

Edmunds County South Dakota



**NATURAL HAZARD MITIGATION PLAN
EXPIRES: 2026**



**PREPARED BY:
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TABLE OF CONTENTS

I.	INTRODUCTION	
a.	Introduction	1
b.	Purpose, Plan Use, Scope, Goals	1
c.	What is Hazard Mitigation	3
d.	County profile	5
II.	PREREQUISITES	
a.	Adoption by the Local Governing Body	10
b.	Multi-Jurisdictional Planning Participation and Adoption	10
III.	PLANNING PROCESS	
a.	Documentation of the Planning Process	13
b.	Selection of a Steering committee	14
c.	Public Involvement	15
1.	Opportunities for Public Comment	16
2.	Survey Responses	16
d.	Technical Review of Documents	17
1.	Review of 2016 Mitigation Plan	19
IV.	RISK ASSESSMENT	
a.	Identifying Hazards	20
1.	Natural Hazards in the Plan Jurisdiction	25
b.	Hazard Profile	34
1.	Dam Failure	35
2.	Drought Wildfire	36
3.	Extreme Temperatures	38
4.	Flood	38
5.	Hail	40
6.	High/Severe Wind	40
7.	Lightning	40
8.	Thunderstorms and Tornadoes	40
9.	Winter Storms	42
c.	Assessing Vulnerability: Addressing Repetitive Loss Properties	42
d.	Assessing Vulnerability: Identifying Structures	42
e.	Assessing Vulnerability: Estimating Potential Losses	45
f.	Assessing Vulnerability: Analyzing Development Trends	47
g.	Unique or Varied Risk Assessment	49
V.	MITIGATION STRATEGY	
a.	Mitigation Requirements and Overview	52
b.	Identification and Analysis of Mitigation Actions	53
c.	National Flood Insurance Program Compliance	62
d.	Implementation of Mitigation Actions	63
VI.	PLAN MAINTENANCE PROCESS	
a.	Monitoring, Evaluating, and Updating the Plan	64
b.	Incorporation into Existing Planning Mechanisms	65
c.	Continued Public Involvement	69
APPENDIX A: MITIGATION PLAN MEETING AGENDAS, MINUTES AND SIGN-IN		
APPENDIX B: NATURAL HAZARD EVENT DATA 2011-2020		
APPENDIX C: RISK ASSESSMENT WORKSHEETS		
APPENDIX D: SURVEY RESULTS		
APPENDIX E: BURN BAN ORDINANCE		
APPENDIX F: RESOLUTIONS OF ADOPTION		

I. INTRODUCTION

CHANGES/REVISIONS TO INTRODUCTION:

Population statistics were updated. Information on Community Lifelines was added. Maps were added for visual reference.

INTRODUCTION

Edmunds County is vulnerable to natural hazards that have the possibility of causing serious threat to the safety of our citizens. The cost of response and recovery from potential disasters in terms of potential loss of life, property, or infrastructure can be reduced when planning efforts focus on mitigating the impacts of a natural hazard before an event occurs.

This plan identifies the county's natural hazards and vulnerabilities to those hazards. This knowledge will help identify a mitigation strategy that can significantly reduce threats to life and property. This plan is based on the premise that hazard mitigation works. With increased attention to mitigating natural hazards, communities can reduce risk to citizens and avoid creating new problems in the future. Additionally, many mitigation actions can be implemented at minimal cost.

Mitigation planning is a process which identifies areas of vulnerability and potential risk in relationship to known natural hazards that occur in the planning area, followed by the creation of a strategy to reduce the likelihood of loss of life, loss or damage to property and infrastructure caused by natural hazards. With increased attention to mitigating natural hazards, communities can reduce threats to existing developments and prevent new risks by limiting and/or regulating future development. Many mitigation actions can be implemented at minimal or no cost. Improved focus on land use planning and smart design is one of the most effective mitigation tools for City and County governments.

Section headings and subheadings follow the organization of the Local Mitigation Plan Review Tool. Several appendices accompany this plan. They contain technical data, meeting minutes, and other relevant information that compliments the content of this plan.

This is not an emergency response or emergency management plan. Certainly, the plan can be used in conjunction with other types of planning documents to identify weaknesses and/or refocus emergency response planning. Enhanced emergency response planning is an important mitigation strategy. However, the focus of this plan is to support better decision making directed towards avoidance of future risks and the implementation of activities or projects that will eliminate or reduce the risks caused by natural hazards.

PURPOSE OF THE PRE-DISASTER MITIGATION PLAN

In October of 2000, the Disaster Mitigation Act (DMA2K) was signed to amend the 1988 Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 322 (a-d) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a pre-disaster mitigation (PDM) plan in place that:

1. Identifies hazards and the associated risks and vulnerabilities to such hazards;
2. Develops and prioritizes mitigation projects; and
3. Encourages cooperation and communication between all levels of government and the public.

The purpose of this plan is to meet the hazard mitigation planning needs for Edmunds County and participating entities. Consistent with the Federal Emergency Management Agency's guidelines, this plan will review all possible activities related to disasters to reach efficient solutions, link hazard management policies to specific activities, educate and facilitate communication with the public, build public and political support for mitigation activities, and develop implementation and planning requirements for future hazard mitigation projects.

PURPOSE

To fulfill federal, state, and local hazard mitigation planning responsibilities; to promote pre and post disaster mitigation measures, implement short/long range strategies that minimize suffering, loss of life, and damage to property resulting from hazardous or potentially hazardous conditions to which citizens and institutions within the county are exposed; and to eliminate or minimize conditions which would have an undesirable impact on our citizens, economy, environment, or the well-being of the County. This plan will aid city, township, and county agencies and officials in enhancing public awareness to the threat hazards have on property and life, and what can be done to help prevent or reduce the vulnerability and risk of each Edmunds County jurisdiction.

PLAN USE

First, the plan should be used to help local elected and appointed officials plan, design, and implement programs and projects that will help reduce their community's vulnerability to natural hazards. Second, the plan should be used to facilitate inter-jurisdictional coordination and collaboration related to natural hazard mitigation planning and implementation. Third, the plan should be used to develop or provide guidance for local emergency response planning. Finally, when adopted, the plan will bring communities in compliance with the Disaster Mitigation Act of 2000.

SCOPE

1. Provide opportunities for public input and encourage participation and involvement regarding the mitigation plan.
2. Identify hazards and vulnerabilities within the county and local jurisdictions.
3. Combine risk assessments with public and emergency management ideas.
4. Develop goals based on the identified hazards and risks.
5. Review existing mitigation measures for gaps and establish projects to sufficiently fulfill the goals.
6. Prioritize and evaluate each strategy/objective.
7. Review other plans for cohesion and incorporation with the PDM.
8. Establish guidelines for updating and monitoring the plan.
9. Present the plan to Edmunds County and the participating municipalities within the county for adoption.

LOCAL GOALS

These ideas form the basis for the development of the PDM Plan and are shown from highest priority, at the top of the list, to those of lesser importance nearer the bottom.

- Protection of life before, during, and after the occurrence of a natural hazard;
- Protection of emergency response capabilities (critical infrastructure);
- Establish and maintain communication and warning systems;
- Protection of critical facilities;
- Government continuity;
- Protection of developed property, homes and businesses, industry, education opportunities and the cultural fabric of a community, by combining hazard loss reduction with the community's environmental, social, and economic needs; and
- Protection of natural resources and the environment, when considering mitigation measures.

LONG-TERM GOALS

- Eliminate or reduce the long-term risk to human life and property from identified natural and hazards;
- Aid both the private and public sectors in understanding the risks they may be exposed to and finding mitigation strategies to reduce those risks;
- Avoid risk of exposure to identified hazards;
- Minimize the impacts of those risks when they cannot be avoided;
- Mitigate the impacts of damage as a result of identified hazards;
- Accomplish mitigation strategies in such a way that negative environmental impacts are minimized;
- Provide a basis for funding of projects outlined as hazard mitigation strategies; and
- Establish a regional platform to enable the community to take advantage of shared goals, resources, and the availability of outside resources.

WHAT IS HAZARD MITIGATION?

Hazard mitigation is defined as any cost-effective action(s) that has the effect of reducing, limiting, or preventing vulnerability of people, property, and the built environment to potentially damaging, harmful, or costly hazards. Hazard mitigation measures, which can be used to eliminate or minimize the risk to life and property, fall into three categories. First are those that keep the hazard away from people, property, and structures. Second are those that keep people, property, and structures away from the hazard. Third are those that do not address the hazard at all but rather reduce the impact of the hazard on the victims such as insurance. This mitigation plan has strategies that fall into all three categories.

Hazard mitigation measures must be practical, cost effective, and environmentally and politically acceptable. Actions taken to limit the vulnerability of society to hazards must not in themselves be more costly than the value of anticipated damages.

Mitigation actions should be incorporated into the planning activities associated with capital improvements with consideration given to areas with the greatest vulnerability to natural hazards. Capital investments, whether for homes, roads, public utilities, pipelines, power plants, or public works, determine to a large extent the nature and degree of hazard vulnerability of a community. Once a capital facility is in place, very few opportunities will present themselves over the useful life of the facility to correct any errors in location or construction with respect to hazard vulnerability. It is for these reasons that zoning and other ordinances, which manage development in high vulnerability areas, and building codes, which ensure that new buildings

are built to withstand the damaging forces of hazards, are often the most useful mitigation approaches a city can implement.

Previously, mitigation measures have been the most neglected programs within emergency management. Since the priority to implement mitigation activities is generally low in comparison to the perceived threat, some important mitigation measures take time to implement. Mitigation success can be achieved, however, if accurate information is portrayed through complete hazard identification and impact studies, followed by effective mitigation management. Hazard mitigation is the key to eliminating long-term risk to people and property in South Dakota from hazards and their effects. Preparedness for all hazards includes: response and recovery plans, training, development, management of resources, and mitigation of each jurisdictional hazard.

This plan evaluates the impacts, risks, and vulnerabilities of natural hazards within the jurisdictional area of the entire county. The plan supports, provides assistance, identifies and describes mitigation projects for each of the local jurisdictions who participated in the plan update. The suggested actions and plan implementation for local governments could reduce the impact of future natural hazard occurrences. Lessening the impact of natural hazards can prevent such occurrences from becoming disastrous, but will only be accomplished through coordinated partnership with emergency managers, political entities, public works officials, community planners and other dedicated individuals working to implement this program.

COMMUNITY LIFELINES

Mention has been given to Community Lifelines throughout the plan. These community lifelines are the focus of FEMA's response to natural hazards. The creation of Community Lifelines allowed FEMA to prioritize and deliver a concentrated response in mitigating effects in the event of a natural hazard. These community lifelines are:

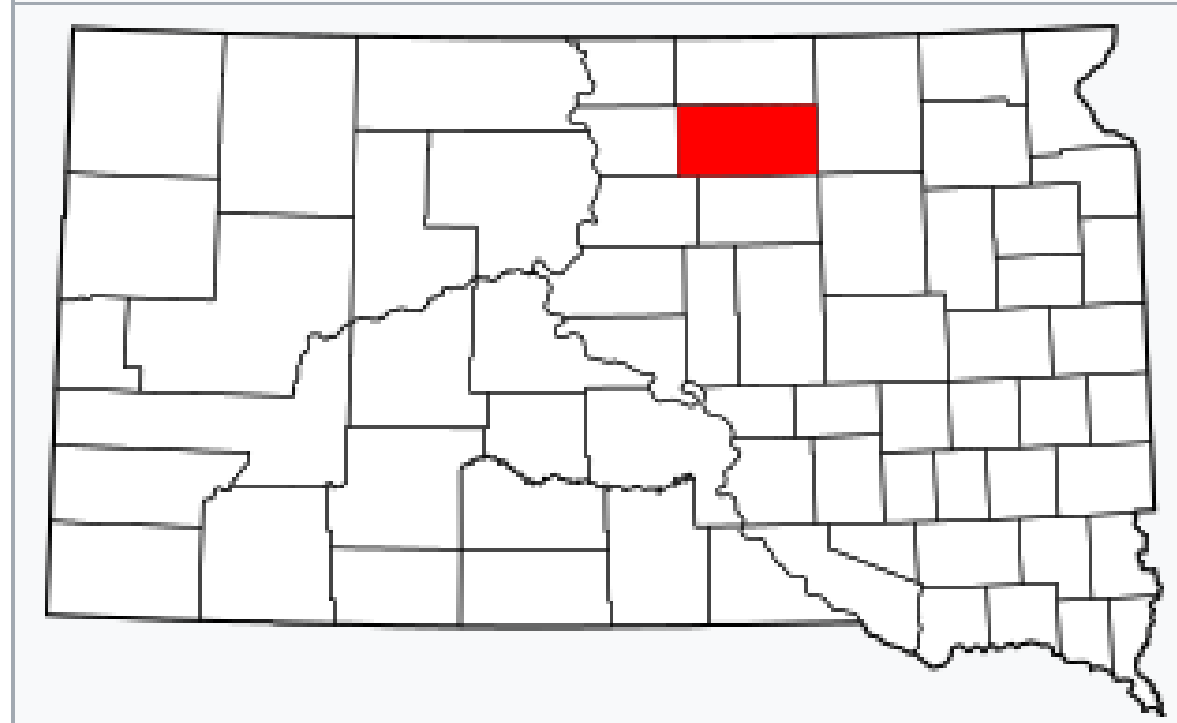
- Safety and Security: law enforcement/security, fire service, search and rescue, government services, community safety
- Food, Water, and Shelter: food, water, shelter, agriculture
- Health and Medical: medical care, public health, patient movement, medical supply chain, fatality management
- Energy (Power and Fuel): power grid, fuel
- Communications: infrastructures, responder communications, alerts, warnings, and messages, finance, 911 and dispatch
- Transportation: highway/roadway/motor vehicle, mass transit, railway, aviation, maritime
- Hazardous Materials: facilities, HAZMAT, pollutants, contaminants

These are recognized by FEMA as the basic services communities need to enable all other aspects of society to function. This prioritization of resources focuses FEMA's efforts. Each function is further broken into subcategories dedicated to prioritizing resources before and after a natural hazard event. These community lifelines are essential to mitigating and addressing natural hazard events and focuses response. By ensuring stability of community lifelines through mitigation before a disaster, it allows the process of responding to a disaster to become more efficient.

