River. These older neighborhoods had tree-lined streets, green spaces shaded by large trees, and an interesting blend of architectural styles including craftsman, Cape Cod, and bungalows. People who lived in these neighborhoods had known and cared about one another for years. The social cohesion and sense of community in these neighborhoods was an important asset for the entire city.

Following the flood and the economic shocks generated by the oil industry housing construction increased dramatically, as did the cost of housing. Although housing costs in Minot, particularly rental rates, have moderated slightly since the extraordinary increases experienced between 2012 and 2014, today two-bedroom apartments range from \$1,050 to \$1,595 per month while three-bedroom apartments rent for \$1,460 to \$2,100 per month.<sup>1</sup> The tight rental market in Minot and Ward County led HUD to increase the fair market rents from \$686 to \$1,087 in 2012.<sup>2</sup>

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<sup>1</sup>September 18, 2015 review of property management websites with Minot, ND listings: 1<sup>st</sup> Minot Mgt., IERT Properties, SMC Minot, Realtor.com, Zillow.com

<sup>2</sup> "Minot-Williston, North Dakota Housing Market Profile," US Department of Housing and Urban Development, Office of Policy Development and Research, May 2013.

With Minot’s population growth projected to continue over the next 10 years, even as oil prices drop, rents in Minot and Ward County will increase, though on a more moderate trajectory.<sup>3</sup> For homebuyers the escalation in housing costs has perhaps been even more challenging. The average price of a new single family home in Minot in 2011 was \$256,979. By 2015 the average price had reached \$348,185, making homeownership an unrealized dream for more and more Minot residents. To put this in perspective, a family of four at 80% of Minot’s median income (\$56,300) could afford to pay \$169,814 for a home.<sup>4</sup> Based on our analysis and working with local bankers and the Minot Homebuilders Association, we estimate a well-priced new three-bedroom home in Minot today costs \$301,000.

In addition to being financially inaccessible to a larger percentage of our population, most new construction hasn’t been sited or built to adapt to current, must less future climate and socio-economic conditions. Instead, low-cost options such as mobile homes are often located in flood prone areas or those with poor access, and many were not constructed for the harsh climate of Minot. Even high-end housing built in the market boom often falls short in quality of construction, particularly in regard to its suitability for Minot’s winter weather, and does not foster connectivity between residents and access to services and amenities.

The activities proposed within the *build affordable, resilient neighborhoods* project focus on developing affordable housing through:

- Constructing new affordable housing and community amenities in two of our neighborhoods with the greatest housing needs and resilience potential: downtown and near Minot State University

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<sup>3</sup> North Dakota Oil & Gas Industry Impacts Study, prepared for the North Dakota Legislature by KLJ.

<sup>4</sup> Assumes 3% down payment, 4.2% interest rate, 30-year convention mortgage, medium credit rating, moderate debt to income ratio.

- Constructing new, resilient neighborhoods with affordable housing, enabling both displaced and new residents to “buy-in” to Minot

Each of these new neighborhoods will leverage existing city resources, other existing and ongoing city plans, and the unique attributes of their respective context and location. Planning and design features will integrate the quality neighborhood and housing characteristics identified by stakeholders in Phase 1, which were refined and prioritized by the Community Advisory Committee in Phase 2 and then described and translated into specific design priorities and recommendations by potential resilient neighborhood residents through two design charrettes with MSU students, military personnel from the Minot Air Force Base, young professionals and families, police and fire personnel, and active seniors. While some preferences varied across stakeholder groups, neighborhood qualities were consistently described across all groups as providing a variety of housing densities for diverse residents; ensuring quality as well as affordable design; enabling walkability and access to jobs and services; and providing open space with access to nature, trees and other vegetation, recreation and walking and biking for transportation.

Collaboration with potential housing residents through the NDRC process has grounded the concept of resilient neighborhoods in the unique needs and wants of our own community, informing the site selection process, housing density, and mix of architectural styles and urban designs. Community stakeholders, particularly target groups for affordable housing, will continue to be involved and engaged throughout the planning and design process. We want these neighborhoods and homes to serve our residents and set the standard for outstanding quality, energy efficiency, and design in Minot, across the state, and in the Great Plains, and we want them to be neighborhoods people in Minot will be proud of.



We proposed to construct 609 affordable homes in these neighborhoods so that:

- People who move from lower-lying areas through our buy-out program or other means can remain in Minot.
- Civilian personnel and officers considering positions at the Air Force Base and wanting to put down roots, as well as junior officers with shorter postings, will find housing options that meet their needs, preferences, and pocket books, thereby building a diverse and skilled employee base for our city.
- Our most vulnerable residents including the elderly, youth, disabled, and financially burdened will have affordable rental and homeownership options with better transit connection to jobs and services.

Although 609 new affordable homes won't eliminate our affordable housing shortage, it will give Minot a chance to make real headway in solving this critical unmet recovery need, and will enable us to provide housing to residents from all walks of life well into the future. Given our very limited access to other resources to support affordable housing, this may well be our only opportunity to make serious inroads in addressing this problem in the foreseeable future. The North Dakota Housing Finance Agency receives very limited funding for affordable housing from federal or state sources (low income housing tax credits, state CDBG funds, and the state's Housing Incentive Fund), and these funds must leverage affordable housing statewide.

The homes in these new neighborhoods will be built appropriately for the Minot climate and will meet high construction standards, including Green Building Standards for Replacement and New Construction of Residential Housing and ENERGY STAR certification. While we develop the housing plan book, NDSU faculty and students will evaluate innovative construction materials and best practices for disaster resistant construction, green building, and energy

efficiency and we will perform a benefit-cost analysis to determine if these innovations could reasonably be incorporated in the standards for our new homes.

To accomplish this, Minot has pulled together an award-winning group of design partners with outstanding national, state, regional, and local design expertise. The design team includes North Dakota State University Department of Architecture and Landscape Architecture; SCAPE, a partner in the Living Breakwaters Rebuild by Design project; EAPC, an award-winning architecture firm; and KLJ, which brings outstanding landscape architecture and cultural resources experience to the team. These design partners will work with the City of Minot, our NDRC program manager CDM Smith, our nonprofit developers, and the community to create well-designed neighborhoods with mixed density, mixed income housing offering rental and homeownership options. The text that follows provides additional detail about each of these neighborhoods and our proposed activities.

**Downtown: Our resilient neighborhood for the region** – Downtown is the heart of our city. It is also almost entirely outside the floodplain and the 2011 flood inundation area, and is where we have the greatest existing concentration of infrastructure and services including schools, businesses, and transportation options.

**Affordable downtown student housing** - We propose to use NDRC funds to construct 40 two-bedroom units of affordable student housing to house 80 students on the upper floors of the new Minot State University (MSU) Arts building. These units will be available to LMI qualified students. The city is expanding its transit routes and will develop a transit circulator to run between downtown and the MSU campus; also, the new Broadway Bridge will have pedestrian and bike lanes to improve non-vehicular access across the river. This live-work-play housing will offer MSU art students access to studios, classrooms, coffee shops, restaurants,

shops, and bicycle and pedestrian trails. In our workshop with MSU students, they expressed a strong preference for more dense housing options with increased access to shopping, jobs, and other amenities. Art department students, in particular, expressed a strong desire for expanded studio space and an opportunity to collaborate with artists in ArtSpace, an existing live-work space for artists, and other art institutions that have clustered in downtown Minot. Depending on market demand, 15 market rate apartments could be built on the top floor of this building. In addition to the academic programs and housing,, a new downtown mini-YMCA with a workout facility, exercise studios, and community meeting space will also locate in this new building. The “Y” will offer low-cost memberships to LMI and vulnerable people, including seniors living at the Parker Senior Center.

The new housing for art students will build on the arts and cultural momentum that has already begun downtown, and will further expand economic resilience. The ArtSpace Lofts, which opened in 2014, provides 34 affordable downtown apartments and studios for working artists, along with a gallery on the first floor operated by the Turtle Mountain Tribal Arts Association, a Children’s Music Academy, and additional commercial arts space.

Research shows the arts rank high on the list of characteristics that make places livable. The new student housing, ArtSpace, the Taube Museum of Art, and other small arts businesses on Main Street are drawing residents and visitors downtown for arts and cultural events and improving economic outcomes for existing small businesses.

**A Downtown Gathering Place**, also proposed for NDRC funding, will capitalize on these assets and create a public space for arts and cultural activities in addition to recreational open space which is sorely lacking downtown. Minot and the region need a place that represents their past and their future, where people can gather to enjoy what makes this region special and

build connections among all of the people who now live here. This new public space will be located on a 2-acre site downtown and will feature design elements that depict the heritage and culture of Minot and the region, including iconic lighting bollards which will contribute to a sense of place as well as safety; a fountain dedicated to the heroism of Minot's volunteers and public servants who worked tirelessly before, during, and after the flood; a walking path; and events space for morning yoga, storytelling time, a Saturday morning farmer's market, the city's Arts Festival, and other activities and events. This space will also provide connections and wayfinding for the riverfront greenway, serving as a gateway to downtown for residents using non-vehicular transportation.

These projects are not meant to stand alone. Minot is diligently working to further revitalize downtown, and significant local public and private funds are being invested to make the downtown neighborhood more vibrant and resilient. Two new parking garages are nearing completion, and 200 units of market rate and 50 units of affordable housing will be constructed above these parking structures. Furthermore, working with the Economic Development Administration, the city has already begun repairs and upgrades to downtown utilities and streets and a downtown streetscape improvement program is under way. A group of business leaders is planning a new downtown Children's Museum featuring the river and the city's economic heritage – agriculture, military, and energy – and there are plans to renovate the Carnegie Library building. The City of Minot will harness Renaissance and Magic City funds to provide grants and low-interest loans to small businesses along Main Street and Central Avenue for facade improvements and redevelopment.<sup>5</sup> Together these ongoing efforts, coupled with activities proposed in this application, will address current and future needs, provide a catalyst for further

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<sup>5</sup> Minot Area Growth through Investment & Cooperation Fund (MAGIC), created in 1990 for economic development and capital improvements, has invested \$33 million in over 200 projects in 44 communities. Renaissance Fund is a State of North Dakota tax incentive program for approved zones.

investment in the form of new residents and better infrastructure and activities downtown, and ensure that our downtown is successful and resilient.

**The Minot State University neighborhood: a neighborhood for our next generation** - MSU is part of the heart and soul of Minot. Like many institutions of higher education, the university operates under constrained budgets and expanding educational demands. The 2011 flood displaced over 567 MSU students and enrollment has not recovered to pre-2011 levels, due primarily to the loss of affordable student housing. Fall 2015 enrollment is down by 456 students compared to enrollment levels prior to the flood. The MSU Foundation has facilitated the development of 56 new units of affordable student housing – a great start, but additional units are needed. MSU is an active partner in Minot’s recovery and is dedicated to the goal of creating a more resilient city and region. MSU has worked cooperatively with the leaders of Minot throughout this NDRC process and is determined to be a vital part of its resilient transformation.

Minot proposes to use NDRC funds to help **build 24 units of affordable student housing** adjacent to the MSU campus. The City will partner with the MSU Foundation to develop 12 two-bedroom and 12 four-bedroom units to house at least 72 students. The MSU Foundation will own and manage these units. At least 50 percent of these units will be available to LMI students for at least ten years, and the first floor units will be designed meet the needs of disabled students.<sup>6</sup>

**New Resilient Neighborhoods: Enabling people to “buy-in,” not just “buy-out”** - While downtown and the neighborhood around MSU are critical to the city and the region, the input we received from residents and conversations with affordable housing developers told us that these

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<sup>6</sup> MSU Foundation has reviewed financial aid data to determine that more than 50% of MSU students qualify as LMI, based on their family income or individual income if they are independent of family income support.

two neighborhoods alone do not meet the housing needs of many of the residents we want to retain in Minot. Minot proposes to use NDRC funds to help build three new neighborhoods that are located and designed to incorporate the quality neighborhood characteristics people told us matter most.<sup>7</sup> Within these new neighborhoods we will build 609 new, high-quality affordable homes, improve resident's access to jobs and services, and incorporate principles of good design. Although it isn't easy to accomplish, it is possible to achieve well-designed neighborhoods and homes that are affordable. Housing and neighborhoods that are well designed help strengthen social cohesion, reduces stress, and enhance a sense of safety and community belonging.

The planning and design process for these new neighborhoods and homes began with discussions among the Minot Community Advisory Committee and in public meetings, and was expanded in recent housing design charrettes that included Minot State University students, Air Force base personnel including civilian staff, active duty officers and their families, young professionals, seniors, and people whose homes were damaged in the 2011 flood. We will continue to engage representatives of the Advisory Committee as well as neighborhood and stakeholder representatives in discussions about these neighborhoods and the homes that will be built there. It has been, and will continue to be, important to frame these discussions in terms of cost and affordability, while also considering planning and design elements. Each neighborhood will integrate common green space – to be used for neighborhood events, play areas, community gardens, and other activities to bring people together – as well as walking trails that connect to surrounding neighborhoods and destinations, such as schools. The neighborhoods will be connected to transit services, neighborhood schools, other community services, and trails linking the neighborhood to the rest of the city.

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<sup>7</sup> In public meetings, design charrettes, vulnerable populations meetings, community advisory committee meetings, and numerous civic and organizational meetings throughout Minot and the region

In addition to ongoing conversations with constituents we hope will live in these neighborhoods, we will monitor market dynamics throughout the development process. This will include securing detailed market studies of housing in Minot and Ward County. This information will be shared and discussed with our stakeholders and updated as needed during the development of these new neighborhoods and homes. The market analysis will help the development team assess housing and market conditions that could require adjustments in density mix, type of units, and related factors, and enable us to make mid-course corrections that may be needed.

To develop high quality neighborhood settings, we will acquire property in three areas of the city, away from the flood hazard area, with access to concentrations of employment, transportation, and commercial and professional services. The site evaluation and selection process will begin immediately after an award announcement is made. We have initially analyzed several sites that could accommodate these new neighborhoods, and have identified one urban infill site that may potentially accommodate at least 70 new townhomes or twin-homes. The team has worked with potential regulators on CDBG-DR and other projects in Minot. We have identified regulatory agencies that may review elements of these projects and have provided them with information about our proposal. To ensure regulators have the information they need, we will establish regular coordination and communication with all appropriate agencies including senior leadership.