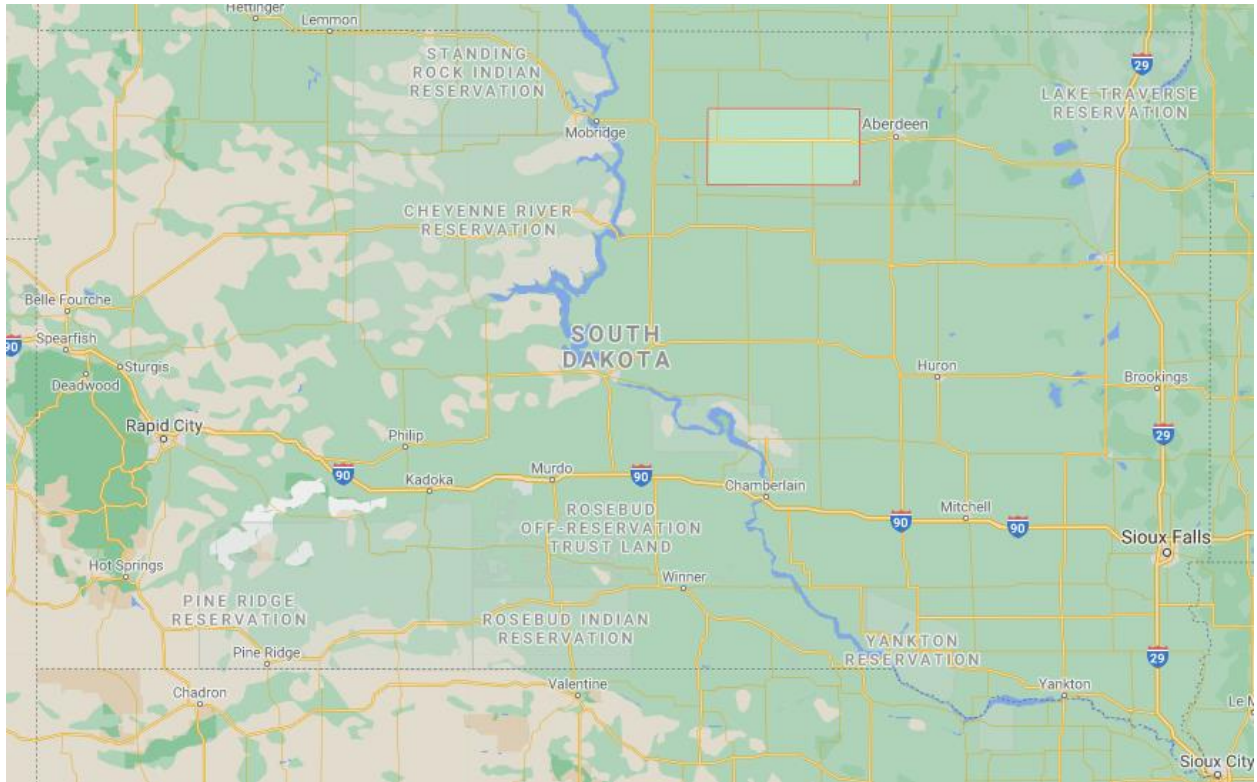
EDMUNDS COUNTY PROFILE

Edmunds County is located in north central south Dakota.

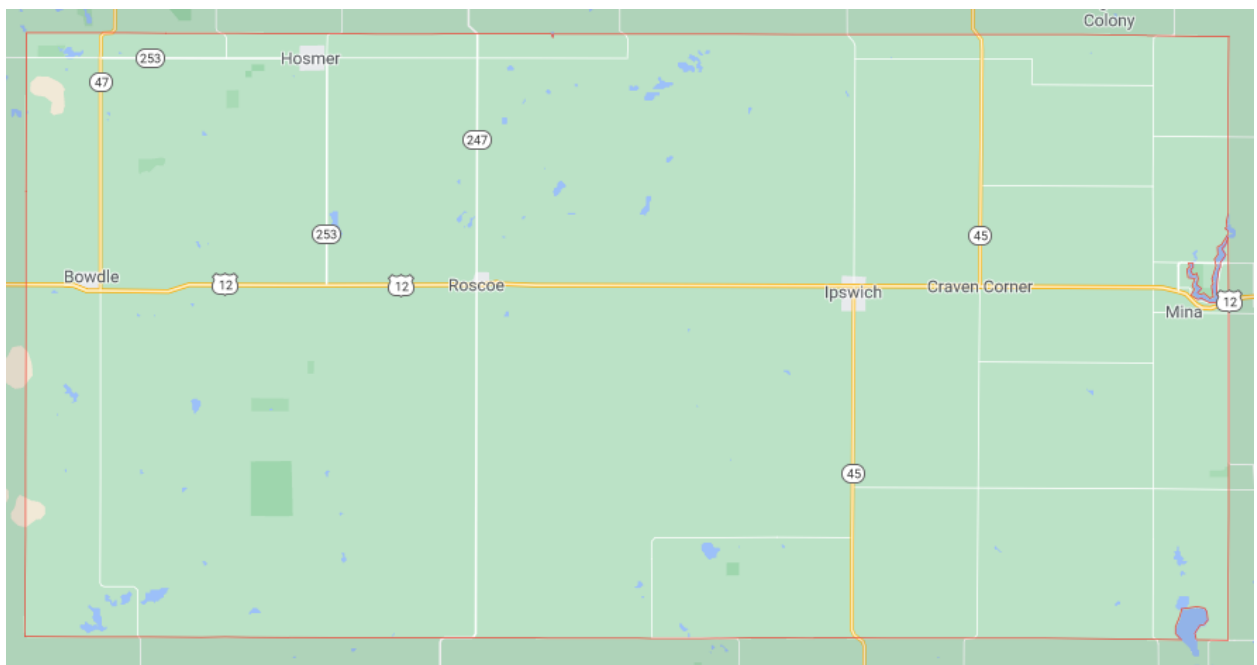
According to the U.S. Census Bureau website, the 2019 population estimate for Edmunds County is 3,829, a decline from the County's 2010 population which was 4,071 persons. The geographic area constitutes 1145.66 square miles. Using the 2019 population estimate, a population distribution of 3.35 persons per square mile is achieved. As of 2019, twenty-two percent (22%) of the population was older than 65. Roughly forty-eight percent (48%) of the population is between the ages of 18 and 65.



Map 1.1 South Dakota Map Showing Edmunds County



Map 1.2 South Dakota Map Showing Edmunds County



Map 1.3 Edmunds County Map

Seasonal impact from May 1 to October 15 significantly increases the population. This concentration is largely centered near the eastern portion of the county around Mina Lake and throughout the rest of the county at various times depending on seeding and harvesting. Other events which cause an increase in population include the demolition derbies in Roscoe and

Ipswich, Ipswich's Rodeo and Trail Days, Tower Days in Bowdle, and sporting events. Each of these scenarios adds several hundred people to the population. Hunting season also brings individuals to rural areas.

Highway 12 is a major east-west highway and as such receives the majority of commercialized traffic. All other transportation routes receive high usage due to the agricultural-based economy. The Northern Border Pipeline crosses the extreme northeast corner of the county and is used to transport large quantities of natural gas. A secondary gas pipeline travels north of U.S. highway 12 east to west. This pipeline supplies natural gas to Ipswich, Roscoe, and Bowdle, and is operated by Montana Dakota Utility (MDU). A crude oil pipeline, the Dakota Access Pipeline runs through the county, entering the county in the northwest and exiting in the south central portion of the county.

The county seat, Ipswich, is located at the junction of U.S. Highway 12 and State Highway 45. With a 2019 population estimate of 891, it is the largest municipality in the county. Its legal location is 45°26'40"N, 99°1'44"W. The town covers 1.31 miles and is located at an elevation of 1,541 feet. There are 479 occupied units within the city.

The city of Roscoe has an estimated population of 289. It is located near the center of the county at 45°26'55"N, 99°20'18"W and an elevation of 1,830 ft. It has 137 occupied units. The City owns a new and old fire hall, city shop, city office building, park, a tennis court, a restricted use site, and many tracts of land in the city limits. Roscoe has a 50,000 and 100,000-gallon water tower. There is a pump house and chlorine building. The city contracts 20 gallons per minute of water from WEB Rural Water Development Association. Sixty blocks of sewer line plus line running from limits to the lagoon was constructed in 1948-49 at a cost of \$59,340. Lines to the new lagoon and from highway 12 to the County Implement were constructed in 1997 at a cost of \$112, 062. Lines to the Legion Building in 2001 were constructed at a cost of \$57,429. Garbage disposal is contracted with Dependable Sanitation of Aberdeen.

There are two other municipalities in the County, Hosmer and Bowdle. Bowdle has an estimated 2019 population of 468. Hosmer has an estimated 2019 population of 186

In addition to the municipalities there is residential development around Mina Lake which is located on the eastern border of Edmunds County. There are 377 drinking water/sewer connections through the Mina Lake Sanitary District which include seasonal cabins. There are another 30-40 residences on the west side of the lake that have individual septic systems and drinking water connections from WEB Sater. The homes are not located in the 100-year flood plain and thus are not required to purchase flood insurance. Some of the homes are seasonal cabins which are only occupied during the summer months, and other homes are year-round residences.

DEMOGRAPHIC CONDITIONS (source: US Census Bureau, 1990-2010)

Table 1.1 County Population History		
Year	Population	% Change
1930	8712	
1940	7814	-11%
1950	7275	-7%
1960	6079	-17%

1970	5548	-9%
1980	5159	-7%
1990	4356	-16%
2000	4367	1%
2010	4071	-7%
2019 (est)	3,829	-6%

Table 1.2 Current Demographic Statistics				
	1990 Population	2010 Population	2019 (estimate)	% Change
Edmunds County	4356	4071	3,829	-12%
Ipswich	965	954	891	-8%
Bowdle	589	502	468	-21%
Roscoe	362	329	289	-21%
Hosmer	310	208	186	-40%

Table 1.3 Township Populations – 2010 Census			
Township	Population	Township	Population
Adrian	14	Huntley	45
Belle	145	Ipswich (township)	58
Bowdle (township)	90	Kent	29
Bryant	19	Liberty	26
Clear Lake	32	Madison	19
Cleveland	17	Modena	19
Cloyd Valley	11	Montpelier	43
Cortlandt	628	North Bryant	48
Cottonwood Lake	42	Odessa	23
Fountain	71	Pembroke	34
Glen	48	Powell	42
Glover	48	Richland	46
Harmony	159	Rosette	104
Hillside	32	Sangamon	60
Hosmer (township)	19	Union	29
Hudson	43	Vermont	35

TRANSPORTATION

Transportation planning for streets and roads begins with understanding the relationship between land use and road network. Streets and roads balance between the functions for mobility and land access. On one side, such as interstate highways, mobility is the primary function of the network. On the other side, such as local roads, land access to farms and residences is the primary service. In between these two extremes, mobility and land access varies depending on the function of the road network.

Functional classification is the process of grouping streets and roads into classes according to the function they are intended to provide. Listed below is Edmunds County's functional classification system. The classification is according to the rural systems classification as developed by the Federal Highway Administration.

1. Principal Arterials – serve longer strips of a statewide or interstate nature, carry the highest traffic volumes, connect larger urban areas, provide minimal land access, and include both interstate and non-interstate principal arterial highways.
2. Minor Arterials – interconnect the principal arterials, provide less mobility and slightly more land access, and distribute travel to smaller towns, and major resorts attracting longer trips.
3. Major Collectors – provide both land access and traffic circulation connecting county seats not served by arterials and connect intracounty traffic generators like schools, shipping points, county parks, and important mining and agricultural areas.
4. Minor Collectors – collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road.
5. Local Roads – provide direct access to adjacent land and to the highest classified roads and serve short trips.

A Major Street Plan includes a current and future hierarchy of street classifications for use in identifying and prioritizing transportation needs of Edmunds County.

II. PREREQUISITES

CHANGES/REVISIONS TO PREREQUISITES:

Tables were updated to reflect current information.

ADOPTION BY LOCAL GOVERNING BODY

Requirement 201.6(c)(5) Documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

The local governing body that oversees the update of the Edmunds County Natural Hazard Mitigation Plan is the Edmunds County Commission. The Commission has tasked the Edmunds County Emergency Manager with the responsibility of ensuring that the Mitigation Plan is compliant with Federal Emergency Management Agency (FEMA) Guidelines and corresponding regulations.

MULTI-JURISDICTIONAL PLAN PARTICIPATION

This plan is a multi-jurisdictional plan which serves the entire geographical area located within the boundaries of Edmunds County, South Dakota. Edmunds County has four incorporated municipalities. All of the municipalities located within Edmunds County elected to participate in the planning process and the update of the existing Edmunds County Pre-Disaster Mitigation (PDM) Plan. The participating local jurisdictions include the following municipalities:

Table 2.1: Plan Participants		
New Participants	Continuing Participants	Do Not Participate
	Edmunds County	Mina Lake**
	Bowdle	FEM Electric*
	Hosmer	
	Ipswich	
	Roscoe	

*FEM Electric Cooperative was more than willing to participate and expressed interest in being part of the PDM plan update; however rural electric and energy cooperatives can participate in and adopt the Statewide plan due to the nature of their service areas; most cross the borders of several counties which under the old format required them to participate in multiple county plans. The current format of adopting the statewide plan, allows them to participate in one planning process at the state level rather than several at the county level.

**Mina is located on the border of Brown and Edmunds counties. Approximately 377 water/sewer hookups are at Mina Lake. Mina Lake has an organized sanitary district, but is not an incorporated municipality.

The Edmunds County Commissioners and each of the listed participating municipalities will pass a resolution to adopt the updated Mitigation Plan.

The townships are not direct participating entities in the plan because the townships are too small, both in population and in resources, to be capable of handling disaster needs on their own. The townships are served by the County whenever necessary. The townships were invited to participate in the PDM Plan update.

The Edmunds County PDM Plan was adopted by resolution by four incorporated municipalities and the Edmunds County Commission. The Resolutions of Adoption are included as supporting documentation for the PDM Plan. The dates of adoption by resolution for each of the jurisdictions are summarized in Table 2.2.

Table 2.2: Dates of Plan Adoption by Jurisdiction	
Jurisdiction	Date of Adoption
Edmunds County Commission	
Bowdle	
Hosmer	
Ipswich	
Roscoe	

All of the participating jurisdictions were involved in the plan update. Representatives from each municipality and the County attended the planning meetings and provided valuable perspective on the changes required for the plan. All representatives took part in the risk assessment by reviewing the risk assessment worksheets, which are included as Appendix C and by profiling the risks.

Representatives also took information from the mitigation planning meetings back to their respective councils and presented the progress of the plan update on a monthly basis.

Table 2.3 was derived to help define “participation” for the local jurisdictions who intend on adopting the plan. Out of nine categories, each jurisdiction must have at least six of the participation requirements fulfilled.

Table 2.3 Local Jurisdiction Participation					
Nature of Participation	Edmunds County	Ipswich	Bowdle	Roscoe	Hosmer
Attended Meetings or work sessions (a minimum of 1 meeting will be considered satisfactory).	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Submitted inventory and summary of reports and plans relevant to hazard mitigation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Submitted Risk Assessment Worksheet.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Submitted description of what is at risk (including local critical facilities and infrastructure at risk from specific Hazards)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Submitted a description or map of local land-use patterns (current and proposed/expected).	C	C	C	C	C
Developed mitigation actions with an analysis/explanation of why those actions were selected.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Prioritized actions emphasizing relative cost-effectiveness.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Reviewed and commented on draft Plan.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Hosted opportunities for public involvement (allowed time for public comment at a city council/county commission meetings after giving a status report on the progress of the Plan update)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

III.PLANNING PROCESS

CHANGES/REVISIONS TO PLANNING PROCESS:

Tables were updated as necessary. Information on the planning process was updated to reflect public meetings and work sessions. Information on the public survey was included. Mina Lake was removed from Table 3.8 as they are not an incorporated jurisdiction.

DOCUMENTATION OF THE PLANNING PROCESS

“An open and public involvement process is essential to the development of an effective plan.” Requirement 201.6(b).

An information meeting was held at the Edmunds County Courthouse on March 2, 2021, during the regular county commission meeting to inform the public about the required plan update and discuss the process for completing the update. The County also discussed and approved the contract for NECOG to complete the plan update.

Public meetings were held at the Bowdle Fire Hall, Roscoe Fire Hall, Edmunds County Courthouse, Hosmer City Hall, and Ipswich City Hall to inform the public about the required PDM Plan update. In the past a committee was formed and would meet regularly until the updates were complete; however, at the request of several council members who were unable to attend committee meetings the format was changed and plan author presented information at council meetings where the entire council was in attendance and the meetings were open and advertised to the public. After the initial informational meeting was held, the communities started working through the existing plan and noting changes and updates that needed to be made. In-kind documentation was collected from each of the city council/county commission meetings as well as work sessions and are included as Appendix A.

The 2016 Edmunds County PDM Plan includes most of the requirements of the planning tool. Any changes or additions necessary were noted and included in the plan update. The remaining portions of the 2016 Plan were evaluated and areas that required updates were highlighted. The Plan Author followed the direction provided at the FEMA G318 Mitigation Planning Workshop for Local Governments and also used the FEMA Multi-Hazard Mitigation How-To Guidance.

Participating jurisdictions were provided a copy of the mitigation strategy and were instructed to review all goals and projects and determine if changes were needed. Plan representatives were then asked to discuss the mitigation strategy at their city council or county commission meetings to determine if projects should be left in the plan, removed or if they have been completed. Plan participants were also asked to consider if recent development in their jurisdiction has created new risk or changed previously identified risks. The meeting minutes and agendas for each of the city council and county commission meetings were published in the local newspaper or paper of record.

The public was provided several opportunities at City Council meetings to comment on the plan during the drafting stage of the plan update. State law requires that public meetings allow for public comment during the meetings as described in SDCL 1-25-1.

...The public body shall reserve at every regularly scheduled official meeting a period for public comment, limited at the public body's discretion, but not so limited as to provide for no public comment. At a minimum, public comment shall be allowed at regularly scheduled official meetings which are designated as regular meetings by statute, rule, or ordinance.

It was during this legally required public comment period that the public was allowed to provide comments. Mitigation Planning was listed on the required notices for the City Council and County Commission meetings. Notices for public meetings require a minimum of time, date, and location, and were posted in accordance with SDCL 1-25.1.1:

1-25-1.1. ...Each political subdivision shall provide public notice, with proposed agenda, that is visible, readable, and accessible for at least an entire, continuous twenty-four hours immediately preceding any official meeting, by posting a copy of the notice, visible to the public, at the principal office of the political subdivision holding the meeting. The proposed agenda shall include the date, time, and location of the meeting. The notice shall also be posted on the political subdivision's website upon dissemination of the notice, if a website exists. For any special or rescheduled meeting, the information in the notice shall be delivered in person, by mail, by email, or by telephone, to members of the local news media who have requested notice. For any special or rescheduled meeting, each political subdivision shall also comply with the public notice provisions of this section for a regular meeting to the extent that circumstances permit.

SELECTION OF THE PLANNING TEAM [§201.6(c)(1)]

[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

The Edmunds County Emergency Manager and staff from Northeast Council of Governments led the development of the plan update. The local jurisdictions were represented by city council members and/or finance officers who attended the meetings. The council discussed the progress of the plan at their council meetings.

City Council members and County Commissioners were tasked with reviewing the drafts and providing comments to Northeast Council of Governments. They were also helped collect data and provided information needed to complete the plan.

The representatives from the municipalities were asked to share the progress of the plan at their council meetings and to ensure that those attending the council meetings were aware that they are invited to make comments on and participate in the process of updating the new plan. City Council Members and County Commissioners are listed in Tables 3.1 to 3.5 below.

Table 3.1: Edmunds County Commissioners Involved in the Plan

Dennis Hoyle	Commissioner
Robert Olson (replaced by Dean Mehlhaff)	Commissioner
Timothy Thomas	Commissioner
Morris Grosz	Commissioner
Jerome Schaffner	Commissioner

Table 3.2: Bowdle City Council Members Involved in the Plan

Rick Boschee	Mayor
Erick Bieber	Council Member

Gary Frankfurth	Council Member
Rex Gab	Council Member
Mike Gunderson	Council Member
Amy Kappernman (replaced by Ryan Schlechter)	Council Member

Table 3.3: Hosmer Town Board Members Involved in the Plan	
Lew Paulson	Mayor
Barb Gienger	Council Member
Jerome Malsom	Council Member
Dean Schumacher	Council Member
Mike Schwingler	Council Member
Dewayne Sowards	Council Member
Paul Wollman	Council Member

Table 3.4: Ipswich Town Board Members Involved in the Plan	
LeRoy Kilber	Mayor
David Coisman	Council Member
Jon Gilbert	Council Member
Chris Gillick	Council Member
Mike Hammrich	Council Member
Mike Steen	Council Member
Erica Larson	Council Member

Table 3.5: Roscoe Town Board Members Involved in the Plan	
Leland Treichel	Mayor
Dee Bauman	Council Member
Mike Faw	Council Member
Dale Hettick	Council Member
Austin Holscher	Council Member
Andrew Lehr	Council Member
Darwin Rohrbach	Council Member

NEIGHBORING JURISDICTION PARTICIPATION [201.6(b)(2)]

An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities...to be involved in the planning process.

At the beginning of the planning process, an email was sent to all neighboring emergency managers in the counties of: Brown, McPherson, Campbell, Walworth, Potter, Faulk and Spink Counties giving them opportunity to participate in Edmunds County's planning process and provide input on the plan's content. After the plan was drafted, it was emailed to all of the participants and to the emergency managers in the neighboring counties. Everyone who received an email copy of the plan draft was allowed 32 days to comment on the draft.

PUBLIC INVOLVEMENT [§201.6(b)(1)]

An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

The public was provided several opportunities to comment on the plan during the drafting stages, both at the Planning Meetings and at City Council and County Commission Meetings. Those who were most involved were those elected officials and city/county staff who participated in the meetings. The municipalities put the plan update on the agenda at their council meetings and allowed people to comment at the meetings. Table 3.7 identifies the location and date of each opportunity that was provided for the public to comment and how it was advertised. After the plan was drafted it was posted [insert where it was posted] and emailed to all of the participants and to the emergency managers in the neighboring counties. Everyone who received an email copy of the plan was given 30 days to comment on the draft.

Table 3.7: Opportunities for Public Comment

Location of Opportunity	Date	Type of Participation			How Was Meeting Advertised			Social Media
		City Council Meeting	County Commission Meeting	Planning Meetings	Newspaper	Agenda (posted 24 hours before meeting)	Website	
Edmunds County	3/2/2021		X			X	X	
	4/13/2021		X			X	X	
Bowdle	7/6/21	X				X	X	
Hosmer	4/13/2021	X				X		
	5/11/2021	X			X	X		
Ipswich	6/21/21	X				X	X	
Roscoe	4/5/2021	X				X	X	
Stakeholder Meetings	3/23/2021			X				
	5/3/2021			X	X			
LEPC Meeting	7/1/21			X		X		

SURVEY

In addition to the stakeholder meetings, county commission and council meetings, the mitigation planning group decided to conduct a survey which was distributed online and marketed through email, Facebook and on the respective jurisdictions' websites. There were 95 surveys completed online via Alchemer (formerly Survey Gizmo). Results of the survey are included as Appendix D.

TECHNICAL REVIEW OF EXISTING DOCUMENTS [§201.6(b)(3)]

Review and incorporation...of existing plans, studies, reports, and technical information.

The review and incorporation of existing plans, studies, reports and technical information was completed by the local jurisdictions and the plan author. Each of the communities were asked to provide a list of existing documents that they have available. Many of the smaller communities do not have such documents.

The 2016 plan was used as a resource for the new plan because most of the natural hazard profile research had already been completed when it was drafted. In addition to the 2016 Edmunds County PDM Plan, the plan author reviewed several other existing documents including but not limited to the South Dakota State Hazard Mitigation Plan, Edmunds County Hazmat Plan, Local Emergency Operations Plan, County Zoning Ordinances, and Flood Insurance Rate Maps for the local jurisdictions. A summary of the technical review and incorporation of existing plans is included in Table 3.8 below.

The use of existing policies and technical documents tends to be less involved than what might be seen in larger cities or communities. For instance, while State Law requires that a comprehensive plan be adopted prior to incorporating zoning ordinances, it is common for communities to have outdated comprehensive plans, some dating back to the late 1970's. At the time this plan was drafted, Edmunds County is in the process of updating their comprehensive plan and zoning ordinances.

Table 3.8 :Record of Review (Summary)

Existing Program/Policy/ Technical Documents	Local Jurisdiction					Plan Incorporation
	Edmunds Co	Bowdle	Hosmer	Ipswich	Roscoe	
Comprehensive Plan	✓	NA	NA	✓	C	Development Trends; Plan Maintenance
Flood Damage Prevention Ordinance	NA	NA	NA	NA	NA	NA
Floodplain Management Plan	NA	NA	NA	NA	NA	NA
Flood Insurance Studies or Engineering studies for streams	NA	NA	NA	✓ (Drainage Study)	NA	Overall Summary of Vulnerability; Development Trends; Mitigation Strategy
Emergency Operations Plan	✓	C	C	C	C	Assessing Vulnerability
Zoning Ordinance	✓	✓	✓	✓	NA	Development Trends; Plan Maintenance
Building Code	State	NA	NA	State	NA	Development Trends
Drainage Ordinance	NA	NA	NA	✓	NA	Overall Summary of Vulnerability; Development Trends; Mitigation Strategy
Critical Facilities maps	NA	NA	NA	NA	NA	NA
Existing Land Use maps	NA	NA	NA	✓	NA	NA
Elevation Certificates	NA	NA	NA	NA	NA	NA
State Hazard Mitigation Plan	✓	✓	✓	✓	✓	Risk Assessment Hazard Identification
Capital Improvement Plan	NA	NA	NA	NA	✓	Development Trends
NA: the jurisdiction does not have this program/policy/technical document						
O: the jurisdiction has the program/policy/technical document, but did not review/incorporate it in the mitigation plan						
C: the jurisdiction is regulated under the County's policy/program/technical document						

REVIEW OF THE 2016 PDM PLAN

Plan participants reviewed and analyzed the plan and each section was revised as part of the update process. The 2016 Plan was consistent with the layout of the local mitigation planning tool. The plan author helped to determine which sections were still useful and which sections should be eliminated, updated, or revised. The March 2021 meeting was a presentation that explained the purpose and reason for the Mitigation Plan and the required plan update. The participant review of the plan took place over the course of several worksessions that were held on the following dates and locations:

March 2, 2021 – Edmunds County Commission Meeting
March 23, 2021 – Planning Meeting at Bowdle Fire Hall
April 5, 2021 – Roscoe City Council Meeting
April 13, 2021 – Edmunds County Commission Meeting
April 13, 2021 – Hosmer City Council Meeting
May 3, 2021 – Planning Meeting at Roscoe Fire Hall
May 11, 2021 – Hosmer City Council Meeting
June 21, 2021 – Ipswich City Council Meeting
July 1, 2021 – Work Session at Ipswich City Hall
July 6, 2021 – Bowdle City Council Meeting
July 22, 2021 – Work Session at Edmunds County Courthouse

IV. RISK ASSESSMENT

CHANGES/REVISIONS TO RISK ASSESSMENT:

- Information was reviewed, most of the information stayed the same.
- Hazard Occurrences and Probability of Future Events information was included as a table and expanded on from previous plan updates.
- Identifying the hazards (a description of the hazards along with the jurisdiction's vulnerability to the hazards was combined to make the plan more concise and less redundant.
- Information on Presidential Disaster Declarations in Edmunds County was added.