Minot has developed site selection factors for evaluating properties where new neighborhood may be developed. These factors include:

- Located outside the worst-case scenario projected floodplain from 2016
- Proximity to existing utility infrastructure
- Access to schools with available student capacity

- Proximity to existing concentrations of commercial and social services and employment
- Connections to transit and transportation networks
- Compatible surrounding land uses, condition of surrounding neighborhoods, types of occupancy, and existing zoning
- Suitability of the site for housing, including topography and geology
- Environmental factors on and adjacent to the site
- Ability of the site to physically accommodate the proposed project
- Land and infrastructure costs

In the first neighborhood we will develop 150 units of multifamily housing and townhomes and 150 single family homes. The second neighborhood will include 107 multifamily, townhomes, and twin-homes. The third neighborhood will include 100 units of multifamily and town homes and 100 units of single family homes. By carefully selecting quality sites, incorporating mixed densities, and using efficient infrastructure and building layouts, we can incorporate shared green space, community gardens, and walking trails – features usually reserved for higher priced developments. Our design team will develop a plan book, including technical as well as massing and aesthetic guidelines, and these plans will be used for each development. A construction specifications expert will develop construction and building specification standards for each neighborhood, and on-site inspections will ensure adherence to these standards. Using these plans and specifications will help reduce costs and ensure local builders are familiar with all requirements.

Working with two experienced nonprofit developers will facilitate the development process. Our early conversations with these developers will enable us to begin construction on two neighborhood sites in 2016, and the third site will be under construction by 2017. The first



multifamily development, utilizing a 9% LIHTC, would begin construction in 2016 and all 120 units would be in service by 2021. The second multifamily development, utilizing a 4% LIHTC, would begin construction in 2017 and 80 units would be in service in 2019. The total project cost for these two developments is \$47,905,800. We propose to use NDRC grants to provide gap funding for these two projects in the amount of \$16,450,000.

Developing an affordable homeownership program is crucial to the city's recovery and future resilience. It is, however, more difficult to determine the gap funds required to provide subsidies that will enable households with incomes below 80% of AMI to purchase a home. We also want to assist homebuyers with incomes between 80% and 120% of AMI who may require gap funding to qualify for a mortgage loan. These homebuyers include essential personnel, households who are financially decimated as a result of the flood, and civilian personnel needed to fill mission-critical positions at Minot Air Force Base.

Many of the families participating in the buy-out program already incurred significant debt when they repaired their homes after the flood. Fewer than 10 percent of the homeowners in the flood inundation area had flood insurance (because their homes were outside the mapped flood plain at that time), and many of these homeowners now have two mortgages. Developing an affordable homeownership program that works in tandem with the buy-out program to enable these homeowners who are most at risk for future flooding to move out of harm's way (and returning the low-lying land to flood storage) is critical to Minot's recovery and to reducing our flood risk.

The team interviewed local bankers, builders, the Minot Homebuilders Association, area realtors, and non-profit developers to develop a method for calculating the NDRC funding needed to provide the gap funds to develop three neighborhoods and 607 units of new affordable housing in Minot. We evaluated lending programs available through the North Dakota Housing

Finance Agency and local lenders, underwriting criteria, down payment assistance programs, construction costs, land, and on-site infrastructure costs. We assessed the square footage of affordable homes with two, three, and four bedrooms to determine a reasonable range of housing sizes to accommodate the needs of a variety of households.

Based on this analysis, we used the following assumptions to calculate an average gap funding requirement for a range of housing sizes, based on family size and number of bedrooms: land, utilities, and site development costs of \$160,000 per acre; mortgage interest rate of 4.2% (assumes an increase in interest rates over the life of the project); average per square foot housing cost of \$200/sf, which is \$15/sf less than the current average per square foot housing cost in Minot; a 1,450 square foot three bedroom house; 3% down payment; median income for a family of four at \$56,300; 12% taxes and insurance; and an estimated maximum mortgage and standard underwriting criteria.<sup>8</sup> Based on this analysis, Minot will request \$57,748,000 in NDRC funds to provide the gap funding for a homeownership program for 357 households with incomes below 80% of AMI.

Gap funds from NDRC would be used to fund a second mortgage for qualified home buyers; the amount of the second mortgage would depend on family income and other factors including underwriting criteria and mortgage interest rates. The team will work with area lenders, the North Dakota Housing Finance Agency, FHA, and other lenders who assist affordable home buyers to fully develop these parameters. A portion of the second mortgage would be structured as a forgivable loan over a fixed period and tied to homeowner performance requirements such as maintenance and upkeep, completion of homeownership training for first time homebuyers, and payment of mortgage and taxes. The balance of the second mortgage

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<sup>8</sup> Average national per sf housing costs \$125, and interviews with Minot lenders, builders, and realtors in June and August 2015

could be a zero-interest loan that becomes due and payable when the house is sold or otherwise transferred. Overall, we aim to develop flexible gap funding tools that enable households in the buy-out program and other essential personnel with incomes below 80% of area median income to find quality affordable housing in Minot. The final design of these gap funding programs will be determined in collaboration with our Financial Advisory Committee, which will include representatives from local banks, NDHFA, our non-profit developers, and our state HUD office.

**Minot Family Homeless Shelter** – Minot has developed several facilities to provide housing and services to homeless individuals. The YWCA provides shelter for women, boys under the age of 12, and girls, and the Men’s Winter Refuge provides shelter to single men during the winter months. There is no shelter for families, and no options for single mothers with boys over the age of 12 to keep their family intact if they become homeless. Since the beginning of the NDRC process, the Vulnerable Populations Committee has promoted a family shelter as a critical need in Minot and the region. A number of volunteer organizations have tried to tackle this housing need for vulnerable people over the past few years. The most significant obstacle has been access to capital to develop or rehabilitate a suitable facility that could offer housing for families, access to coordinated services, and a commercial kitchen that could also provide meals for individuals not residing in the shelter.

Minot proposes to dedicate \$2,765,000 in NDRC funds to build the Minot **Shelter for Homeless Families and a commercial kitchen**. The 8,000 square foot facility will be designed by EAPC, a member of the Minot NDRC team that has designed other shelters and supportive family housing in the state. The shelter will be owned by the Minot Housing Authority, who will continue to actively engage Vulnerable Populations Committee members and area churches and volunteer groups to help support the shelter.

The shelter will provide a safe, temporary home for families. Area social service agencies will provide case management to assess the family's needs and develop a plan to help the family find employment, if needed, and permanent housing as soon as possible. Families living in the shelter will be required to follow shelter rules and schedules. Adults will be expected to go to work or to actively seek employment, and children will attend school or child-care programs. Volunteer drivers will be available to help shelter residents with transportation. The shelter will be designed in keeping with quality architectural standards to fit with the surrounding residential neighborhood, and site planning will be an important component of the overall design process. The shelter will offer a play area, outdoor space, and a safe and secure environment for families.

**Improving community resilience** - The lack of available affordable housing continues to dramatically impact the city's economic and social resilience. We are unable to estimate the number of long-time residents forced to leave the city after the flood due to the high cost of housing, inadequate resources to make necessary repairs, and the need for additional support to live independently. The enrollment at Minot State University remains below pre-flood levels due to the lack of affordable student housing. Minot Air Force Base is having difficulty filling mission-critical civilian positions at the base, primarily due to the dearth of affordable quality housing. More than 600 families are on the Minot Housing Authority waiting list, and the severe shortage of affordable housing will make it impossible to move LMI families out of the lowest-lying areas with the greatest flood risk. Minot's resilience depends on developing affordable housing to allow essential personnel – teachers, healthcare workers, police and fire personnel, Air Force Base personnel, small business employees, and others – to continue to live in Minot.

**Addressing unmet recovery need** - While reducing flood risk and improving water management is a significant unmet recovery need for Minot and the region, one of Minot's most

serious unmet recovery needs is the lack of affordable housing in quality, resilient neighborhoods that enable people to remain in the city and begin to rebuild the important social and community connections and neighborhood spirit fragmented by the flood. Building affordable, resilient neighborhoods will allow the city to move forward with a buy-out program to move people out of flood-prone neighborhoods. Creating 607 new affordable housing units in Minot will provide housing options for our most vulnerable people and help small businesses serving LMI residents.

Developing this affordable housing will allow the city to help 740 households in the strategic buy-out areas move out of harm's way. An initial analysis using HAZUS modeling indicates the proposed buy-out program would have reduced the 2011 flood damage cost by \$96,782,000, and if the first four phases of the Mouse River Enhanced Flood Protection Project had been in place along with the buy-out program, the 2011 flood damage cost would have been reduced by \$554,000,000.

**Alternatives considered** - While a number of potential project alternatives were considered in developing this proposal, the overwhelming need for affordable housing was clearly recognized from the very beginning. In the very first public meeting in Phase 1 of this process, every small group discussion identified the need for affordable housing. It took time to recognize, however, that Minot's affordable housing crisis was the result of both the flood disaster and the economic shock caused by the oil boom.

Because of the constrained construction season in this region and the need to complete construction of these homes by September 30, 2022, Minot did consider building homes on infill lots throughout the city. While that option might offer advantages in expediting schedules, it would not create resilient neighborhoods. If we learned nothing else from our public and stakeholder engagement, we heard the message loud and clear that neighborhoods matter. This

project had to be about creating neighborhoods, not just housing. Housing is crucial, but a resilient Minot needs resilient neighborhoods and the social connections they help to foster.

Neighborhoods and the opportunity they offer to re-build and reconnect people is almost as important as the availability of affordable housing. We therefore decided to link quality neighborhoods and affordable housing. We have identified potential sites that would allow us to begin construction on homes in 2016, subject to an evaluation of these properties using the site selection prioritization factors described previously and after appropriate environmental reviews. With options available to create affordable neighborhoods with the characteristics that matter most to people in Minot, and to do so in a timely manner, the decision was made to build neighborhoods with affordable housing rather than random in-fill development. After the flood and the economic shock this community has weathered, the security and connection of neighborhoods means even more to the people who live here.

**Meeting a National Objective** – An October 2013 study completed by the City of Minot documented that affordable homeowner housing is sorely needed in Minot.<sup>9</sup> According to the study, data from the 2011 American Community Survey revealed that 38 percent of the homeowner households in Minot were cost burdened, meaning they were paying more than 30 percent of their income for housing. Approximately 27 percent of Minot’s housing stock was damaged by the flood, which exacerbated residents’ difficulty in finding affordable housing. Recent interviews conducted with social service organizations, the Minot Housing Authority, and individuals looking for affordable housing indicate the percentage of cost burdened households in Minot is now greater than 38 percent. To assist with the housing shortage the City

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<sup>9</sup> Minot Affordable Housing Strategy: Affordable Housing Action Plan, prepared by CDM Smith for the City of Minot. October 25, 2013.

of Minot has proposed to develop 252 affordable multifamily and townhome units and 357 units of single family and twin-homes. All units assisted with CDBG-NDR funds will be required to meet HUD's affordability requirements and will remain affordable for at least 20 years after initial occupancy. This project will meet the LMI national objective.

**Benefits to vulnerable populations** - The availability of affordable housing, including units developed for seniors and people with disabilities, will significantly benefit our community's vulnerable populations. Adding 607 affordable housing units will enable LMI households to move out of flood-prone areas of the city. These new affordable homes will allow some households making below 60 percent of AMI to find housing that is not available in Minot Housing Authority's current inventory. Finding quality affordable housing will improve social cohesion for many of these families, who may currently be experiencing overcrowding, sub-standard housing conditions, and significant housing cost burdens.

### **Project 3: Foster economic resilience and diversification**

**Recapping the Need** - Maintaining a sustainable, diverse economy in Minot may be the greatest challenge to the region's long-term resilience and recovery. The influx of oil industry jobs has been an asset in many ways, but the city risks becoming dependent on these oil jobs and vulnerable to the volatility of the oil industry. If that happens, when the next downturn in the oil industry hits Minot would face significant unemployment, loss of businesses, and other economic impacts affecting communities that depend too heavily on a single industry sector. Minot businesses documented the loss of 800 employees after the flood, and these businesses continue to report challenges in retaining employees. They attribute this primarily to two factors: the lack of affordable housing and the draw of much higher wages and per diems in the oil industry. Employees in many sectors have left regional employers for higher paying oil jobs.

Minot has begun to lose its robust base of workers with the technical skills needed to fill industry-specific jobs in non-oil sectors; people with these skills will be critical to our economic resilience as we face the ups and downs of the oil industry. While we need to address housing affordability, we also need to build the skills and capacity of our workforce.

**The Proposed Project** - Recently the North Dakota University System Chancellor met with Minot business leaders to ask how the university system could help. Their first response was technical education. At present the community college and technical education center closest to Minot is 85 miles away on two-lane rural roads, requiring an hour and a half drive each way. The time, distance, and winter driving conditions make the Dakota College at Bottineau an untenable option for many employees and students. While Minot has MSU, the four-year university option is not the right fit for everyone. For many, including individuals with limited training who are looking to re-enter the workforce because they have been laid off from an oil job, or because they need to supplement their family's income, targeted technical training over a shorter timeframe may be more appropriate.

We propose to use NDRC funding to **develop a Center for Technical Education** in Minot. A recent study by the Georgetown University Center on Education and the Workforce found that job opportunities for high school graduates were declining. In 2011, one in four young high school graduates were unemployed, and those with jobs had seen their wages fall by 12 percent to just \$19,400 annually.<sup>10</sup> The same study found that by 2020 almost two out of every three jobs will require some postsecondary education and training. For many industry sectors, training for employees is an important ongoing investment. Many of the jobs available to those with post-secondary education and training, but that do not require a bachelor's degree, provide

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<sup>10</sup> "Career and Technical Education, Five Ways that Pay," Georgetown University Center for Education and the Workforce, September 2012



annual earnings of \$35,000 to \$95,000. Some of the fastest-growing jobs are in healthcare, professional and technical services, sales and office support, and STEM. Minot currently has a strong employment concentration in healthcare and sales and office support.

Minot State University (MSU) is working with Dakota College (DC) to provide the programming and management for a new Center for Technical Education for Minot and the region. John MacMartin, President of the Minot Chamber of Commerce, and Stephanie Hoffart, President and CEO of the Minot Area Development Corporation, strongly support the development of this facility and reiterate that ongoing education and training is a significant need in Minot and throughout the region. The Center for Technical Education would provide one- and two-year certificate programs, customized technical training services for area businesses, associate degree programs, and eventually college transfer programs. Working with Minot Public Schools, MSU and Dakota College have identified career training courses offered at the Northwest Career and Technology Education Center and would develop post-secondary training options for targeted career programs including aviation, biomedical science, child development, and diesel technology. Minot proposes to use \$11 million in NDRC funds to develop the facility for the Center for Technical Education in Minot. The new 30,000 square foot building would include laboratory and classroom space as well as study areas. The building would be a pre-engineered structure with a customized, locally appropriate skin. Some parking will be provided adjacent to the building along with aprons to serve docks for laboratories. Programs and ongoing operations will be funded by the North Dakota University system.

MSU and DC are in a unique position to assume responsibility for career and technical education in this region. Together the two campuses have the authority to offer one-year certificates of completion up to master's degrees. MSU and Dakota College have a long history of collaboration and close cooperation, with Dakota College serving as a branch campus of

MSU. The long-term goal for this initiative would also include partnering with the state’s other community colleges to maximize the offerings available to students in Minot, ensuring the needs for workforce training in this region are satisfied.