IDENTIFYING HAZARDS [§201.6(c)(2)(i)]

The risk assessment shall include a description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Many websites have been further developed and updated since the drafting and of the previous Edmunds County Plan in 2016, so the Planning Committee used some of those websites as resources for the updated plan. Specifically, the National Oceanic Atmosphere Administration (NOAA), the National Weather Service of Aberdeen and the United States Drought Monitor were used to research natural hazards and disasters that have occurred within the last 10 years within the geographic location covered under the Edmunds County Mitigation Plan. A summary of the findings for significant hazard occurrences from the past 10 years is provided in Table 4.1. A complete list of all hazards is included in Appendix B.

Table 4.1: Significant Hazard Occurrences 2011-2020

Type of Hazard	# of Occurrences Since 2010	# of Years	Probability of Future Events, as a %	Source
Blizzard (19) / Heavy Snow (13) / Ice Storm (1) / Winter Weather (4) / Winter Storm (10)	47	10	100%	NOAA
Drought	7	10	70%	NOAA & US Drought Monitor
Wildfire/Other Outdoor Fire (Jan 1, 2010-December 31, 2019)	147	10	100%	NOAA & State Fire Marshal's Office

Flood	9	10	90%	NOAA
Flash Flood	4	10	40%	NOAA
Hail	31	10	100%	NOAA
Lightning	0	10	0%	NOAA
Funnel Cloud (0) Tornado (3)	3	10	30%	NOAA
Extreme Cold (19)/Cold (1)	20	10	100%	NOAA
Excessive Heat	2	10	20%	NOAA
Strong/High Wind (12)/ Thunderstorm Wind (63)	75	10	100%	NOAA
Dust Storm	0	10	0%	NOAA

While researching the hazard occurrences that have taken place in Edmunds County, it became evident that the information found on the NOAA website was incomplete. Therefore, other sources were contacted whenever possible. Specifically, NOAA only had only 1 occurrence listed for wildfires in Edmunds County. The State Fire Marshal's Office was contacted to verify fire information. Their office said their information is derived from the reports submitted by the local fire departments who respond to the fires. They also explained that since all of the fire departments in Edmunds County are Volunteer Fire Departments many times wildfires are extinguished and reports are never filed with the State. Thus, the information provided by the State Fire Marshal's office is not entirely complete either. The State Fire Marshal's Office reported 147 Wildfires and Outdoor fires. The cause of the outside fires is not listed, so it is not known for certain whether all or some of these fires resulted due to a natural hazard occurrence or as a result of human behavior.

NOAA data also shows that there were 3 continuous periods of drought in the last 10 years. However, when looking at information from the US Drought Monitor, it shows several periods of abnormally dry or moderate drought. The plan author documented 7 periods in the last 10 years where Edmunds County experienced significant periods (several months) where the drought monitor indicated the area was in a Moderate Drought (D1).

Lightning is also reported as zero occurrences in the NOAA database for weather events. Lightning is a common occurrence in Edmunds County, with numerous storm events each year producing lightning. Lightning has been reported as the cause to numerous fires in this region and is especially dangerous during drought years. The County acknowledges that the information provided by NOAA for this particular hazard is inaccurate but does not have another source for more accurate information.

The NOAA database has numerous different categories for winter weather hazards to include: Blizzard, Extreme Cold, Heavy Snow, Winter Storm, Winter Weather, Cold/Wind Chill, Extreme Cold/Wind Chill. The number of days with events reported in Table 4.1 is the total reported for all of these categories.

Table 4.2 is a list of natural hazards produced from the FEMA worksheets completed by each local jurisdiction located within Edmunds County during the 2021 update. Representatives from each community completed the worksheet for their geographical location, while representatives of Edmunds County completed the worksheet for county-wide risks. All of the worksheets are included as Appendix C.

Table 4.2: Natural Hazards Categorized by Likelihood of Occurrence		
High Probability	Low Probability	Unlikely to Occur
Blizzard/Winter Storm	Drought	Dam Failure
Extreme Cold	Flood	Ice Jam
Extreme Heat	Flash Flood	Landslide
Freezing Rain/Sleet/Ice	Tornado	Subsidence
Hail	Urban Fire	
Heavy Rain	Wildland Fire	
Heavy Snow	* Utility interruption is usually caused by severe winter storms, freezing rain, and high winds. Utility interruptions are not a natural hazard, but rather a result of a natural hazard. In January 2010, utility interruption was caused by freezing rain which tore down electrical wires and pole which resulted in loss of power throughout the county in some areas for up to 16 days.	
Lightning		
Rapid Snow Melt		
Strong Winds		
Thunderstorm		
Utility Interruption*		

Every possible hazard or disaster was evaluated and then placed in three separate columns depending on the likelihood of the disaster occurring in the planning jurisdiction. Hazards that are likely to occur at least once a year or more were placed in the High Probability column; hazards that may have occurred in the past or could occur in the future but do not occur on a yearly basis were placed in the low probability column; and hazards or disasters that have never occurred in the area before and are unlikely to occur in the planning jurisdiction any time in the future were placed in the Unlikely to Occur column.

Only the natural hazards from the High Probability and Low Probability Columns will be further evaluated throughout this plan. The exception to this is dam failure, because of Mina Lake dam, which is listed as a significant hazard. There is repair work being planned for Mina Lake dam at the time this plan is being written (2021). Table 4.3 below identifies the hazards that will be addressed in the Plan update throughout the planning process. Hazards were identified for this plan in several ways, including: observing development patterns, interviews and surveys from towns, public meetings, plan work sessions, previous disaster declarations, consulting the State Hazard Mitigation Plan and research of the history of hazard occurrences located within Edmunds County.

In a survey conducted as part of the mitigation planning process, 72% of people said Strong Winds were most likely to happen followed by Thunderstorms (lightning, hail), Severe Winter Weather (i.e., blizzards), Drought, Tornadoes, Floods and Wildfire. Thirty three percent of the survey takers said that all hazards have an equal chance/likelihood of occurring in their area.

Table 4.3 Overall Summary of Vulnerability by Jurisdiction					
Natural Hazards Identified	Location				
	Edmunds Co.	Bowdle	Hosmer	Ipswich	Roscoe
Blizzards/Winter Storms	H			L	
Dam Failure	L	NA	NA	NA	NA
Drought	H	M	L	L	M
Earthquake	L	L	NA	M	L
Extreme Cold	H	H	M	L	H
Extreme Heat	H	H	L	L	H
Flash Flood	M	L	NA	H	L
Flood	M	L	L	H	M
Freezing Rain/Sleet	M	H	M	M	H
Hail	M	H	M	L	H
Heavy Rain	M	H	M	M	M
Heavy Snow	M	H	M	M	H
Ice Jam (culverts)	L	L	NA	L	L
Landslides	L	NA	NA	NA	NA
Lightning	M	H	L	L	L
Rapid Snow Melt	M	M	L	M	L
Strong Winds	M	H	H	H	H
Subsidence	L	NA	NA	L	L
Thunderstorm	M	H	M	L	M
Tornado	M	H	H	H	H
Urban Fire	M	M	H	H	M
Utility Interruption	M	M	L	M	M
Wildfires	L	M	H	M	H
NA	Not applicable; not a hazard to the jurisdiction				
L	Low risk; little damage potential (minor damage to less than 5% of the jurisdiction)				
M	Medium risk; moderate damage potential (causing partial damage to 5-10% of the jurisdiction and irregular occurrence).				
H	High risk; significant risk/major damage potential (for example, destructive, damage to more than 10% of the jurisdiction and regular occurrence)				

Edmunds County Overall Summary of Vulnerability

Edmunds County has identified that they are particularly vulnerable to blizzards/winter storms, drought, extreme cold, extreme heat, flash flood, flood, freezing rain/sleet/ice, hail, heavy rain, heavy snow, lightning, rapid snow melt, strong winds, thunderstorms, tornados, urban fire, and utility interruption. These hazards were given a rating of “H” for high risk or “M” for moderate risk in Table 4.3.

Many of these hazards pose the risk of knocking down utility lines which results in loss of power. The weather in northeast South Dakota can be extreme, especially during the winter months when the threat of losing power for even a few days can be deadly. During the winter months,

an event that causes disruption of utilities can take days to repair. Sometimes ice storms take out several miles of power lines and it takes weeks to repair the line and get them up and running again. With no power, many people are left without a source for heat. There are also several people in the county that have life-preserving medical devices that require power for operation.

Even though only 51% of people have an alternative source of power if the heat goes out, many others said they would go to a neighbor's or family's house if they were without power. People identified backup generators and woodburning stoves/fireplaces as their backup sources. One person in the survey even said they could live for months days without power, showing how self-reliant people in Edmunds County are. Many people commented that as long as they had gas for their generator, they could survive. Common answers were that people could survive for 2-5 days without power.

In the survey conducted of Edmunds County residents, over 78% said they have been negatively affected by a natural hazard in the last 10 years. The most common hazard (82%) was strong winds, 70 had been negatively impacted by severe summer storms, followed by severe winter weather (46%) and drought (39%). Other natural hazards that were identified were flood, tornado and wildfire. The hazards caused damage to personal property and caused residents to take an alternative route to work, school, church, etc.

The majority of people surveyed (80%) said they do have a safe place to go in the event of a tornado, with most people going to their own basement. Edmunds County residents were split about the need for a storm shelter in their area. 53% said there is no need for a storm shelter, while 47% said there is a need for a storm shelter in their area. Only 20% of people were familiar with where storm shelters were located; 19% said there wasn't one in their area and 61% of people said they didn't know where one was located. When asked what types of projects would help mitigate against natural hazards, the answers were all across the board. Many projects fell under the preparedness category but several mentioned the need for storm shelters.

Bowdle Overall Summary of Vulnerability

Bowdle has identified that they are particularly vulnerable to dam failure, drought, extreme cold, extreme heat, freezing rain/sleet, hail, heavy rain, heavy snow, lightning, rapid snow melt, strong winds, thunderstorm, tornado, urban fire, utility interruption and wildfire. These hazards were given a rating of "H" for high risk or "M" for moderate risk in Table 4.3.

There are some areas of Bowdle – particularly the west side of town – that have some flooding issues due to a high groundwater table. The City has looked at additional storm sewer capacity in town, but to date, have not completed the project.

There are backup generators at the hospital and fire hall in case power goes out. The healthcare center has also been used for a winter storm shelter at times, when needed. There are no designated tornado/summer storm shelters in town. Most people take shelter in their basements if there is a tornado warning or severe summer storm.

In 2018 or 2019, Bowdle had a period where residents were without water due to frozen water lines that burst during a period of extreme cold. One entire street had water and sewer lines frozen. Some residents were without a main water line for about one month.

Hosmer Overall Summary of Vulnerability

Hosmer has identified that they are particularly vulnerable to extreme cold, freezing rain/sleet/ice, flood, freezing rain/sleet, hail, heavy rain, heavy snow, strong winds, thunderstorms, tornados, urban fires and wildfires. These hazards were given a rating of “H” for high risk or “M” for moderate risk in Table 4.3.

There is a backup generator for City Shop and the Fire Hall, which would allow the City to continue operating and respond to emergencies in the event of a power outage. Most people in town have basements where they can seek shelter during adverse weather events.

Ipswich Overall Summary of Vulnerability

Ipswich has identified that they are particularly vulnerable to drought, flash flood, flood, freezing rain/sleet/ice, heavy rain, heavy snow, rapid snow melt, strong winds, tornado, urban fire, utility interruption, and wildfire. These hazards were given a rating of “H” for high risk or “M” for moderate risk in Table 4.3.

During the periods of heavy rain or rapid snow melt, Ipswich has had flooding issues in town. The City has recently completed a drainage study (in 2021) and is looking at some projects to actively reduce their vulnerability to flooding and flash flooding. The Courthouse does act as a storm shelter during severe summer storms or tornados, though most residents have basements in their homes. The fire department and city hall can be used as winter storm shelters in the event of an extended period of no power during winter months. This past winter (2020-2021) the City was without power for 15 hours. They also had an extended period without power in 1997.

The City has backup generators at their water tower, lift stations, City Hall and City Shop, which would allow the City to continue operating and respond to emergencies in the event of a power outage.

Roscoe Overall Summary of Vulnerability

Roscoe has identified that they are particularly vulnerable to drought, extreme cold, extreme heat, freezing rain/sleet/ice, hail, heavy rain, heavy snow, strong winds, thunderstorms, tornados, urban fires, utility interruptions and wildfires. These hazards were given a rating of “H” for high risk or “M” for moderate risk in Table 4.3.

The Fire Hall in Roscoe has a backup generator and has been used for a winter storm shelter in the past when a severe winter storm or blizzard has left the town without power. The City does not have any backup generators at water tower, lift stations or other City facilities. The City does require tie downs on mobile homes, making them less vulnerable to strong winds and most people in town have basements where they can seek shelter during adverse weather events.

As a rural community, Roscoe does not have its own ambulance service – service comes from neighboring towns. There are no medical clinics or facilities in Roscoe, making their population (which is aging) even more vulnerable to natural disasters.

NATURAL HAZARDS IN THE PDM PLAN JURISDICTION

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type of the... location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

ASSESSING VULNERABILITY: OVERVIEW

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

The following paragraphs summarize the description of the jurisdiction's vulnerability to each hazard and the impact of each hazard on the jurisdiction.

Descriptions of the natural hazards likely to occur in the Plan Jurisdiction have not been changed from the 2016 version of the Edmunds County Mitigation Plan. For the purpose of consistency throughout the plan, additional definitions were included to reflect all of the hazards that have a chance of occurring in the area and all of the hazards are alphabetized.

Blizzards are a snowstorm that lasts at least 3 hours with sustained wind speeds of 35 m/h or greater, visibility of less than ¼ mile, temperatures lower than 20°F and white out conditions. Snow accumulations vary, but another contributing factor is loose snow existing on the ground which can get whipped up and aggravate the white out conditions. When such conditions arise, blizzard warnings or severe blizzard warnings are issued. Severe blizzard conditions exist when winds obtain speeds of at least 45 mph plus a great density of falling or blowing snow and a temperature of 10°F or lower.

Blizzards are characterized by high winds, blowing snow, cold temperatures, and low visibility. Blizzards create conditions such as icy roads, closed roads, downed power lines and trees. Edmunds County's population is especially vulnerable to these conditions because people tend to leave their homes to get places such as work, school, and stores rather than staying inside. Traffic is one of the biggest hazards in Edmunds County during a blizzard because people often get stuck, stranded, and lost when driving their vehicles which usually prompts others such as family and or emergency responders to go out in the conditions to rescue them.

Dam Failure Dams function to serve the needs of flood control, recreation, and water management. During a flood, a dam's ability to serve as a control agent may be challenged. An excessive amount of water may result in a dam breach, simply an overflowing. Dams that are old or unstable, dams that receive extreme amounts of water, or dams that get debris pile-up behind their face may result in dam failure, a cracking and/or breaking. The County has 6 dams and only 1 is listed as a significant hazard. The dam rated as a significant hazard is the Mina Lake dam.

If the Mina Lake dam were to breach or fail, much of the impacts of flooding from that failure would be borne by residents in neighboring Brown County. Mina Lake is less than a mile from the Edmunds County/Brown County line.

Drought is an extended period of months or years when a region notes a prolonged lack of moisture. Generally, this occurs when a region receives consistently below average precipitation. It can have a substantial impact on the ecosystem and agriculture of the affected region. Although droughts can persist for several years, even a short, intense drought can cause significant damage and harm the local economy. This global phenomenon has a widespread impact on agriculture.

High temperatures, high winds, and low relative humidity all result from droughts and are caused by droughts. A decrease in the amount of precipitation can adversely affect stream flows

and reservoirs, lakes, and groundwater levels. Crops and other vegetation are harmed when moisture is not present within the soil.

South Dakota's climate is characterized by cold winters and warm to hot summers. There is usually light moisture in the winter and marginal to adequate moisture for the growing season for crops in the eastern portion of the state. Semi-arid conditions prevail in the western portion. This combination of hot summers and limited precipitation in a semi-arid climatic region present a potential position of suffering a drought in any given year. The climatic conditions are such that a small departure in the normal precipitation during the hot peak growing period of July and August could produce a partial or total crop failure. South Dakota's economy is closely tied to agriculture only magnifies the potential loss which could be suffered by the state's economy during drought conditions. Roughly every 50 years a significant drought is experienced within the county, while less severe droughts have occurred as often as every three years.

Earthquakes are a sudden rapid shaking of the earth caused by the shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and often cause landslides, flash floods, fires, avalanches, and tsunamis. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks and are followed by vibrations of gradually diminishing force called aftershocks. The underground point of origin of an earthquake is called its focus; the point on the surface directly above the focus is the epicenter.

Earthquakes occur in the area, though it is rare. An earthquake was reported 7 miles NW of Bowdle in December 2020. The 3.2 magnitude earthquake was actually in Walworth County. The last earthquake to hit the area was in 1989. The magnitude and intensity of an earthquake is measured by the Richter scale and the Mercalli scale.

Extreme Cold What constitutes extreme cold and its effects can vary across different areas of the country. In regions relatively unaccustomed to winter weather, near freezing temperatures are considered "extreme cold," however, Eastern South Dakota is prone to much more extreme temperatures than other areas in the country. Temperatures typically range between zero degrees Fahrenheit and 100 degrees Fahrenheit, so extreme cold could be defined in the Edmunds County PDM jurisdiction area as temperatures below zero.

Extreme Cold temperatures often accompany a winter storm, so power failures and icy roads are common occurrences. Whenever temperatures drop decidedly below normal and as wind speed increases, heat can leave the body more rapidly. These weather-related conditions may lead to serious health problems. Extreme cold is a dangerous situation that can bring on health emergencies in susceptible people, such as those without shelter or who are stranded, or who live in a home that is poorly insulated or without heat. Exposure is the biggest threat/vulnerability to human life; however, incidences of exposure are isolated and thus unlikely to happen in masses.



Wind Chill Chart



		Temperature (°F)																				
Wind (mph)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45			
	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63			
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72			
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77			
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81			
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84			
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87			
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89			
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91			
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93			
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95				
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97				
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98				

Frostbite Times

30 minutes

10 minutes

5 minutes

Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

Extreme Heat, also known as a Heat Wave, is a prolonged period of excessively hot weather, which may be accompanied by high humidity. There is no universal definition of a heat wave; the term is relative to the usual weather in the area. Temperatures in Edmunds County have a very wide range typically between 0-100 degrees Fahrenheit, therefore anything outside those ranges could be considered extreme. The term is applied both to routine weather variations and to extraordinary spells of heat which may occur only once a century.

Severe heat waves have caused catastrophic crop damage, thousands of deaths from hyperthermia, and widespread power failures due to increased use of air conditioning. Loss of power and crop damage are the largest vulnerability to the county during extreme heat. Both have an effect on quality of life, however, neither are detrimental to the existence of the population of Edmunds County.

NWS Heat Index		Temperature (°F)															
		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
Relative Humidity (%)	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
	60	82	84	88	91	95	100	105	110	116	123	129	137				
	65	82	85	89	93	98	103	108	114	121	128	136					
	70	83	86	90	95	100	105	112	119	126	134						
	75	84	88	92	97	103	109	116	124	132							
	80	84	89	94	100	106	113	121	129								
	85	85	90	96	102	110	117	126	135								
	90	86	91	98	105	113	122	131									
	95	86	93	100	108	117	127										
	100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution (light yellow) Extreme Caution (yellow) Danger (orange) Extreme Danger (red)

Flooding is an overflow of water that submerges land, producing measurable property damage or forcing evacuation of people and vital resources. Floods can develop slowly as rivers swell during an extended period of rain, or during a warming trend following a heavy snow. Even a

very small stream or dry creek bed can overflow and create flooding. Two different types of flooding hazards are present within Edmunds County.

1. Flash flooding is more typically realized during the summer months. This flooding is primarily localized, though enough rain can be produced to cause inundation flooding in all areas throughout the county. The threat of flooding would be increased during times of high soil moisture. The elevation drop from the west side of Edmunds County to the east side is around 600 feet, sufficient to produce strong flash flooding.
2. Inundation flooding occurs most often in the spring. The greatest risks are realized typically during a rapid snowmelt, before ice is completely off all of the rivers, ditches, and streams.

Floods can result in injuries and even loss of life when quickly moving water is involved. Six inches of moving water is enough to sweep a vehicle off a road. Disruption of communication, transportation, electric service, and community services, along with contamination of water supplies and transportation accidents are very possible.

Freezing Rain/Ice occurs when temperatures drop below 30 degrees Fahrenheit and rain starts to fall. Freezing rain coats objects with ice, creating dangerous conditions due to slippery surfaces, platforms, sidewalks, roads, and highways. Sometimes ice is unnoticeable and is then referred to as black ice. Black ice creates dangerous conditions, especially for traffic. Additionally, a quarter inch of frozen rain can significantly damage trees, electrical wires, weak structures, and other objects due to the additional weight bearing down on them.

Freezing Rain causes adverse conditions such as slippery surfaces and extra weight buildup on power lines, poles, trees, and structures. The additional weight can often cause weak structures to cave in and cause tree branches and power lines to break and fall. Edmunds County and the local jurisdictions within are vulnerable to these conditions due to the types of structures and surfaces that exist in the county that cannot be protected from freezing rain. Traffic on the roads and highways tend to be the biggest hazard during freezing rain conditions because vehicles often slide off the road which prompts emergency responders and others to have to go out on rescue missions in the adverse conditions.

Hail is formed through rising currents of air in a storm. These currents carry water droplets to a height at which they freeze and subsequently fall to earth as round ice particles. Hailstones usually consist mostly of water ice and measure between 5 and 150 millimeters in diameter, with the larger stones coming from severe and dangerous thunderstorms.

Hail causes damage to property such as crops, vehicles, windows, roofs, and structures. Edmunds County and its local jurisdictions are vulnerable to hail, like most other areas in the State due to the nature of the hazard. Mitigating for hail is difficult and is usually found in the form of insurance policies for structures, vehicles, and crops.

Heavy Rain is defined as precipitation falling with intensity in excess of 0.30 inches (0.762 cm) per hour. Short periods of intense rainfall can cause flash flooding while longer periods of widespread heavy rain can cause rivers to overflow.

Heavy Rain causes damage to property such as homes and roads. Often when heavy rains occur in Edmunds County it causes sewers to backup in homes due to excess water entering the wastewater collection lines. The excess water sometimes has no place to go and thus

basements fill up with water which results in damage to water heaters, furnaces, and damage to living quarters for people who live in basement apartments. Roads and bridges can be washed out, causing traffic hazards for travelers and commuters. Many times the roads have to be closed causing rural traffic to have to take alternate routes which can sometimes be as much as an additional 25 miles out of the way. All areas of the County are vulnerable when heavy rains occur. Storm sewers are built for the typical storm and therefore do not accommodate for excessive or heavy rains.

Ice Jams occur when warm temperatures and heavy rain cause snow to melt rapidly. Snow melt combined with heavy rains can cause frozen rivers to swell, which breaks the ice layer on top of the river. The ice layer often breaks into large chunks, which float downstream and often pile up near narrow passages and other obstructions, such as bridges, culverts, and dams.

Ice Jams cause damage to bridges, roads, and culverts due to water currents pushing large chunks of ice under or through small openings.

Lightning results from a buildup of electrical charges that happens during the formation of a thunderstorm. The rapidly rising air within the cloud, combined with precipitation movement within the cloud, results in these charges. Giant sparks of electricity occur between the positive and negative charges both within the atmosphere and between the cloud and the ground. When the potential between the positive and negative charges becomes too great, there is a discharge of electricity, known as lightning. Lightning bolts reach temperatures near 50,000° F in a split second. The rapid heating and expansion, and cooling of air near the lightning bolt causes thunder.

Lightning often strikes the tallest objects within the area. In towns trees and poles often receive the most strikes. In rural areas, shorter objects are more vulnerable to being struck. Electrical lines and poles are also vulnerable because of their height and charge. In addition, many streetlights function with sensors. Since thunderstorms occur primarily during hours of darkness, lightning strikes close to censored lights cause the lights to go out, causing a potential hazard for drivers. Flickering lights and short blackouts are not at all uncommon in the county.

One of lightning's dangerous attributes includes the ability to cause fires. Since the entire county is vulnerable to lightning strikes and subsequent fires, these fires will be treated under the fire section of this plan.

Most injuries from lightning occur near the end of thunderstorms. Individuals who sought shelter leave those areas prior to the entire completion of the thunderstorm. Believing it is safe to freely move around, concluding lightning strikes catch them off guard.

Severe Winter Storms deposit four or more inches of snow in a 12-hour period or six inches of snow during a 24-hour period. Such storms are generally classified into four categories with some taking the characteristics of several categories during distinct phases of the storm. These categories include: freezing rain, sleet, snow, and blizzard. Generally winter storms can range from moderate snow to blizzard conditions and can occur between October and April. The months of May, June, July, August, and September could possibly see snow, though the chances of a storm is very minimal.

Severe Winter Storms have a high chance of occurrence. Heavy snow can immobilize transportation, down power lines and trees and cause the collapsing of weaker structures. Livestock and wildlife are also very vulnerable during periods of heavy snow. Most storms can

be considered to have occurred countywide. Due to the multiple occurrences of winter storms each year, an exhaustive compilation is not possible.

Additionally, winter storms often result in some forms of utility mishaps. High voltage electric transmission/distribution lines run the length of Edmunds County. These lines are susceptible to breaking under freezing rain and icy conditions and severing during high blizzard winds. Within the county, there are fiber optics associated with phone transmissions that are the lifeline to communications. Any electrical complications bring associated risk of food spoilage, appliance burnout, loss of water, and potential harm for in-house life support users. Limited loss of power is not uncommon on an annual basis. A typical power interruption lasts from 1 to 3 hours. Most residents are prepared to deal with this type of inconvenience.

The greatest danger during winter weather is traveling. Many individuals venture out in inclement weather. Reasons include the necessity of getting to work, going to school, going out just to see how the weather is, and to rescue stranded persons.

Sleet does not generally cling to objects like freezing rain, but it does make the ground very slippery. This also increases the number of traffic accidents and personal injuries due to falls. Sleet can severely slow down operations within a community. Not only is there a danger of slipping, but with wind, sleet pellets become powerful projectiles that may damage structures, vehicles, or other objects.

Snow is a common occurrence throughout the County during the months from October to April. Accumulations in dry years can be as little as 5-10 inches, while wet years can see yearly totals between 110-120 inches. Snow is a major contributing factor to flooding, primarily during the spring months of melting.

Snow Drifts are caused by wind blowing snow and cold temperatures. These drifts can be small finger drifts on roadways causing cautionary driving, or 20-40 foot high drifts that block entire highways, roads, and farmyards for several days.

Populations at highest vulnerability for this type of hazard are rural homeowners, which account for approximately 50% of the county, and the elderly. As with any weather event, those dependent upon healthcare supplies and other essentials will also bear the brunt of highway closures and slowed transportation due to snow and ice. Emergency services will also be delayed during winter storms. Some of the critical facilities that could be utilized in disaster situations do not have backup generators. Also, some facilities have generators that only power a portion of operations.

Strong winds are usually defined as winds over 40 m/h, are not uncommon in the area. Winds over 50 m/h can be expected twice each summer. Strong winds can cause destruction of property and create safety hazards resulting from flying debris. Strong winds also include severe localized wind blasting down from thunderstorms. These downward blasts of air are categorized as either microbursts or macrobursts depending on the amount geographical area they cover. Microbursts cover an area less than 2.5 miles in diameter and macrobursts cover an area greater than 2.5 miles in diameter.

Strong Winds can be detrimental to the area. Trees, poles, power lines, and weak structures are all susceptible and vulnerable to strong winds. When strong winds knock down trees, poles, power lines, and structures it creates additional traffic hazards for travelers and commuters. Strong winds are a common occurrence in all parts of Edmunds County. The farming

community tends to be vulnerable because many old farm sites have weak, dilapidated, or crumbling structures or structures such as grain bins which can easily be blown over. Another area of particular vulnerability would be those areas with dense tree growth where dead or decaying trees lose their stability and can be blown over or knocked down easily.

Subsidence is a hazard that has a very low probability of occurring in the area. Therefore, the jurisdictions do not consider themselves particularly vulnerable to such a hazard.