The current plan is to locate this facility on the MSU campus, well connected to the MSU and downtown Minot neighborhoods. However, the final site selection process will not be completed until after the NDRC funding awards are announced. Factors to be considered in choosing the site include proximity to the MSU campus, as some programming may include classes with other colleges on campus; access to transit services; proximity to employment concentrations; ability to accommodate the space; access requirements specific to the programs; and ADA accessibility.

The loss of enrollment at Minot State University following the flood is primarily tied to the loss of affordable student housing. Rebuilding the enrollment must focus on adding affordable student housing and expanding programs where student demand is increasing. It is also important to consider co-benefits and synergies that can be developed to help enhance the city’s resilience and recovery.

Resilient cities and regions must focus on education and life-long learning. Education and training will give Minot residents the skills needed to perform in today’s knowledge-based economy and support the application and deployment of technology and innovation. This will be critical in retaining and creating competitive businesses that will provide well-paying jobs in the future. Minot State University is an “anchor institution” in Minot – “a deeply rooted organization offering significant contributions to a community’s continued economic stability and strength.”<sup>11</sup>

Institutions of Higher Learning such as Minot State University are critical catalysts for

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<sup>11</sup> “The Role of Anchor Institutions in Sustaining Community Economic Development, Office of University Partnerships, Office of Policy Development and Research, US Department of Housing and Urban Development.

economic resilience, contributing to economic growth, business development, technology transfer, and business and educational partnerships. Minot State University's economic impact in the region in FY 2011 was \$222.7 million; however, its economic impact declined to \$186.4 million in FY 2012 due to the loss of student population, flood recovery costs, and other flood-related impacts.

The second activity in this project proposes to use NDRC funds to build a new MSU Art Department complex in downtown Minot with 40 units of affordable student housing on the upper floors, as described under Project 2. Minot State University's Art Department offers five undergraduate degrees and has distinguished itself as a center for regional art and art education. Enrollment has increased, and the department has optimized its available space on campus. Additional space is needed to grow these programs, meet increased student demands, and help to rebuild enrollment. While technical training is most definitely needed, people still look to MSU for a quality four-year education. We want to capitalize on the opportunity to attract MSU students – not only to study in Minot but, for some, to stay and contribute to our community as business owners, entrepreneurs, employees, and teachers.

Locating a new MSU Art Department facility downtown would create synergies with the ArtSpace facility, Taube Museum, and small arts businesses that have organically emerged. Studies have documented the tremendous value of art in the economic resilience of communities; excellent examples exist in Asheville NC, Lancaster PA, and Northfield MN.

The proposed contemporary facility will help inspire creative place-making in downtown Minot. The building will accommodate studios, classroom space, faculty offices, and a mini-YMCA on the first floor, and could also accommodate community art classes in a community meeting room. The Art Department would occupy the first two floors of the building and student housing would occupy the third and fourth floors. Important design goals for the entire space are

proper ventilation, natural lighting, and programmatic flexibility. This activity is connected to – and literally in the same building as – the housing for MSU arts students proposed in our *build affordable and resilient neighborhoods* project for downtown, and the synergy and inseparability of these two initiatives are emblematic of our overall approach. These are not isolated projects, but an integrated approach to making our Magic City a resilient city.

**Improving community resilience** – Three hazards (shocks) were identified in Minot’s Phase 1 application, including the threat of an economic crash. Stressors are factors that contribute to our vulnerabilities to shocks, including insufficient economic diversity. The rapid expansion of the oil industry in northwest North Dakota leaves the region extremely vulnerable to potentially catastrophic economic impacts including unemployment, loss of tax base, out-migration of population, and the loss of small and large businesses. Minot also faced the loss of skilled workers after the flood, as documented in the 2011 business survey, and businesses in Minot and the region continue to report real challenges in attracting and retaining employees. This is due primarily to the high cost of housing and the higher wages paid by the oil industry.

Preserving Minot’s quality of life and building the region’s resilience requires a stable and diverse economy to ensure the region does not become too dependent on the oil sector. To foster economic resilience, Minot’s business environment must be one where large and small businesses can prosper and jobs are created. For individuals to contribute to the city’s economic resilience, Minot must offer the education and training required to support cutting edge technologies used in existing businesses, as well as training opportunities to enable local companies to deploy the new innovations that will help them to prosper.

Economic diversity leverages the existing economic drivers in the region such as agriculture and the arts, and major employers including Minot Air Force Base, Minot State

University, and Trinity Health. It encourages emerging economic strengths such as exports and post-production processing in agriculture. The flood changed the workforce characteristics in Minot. The oil industry dramatically shifted the wage structure. It draws skilled employees away from companies where they have worked for many years, in part because they cannot afford housing unless they take higher-paying jobs.

Maintaining a diverse economy in Minot and the region depends on a number of factors: expanding agriculture exports, building on existing economic clusters including arts and culture, and ensuring the stability and sustainability of existing economic drivers including Minot Air Force Base, Minot State University, and the oil industry. Globalization and new technologies continue to change the way these businesses and institutions operate. Minot's future economic resilience depends on the region's ability to provide the environment these organizations need to compete internationally.

Improved workforce skills enhance the resilience of individuals and businesses, and thus the community. Individuals who invest in personal education and training improve their access to better job opportunities with higher wages, leading to improved income. Employees with additional education and training also expand their employment options for a broader array of jobs. Businesses that invest in the education and training of their employees are better able to deploy new technologies that improve their business operations and their profitability.

**Addressing unmet recovery need** – After the flood, a business survey documented the loss of at least 800 skilled workers who left Minot. Area businesses continue to report serious challenges in attracting and retaining skilled workers, due in part to the high cost of housing and the limited access to post-secondary training services. Insufficient economic diversity, a stressor identified in our Phase 1 application, is a critical issue for Minot and could have a significant impact on its

economic resilience. The ability to deliver training programs for businesses and community college and certificate programs improves the workforce and, consequently, the region's economic environment. This will make the region and its employees less vulnerable to the potential catastrophic loss that could occur if the region become almost exclusively dependent on a single industry sector, in this case the oil industry. Helping to ensure that key economic drivers within the region retain their economic competitiveness is also important to the city's economic diversity and resilience.

**Meeting a National Objective** – Minot has many competing needs for funding related to flood recovery. Despite the assistance from the CDBG-DR program which has helped to support essential recovery projects, there has not been sufficient funding to meet all of the city's post-disaster needs, nor is funding available to significantly reduce the city's risk from future flooding. The economic revitalization needs in Minot do not reflect the typical needs in disaster recovery. The flood coupled with the economic shock from the oil boom created an entirely different set of conditions, which may in fact pose a far greater long-term threat to the city's recovery and future resilience. As one of the reviewers of our Phase 1 application acknowledged, "Of the three threats identified, the trickiest one involves the current boom – and anticipated bust – and the lack of economic diversity."

The activities proposed in the *fostering economic resilience and diversification* project qualify under the urgent need national objective. Communities that invest in their economic resilience develop capacities that enable them to resist or recover from economic shocks. In Minot, economic resilience and diversification depends on the community's ability to sustain non-oil businesses in the region and maintain a diverse economic base.

**A comprehensive strategy** - When the projects that make up our entire NDRC proposal are considered together, these interconnected projects form a holistic strategy for building our city's social, economic, and physical resilience. New neighborhoods must be developed to enable people who move out of harm's way in the buy-out program to stay in Minot. Making it possible for these residents to remain in the city they love is vital to Minot's economy and its ability to retain our skilled workforce. Flood risk reduction, affordable and resilient neighborhoods, and economic resilience are intrinsically linked. Through this NDRC process, we have come to realize that our future resilience depends on understanding the city holistically and responding accordingly.

# Minot NDRC Project Implementation

Schedule		2016				2017				2018				2019				2020				2021				2022			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Projects and Activities	Task Leader																												
Initial project team meeting	M Ziegler	█																											
Environmental coordination meetings with regulatory agencies and stakeholders	G Murphy and R Jablon	█																											
Design team meetings for all projects	P Brashear		█	█	█																								
Environmental reviews for all project activities	G Murphy and R Jablon	█	█																										
Site evaluations and review for affordable housing sites	M Ziegler	█	█																										
Conduct second series of housing design charrettes	P Brashear	█	█																										
Ongoing stakeholder and public engagement meetings	M Ziegler	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Engage advisory sub-committees for projects	K Jaynes	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Complete environmental documents, receive approvals	G Murphy and R Jablon	█	█	█	█																								
Prepare and review policies and procedures for all projects	S Elkins	█	█																										
Site acquisition, site plan, infrastructure, construction neighborhood #1	M Ziegler		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█				
Construction on infill rehabilitation project	M Ziegler			█	█	█	█																						
Develop plan book and standard specifications for affordable housing	A Dostert		█	█	█																								
Design and construction MSU student housing on campus	A Dostert		█	█	█	█	█	█	█																				
Begin construction on affordable multifamily and town homes #1	T Berning			█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█				
Site acquisition, site plan, infrastructure, construction neighborhood #3	M Ziegler						█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Complete Downtown Gathering Space planning and design	B Gurholt						█	█	█	█	█	█	█	█	█	█	█												
Planning and design, construction for Center for Technical Education	A Dostert									█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█				
Planning and design, construction for MSU Arts Complex and student housing	A Dostert									█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█				
Install transit shelters	R Rowson																									█	█	█	█
Plan, design, construct Magic Greenway, Oak Park improvements, eco-restoration project	B Gurholt			█	█	█	█	█	█	█	█	█	█	█	█	█	█												
Strategic buy-out program	S Elkins			█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Family shelter housing	K Jaynes																									█	█	█	█
Relocate City Hall, develop social services one-stop facility	G Murphy													█	█	█	█	█	█	█	█	█	█	█	█				
Site acquisition, site plan, infrastructure, construction neighborhood #3	M Ziegler																									█	█	█	█
Plan, design, construct infill townhomes, condos, duplexes	T Berning		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█								



Project Activity	% LMI Benefit	Total Cost	NDRC Funds	Leverage/ Private funds	Source
<b>Reduce flood risk and improve water management</b>					
Buy-outs: 400 mobile homes, 340 single family homes	100%	\$123,000,000	\$33,000,000	\$90,000,000	State of North Dakota
Riverfront Greenway, Oak Park improvements, eco-restoration			\$7,340,000		
Souris River Decision Tool		\$825,000	\$825,000		
Subtotal: reduce flood risk and improve water management		\$123,825,000	\$41,165,000	\$90,000,000	
<b>Build affordable resilient neighborhoods</b>					
609 units of affordable housing, 3 neighborhoods					
252 units affordable rental multifamily and townhomes	100%	\$63,938,900	\$22,844,800	\$41,094,100	
322 units affordable single family homeownership + 35 rehab	100%	\$97,025,000	\$57,748,000	\$39,277,000	\$750,000 Minot Area Community Foundation, \$38,527,000 mortgage financing
Public gathering space		\$8,795,000	\$8,795,000		
MSU student housing - campus	100%	\$4,770,000	\$2,570,000	\$2,200,000	
Downtown student housing - 40 units affordable student housing	100%	\$5,280,000	\$5,280,000		
Family homeless shelter	100%	\$3,765,000	\$3,765,000		
Subtotal: build affordable resilient neighborhoods		\$183,573,900	\$101,002,800	\$82,571,100	
<b>Foster economic resilience and diversification</b>					
City Hall relocation, one-stop social services center	0	\$6,350,000	\$3,750,000	\$2,500,000	
MSU and Dakota College Center for Technical Education	0	\$11,000,000	\$11,000,000		
MSU Arts Department and arts studios downtown	0	\$16,500,000	\$16,500,000		
Subtotal: foster economic resilience and diversification		\$33,850,000	\$31,250,000	\$2,500,000	
<b>Long-Term Commitment: Mouse River Enhanced Flood Protection Plan</b>					
Flood storage areas, excavation, grading, and improvements for resilient flood storage sites		\$42,000,000	\$0	\$42,000,000	State of North Dakota
Subtotal: Long-term Commitment		\$42,000,000		\$42,000,000	
<b>Planning:</b>					
Affordable Housing Market Study & annual updates		\$450,000	\$450,000		
Affordable Housing Plan Book and Standard Specs		\$385,000	\$385,000		
Vulnerable Populations Action Plan		\$325,000	\$325,000		
Subtotal Planning		\$1,160,000	\$1,160,000		
Total all above projects and activities:		\$384,408,900	\$174,577,800	\$217,071,100	
City Administration (5%):			\$8,089,562		
<b>Total NDRC Application:</b>			<b>\$182,667,362</b>		
\$ LMI Benefit			\$124,957,800	70%	

## **EXHIBIT F: FACTOR 4 - LEVERAGE**

The City of Minot has \$469,965,567 in total direct leverage for its proposed NDRC projects. Commitments range from \$100 to more than \$100 million, and come from state and local government, nonprofit organizations, local business and professional groups, and private sector firms.

The State of North Dakota has committed \$90 million towards the Strategic Buy-out program and an additional \$42 million to fund Flood Risk Reduction and Water Management activities. The City of Minot has committed a minimum of \$337 million over the next 30 years to fund the local cost share for the Mouse River Enhanced Flood Protection Project for the entire Souris River basin in the United States. The City of Minot committed \$152,933 to fund the Phase 1 grant application. Ward County and the Souris River Joint Water Resource Board committed \$76,467 under a Joint Powers Agreement to fund the Phase 1 grant application.

The Minot Area Community Foundation has committed \$750,000 to fund recovery and resilience support for vulnerable populations, increasing the supply of affordable housing, adding recreational uses along the river, and other activities to build resilience capacity in the community that are included in Minot's Phase 2 NDRC application.

Local businesses and organizations have pledged \$129,100 to support Minot's resilience efforts. These businesses are shown in the leverage table below, which summarizes our leverage commitments:

Entity	Direct leverage	Supporting leverage
State of North Dakota - Flood Protection Plan	\$132,000,000	
City of Minot –½ cent sales tax for flood control	\$337,000,000	
Ward County and Souris River Joint Water Resource Board	\$ 76,467	
Minot Area Community Foundation	\$ 750,000	
American Bank Center	\$ 1,000	
CDM Smith	\$ 25,000	
Downtown Business & Professional Association	\$ 25,000	
EAPC Architects	\$ 7,500	
First International Bank and Trust	\$ 5,000	
Houston Engineering, Inc.	\$ 15,000	
Mainstream Boutique	\$ 2,500	
McGee, Hankla, Backes & Dobrovolny, P.C.	\$ 2,000	
Minot Young Professionals	\$ 10,000	
Northern Tier Federal Credit Union	\$ 100	
Northgate on Broadway	\$ 2,500	
Sandman Partnership LLP	\$ 1,000	
Strata Corporation	\$ 22,500	
Xcel Energy	\$ 20,000	
<b>Total commitments:</b>	\$ 469,965,567	

## **EXHIBIT G: FACTOR 5 - REGIONAL COORDINATION AND LONG-TERM COMMITMENT**

This NDRC process has changed how Minot and the region think about resilience. As a result, the city and the region have already begun to take important steps to enhance the resilience of the entire Souris River Basin. In the Phase 1 application, Minot committed to naming a Chief Resiliency Officer and supporting the necessary inter-agency coordination among city departments to foster increased resilience in the city. Donna Bye is the new Chief Resilience Officer. She has been actively engaged in the development of this proposal and is working with city departments, local agencies and organizations, and the private sector to define new strategies for increasing resilience in the city and the region.

Minot also committed in Phase 1 to have 90 percent of its firefighters trained in crude oil train emergencies by the Security and Emergency Response Training Center (SERTC) in Colorado, a nationally recognized training program for train accident response. To facilitate the completion of this training commitment, the City of Minot is working with SERTC to arrange for crude oil train emergency training experts to come to Minot to provide train accident response training to Minot Fire Department's (MFD) emergency responders. To date, 30 percent of MFD emergency responders have completed this SERTC training. By June 2016, at least 60 percent of MFD emergency responders will have completed this training, and by January 2017, 90 percent of MFD emergency responders will complete SERTC training.

The City of Minot updated its Comprehensive Master Plan in 2013 to improve land use patterns and allow for development of higher density housing. Currently the city is completed a post-flood revitalization plan for downtown, including reconstruction of public utilities, replacement of streets, installation of new street lights and streetscape, and construction of two

park structures where new market rate and affordable housing will be built. Minot is also expanding its transit routes, based on the analysis completed in the recent transit system study. A copy of the new transit routes are included in *Attachment E*.

**Resilience actions related to financing and economic issues** - To further improve resilience in the MID and Souris River basin, the City of Minot has committed to fund the local cost share for the Mouse (Souris) River Enhanced Flood Protection Project, a flood protection system. A Joint Powers Agreement executed between the Souris River Joint Water Resource Board and the City of Minot on January 9, 2014 includes Renville, Ward, McHenry, and Bottineau counties, working with the North Dakota State Water Commission. This flood protection system will reduce flood risks for the four counties included in this agreement.

The City of Minot has committed a one-half cent sales tax to fund the local cost share for the construction and implementation of the entire basin-wide project, including the percentage of cost share necessary to match funds provided by the State Water Commission and all other local costs not provided by state or federal funding.<sup>1</sup> At a minimum the city will invest \$337 million over the next thirty years to fund the required local cost share according to Minot's Chief Financial Officer, Cindy Hemphill. The design for the first three phases of this flood protection system will be completed in 2016 and construction will begin within one year of the Phase 2 grant award. This initial project will protect sensitive utility infrastructure, namely the city's water treatment plant which serves Minot and other cities and towns in the region. The Mouse River Enhanced Flood Protection Project is included in the benefit cost analysis in this application.

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<sup>1</sup> Sub-Agreement between the Souris River Joint Water Resource Board and the City of Minot for the Mouse River Enhanced Flood Protection Project, executed January 9, 2014

The city of Minot will identify the number of structures within the previous 2011 flood inundation area as a baseline metric for this project, and will determine the number of structures that will be protected by each phase of the flood protection project. Data from this analysis will be used to inform the various metrics for this project. When construction begins on each phase of the flood protection system, the number of structures that will be protected by that phase compared to the total number of structures in the flood inundation area will be calculated as a percentage.

**Lessons learned** - Since the release of the NDRC NOFA, the City of Minot has initiated discussions with the Souris River Joint Water Resources Board (SRJWRB), the North Dakota State Water Commission, the International Souris River Board (ISRB), the U.S. Fish and Wildlife Service (USFWS), and the U.S. Army Corp of Engineers (USACE). As a result of research conducted in preparing this application, Minot was able to determine that much of the watershed in the upper Souris River basin is considered non-contributory under normal conditions. However, these areas appear to have significantly contributed to the 2011 flood for a variety of reasons. The city has requested these agencies consider environmental opportunities to enhance or restore storage in wetlands and lakes, evaluate declining or depleted aquifer zones for water recharge, and consider options to further expand low or high level dams in Canada. Minot has also requested USFWS and ISRB adopt and implement a one foot lower normal water level control for Lake Darling before next spring, and adopt and implement additional flood release operation protocols as soon as possible. The one foot lower normal water level would provide approximately 10,000 acre-feet of additional storage. This would increase public safety and reduce potential flood mitigation costs. To put this in perspective, if a 2.5 foot lower normal water level control for Lake Darling had been in effect in advance of the 2011 flood

events, \$126 million in losses could have been avoided. We proposed to utilize the Souris River Flood Decision Support Tool model proposed in this application to help decision-makers in Minot and the region evaluate additional operational protocols for Lake Darling and other changes in upstream water management that might reduce flood risks and improvement water management for the region.

The City of Minot has identified six potential flood storage areas within the city and several located outside the city. These flood storage areas are part of an effort to identify actions that can be layered with ongoing local and regional flood protection efforts to reduce risk and provide resiliency benefits. These efforts have already begun, and will continue until the flood protection system is completed. These projects provide flood risk reduction benefits sooner to some of the most vulnerable and at-risk areas of the city. They may also reduce the cost and construction timetable for the long-term flood protection system, and will provide co-benefits including ecosystem restoration, education and recreational opportunities, improved connectivity, and economic enhancements. A map of the six flood storage areas that will be further evaluated using the Souris River Decision Tool model is included in *Attachment E*.

**Resilience actions related to plan updates or alignment** – Minot and Ward County updated and finalized a FEMA-approved Multi-Hazard Mitigation Plan in September 2013 that considers threats imposed by climate change. This plan is being implemented by the Ward County Emergency Management Department. Minot updated its Transportation Plan and it was approved by FHWA and the North Dakota Department of Transportation in January 2015.

**ATTACHMENT D: PHASE 2 CONSULTATION SUMMARY**

Agency name or Stakeholder group	Agency type or Target population	Type of outreach	Method of notification and Materials provided
<p><b>Vulnerable Populations Committee:</b>  <i>Representatives from:</i>                      Ward County Social Services                      North Central Human Services                      Minot Area Community Action Partnership                      MSU ND Center for Persons with Disabilities                      Independence, Inc.                      Minot Veterans Center                      Minot Commission on Aging                      Minot Area Homeless Coalition                      Men’s Winter Refuge                      2<sup>nd</sup> Story                      Minot Housing Authority                      YWCA Center of Hope Shelter*                      Rehab Services*                      Bethany Lutheran Church*                      *added in Phase 2</p>	<p>Public – low income, homeless, veterans, elderly; disabled or mentally challenged citizens and their families</p>	<p>Vulnerable Populations Committee meeting July 14, 2015 (9 in attendance)</p>	<p><b>Notification:</b> initial email and follow-up email reminder and phone calls</p> <p><b>Materials:</b> Agenda, project concepts</p>
<p><b>Vulnerable Populations Committee</b></p>	<p>See above</p>	<p>Vulnerable Populations Committee meeting Aug. 13, 2015 (9 in attendance)</p>	<p><b>Notification:</b> initial email and follow-up email reminder</p> <p><b>Materials:</b> List of NDRC projects</p>
<p><b>Vulnerable Populations Committee</b></p>	<p>See above</p>	<p>Vulnerable Populations Committee meeting Aug. 27, 2015 (12 in attendance)</p>	<p><b>Notification:</b> initial email and follow-up email reminder</p> <p><b>Materials:</b> Review of revised projects, homeless shelter project, and social services</p>
<p><b>Vulnerable Populations Committee</b></p>	<p>See above</p>	<p>Vulnerable Populations Committee meeting Oct. 8, 2015</p>	<p><b>Notification:</b> initial email and follow-up email reminder</p> <p><b>Materials:</b> Information on final NDRC projects</p>



**ATTACHMENT D: PHASE 2 CONSULTATION SUMMARY**

Agency name or Stakeholder group	Agency type or Target population	Type of outreach	Method of notification and Materials provided
<p><b>Community Advisory Committee</b>  <i>Members are listed in Phase 1 application</i></p>	<p>Representatives from local government, state and local nonprofit agencies, business and professional organizations, private businesses, and other community leaders</p>	<p>Community Advisory Committee meeting July 13, 2015 (49 in attendance)</p>	<p><b>Notification:</b> initial email and follow-up email reminder</p> <p><b>Materials:</b> Presentation on reviewing NDRC Phase 1 proposal: vision for Minot, threats and hazards; what makes a great neighborhood; Phase 2 application overview and project requirements; importance of leverage. In small groups: discuss projects that meet NDRC requirements, leverage opportunities</p>
<p><b>Community Advisory Committee</b></p>	<p>See above; also 10 students from the Burdick Job Corps</p>	<p>Community Advisory Committee meeting Aug. 12, 2015 (51 in attendance)</p>	<p><b>Notification:</b> initial email and follow-up email reminder</p> <p><b>Materials:</b> Presentation on reviewing quality neighborhoods criteria; discussion of filters for evaluate proposed NDRC projects; small group review of proposed project list</p>
<p><b>Community Advisory Committee</b></p>	<p>See above</p>	<p>Community Advisory Committee meeting Oct. 8, 2015</p>	<p><b>Notification:</b> initial email and follow-up email reminder</p> <p><b>Materials:</b> Prioritization strategies, information on final NDRC project</p>
<p><b>Minot State University students</b></p>	<p>n/a</p>	<p>Resilient Neighborhood design charrette at MSU on Sept. 22, 2015</p>	<p><b>Notification:</b> MSU Office of the President invited participants from student government,</p>

**ATTACHMENT D: PHASE 2 CONSULTATION SUMMARY**

Agency name or Stakeholder group	Agency type or Target population	Type of outreach	Method of notification and Materials provided
		(31 in attendance)	<p>student residence groups, and other student leaders</p> <p><b>Materials:</b> Presentation on resilient and affordable neighborhoods and homes; individual and small group worksheets</p>
<p><b>Community citizens, especially seniors, young singles and families, Minot Air Force Base personnel, and essential workforce representatives</b></p>	n/a	<p>Resilient Neighborhood design charrette at St. Mark’s Lutheran Church on Sept. 23, 2015 (25 in attendance)</p>	<p><b>Notification:</b> Participants were invited by Souris Valley United Way, Minot Young Professionals, Minot Air Force Base, and the City of Minot (firefighters, police, and teachers)</p> <p><b>Materials:</b> Presentation on resilient and affordable neighborhoods and housing; individual and small group worksheets</p>
<p><b>Community citizens</b></p>	<p>Residents of Minot, Ward County, and the Souris River Basin, including residents of flood-impacted areas</p>	<p>Phase 2 Public meeting 1 on Aug. 13, 2015 at Minot Municipal Auditorium (27 in attendance)</p>	<p><b>Notification:</b> press release from City sent to area radio, newspaper, and television media</p> <p><b>Materials:</b> Presentation on moving from Phase 1 to Phase 2; review of Phase 2 application</p>
<p><b>Community citizens</b></p>	<p>Residents of Minot, Ward County, and the Souris River Basin, including residents of flood-impacted areas</p>	<p>Phase 2 Public meeting 2 on Oct. 1, 2015 at Parker Senior Center in downtown Minot (13 in attendance)</p>	<p><b>Notification:</b> email invitation to members of Vulnerable Populations and Community Advisory committees; public notice in Minot Daily News</p>

**ATTACHMENT D: PHASE 2 CONSULTATION SUMMARY**

Agency name or Stakeholder group	Agency type or Target population	Type of outreach	Method of notification and Materials provided
			<b>Materials:</b> Presentation on moving from Phase 1 to Phase 2; review of Phase 2 application
<b>Community citizens</b>	Residents of Minot, Ward County, and the Souris River Basin, including residents of flood-impacted areas	Phase 2 Public meeting 3 on Oct. 6, 2015 at Minot Municipal Auditorium	<b>Notification:</b> email invitation to members of Vulnerable Populations and Community Advisory committees; public notice in Minot Daily News  <b>Materials:</b> Presentation on moving from Phase 1 to Phase 2; review of Phase 2 application
<b>Community citizens</b>	Residents of Minot, Ward County, and the Souris River Basin, including residents of flood-impacted areas	Phase 2 Public meeting 4 on Oct. 1, 2015 at Perkett Elementary School	<b>Notification:</b> email invitation to members of Vulnerable Populations and Community Advisory committees; public notice in Minot Daily News  <b>Materials:</b> Presentation on moving from Phase 1 to Phase 2; review of Phase 2 application
<b>Minot area business leaders</b>	Business leaders, economic development professionals	Luncheon sponsored by Minot Area Development Corporation and Minot Area Chamber of Commerce on Aug. 13, 2015 (31 in attendance)	<b>Notification:</b> invitations sent to business leaders by MADC and Minot Chamber of Commerce  <b>Materials:</b> Brochure on the NDRC competition and importance of leverage
<b>Minot area community and business leaders</b>	Community agencies, education, Minot Air Force Base, business leaders, and community	Community LEADership Summit, held at ND State Fairgrounds in Minot on at 8 am, Aug. 13, 2015 (24 in attendance)	<b>Notification:</b> invitations sent to community and business leaders  <b>Materials:</b> Presentation on HUD