Summer Storms are generally defined as atmospheric hazards resulting from changes in temperature and air pressure which cause thunderstorms that may cause hail, lightning, strong winds, and tornados. Summer storms are considered a weather event rather than a natural hazard; therefore, summer storms are not evaluated as a natural hazard throughout this plan.

Thunderstorms are formed when moisture, rapidly rising warm air, and a lifting mechanism such as clashing warm and cold air masses combine. The three most dangerous items associated with thunderstorms are hail, lightning, and strong winds.

Thunderstorms cause lightning and sometimes large amounts of rain in a small timeframe. The entire county experiences thunderstorms on a regular basis and is only vulnerable when weather events outside the norm occur. Specific vulnerabilities are further identified in the paragraphs for “Lightning” and “Heavy Rains”.

Tornados are violent windstorms that may occur singularly or in multiples as a result of severe thunderstorms. They develop when cool air overrides warm air, causing the warm air to rapidly rise. Many of these resulting vortices stay in the atmosphere, though touchdown can occur. The Fujita Tornado Damage Scale categorizes tornadoes based on their wind speed:

F0=winds less than 73 m/h
F1=winds 73-112 m/h
F2=winds 113-157 m/h
F3=winds 158-206 m/h
F4=winds 207-260 m/h
F5=winds 261-318 m/h
F6=winds greater than 318 m/h

Tornadoes typically occur in South Dakota in May, June, and July, but they can occur in any month. The greatest period of tornado activity (about 82 percent of occurrence) is from 11 a.m. to midnight. Within this time frame, most tornadoes occur between 4 pm and 6 pm.

The annual risk for intense summer storms is very high. Often associated with summer storms are utility problems. High voltage electrical transmission lines run the length of Edmunds County. These lines are susceptible to breaking during high winds and hail. Tall trees located near electrical lines can be broken in wind or by lightning strikes and land on electrical lines, severing connections. Any electrical complications bring associated risk of food spoilage, appliance burnout, loss of water, and potential harm to in-house life support dependents. Limited loss of power is common on an annual basis. Typical power interruptions last around 1 to 3 hours. Most residents are prepared to deal with this.

All of Edmunds County is susceptible to any of the summer storms. Warning time for summer storms is normally several hours, sufficient for relocation and evacuation if necessary. However, tornadoes may occur with little or no warning.

Specific areas within the County have a high risk of being impacted if hit by a tornado or severe storms. Mina Lake park area is at high risk due to the large weekend camping numbers, as is Ipswich during their annual Trail Days. All schools, mobile home parks, nursing homes, and the hospital are at high risk during summer storms.

Gathering historical data on tornadoes and thunderstorms is very difficult due to the number of occurrences and unconfirmed reports. Each year, many storms and a few tornadoes affect the county. Summer storms in Edmunds County usually produce a wide range of damage making damage estimates very difficult. A complete listing of all summer storms having occurred within the county is not possible to produce. Available data regarding the many major summer storms that have affected the county was gathered.

Wildland Fires are uncontrolled conflagrations that spread freely through the environment. Other names such as brush fire, bushfire, forest fire, grass fire, hill fire, peat fire, vegetation fire, and wildland fire may be used to describe the same phenomenon. A wildfire differs from the other fires by its extensive size; the speed at which it can spread out from its original source; its ability to change direction unexpectedly; and to jump gaps, such as roads, rivers, and fire breaks.

Fires start when an ignition source is brought into contact with a combustible material that is subjected to sufficient heat and has an adequate supply of oxygen from the ambient air. Ignition may be triggered by natural sources such as a lightning strike or may be attributed to a human source such as "discarded cigarettes, sparks from equipment, and arched power lines.

Wildfires occur primarily during drought conditions. Wildfires can cause extensive damage, both to property and human life, and can occur anywhere in the county. Even though wildfires can have various beneficial effects on wilderness areas for plant species that are dependent on the effects of fire for growth and reproduction, large wildfires often have detrimental atmospheric consequences, and too frequent wildfires may cause other negative ecological effects. Current techniques may permit and even encourage fires in some regions as a means of minimizing or removing sources of fuel from any wildfire that might develop.

Since there are no remote forested regions in Edmunds County, wildfires can be easily spotted and are capable of being maintained. Edmunds County does not have any areas that are considered Wildland-urban interface because property outside city limits is primarily agricultural land, thus, there are no urban interface areas of risk in Edmunds County. In addition, fire interference with traffic on highways is not a major concern. The most important factor in mitigating against wildfires continues to be common sense and adherence to burning regulations and suggestions disseminated by the County.

Moisture amounts have the biggest impact on fire situations. During wet years, fire danger is low. More controlled burns are conducted and fewer mishaps occur. During dry years, severe restrictions are placed on any types of burns. For information on dealing with open/controlled burning within the county, see SDCL 34-29B and 34-35.

Hunting season brings thousands of hunters to the area. Shots have the potential to ignite dry grassland, hay bales, or storage areas. This is a risk that is addressed in hunting education and safety.

HAZARD PROFILE [§201.6(c)(2)(ii)]

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type of the... location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Geographic location of each natural hazard is addressed in the updated plan. Most of the hazards identified have the potential of occurring anywhere in the County. Previous occurrences are listed individually by the type of hazard and by location in Appendix B. Table 4.3 identifies the Latitude and Longitude of the local jurisdictions along with the population, elevation, and number occupied homes according to the 2010 US Census.

Table 4.4: Latitude/Longitude of Communities within the County				
City	2019 Est. Population	Location	Elevation	Occupied Units
Edmunds Co	3,829	**	**	1,544
Bowdle	468	45°27'11"N, 99°39'13"W	1998	169
Hosmer	186	45°34'44"N, 99°28'28"W	1906	111
Ipswich	891	45°26'40"N, 99°1'44"W	1541	415
Roscoe	289	45°26'55"N, 99°20'18"W	1830	137
Mina Lake (Cortland Township)	**792	45°27'09.88"N, 98°43'58.14"W	**	300**
<p>*** The estimated population for Cortland Township (where Mina Lake is located). However, there are people who live in Cortland Township, but not at Mina Lake. There are approximately 377 drinking water connections at Mina Lake which includes some seasonal homes. Occupied units include an estimate of those who live at Mina Lake year-round.</p> <p>Population and Occupied Units information was collected from US Census Bureau website: http://data.census.gov</p>				

There have been 3 presidential disaster declarations related to natural hazards in the last 10 years. They were all either related to flooding or severe winter weather. There were also two presidential disaster declarations related to the COVID-19 pandemic. Table 4.5 has more detailed information on the disaster declarations.

Table 4.5 Presidential Disaster Declarations in South Dakota Including Edmunds County						
Declaration Date	Incident Period	Disaster Dec #	Type	Total Damage	Public Assistance Cost	Individual Assistance Cost
5/13/2011	March 11 - July 22, 2011	1984	Flooding		\$7,154,975	
2/1/2017	December 24 – December 26, 2017	4298	Severe Winter Storm		\$9,130,061	
6/7/2019	March 13 - April 26, 2019	4440	Severe Winter Storm, Snowstorm		\$49,571,501	\$2,154,577

			and Flooding			
3/13/2020	Jan 20 - continuing	EM-3475	COVID-19			
4/5/2020	Jan 20 - continuing	4527	COVID-19 Pandemic			

Additionally, the extent (i.e., magnitude or severity) of each hazard, information on previous occurrences of each hazard and the probability of future events (i.e., chance or occurrence) for each hazard are addressed in the following tables. The information provided in the tables is not a complete history, but rather an overview of the hazard events which have occurred over the last ten years. The planning committee felt the hazard trend for the last 10 years could be summarized in this section and decided to include any new occurrence that have taken place since the previous plan was drafted. The complete 10-year history can be found in Appendix B.

DAM FAILURE

Dam failure is usually associated with intense rainfall or a prolonged flood condition (rainy day), or it can occur anytime (clear day). Dam failure can be caused by a variety of sources, to include: faulty design, construction and operational inadequacies, intentional breaches, or a flood event larger than the design. The greatest threat from dam failure is to people and property in areas immediately below the dam since flood discharges decrease as the flood wave moves downstream.

The degree and extent of damage depend on the size of the dam and circumstances of the failure. A large dam failure might bring about considerable loss of property, destruction of cropland, roads and utilities and even loss of life; as well as similar consequences to a small dam failure: loss of irrigation water for a season and extreme financial hardship to many farmers. More severe consequences of dam failure can include loss of income, disruption of services and environmental devastation.

Edmunds County has 6 dams, of which, one has a significant risk. The National Inventory of Dams identifies the Mina Lake Dam as significant risk. The Mina Lake Dam is owned by South Dakota Game, Fish and Parks (GFP). It has a height of 32 feet and maximum storage capacity of 19,000 acre-feet. It is located on the very eastern edge of the county.

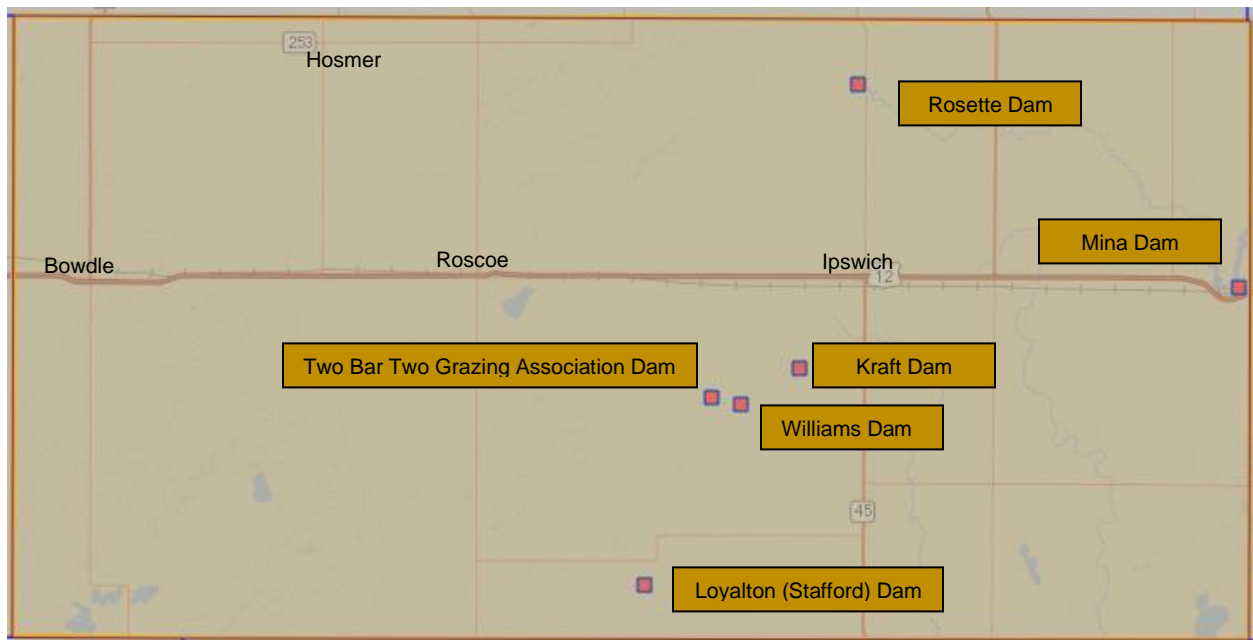
In, 2019, a localized large rain even caused severe damage to the spillway and temporary repairs were made in 2020. It was recommended by GFP's consultant engineering firm the spillway be replaced as soon as possible as a long-term solution. Mina Lake Dam is considered a high hazard dam based on the damage it could cause if a breach were to occur. Spillway design is nearing completion at the time the mitigation plan was drafted. A temporary draw down will be necessary for a contractor to perform the work that includes a diversion channel and complete spillway replacement Lake elevations, spillway design, wildlife and fisheries management, lake access, construction timelines, road closures, and several other impacts will be addressed.

Starting approximately July 6, 2021, work will begin on the nearby Mina dam spillway. This work could cause the water to be lowered in the reservoir to as much as 10 feet to allow for safe construction. Mina reservoir at its deepest is about 25 feet deep so this would leave 10-15 feet of water remaining. As the reservoir level lowers, boat ramps could be affected and even become closed depending upon conditions. Shorelines will remain accessible for fishing,

swimming, and small watercraft launching as in the past. Construction is expected to last into Spring 2022.

The locations of the dams are found in Table 4.6 and Map 4.1:

Table 4.6 Dam Locations in Edmunds County							
ID	Name	Owner	Hazard	Year Built	Inspection Date	Height (ft)	Max Storage (acre-feet)
SD00657	Rosette	GF&P (State)	Low	1937	2017	17	283
SD00016	Mina	GF&P (State)	Significant	1934	2017	32	19,000
SD02218	Kraft	GF&P (State)	Low	1939	2016	15	300
SD02388	Williams	Leroy Williams	Low	1994	NA	12	135
SD02387	Two Bar Two Grazing Association	Two Bar Two Grazing Association	Low	1994	NA	14	250
SD00656	Loyalton (Stafford)	USFWS (Federal)	Low	1934	2004	33	460



Map 4.1 Dam Locations in Edmunds County

DROUGHT AND WILDFIRE

South Dakota's climate is characterized by cold winters and hot summers. There is usually light moisture in the winter and marginal to adequate moisture for the growing season for crops in the eastern portion of the state. Semi-arid conditions prevail in the western portion. This combination of hot summers and limited precipitation in a semi-arid climatic region places South Dakota present a potential position of suffering a drought in any given year. The climatic conditions are such that a small departure in the normal precipitation during the hot peak growing period of July and August could produce a partial or total crop failure.

The fact that South Dakota's economy is closely tied to agriculture only magnifies the potential loss which could be suffered by the state's economy during drought conditions. Table 4.6 identifies drought occurrences in Edmunds County over the past 10 years.

The following information was provided by the NOAA website and the U.S. Drought Monitor, with description of the drought occurrences from the past 10 years.