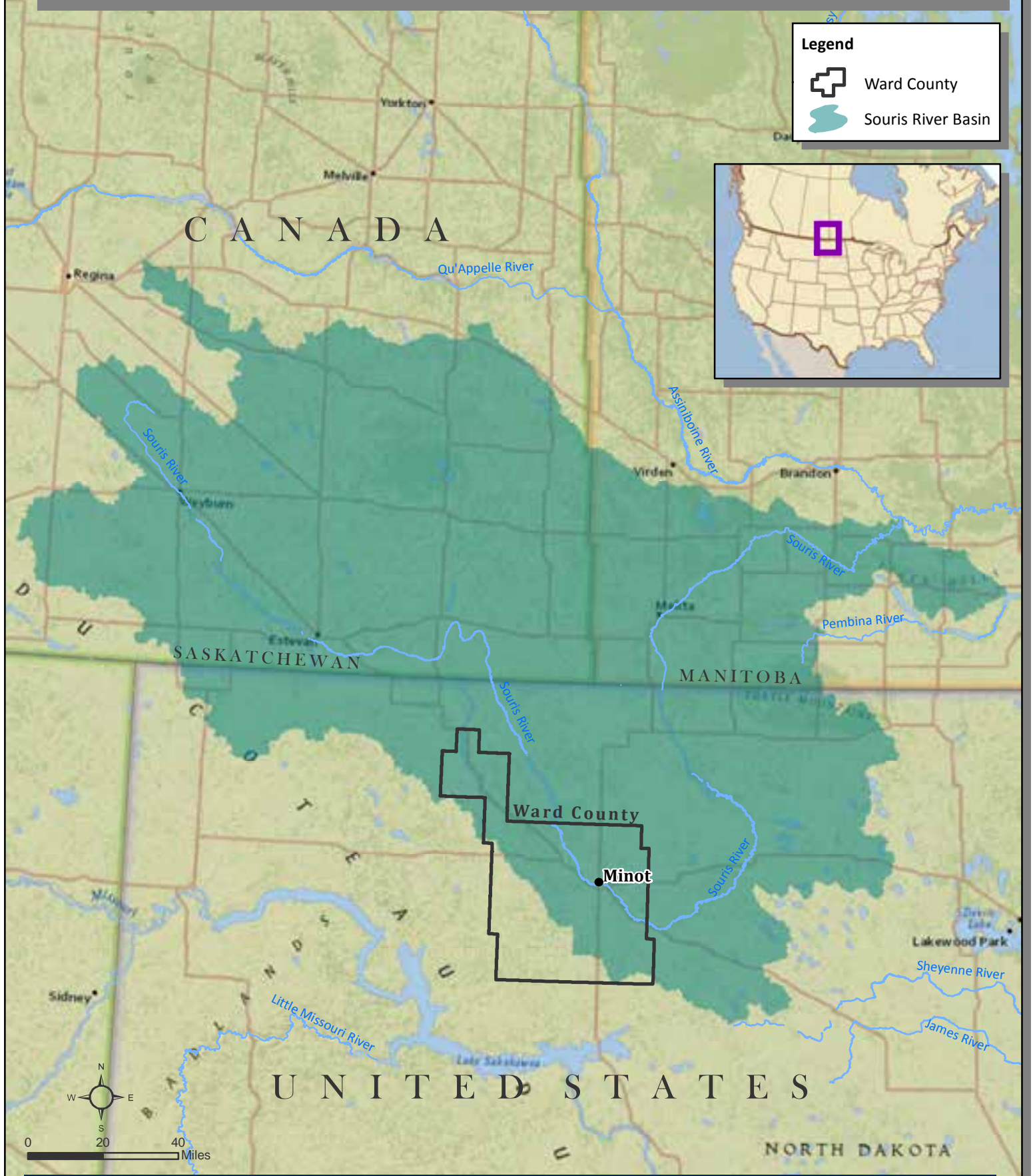
**ATTACHMENT D: PHASE 2 CONSULTATION SUMMARY**

Agency name or Stakeholder group	Agency type or Target population	Type of outreach	Method of notification and Materials provided
	foundations		NDRC competition overview; stakeholder presentations; breakout groups discussion of priorities
<b>Downtown Minot Business Association</b>	Small businesses	Downtown Minot Business Association meeting on Aug. 17, 2015 (28 in attendance)	<b>Notification:</b> invitations sent to downtown businesses
<b>Rotary Club of Minot</b>	Community organization	Rotary Club of Minot meeting on Aug. 31, 2015 (45 in attendance)	<b>Notification:</b> regular meeting of the Rotary Club of Minot
<b>Sunrise Rotary Club</b>	Community organization	Sunrise Rotary Club meeting on Sept. 3, 2015 (21 in attendance)	<b>Notification:</b> regular meeting of the Sunrise Rotary Club
<b>Minot Retired Railroaders</b>	Community organization	Retired Railroaders meeting on Sept. 1, 2015 at the Moose Lodge (33 in attendance)	<b>Notification:</b> regular meeting of the Retired Railroaders
<b>Minot Republican Women</b>	Community organization	Minot Republican Women’s meeting on Sept. 11, 2015 (30 in attendance)	<b>Notification:</b> regular meeting of Minot Republican Women

# International Souris River Basin

**Legend**




-  Ward County
-  Souris River Basin

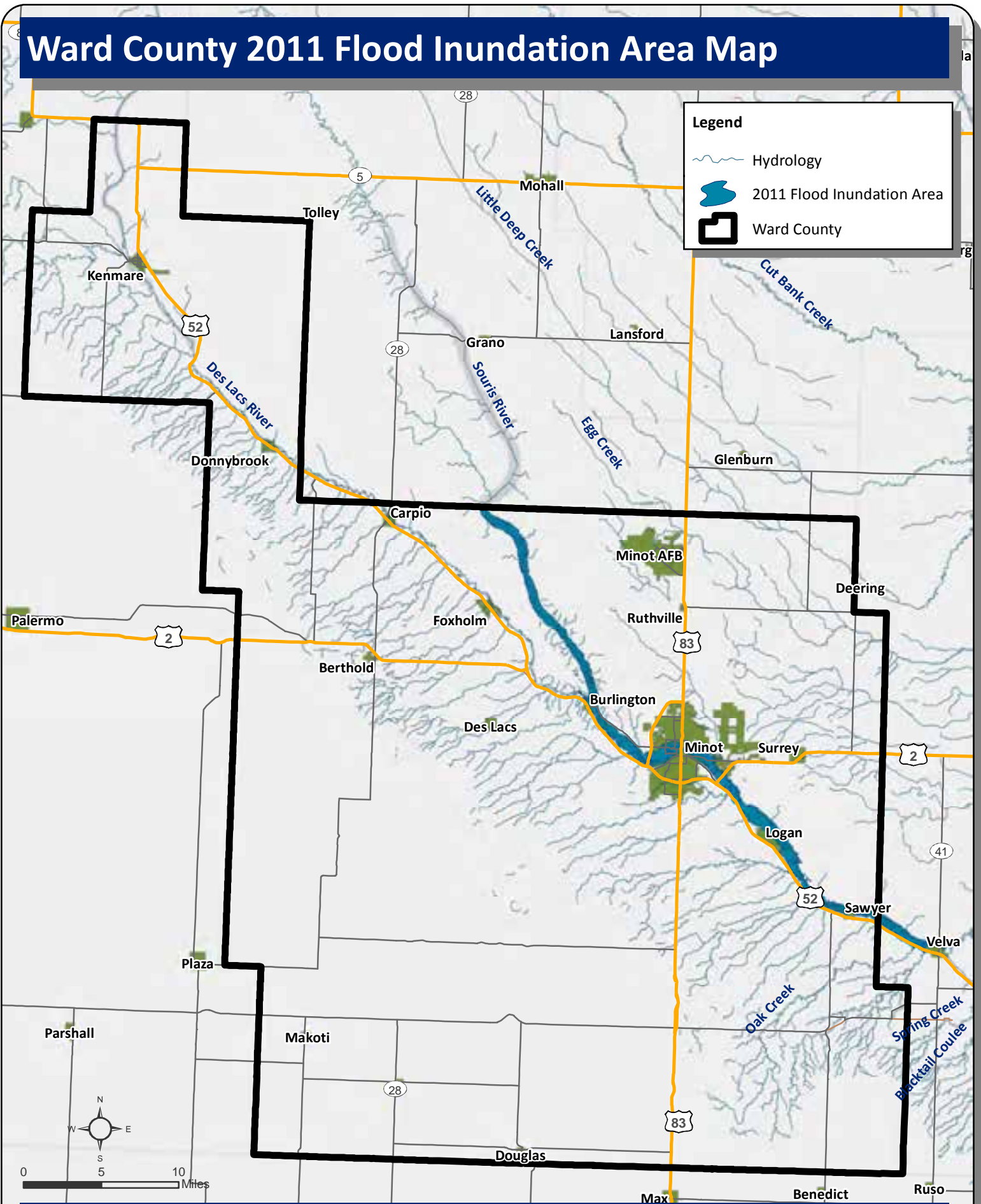




# Ward County 2011 Flood Inundation Area Map







## Legend

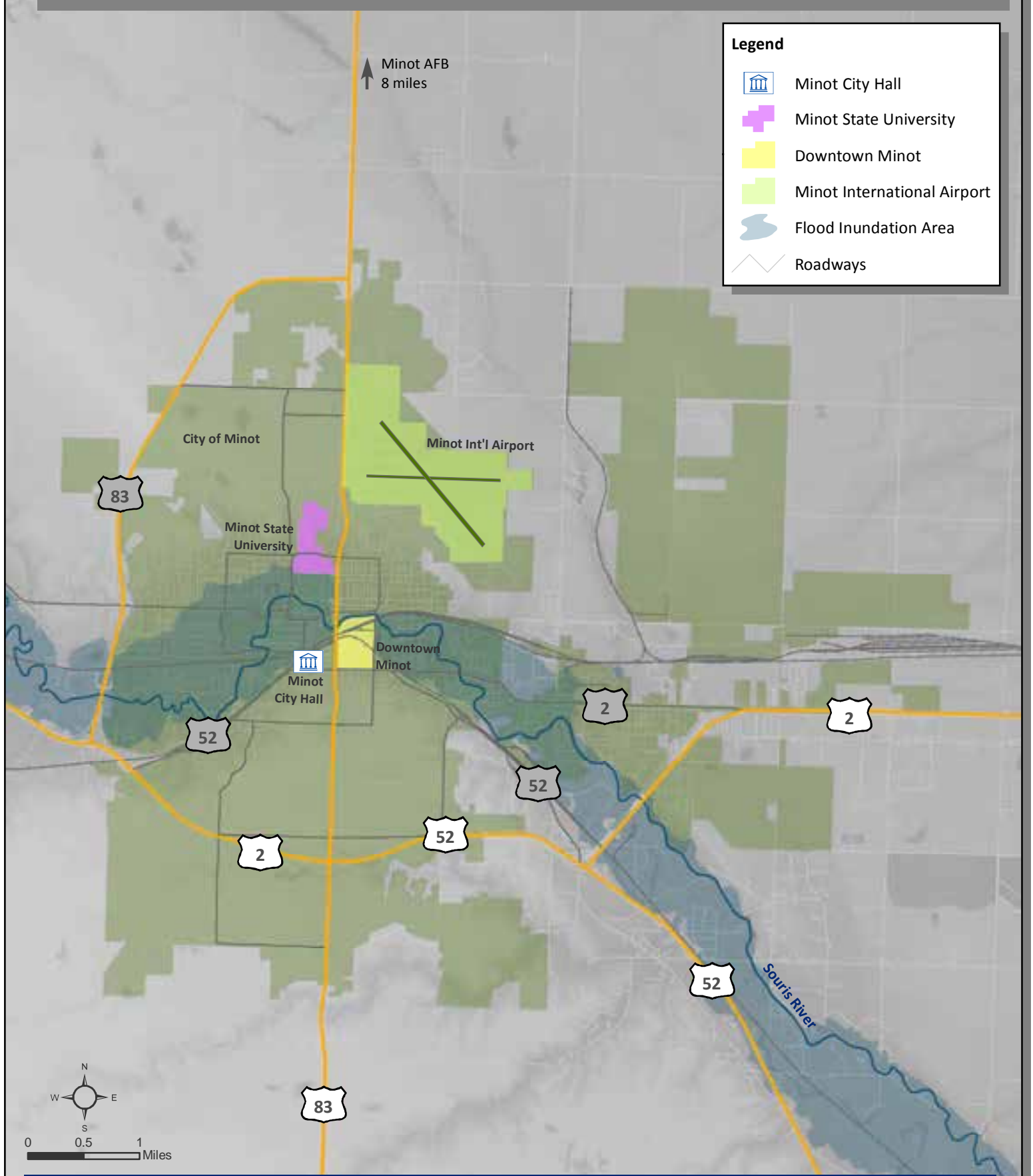
-  Hydrology
-  2011 Flood Inundation Area
-  Ward County



# Minot Area Map

## Legend

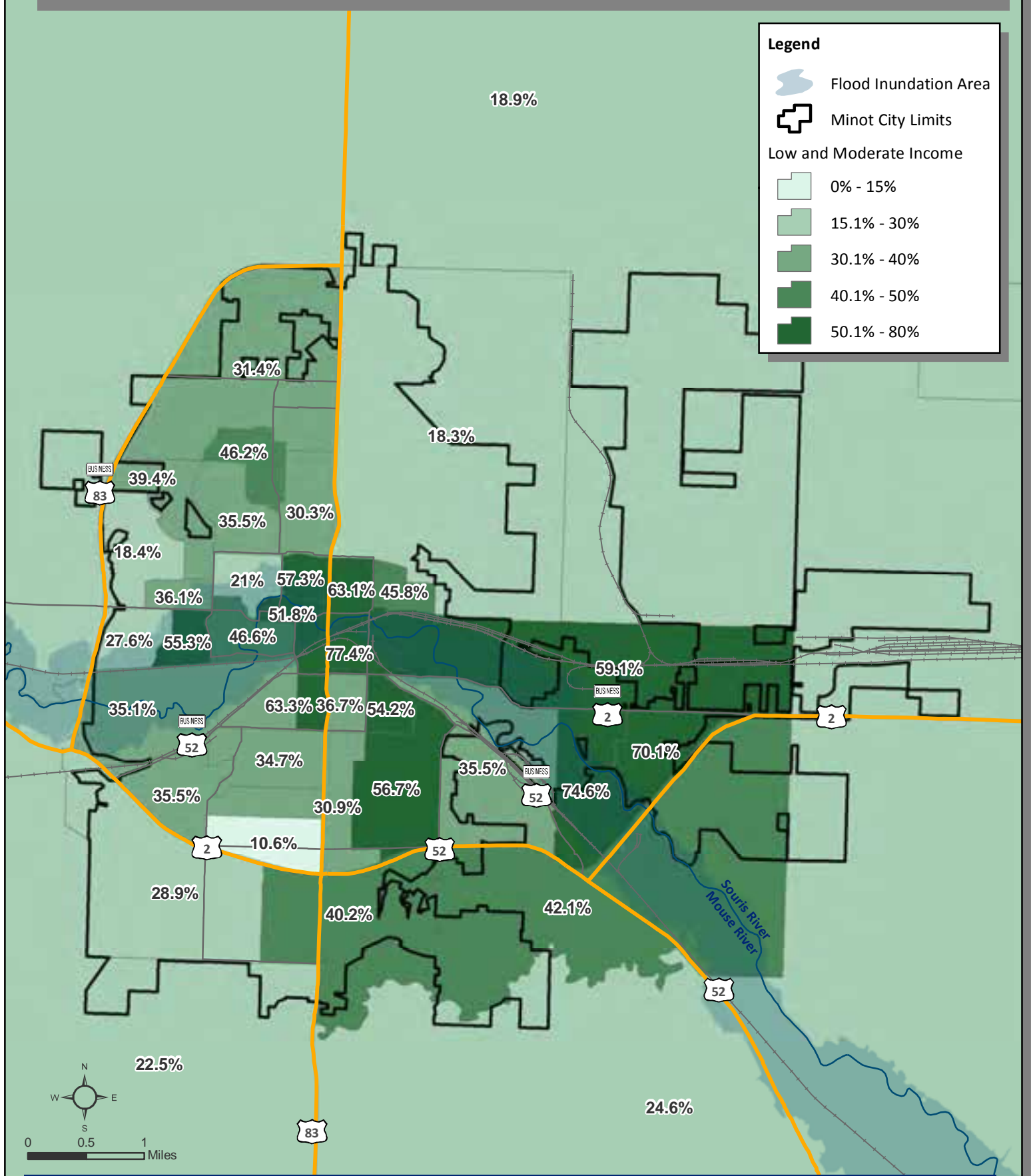
-  Minot City Hall
-  Minot State University
-  Downtown Minot
-  Minot International Airport
-  Flood Inundation Area
-  Roadways



# Percent of Low and Moderate Income in Minot

**Legend**


- Flood Inundation Area
- Minot City Limits
- Low and Moderate Income
  - 0% - 15%
  - 15.1% - 30%
  - 30.1% - 40%
  - 40.1% - 50%
  - 50.1% - 80%







# Assessed Value of Single Family Housing (2010)


## Legend


 Flood Inundation Area


 Minot City Limits


### 2010 Assessed Value


 \$0 - \$50,000


 \$50,001 - \$100,000

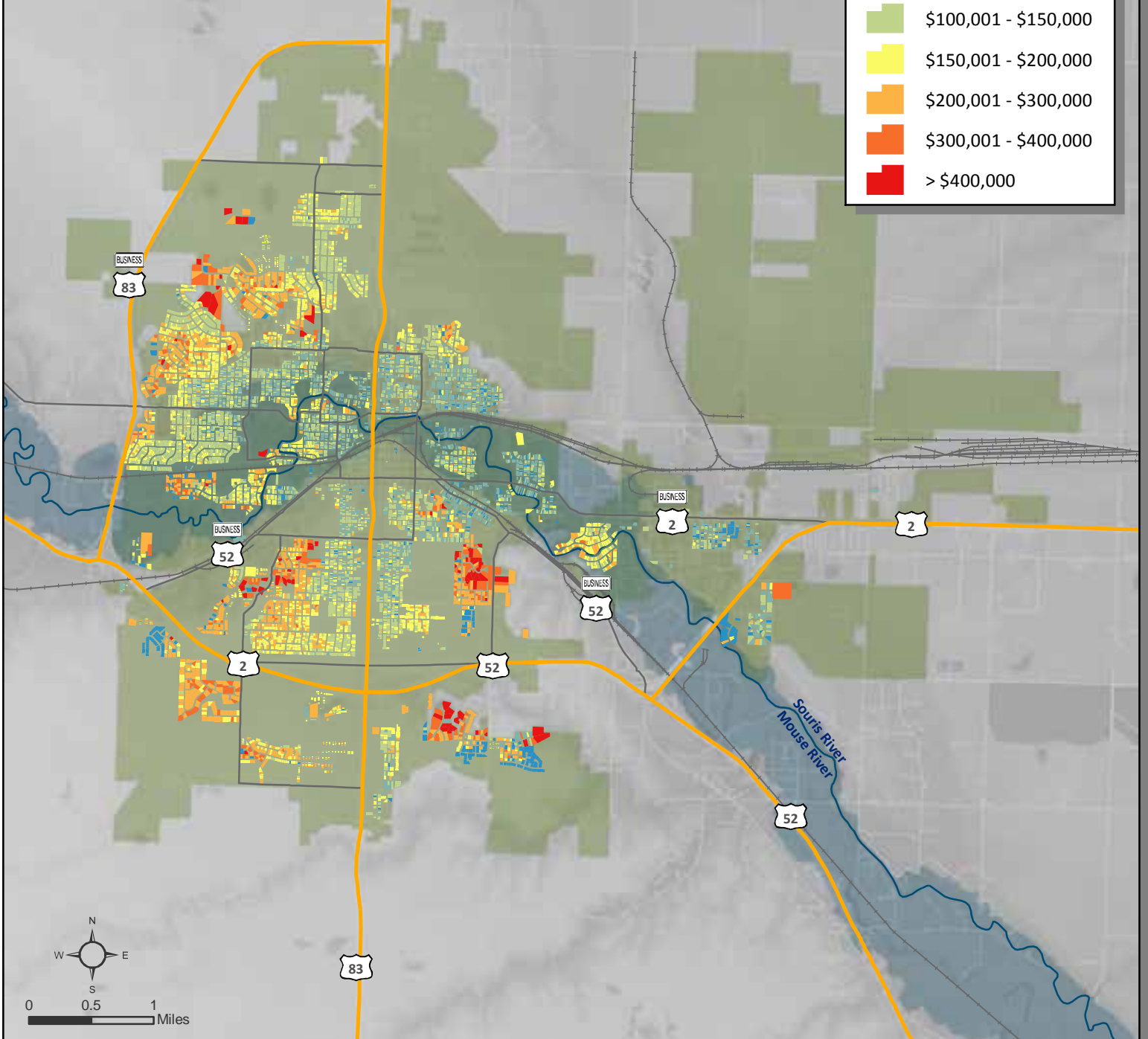
 \$100,001 - \$150,000

 \$150,001 - \$200,000

 \$200,001 - \$300,000


 \$300,001 - \$400,000


 > \$400,000




# Assessed Value of Single Family Housing (2012)


## Legend


 Flood Inundation Area


 Minot City Limits


### 2012 Assessed Value


 \$0 - \$50,000


 \$50,001 - \$100,000

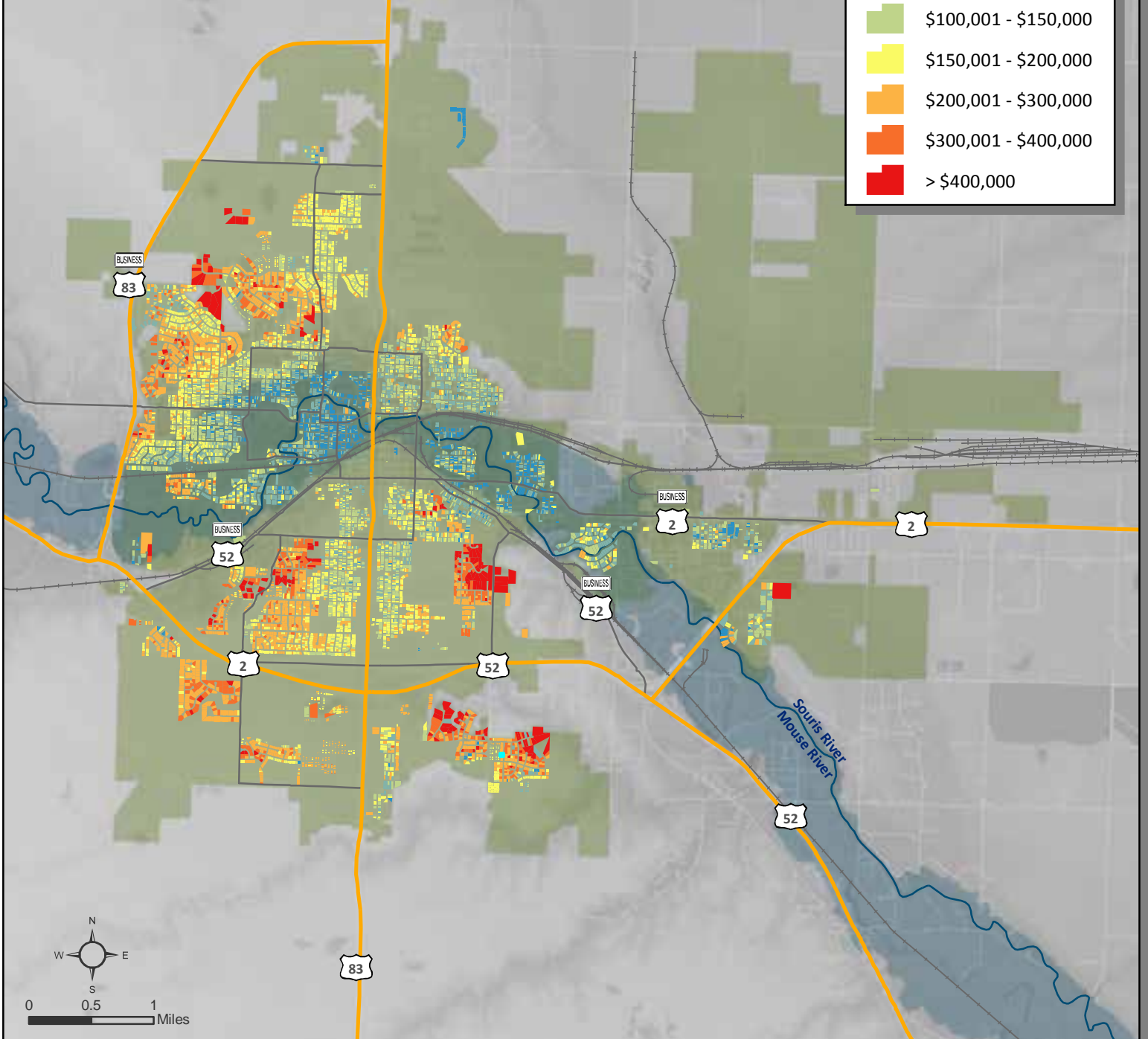
 \$100,001 - \$150,000

 \$150,001 - \$200,000

 \$200,001 - \$300,000


 \$300,001 - \$400,000


 > \$400,000




# Assessed Value of Single Family Housing (2015)


## Legend


 Flood Inundation Area


 Minot City Limits


### 2015 Assessed Value


 \$0 - \$50,000


 \$50,001 - \$100,000

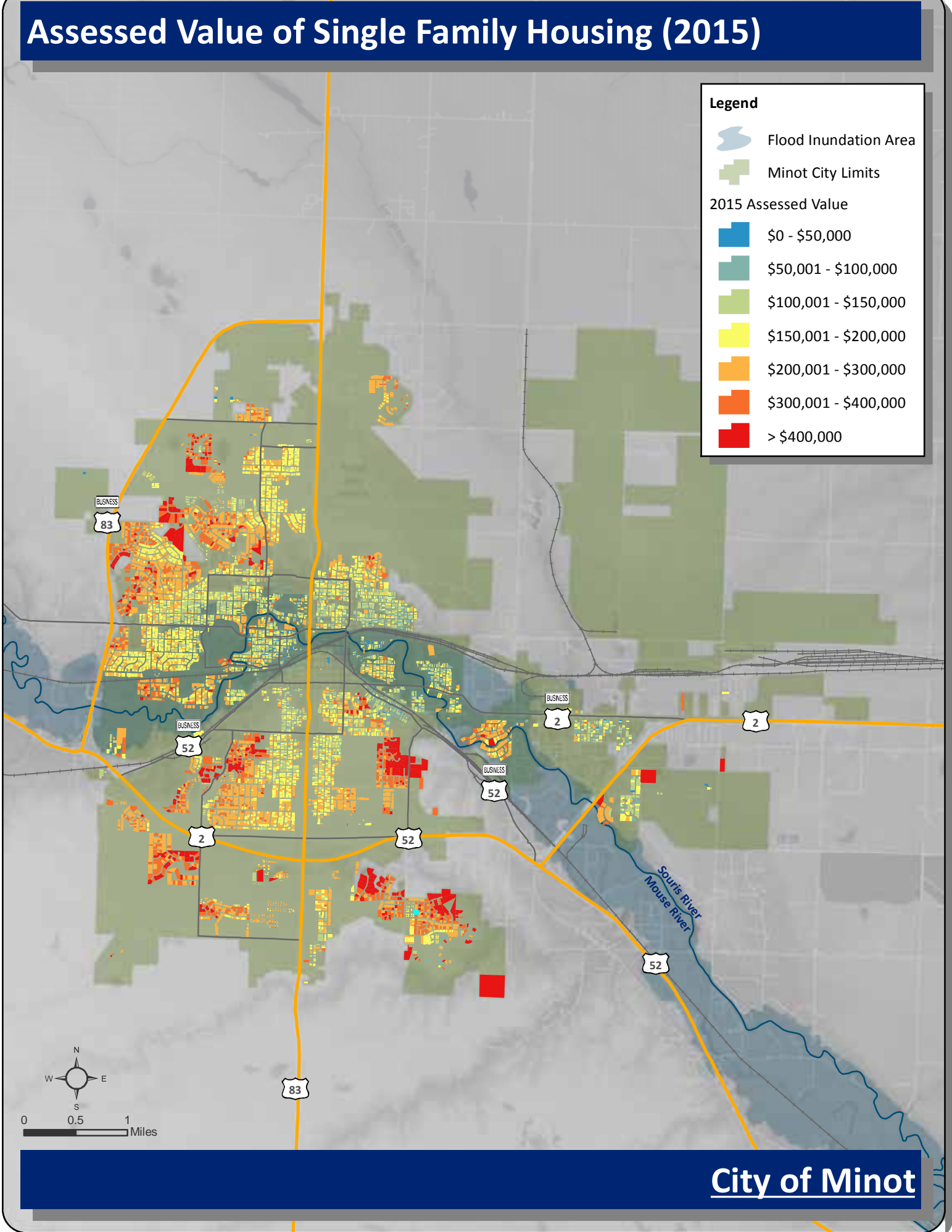
 \$100,001 - \$150,000

 \$150,001 - \$200,000

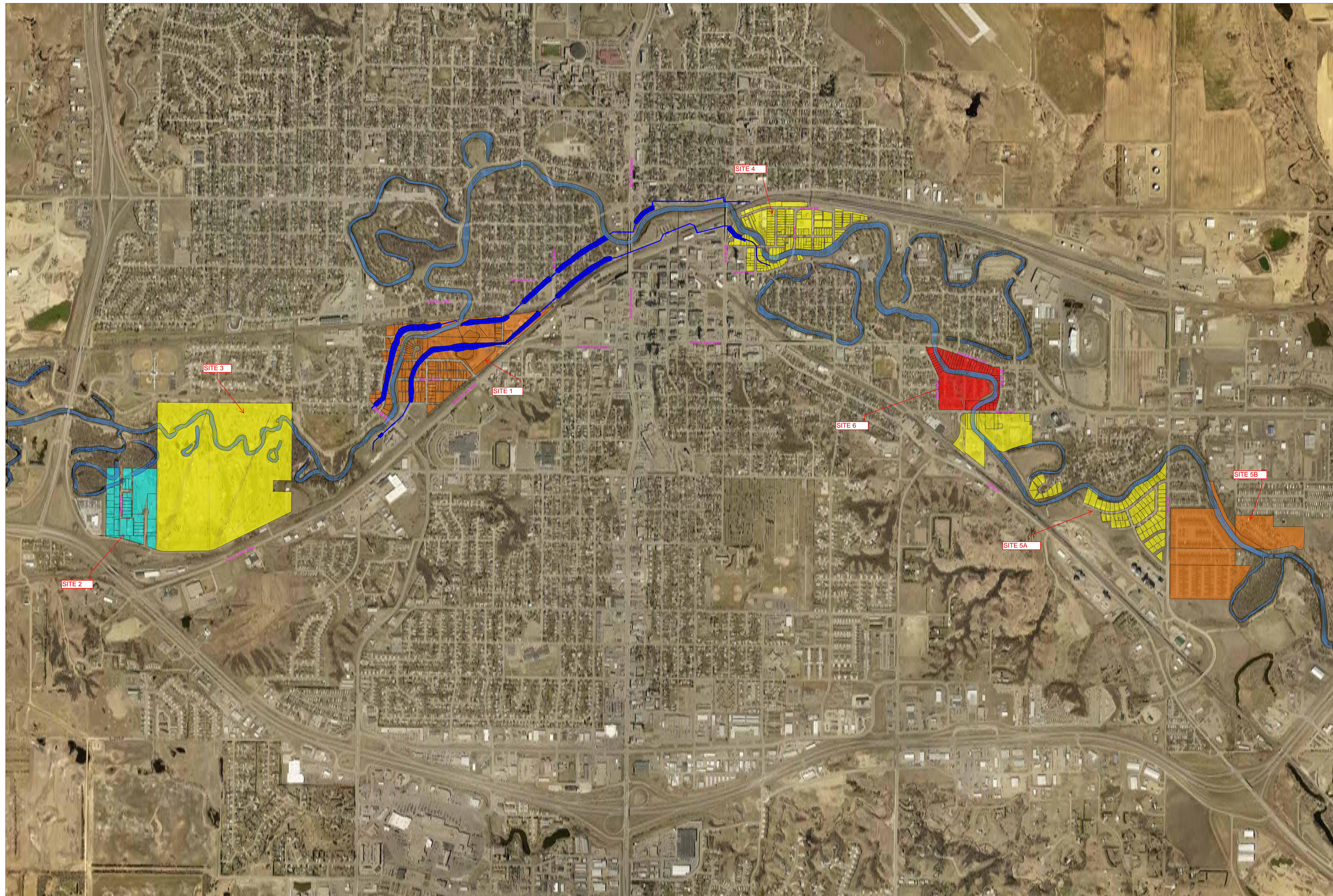
 \$200,001 - \$300,000

 \$300,001 - \$400,000

 > \$400,000







SITE 4

SITE 3

SITE 1

SITE 6

SITE 5B

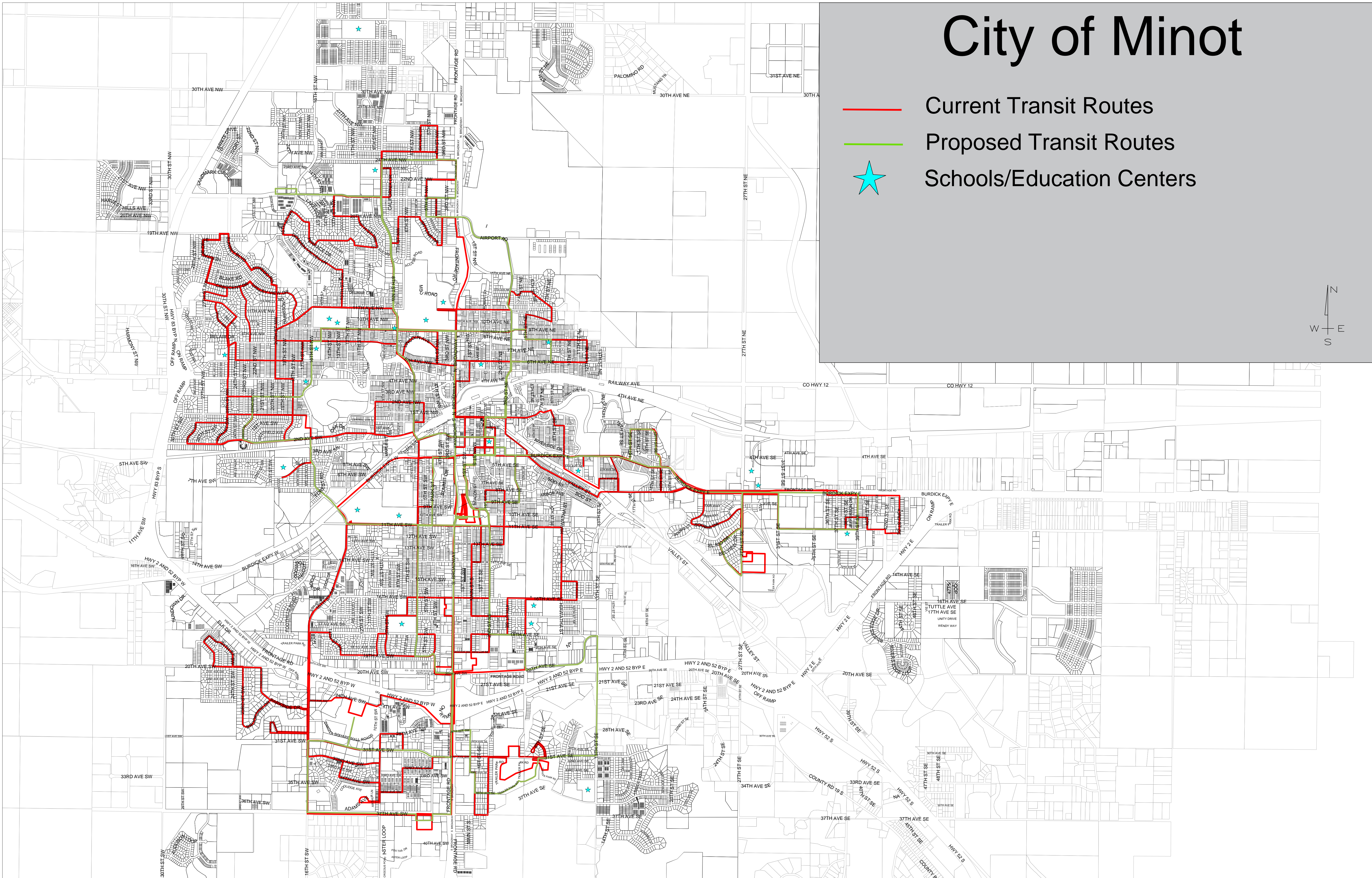
SITE 5A

SITE 2



# City of Minot

- Current Transit Routes
- Proposed Transit Routes
- ★ Schools/Education Centers





# City of Minot – National Disaster Resilience Competition, Phase 2

## Summary of Benefit-Cost Analyses Results

### Introduction

This section of the City of Minot’s draft application for Phase 2 of the U.S. Department of Housing and Urban Development’s (HUD) National Disaster Resilience Competition (NDRC) summarizes the results of three benefit-cost analyses (BCAs) conducted for the City’s proposed projects as required in the Notice of Funding Availability (NOFA) dated June 2015. Appendix H of the NOFA states:

*“In Phase 2, each applicant will complete a benefit-cost analysis for any Covered Projects. This Community Development Block Grant National Disaster Resilience BCA will provide a sense of the cost efficiency of the proposal, but the BCA score will not be used alone to determine soundness of approach. HUD will not fund any Phase 2 activities for which the benefits to the applicant’s community and to the United States as a whole are not demonstrated by the evidence submitted to justify the costs. The standard criterion for funding projects is a net present value above zero (or equivalently, a benefit-to-cost ratio greater than one). However, HUD recognizes that some benefits and costs may be difficult or impossible to quantify, and qualitative descriptions of benefits that cannot be monetized will be taken into account as evidence, as appropriate. Note that quantifying or otherwise accounting for social and ecological benefits and costs is a critical component, as is consideration of all related resources, including leverage.”*

This summary includes a discussion of the organization of the City’s proposed projects within each BCA; measurement of benefits and costs; and the results of each BCA, expressed in terms of net present value (NPV) and benefit-cost ratio (BCR).

### Organization of Projects within Benefit-Cost Analyses

The City of Minot has three primary post-2011 flood issues it desires to address through several projects it has proposed in the NDRC competition. For the purpose of measuring their benefits and costs, the projects were organized into categories according to these issues, which resulted in the performance of three separate BCAs. Projects were grouped into the following categories:

- Flood Protection – The 2011 flood devastated the City of Minot, generating severe economic loss and mental anguish for its residents. A BCA was conducted that includes several proposed projects that will protect the safety and livelihoods of the City’s residents from future floods.
- Housing – The City of Minot has a shortage of affordable housing, which discourages employers and talent from locating in the area. A BCA was conducted for several affordable housing developments that are proposed to alleviate this problem.
- Economic Revitalization – Many of the City of Minot’s businesses were destroyed in the 2011 flood and remain vacant, putting a fiscal burden on the City government and detracting from the livability of the neighborhoods in which they are located. Further, the regional economy is heavily dependent on oil and gas extraction and agriculture, leaving the City susceptible to wide swings in both industries. A BCA was conducted for several projects proposed by the City that will revitalize and diversify the regional economy.

**Table 1** provides a summary of the specific proposed projects included in each BCA. As shown in Table 1, the flood protection BCA includes four projects, the housing BCA includes five projects, and the economic revitalization BCA includes three projects.

**Table 1**  
**City of Minot Proposed Projects Included**  
**in the Benefit-Cost Analyses**

Flood Protection BCA
Flood Wall and Levee System
Buyouts for Most At-Risk Locations
Riverfront Greenway, Oak Park Improvements, and Eco-Restoration
Housing BCA
Develop Three New Neighborhoods and 609 Units of Affordable Housing
Develop Downtown Affordable Student Housing for Minot State University
Develop Affordable Student Housing Adjacent to Minot State University Campus
Construct a Family Homeless Shelter and Commercial Kitchen
Economic Revitalization BCA
Establish a Downtown Public Gathering Place
Development of the Minot State University and Dakota College Center for Technical Education
Relocate and Renovate Minot City Hall, Central Dispatch Offices, Regional Social Services Facility, and Vulnerable Populations Community Hall
Construct a Minot State University Downtown Arts Education Complex

Source: CDM Smith

## Measurement of Benefits and Costs

As required in the NOFA, the benefits and costs of the projects in Table 1 were measured according to five categories. These categories include:

- **Lifecycle Costs** – These include project/investment costs and operations/maintenance costs.
- **Resilience Value** – The value of protection from future disasters. Examples include the reduction of expected property damages and the value of reduced displacement caused by future disasters.