Table 4.7 Edmunds County 10-Year Drought History		
Location	Date	Intensity
Edmunds County	August 2011 – April 2012	D0-D1
Edmunds County	June 2012 – October 2013	D0-D2
Edmunds County	December 2014 – May 2015	D0-D1
Edmunds County	October 2105 – April 2016	D0
Edmunds County	August 2016 – December 2016	D0-D1
Edmunds County	May 2017 – November 2018	D0-D3
Edmunds County	June 2020 – February 2021	D0-D2

A strong possibility exists for simultaneous emergencies during droughts due to the conditions created by droughts. Grassland fires are the most common. Pestilences could also occur but have not previously occurred in this area. During wet years, fire danger is low. More controlled burns are conducted and less mishaps occur. Edmunds County has also implemented a controlled burn process. Whenever a landowner wants to start a controlled burn, they are required to call the Sheriff's Office to report the controlled burn – where it will be located and when they plan to start. The local Volunteer Fire Department then makes the call on whether it's OK to start a controlled burn or not. This allows the Sheriff's Office to know about these and prevents them from sending out a fire truck if someone else calls in to report a fire in that area. This process actually came out of some prior mitigation planning meetings. A copy of the burning ban ordinance is included as Appendix E.

Wildfires (grassland fires/prairie fires) are a threat to most of the county. With 1,151 square miles and a majority of that being flat and rolling farmland and grassland, Edmunds County has a high risk for fires. The Conservation Reserve Program (CRP) also covers a large number of acres within the county and is threatened by wildfires. Ipswich, Roscoe, Bowdle, and Hosmer do not allow burning within city limits.

Another area of threat is highways. When wildfires are out of control, roads provide no barrier to promulgation. In the past, a large section of Highway 12, the main east-west route through Edmunds County, was closed for a 10 mile stretch in Brown County (just east of Edmunds) due to a grass fire. Similar events are possible in Edmunds County.

The National Weather Service has several fire danger informational items located on their website which are used by local emergency management and fire department personnel.

- The Rangeland Fire Danger Forecast is issued daily. From data, it computes the potential for non-agricultural grasslands to carry fire. The forecast is based on temperature, humidity, wind, sky cover, and greenness of vegetation.
- The Daily Fire Weather Zone Forecast is updated each morning and evening. Given within this is the Haines Index, transport winds, and smoke dispersal.

- The Red Flag Program was developed this June. It classifies a zone as an extreme fire danger when conditions are: temperature >80°, wind >24 m/h, RH factor <15%, and a Rangeland Fire Index of Very High or Extreme.

Fire halls have been built within the communities to better aid with firefighting capabilities, however aging infrastructure within the communities can pose additional threat when fire hazard increases. For example, in January 1982 the City of Roscoe's last well, and only source of water, ceased to function. Of greatest concern during this period was a lack of water available for fighting fires. Private wells, water from other cities, and snow melt served the citizens until water could be restored.

As mentioned on page 21 of this plan, the accuracy of the fire history is questionable because the State Fire Marshal's Office collects information from the volunteer fire departments, thus the accuracy of the information reported relies on the local fire departments that are responsible for filing the reports. Only 2 fires have been reported on the NOAA website since 1950.

EXTREME TEMPERATURES

Extreme temperatures in Edmunds County are common occurrences. It is expected that at least once each year there will be extreme heat or extreme cold in the area. Storm event history for temperature extremes are included in Appendix B. It is possible that people in the area have adapted to such extreme temperatures and thus such weather events are not reported as often as they occur. It is also possible that the information has only in recent years been tracked or reported.

FLOOD

Flooding is a temporary overflow of water onto lands not normally covered by water producing measurable property damage or forcing evacuation of people and resources. Floods can result in injuries and even loss of life when fast flowing water is involved. Six inches of moving water is enough to sweep a vehicle off a road. Disruption of communication, transportation, electric service, and community services, along with contamination of water supplies and transportation accidents are very possible.

Numerous flood events have occurred in Edmunds County since 1950 which is about the time historical data has been tracked. Most flood events are overland flooding that result from heavy rainfall and spring thaw and not usually a result of an overflowing body of water.

A summary of the 10-year flood history is below. More information on flood history is included in tables B.6 and B.7 in Appendix B.

March – July 2011 - A deep and expansive snowpack across the area began to melt bringing many areas of flooding to central and northeast South Dakota from mid through late March. The flooding continued into April. Many roads along with countless acres of crop and pastureland were flooded. Roads, culverts, and bridges were damaged across the region. Several roads were washed out with many closed. Many homes were threatened with some surrounded by water. Many people had to use four-wheelers to get to their homes. A Presidential Disaster was declared for all of the counties due to the flooding damage. The damage estimates were from 4.5 to 5 million dollars for the area. Many county and township roads were flooded and damaged in Edmunds county including U.S. Highway 12. The flooding of U.S. Highway 12 severely affected the busy highway traffic. Several roads were also closed across the county.

Above normal May, June and July rainfall kept many roads flooded and damaged throughout Edmunds County. The highway remained closed near Roscoe with the traffic being detoured. The flooding continued into July.

March – June 2019 - Many roads were flooded throughout Edmunds county with many of them closed. Also, several structures were threatened by the high water. The continuation of snowmelt from a much above normal snowfall winter combined with a historic heavy snow/blizzard in mid-April resulted in widespread flooding across central and northeast South Dakota. Countless roads along with thousands of acres of cropland were flooded throughout April. Impacts include damaged roads, culverts, and bridges, and livestock, homes, and businesses were affected. Delayed planting resulted across all of the region as well. Cattle and calves were stressed by the cold and wet pattern, as the mud and cold caused some sickness with the livestock. Flooded roads made it difficult for many farmers or ranchers to get to their fields or livestock. The wet pattern along with the flooding continued into May, further delaying planting across the region.

All counties declared emergencies/disasters in March and April due to the widespread flooding and March blizzard. South Dakota's governor declared a disaster for the state in March. This declaration was followed by a disaster declaration by the President of the United States. As a result, 24 of the 26 counties across central and northeast South Dakota were able to have access to public property damage assistance. Overall, damage estimates from the blizzards and floods for the state were at 43 million dollars.

For the entire state of South Dakota, nearly 4 million acres of crops were left unplanted as a result of the flooding. Total damaged or unplanted crop loss estimates for central and northeast South Dakota were near 307 million dollars.

While this information is valuable in showing the likelihood of future flood events, the information collected from the NOAA website appears to be incomplete as it mostly does not show values in the property and crop damage column. It would be reasonable to assume that damage was caused in each event listed but for whatever reason was not reported in dollars lost or damaged. For the purpose of mitigation planning, future damage was estimated based on the historical evidence that flooding will occur in Hand County on a regular basis. One should note that the type of flooding is not always a result of an overflowing body of water but usually a result of flash flooding and high ground water which leaves the ground saturated and unable to absorb any additional water from rainfall or snowmelt.

NFIP: [§201.6(c)(2)(ii)] *All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods.*

Edmunds County and the City of Hosmer, Ipswich and Roscoe all participate in NFIP. However, the County along with the Cities of Hosmer and Roscoe have never been mapped. They are all identified as NSFHA. Ipswich is the only community that has been mapped. Bowdle does not participate in NFIP and has never been mapped.

There are five policies in force in the County with a total of \$1,540,000 in coverage. All of the active policies are in unincorporated areas. There have been five claims that have been paid totaling \$2,980. There have been 0 repetitive losses and 0 substantial damage claims.

Community Rating System Program:

Edmunds County is not part of the Community Rating System program at this time.

While Edmunds County is a participant in the National Flood Insurance Program, there is little flooding that puts populated areas at risk. There is only one identified flooding hazard area within the county. This is located on the southern end of Ipswich. A creek runs through the southern portion of the city and is a threat to that portion of Ipswich.

Roads are one of the biggest concerns when flooding occurs in the County, due to the necessity of road infrastructure for routine activities in the county such as commuting to work and school, farming and agriculture, and emergency response accessibility to rural homes.

HAIL

Hail occurrences are common in Edmunds County. Hail occurrences in Edmunds County are included in the full event history in Appendix B. Obviously, with such a high number of occurrences it is reasonable to expect that at least some property or crop damage was sustained in the communities during some of the occurrences, even though the damage may not have been reported or recorded. It is possible that such damage was not reported because it was believed to be insignificant at the time, or because those responsible for reporting such information did not report to the proper agencies. Hail is common for this region during the spring, summer, and fall and causes thousands of dollars of damage every year. Unfortunately, the total damages for each event are not available but hopefully in the near future a method for collecting this data will evolve so that it can be made available to local governments for mitigation planning.

HIGH/SEVERE WIND

Severe wind events are common in eastern South Dakota. Several times a year the residents of Edmunds County can expect to experience strong winds in excess of 40 mph. Gusts of wind in excess of 100 mph have also been recorded for the area. A list of severe wind events can be found in Appendix B.

LIGHTNING

The extent or severity of lightening can range from significant to insignificant depending on where it strikes and what structures are hit. Water towers, cell phone towers, power lines, trees, and common buildings and structures all have the possibility of being struck by lightning. People who leave shelter during thunderstorms to watch or follow lightening also have the possibility of being struck by lightning. The lightning history for the past 10 years reported on the NOAA websites indicates that there were no occurrences in Edmunds County however, possibility exists that the information reported is incomplete or it is possible that the occurrences were not significant enough to be reported. Lightening is a common occurrence in Edmunds County on an annual basis.

THUNDERSTORMS AND TORNADOS

Thunderstorms and high wind occurrences in the County are also very common. Appendix B has local storm event history. The County continues to educate residents of the dangers of such storms through public service announcements, social media, and other printed media.

The likelihood for intense summer storms is high. All of Edmunds County is susceptible to any of the summer storms. Warning time for summer storms is normally several hours, sufficient for relocation and evacuation if necessary. However, tornadoes may occur with little or no warning.

Specific areas within the county have a high risk of being impacted if hit by a tornado or severe storms. The fairgrounds are particularly vulnerable because of a high seasonal population. All

schools, mobile home parks, nursing homes, and the City Parks are at high risk during summer storms.

Gathering historical data on tornados and thunderstorms is very difficult due to the number of occurrences and unconfirmed reports. Each year, many storms affect the county. Summer storms in Edmunds County usually produce a wide range of damage making damage estimates very difficult. Available data regarding the many major summer storms that have affected the county was gathered. The National Weather Service reports online were the primary source for this information.

Due to the past occurrences of violent summer storms and the potential that does exist for damage, Edmunds County has implemented several warning and mitigation strategies.

- Shelters are available for public use. These include schools and the courthouse. However, they are not designated shelters and are not open to the public after hours. Most individuals, though, find that their homes provide the needed shelter. Interior walkways based on a solid foundation with sturdy walls and no windows may provide the best shelter for some individuals. Housing basements also provide the shelter necessary for individuals to take refuge during severe weather.
- The National Weather Service (NWS) helps to relay information via a public access website. This website not only relays the local conditions and forecast, but provides access to weather reports, radar imagery, watches and warnings, and weather safety. The NWS encourages individuals to take an active role in severe weather reporting and to be alert to any weather conditions.
- Severe thunderstorm and tornado warning sirens have been placed throughout the county. Nine sirens are located within the county. Ipswich has 2, located at the pool in the northwest portion of the community and at the ballpark in the southwest portion of the community. Mina Lake has 3 sirens. One is located at the park entrance, another near 37160 133rd St. on the west side of the east arm of the lake, the third is situated ¼ mile north of the Wakeside Bar & Grill, which is located on Hwy. 12B just on the west side of Mina Lake. Bowdle has 2 sirens, one located at the fire hall, the second located 1 block northeast from the Hospital. Hosmer has 1 siren located at the fire hall. Roscoe has 1 siren located at the fire hall. These sirens provide coverage for the entire communities. Trail Days are located outside of the siren coverage area for Ipswich. Perhaps another siren is necessary near that location.
- Edmunds County has excellent storm spotters. The National Weather Service conducts this training free of charge. Two spotter classes are held every year, one during the day and one at night and have in excess of 75 trained spotters over the past 3 years
- NOAA weather radios are in use throughout the county. Every township clerk and elected official received a weather radio at one point in time. Weather radios have also been placed in every school, hospital, nursing home, courthouse, daycare facilities, and Ken's Fairway Foods in Ipswich, along with all city offices.

The annual risk for intense summer storms is very high. All of Edmunds County is susceptible to summer storms. Warning time for summer storms is normally several hours, sufficient for relocation and evacuation if necessary. However, tornadoes may occur with little or no warning.

Appendix B includes the tornado history in Edmunds County for the last ten years. A brief summary follows:

August 2014 – The tornado touched down northeast of Ipswich and traveled about a mile to the northeast before lifting. Damage was sustained to a farm with a section of the roof lost along with the siding damaged. A metal outbuilding also lost the majority of its roof with a tractor damaged due to flying debris. There was also tree damage along with a dented grain bin.

May 2016 - Two brief landspout tornadoes touched down in an open field southwest of Bowdle. The tornadoes were on the ground for a total of 1 to 2 minutes. The first weak tornado touched down quickly in an open field southwest of Bowdle.

WINTER STORMS

Snow and ice storms are common in Edmunds County. While such storms would be considered extreme in many parts of the Country, the consistent nature of such weather hazards are expected in this area. Thus, planning and response mechanisms for snow and ice storms are vital to the County and are routine procedures in Edmunds County due to the common nature of such storms.

Winter storms often cover large areas and most storms can be considered to have occurred county-wide. Due to the multiple occurrences of winter storms each year, an exhaustive compilation is not possible. Complete winter storm event data is included in Appendix B.

ADDRESSING VULNERABILITY: REPETITIVE LOSS PROPERTIES

Requirement §201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

Repetitive loss properties are those for which two or more losses of at least \$1,000 each have been paid under the National Flood Insurance Program (NFIP) within any 10-year period since 1978. There are no repetitive loss properties in Edmunds County because the areas of the County that are prone to flooding are primarily agricultural/crop land and township and county roads.

ASSESSING VULNERABILITY: IDENTIFYING STRUCTURES

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area...

One of the primary purposes of this plan is identifying critical facilities and determining which are particularly at risk of damage from natural hazards. To do so, the plan participants were asked to consider what hazards they are particularly prone to (as identified in the Hazard Identification section) and then determining where those hazards overlap or interfere with people and infrastructure. Areas of overlap between vulnerable structures/people and potential natural hazards are then identified as “vulnerable” areas that should be mitigated whenever possible.