- **Environmental Value** – These factors fall into categories such as erosion control, wildlife habitat, reduced energy usage, reduced air quality impacts, and climate regulation.
- **Social Value** – Benefits that would further community development objectives. Examples include health benefits and improved community identity and social cohesion.
- **Economic Revitalization** – Direct effects on the local or regional economy. Examples include tourism revenue, payroll associated with permanent jobs added to the economy, and increases in property values.

Tables 2, 3, and 4 summarize the costs and benefits considered within these categories in each BCA.

**Table 2**  
**Costs and Benefits Considered in the Flood Protection BCA**

Flood Protection BCA
<b>Lifecycle Costs</b>
Construction Cost of Flood Walls and Levees (Phases 1-4)
Operations and Maintenance Cost for Flood Walls and Levees (Phases 1-4)
Construction Cost of Greenway and Oak Park Improvements
Cost Associated with Buyouts for Most At-Risk Locations
Cost for Prairie Restoration/Environmental Education Park
<b>Resilience Value</b>
Flood-Related Economic Loss Avoided (Phases 1-4 of Floodwall/Levee System and Buyout Areas)
<b>Environmental Value</b>
Aesthetic Value (Greenway and Buyout Areas)
Air Quality (Greenway and Buyout Areas)
Biological Control (Greenway)
Climate Regulation (Greenway and Buyout Areas)
Erosion Control (Greenway and Buyout Areas)
Flood Hazard Reduction (Greenway)
Food Provisioning (Greenway)
Habitat (Greenway)
Pollination (Buyout Areas)
Storm Water Retention (Buyout Areas)
Water Filtration (Greenway)
<b>Social Value</b>
Health Benefits Associated with the Greenway
Improved Quality of Life & Strengthened Community Cohesion Associated with the Greenway
<b>Economic Revitalization</b>
Avoided Increase in Flood Insurance Premiums for Homes in Buyout Areas
Increased Property Values for Residences Adjacent to Buyout Areas
Increased Property Values for Residences Adjacent to Greenway
Tourism/Community Revenue from Greenway
Annual Labor Income Generated by Greenway Tourism/Community Revenue

Source: CDM Smith



**Table 3**  
**Costs and Benefits Considered in the Housing BCA**

Housing BCA
<b>Lifecycle Costs</b>
Construction Cost of Three Neighborhoods of Affordable Housing (609 Units)
Construction Cost of MSU Downtown Student Housing
Construction Cost of MSU Student Housing Adjacent to Campus
Construction Cost of Homeless Shelter
<b>Resilience Value</b>
Avoided Loss of Household Income in Minot
Annual MSU Student Expenditures Retained in/Brought to Minot
Reduced Foreclosure Risks and Associated Costs Due to Greater Housing Affordability
Improved Employer Attraction and Retention Due to Greater Housing Affordability
<b>Environmental Value</b>
Annual Gallons of Motor Vehicle Fuel Saved Due to Transit Availability
Annual Hours of Motor Vehicle Delay Saved Due to Transit Availability
Annual Cost of Motor Vehicle Congestion Saved Due to Transit Availability
Annual Energy Savings - Affordable Single Family Homes
Annual Energy Savings - Affordable Multifamily Homes & Townhomes
Annual Energy Savings - MSU Student Housing - Affordable Apartment Suites
Annual Energy Savings - Homeless Shelter
<b>Social Value</b>
Improved Community Identity and Social Cohesion
Health Benefits Associated with Affordable Housing
<b>Economic Revitalization</b>
Increased Buying Power of Residents Due to Greater Housing Affordability
Annual Labor Income - Homeless Shelter Employees

Source: CDM Smith

**Table 4**  
**Costs and Benefits Considered in the Economic Revitalization BCA**

Economic Revitalization BCA
<b>Lifecycle Costs</b>
Construction Cost of MSU and Dakota College Center for Technical Education
Construction Cost of Downtown Public Gathering Place
Construction Cost of MSU Arts Education Complex
Cost of Relocation and Renovation of Minot City Hall, Central Dispatch Offices, Regional Social Services Facility, and Vulnerable Populations Community Hall
<b>Resilience Value</b>
Relocation of Critical Government Offices from the Mouse River Floodplain
Annual Technical College Student Expenditures Retained in/Brought to Minot
Annual Expenditures Retained in/Brought to Minot by Additional MSU Art Program Students
<b>Environmental Value</b>
Annual Energy Savings - MSU and Dakota College Center for Technical Education
Annual Energy Savings - MSU Arts Education Complex
Annual Energy Savings - Minot City Hall, Central Dispatch Offices, Regional Social Services Facility, and Vulnerable Populations Community Hall
<b>Social Value</b>
Improved Community Identity and Social Cohesion Associated with the Downtown Public Gathering Place
Health Benefits Associated with Farmer's Market at the Downtown Public Gathering Place
<b>Economic Revitalization</b>
Annual Additional Income Retained in/Brought to Minot Due to Increased Initial Earnings of New Graduates of the Technical College
Annual Labor Income - Technical College Faculty & Staff
Annual Labor Income - Additional MSU Arts Education Complex Faculty and Staff
Tourism/Community Revenue from Downtown Public Gathering Place
Annual Labor Income Generated by Downtown Public Gathering Place
Tourism/Community Revenue

Source: CDM Smith

## BCA Results

As previously explained, Appendix H of the NOFA states that the standard criterion for funding projects is an NPV above zero or a BCR greater than one. NPV is calculated as follows:

$$\text{Benefits} - \text{Costs} = \text{NPV}$$

A BCR is calculated as follows:

$$\text{Benefits} \div \text{Costs} = \text{BCR}$$

Appendix H further states that applicants must discount future benefits and costs at a rate of 7 percent. The reason future benefits and costs are discounted is that benefits and costs are worth more if they are experienced sooner. **Table 5** presents the results of the three BCAs, expressed in terms of

NPV and BCR using the required discount rate of 7 percent. As shown in Table 5, each BCA meets the project funding criterion stated in Appendix H of the NOFA. The flood protection BCA achieves an NPV of nearly \$207.0 million and a BCR of 1.71. In the housing BCA, the NPV is more than \$293.7 million and the BCR is 2.92. Lastly, the economic revitalization BCA attains an NPV of more than \$218.5 million and a BCR of 6.77.

**Table 5**  
**BCA Results**

	Flood Protection BCA	Housing BCA	Economic Revitalization BCA
Benefits	\$498,303,000	\$446,389,000	\$256,408,000
Costs	\$291,304,000	\$152,658,000	\$37,896,000
<b>NPV</b>	<b>\$206,999,000</b>	<b>\$293,731,000</b>	<b>\$218,512,000</b>
<b>BCR</b>	<b>1.71</b>	<b>2.92</b>	<b>6.77</b>

Source: CDM Smith

## Summary

The preceding discussion summarized the results of three BCAs conducted for the City of Minot's projects proposed in Phase 2 of the NDRC. These BCAs include flood protection projects, housing projects, and economic revitalization projects. All projects were measured according to categories of benefits and costs that include lifecycle costs, resilience value, environmental value, social value, and economic revitalization. Each BCA meets the project funding criterion of a net present value above zero or a benefit-to-cost ratio greater than one, as summarized in Table 5.



**BENEFIT-COST ANALYSIS  
HOUSING DEVELOPMENTS  
2015 DOLLARS**

Base Year	2014
Analysis Period	2017-2036

**COSTS**

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	TOTAL
<b>LIFECYCLE COSTS</b>																					
Construction & Site Development of Affordable Housing	\$17,475,000																				
Construction - MSU Downtown Student Housing	\$17,475,000																				
Construction - MSU Student Housing Adjacent to Campus	\$17,475,000																				
Construction - Homestead Shelter	\$17,475,000																				
<b>Total Costs (No Discount)</b>	\$34,950,000																				
<b>Total Costs (Discounted 7%)</b>	\$30,192,790																				

**BENEFITS**

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	TOTAL
<b>RESILIENCE VALUE</b>																					
Reduced Loss of Household Income in Minor Disasters	\$45,000																				
Improved Employment and Retention Due to Greater Housing Affordability - Qualitative Description Provided																					
Improved Employer Attraction and Retention Due to Greater Housing Affordability - Qualitative Description Provided																					
<b>Total Resilience Value Benefits (No Discount)</b>	\$45,000																				

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	TOTAL
<b>ENVIRONMENTAL VALUE</b>																					
Annual Dollars of Motor Vehicle Fuel Saved	\$1,100																				
Annual Hours of Motor Vehicle Delay Avoided	1,100																				
Annual Dollars of Motor Vehicle Emissions Saved	\$111																				
Annual Energy Savings - Affordable Single Family Homes	\$1,467																				
Annual Energy Savings - Affordable Multifamily Homes & Townhomes	\$134																				
Annual Energy Savings - MSU Student Housing - Affordable Apartment Units	\$4																				
Annual Energy Savings - Homestead Shelter	\$100																				
<b>Total Environmental Value Benefits (No Discount)</b>	\$1,745																				

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	TOTAL
<b>SOCIAL VALUE</b>																					
Increased Community Identity and Social Cohesion - Qualitative Description Provided																					
Health Benefits Associated with Affordable Housing - Qualitative Description Provided																					
<b>Total Social Value Benefits (No Discount)</b>	\$0																				

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	TOTAL
<b>ECONOMIC REVITALIZATION</b>																					
Increased Thrift Power of Residents Due to Greater Housing Affordability - Qualitative Description Provided																					
Annual Labor Hours - MSU Student Housing Operations/Maintenance Staff																					
Homestead Shelter Beds																					
Homestead Shelter Employees																					
Annual Labor Hours - Homestead Shelter Employees																					
<b>Total Economic Revitalization Benefits (No Discount)</b>	\$0																				

<b>Total Benefits (No Discount)</b>	\$46,800,000	\$13,320,000	\$21,800,000	\$28,820,000	\$38,811,400	\$51,811,400	\$66,811,400	\$83,811,400	\$103,811,400	\$126,811,400	\$152,811,400	\$181,811,400	\$213,811,400	\$249,811,400	\$299,811,400	\$364,811,400	\$446,811,400	\$549,811,400	\$674,811,400	\$824,811,400	\$1,004,811,400
<b>Total Benefits (Discounted 7%)</b>	\$40,249,290	\$12,624,294	\$17,680,044	\$23,180,108	\$30,320,108	\$39,320,108	\$50,320,108	\$63,320,108	\$79,320,108	\$98,320,108	\$120,320,108	\$146,320,108	\$176,320,108	\$210,320,108	\$249,320,108	\$294,320,108	\$346,320,108	\$406,320,108	\$474,320,108	\$550,320,108	\$644,320,108

<b>Total Project Benefits (No Discount)</b>	\$81,192,790	\$23,617,294	\$33,200,044	\$43,020,108	\$54,131,508	\$67,142,908	\$82,142,908	\$99,142,908	\$119,142,908	\$142,142,908	\$168,142,908	\$197,142,908	\$229,142,908	\$265,142,908	\$305,142,908	\$349,142,908	\$397,142,908	\$449,142,908	\$505,142,908	\$565,142,908	\$629,142,908
<b>Total Project Benefits (Discounted 7%)</b>	\$70,192,790	\$20,617,294	\$28,200,044	\$36,020,108	\$45,131,508	\$56,142,908	\$69,142,908	\$85,142,908	\$104,142,908	\$126,142,908	\$152,142,908	\$181,142,908	\$213,142,908	\$249,142,908	\$289,142,908	\$333,142,908	\$381,142,908	\$433,142,908	\$489,142,908	\$549,142,908	\$613,142,908

<b>Discount Rate</b>	7.00%
<b>Base</b>	\$99,751,250



**ATTACHMENT I: MID-URN SUMMARY CHECKLIST A**

Target area is a County that was previously determined by HUD to be most impacted

MET RECOVERY NEED		
<ul style="list-style-type: none"> <li>- Response must include at least one criterion</li> <li>- For each criteria category selected, the corresponding data source and data documentation response must be provided</li> </ul>		
Target Area Name: City of Minot		
Criteria	Data Source	Data Documentation
<p><b>Housing:</b></p> <p><input checked="" type="checkbox"/> The prior CDBG-DR funding allocations, along with other funding sources, are inadequate for addressing remaining housing repair needs in each most impacted and distressed target area <b>AND:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Twenty or more households displaced by the disaster <b>OR</b></li> <li><input checked="" type="checkbox"/> Twenty homes still damaged by the disaster</li> </ul>	<p><b>Currently running</b> a CDBG-DR or other recovery housing program:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Analysis that shows the program waiting list <b>AND</b></li> <li><input type="checkbox"/> A reasonable estimate of aggregated average unmet repair needs exceeds the existing CDBG-DR fund available.</li> </ul> <p><b>Not currently</b> running a CDBG-DR or other housing recovery program:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Briefly explain why prior allocations of CDBG-DR funding, together with other funding sources, are inadequate to provide housing <b>AND:</b></li> <li><input type="checkbox"/> Provide recent emergency management data indicating households are still displaced from the disaster</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Provide Methodologically sound “windshield survey” of the target area within a HUD-identified most impacted county conducted since January 2014 <b>AND</b></li> <li><input checked="" type="checkbox"/> A list of 20 addresses of units identified with remaining damage                             <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> At least 9 of these addresses confirming (i) the damage is due to the disaster and (ii) they have inadequate resources from insurance/FEMA/SBA for completing repairs</li> </ul> </li> </ul>	<p><input checked="" type="checkbox"/> Link:</p> <p>B-1_HousingNeeds.pdf</p> <p><a href="https://drive.google.com/folder/view?id=0B53YagP-peBwfnYxNTByT1IMc0FBMfh6TUczT0pnWWhLa1d3SzVOWTZiYUxsVUZpRFUzQWs&amp;usp=sharing">https://drive.google.com/folder/view?id=0B53YagP-peBwfnYxNTByT1IMc0FBMfh6TUczT0pnWWhLa1d3SzVOWTZiYUxsVUZpRFUzQWs&amp;usp=sharing</a></p> <p><b>password:</b> minotndrc</p> <p><input type="checkbox"/> Page number(s) in application: N/A</p>

## ATTACHMENT I: MID-URN SUMMARY CHECKLIST A

Target area is a County that was previously determined by HUD to be most impacted

MET RECOVERY NEED		
<ul style="list-style-type: none"> <li>- Response must include at least one criterion</li> <li>- For each criteria category selected, the corresponding data source and data documentation response must be provided</li> </ul>		
Target Area Name: City of Minot		
Criteria	Data Source	Data Documentation
<p><b>Infrastructure:</b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> 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 target area(s) within a HUD-identified most impacted target area <b>AND</b></li> <li><input checked="" type="checkbox"/> Describe the damage, location of the damage 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 <b>AND</b></li> <li><input checked="" type="checkbox"/> A minimum \$400,000 in unfunded permanent infrastructure repair needs</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> An engineering report <b>OR</b> <input type="checkbox"/> a FEMA Project Worksheet(s) with an estimated repair amount</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> 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) <b>AND</b></li> <li><input checked="" type="checkbox"/> Your explanation of why existing CDBG-DR resources, together with other funding sources, are inadequate to meet this repair need</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Link:</li> </ul> <p>B-3_InfrastructureRepairs.pdf</p> <p><a href="https://drive.google.com/folder/view?id=0B53YagP-peBwfnYxNTByT1IMc0FBMFh6TUczT0pnWWhLa1d3SzVOWTZjYUxsVUZpRFUzQWs&amp;usp=sharing">https://drive.google.com/folder/view?id=0B53YagP-peBwfnYxNTByT1IMc0FBMFh6TUczT0pnWWhLa1d3SzVOWTZjYUxsVUZpRFUzQWs&amp;usp=sharing</a></p> <p><b>password:</b> minotndrc</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Page number(s) in application: N/A</li> </ul>



# ATTACHMENT I: MID-URN SUMMARY CHECKLIST A

Target area is a County that was previously determined by HUD to be most impacted

MET RECOVERY NEED		
<ul style="list-style-type: none"> <li>- Response must include at least one criterion</li> <li>- For each criteria category selected, the corresponding data source and data documentation response must be provided</li> </ul>		
Target Area Name: City of Minot		
Criteria	Data Source	Data Documentation
<p><b>Economic Revitalization:</b></p> <p><input checked="" type="checkbox"/> There are continuing unmet economic revitalization recovery needs due to the disaster in the target area(s) within a HUD-identified most impacted county that cannot be addressed with existing resources, including CDBG-DR funds already allocated <b>AND</b></p> <p><u><b>AND demonstrate one</b></u> of the following:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> A minimum of 5 businesses with remaining repair needs;</li> <li><input type="checkbox"/> Business revenues continued to be decreased by 10 percent or more relative to revenues prior to the disaster for one or more modest-sized employers (10 or more employees) due to the disaster; <b>OR</b></li> <li><input type="checkbox"/> Three or more smaller businesses show revenues 10 percent less than prior revenues</li> </ul> <p><b>AND</b></p> <p><input checked="" type="checkbox"/> Provide a narrative statement describing the extent of those needs and how the needs are connected with the disaster and the target area within a HUD-identified most impacted county</p>	<p><input checked="" type="checkbox"/> <i>Unmet repair needs narrative for businesses:</i></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> “Windshield survey” showing a minimum of 5 businesses with remaining repair needs <b>AND</b></li> <li><input checked="" type="checkbox"/> A survey of 5 business owners confirming damage due to the disaster and repairs not completed due to not receiving adequate resources from insurance and (if applicable) other federal funds <b>AND</b></li> <li><input checked="" type="checkbox"/> Addresses of businesses with continuing needs</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <i>Decreased revenues narrative for business(es):</i> <ul style="list-style-type: none"> <li><input type="checkbox"/> Analysis by a reputable public or private source showing continuing economic damage to the target area within a HUD-identified most impacted county due to the disaster or a survey of business(es) who provide (i) number of employees before the storm and current; (ii) total gross revenues in year before disaster and total gross revenues in most recent year; and (iii) a description of how the reduction in revenues is related to the disaster <b>AND</b></li> <li><input type="checkbox"/> One modest size employer (10 or more employees) or three smaller businesses (fewer than 10 employees) must show most recent year total gross revenues of 10 percent less than the year before the disaster and there needs to be a clean connection to the disaster <b>AND</b></li> <li><input type="checkbox"/> Names and addresses of impacted businesses</li> </ul> </li> </ul>	<p><input checked="" type="checkbox"/> Link:</p> <p>B-2_EconomicRevitalization.pdf</p> <p><a href="https://drive.google.com/folder/view?id=0B53YagP-peBwfnYxNTByT1IMc0FBMFh6TUczT0pnWWhLa1d3SzVOWTZjYUxsVUZpRFUzQWs&amp;usp=sharing">https://drive.google.com/folder/view?id=0B53YagP-peBwfnYxNTByT1IMc0FBMFh6TUczT0pnWWhLa1d3SzVOWTZjYUxsVUZpRFUzQWs&amp;usp=sharing</a></p> <p><b>password:</b> minotndrc</p> <p><input type="checkbox"/> Page number(s) in application: N/A</p>