The planning group advised that in the event of a disaster caused by severe summer or winter storms, Edmunds County and participating entities have the ability to prevent further loss of life by generator-powered critical facility shelters.

The municipalities in Edmunds County have identified structures that are vital to emergency operations. Table 4.7 is a list of critical facilities that would cause the greatest distress in the county if destruction occurred. The table is organized alphabetically by location (column 1) and then alphabetically by structure name (column 5). While these facilities may be vital community assets, it is important to note that they are not necessarily vulnerabilities.

Table 4.8: Critical Structures in Edmunds County			
<u>Location</u>	<u>Value</u>	<u>Structure Name</u>	<u>Owner Type</u>
County		Edmunds County Highway Dept (Mina)	County
County	\$1,421,300	Agtegra – Sun Elevator	Private
County	\$3,060,702	Craven Elevator	Private
County		Red River Grain	Private
County		Glacial Lakes Energy (Mina)	Private
County		WEB Water	
County		Northern Border Pipeline	Private
County		Dakota Access Pipeline	Private
County		Ormat	Private
County		Pembrook Hutterite Colony	Private
County		Plainview Hutterite Colony	Private
County		Deerfield Hutterite Colony	Private
County		Boulder Hutterite Colony	Private
Bowdle		Bowdle Healthcare Center	City
Bowdle		Water Tower	City
Bowdle		Bowdle School	Public School
Bowdle		Agtegra Grain	Private
Bowdle		Agtegra Agronomy	Private
Bowdle		Edmunds Co Hwy Dept	County
Bowdle		Fire Hall	Private
Bowdle		Post Office	Federal
Hosmer	\$80,500	City Hall	City
Hosmer	\$680,000	Water Plant	City
Hosmer	\$398,420	Hosmer City Liquor Store	City
Hosmer	\$316,000	Fire Station	
Hosmer		Boulder Colony	Private
Hosmer		St. John's Church	Private

Hosmer		Hosmer Veterinary Clinic	Private
Hosmer		Meat Market	Private
Ipswich	\$350,000	Kens Food Fair (grocery and gas)	Private
Ipswich	\$5,000,000	Edmunds Co. Courthouse	County
Ipswich	\$1,500,000	Edmunds Co. Hwy Dept	County
Ipswich		4-H Building and Facility	County
Ipswich	\$800,000	FEM Electric Service	Private
Ipswich	\$100,000	Fire Dept	
Ipswich	\$2,000,000	Nursing home	Private
Ipswich	\$80,000	Gramm Funeral Home	Private
Ipswich	\$225,000	Hospitality Hotel	Private
Ipswich	\$80,000	Post Office	
Ipswich	\$200,000	Ipswich State Bank	Private
Ipswich	\$120,000	Ipswich Lumber	Private
Ipswich	\$10,000	Midcontinent Communications	Private
Ipswich	\$10,000	Montana Dakota Utilities	Private
Ipswich	\$1,500,000	Agtegra	Private
Ipswich	\$200,000	Oban Construction	Private
Ipswich	\$650,000	Sanford Clinic	Private
Ipswich		Buffalo Station	Private
Ipswich	\$600,000	SD State Div. of Hwys	State
Ipswich	\$40,000	Tiger Post Daycare	City
Ipswich	\$35,000	Valley Telco Cooperative	Private
Ipswich	\$100,000	City Office/Shop	City
Ipswich	\$850,000	City Water Tower	City
Ipswich		Ipswich Public School	Public School
Ipswich		Agtegra Gas Station	Private
Ipswich			
Ipswich			
Roscoe		City Office	City
Roscoe		City Shop	City
Roscoe		Water Tower and Tanks	City
Roscoe		City Library	City
Roscoe		Edmunds County Highway Department	County
Roscoe	\$135,000	Post Office	Federal
Roscoe	\$9,000,000	Edmunds Central School	School
Roscoe	\$400,000	Fire Hall	Private
Roscoe		Avera Physical	Private

		Therapy	
Roscoe		Fischer Repair	Private
Roscoe		C & B Operations	Private
Roscoe		Rock Tuff	Private
Roscoe		Schurr's Manufacturing	Private
Roscoe	\$1,000,000	First State Bank	Private
Roscoe	\$312,000	AP Express	Private
Roscoe	\$360,000	Ricky's	Private
Roscoe	\$200,000	Roscoe Hardware	Private
Roscoe	\$215,000	Dale's Building Supplies	Private
Roscoe		Global Harvest	Private
Roscoe		Adee Honey	Private
Roscoe		Venture Communications	Private
Roscoe		Westwood Apartments	Private

The information provided in Table 4.8 was taken from the 2015 Mitigation Plan and all jurisdictions were asked to update the list as needed. The participants were instructed to think of structures that would cause the most devastation to their communities if the structures were to be lost in a natural hazard event, "In other words, list those structures that you cannot live/operate without." Plan participants were then instructed to determine value of those structures. Most of the values provided are the insured values from the insurance policies. The plan author acknowledges that determining what is "critical" can mean something different to every community and that the information provided in the table is not comprehensive. However, the information provided by the plan participants in their worksheets was used as a baseline and can be supplemented in future years during the annual plan review and/or during the 5-year update. By using information provided by the representatives from each community it also helps establish a sense of ownership in the mitigation plan. Finally, the plan participants were asked to identify which of the critical structures or facilities are particularly at risk of natural hazards.

While the information may not be comprehensive it does give FEMA, SDOEM, and any other readers of the Plan an idea of how communities in rural South Dakota feel about certain structures. For example, FEMA may not view a City Park as a "critical" structure, however, in many small communities the City Park or baseball field is the hub of where activities take place and may also be the only thing that attracts tourists and people from outside the community. So, it may be the case that without these "landmarks" the communities' existence would be at stake.

ASSESSING VULNERABILITY: ESTIMATING POTENTIAL LOSSES

Requirement §210.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate...

The information provided in the following tables was collected from the local jurisdictions by the representatives from each community. The Edmunds County Emergency Manager provided the information for Edmunds County. Inconsistencies and missing information are a result of lack of existing mechanisms, plans, and technical documents available to the communities and also a

result of people who are serving their communities on a volunteer basis as opposed to many other areas in the nation which have larger communities who pay salaried professionals to represent them during the PDM drafting process. Each of the communities provided the best available data considering the lack of resources in which to access the information.

The assessor's office provided the assessed valuation of properties within the municipalities. All properties with structures, whether owner occupied or not were included in the valuations provided in Table 4.9 through 4.13. The reports provided by the assessor's office did not include the type of structure (for example, a residential structure may be a house or an unattached garage); thus, many of the tables are missing this information.

Table 4.9: Bowdle Estimated Potential Dollar Losses to Vulnerable Structures

Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	\$ in City	\$ in HA	% in HA	# in City	# in HA	% in HA
Residential	259	259	100	\$11,883,150	\$11,883,150	100	468	468	100
Commercial	40	40	100	\$2,820,328	\$2,820,328	100			
Industrial	0			0					
Agricultural	0			0					
Religious									
Government									
Education									
Utilities									
Total	299	299	100%	\$14,703,478	\$14,703,478	100%	468	468	100%

Table 4.10: Hosmer Estimated Potential Dollar Losses to Vulnerable Structures

Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	\$ in City	\$ in HA	% in HA	# in City	# in HA	% in HA
Residential	181	181	100%	\$4,057,821	\$4,057,821	100%	186	186	100%
Commercial	25	25	100%	\$732,610	\$732,610	100%			
Agricultural									
Religious									
Government									
Education									
Utilities									
Total	206	206	100%	\$4,790,431	\$4,790,431	100%	186	186	100%

Table 4.11: Ipswich Estimated Potential Dollar Losses to Vulnerable Structures

Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	\$ in City	\$ in HA	% in HA	# in City	# in HA	% in HA
Residential	430	430	100%	\$38,887,994	\$38,887,994	100%	954	954	100%
Commercial	77	77	100%	\$16,602,778	\$16,602,778	100%			100%
Agricultural	1	1	100%	\$2,956	\$2,956	100%			100%
Religious									
Government									
Education									
Utilities									
Total	508	508	100%	\$55,493,728	\$55,493,728	100%	954	954	100%

Table 4.12: Roscoe Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	\$ in City	\$ in HA	% in HA	# in City	# in HA	% in HA
Residential	183	183	100%	\$9,745,191	\$9,745,191	100%	289	289	100%
Commercial	37	37	100%	\$4,752,494	\$4,752,494	100%			
Industrial	0	0							
Agricultural	3	3	100%	\$334,114	\$334,114	100%			
Religious									
Government									
Education									
Utilities									
Total	223	223	100%	\$14,831,799	\$14,831,799	100%	289	289	100%

Table 4.13: Edmunds County Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in County	# in HA	% in HA	\$ in County	\$ in HA	% in HA	# in County	# in HA	% in HA
Residential	1,200	1,200	100%	\$106,068,597	\$106,068,597	100%	1,995	1,995	100%
Commercial	56	56	100%	\$48,903,578	\$48,903,578	100%			
Industrial	0	0							
Agricultural	641	641	100%	\$25,195,571	\$25,195,571	100%			
Religious									
Government									
Education									
Utilities									
Total	1,897	1,897	100%	\$180,167,746	\$180,167,746	100%	1,995	1,995	100%

Values based on tax assessed value and since churches, schools, utilities, and government buildings do not pay taxes on land or buildings, they were not assigned a value like other structures in the hazard area because the value was not listed.

Values for Edmunds county based on values of structures throughout the county and townships, not including the cities of Bowdle, Hosmer, Ipswich and Roscoe.

** Census numbers per 2019 Census estimate

County census numbers based on total county value of 3,829 countywide population and subtracting the number of people from Ipswich (891), Bowdle (468), Roscoe (289), and Hosmer (186).

ASSESSING VULNERABILITY: ANALYZING DEVELOPMENT TRENDS

Requirement §201.6(c)(2)(ii)(C): The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Requirement §201.6(c)(3) The plan should document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs.

Requirement §201.6(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

The land use and development trends for each jurisdiction were identified by the representatives from each of the jurisdictions. The only community in Edmunds County that is experiencing any growth and/or development at this time is the unincorporated area of Mina Lake (Cortlandt Township) and Ipswich. The rest of the jurisdictions have experienced declining populations over the past 10 years and at this time are just trying to maintain the population they have. Due to their small size and declining populations the Bowdle, Roscoe, and Hosmer do not maintain plans for growth and development.

CURRENT DEVELOPMENT TRENDS

Housing development is occurring in the Mina Lake and Ipswich areas on larger plots of land. There has been additional commercial growth in the Roscoe area, along with four new houses built in the past year. The rest of Edmunds County and the local jurisdictions are not currently experiencing growth, but rather just trying to maintain the population they currently have; thus, development trends are static and not experiencing much change at this time. Most structures throughout the county and in the local jurisdictions are not located within the flood plains, but are susceptible to wildfires, winter storms, and summer storms.

Edmunds County

The Director of Equalization/Zoning Officer handles all building permit applications for the County. If the permit meets all requirements, the Zoning Officer can approve it. If the permit needs a variance (such as building closer to a lot line than allowed) or a conditional use permit, then the board of adjustment makes those decisions.

Edmunds County is in a NSFHA (has never been mapped) so there is no floodplain administrator. They do not have a drainage ordinance.

The area around Mina Lake in the very eastern part of the County continues to grow as more and more houses are built. As of 2021, there are 377 water and sewer connections provided by the Mina Lake Sanitary district, though there are some houses on the lake that have individual WEB Water (rural water system) connections. In 2015, there were 325 water and sewer connections. Using those figures alone, would show growth of about 16%. However, many of the newer homes being built use WEB Water and private septic tanks. There isn't a true count of how many residents live on or near Mina Lake.

City of Ipswich

The Finance Office at the City of Ipswich handles all building permit applications. The City Council makes all decisions on approving or denying building permit applications. Ipswich is the largest community in Edmunds County and has had more housing development than other communities. There is also a newer housing development just outside of city limits on the west side of town.

The City has completed several street improvements in the last five years, including the street in front of the only school in town. They have also completed improvements to their wastewater

system. They recently had an engineer complete a drainage study in town and anticipate making improvements to their storm sewer system in the future. They have also started building a new sports/recreation complex near the existing pool and are planning a shared use path (bike/walking path) from the school to the pool/sports complex area.

City of Bowdle

The Finance Office at the City of Bowdle handles all building permit applications. The City has a Zoning Board that makes all decisions on building permits. Bowdle, like many other small towns, is facing a housing shortage. There are few, if any, houses for sale. Often, houses that are available are smaller, older homes, which aren't in great demand. Being a small town, there aren't any developers to build new houses. Bowdle does have an economic development corporation that is looking into housing options for the community. One of the ideas suggested was putting in more mobile homes in the community. While this might be a quick and easy way to develop housing, it would also make the families living in the mobile homes more vulnerable to tornados and other high wind events.

The healthcare center/hospital in Bowdle is owned by the City. They did expand and add a new clinic facility since the last plan update. The City has also completed improvements to their water and wastewater systems. They also have a plan to complete improvements to their Main Street, most likely that project will take place in 2022. There have also been discussions about incorporating storm sewer improvements in conjunction with the Main Street project.

City of Roscoe

The Finance Office at the City of Roscoe handles all building permit applications. The City Council makes all decisions on building permit applications. Most building permits are for remodeling, backyard sheds, decks, etc. There is not a great deal of new construction. The City does not charge a fee for their building permit. Roscoe has not been mapped for floodplain but is in a NSFHA, therefore there are no floodplain considerations for new construction.

Since the last plan update, there have been a few new houses built in town along with a handful of new businesses or business remodels. The most significant new buildings are the local bank and the school. The City itself has undertaken several projects in the last five years as well including a new cold storage facility and a new picnic shelter at the park. They are currently working on a \$8 million water and wastewater improvement project.

City of Hosmer

Hosmer is the smallest municipality in Edmunds County with only 208 people, according to the 2020 Census. As a small community, development is focused on retaining the people and businesses that are in town, rather than growing. Building permits are obtained at the Finance Office and approved by the City Council. Hosmer has not been mapped for floodplain but is in a NSFHA, therefore there are no floodplain considerations for new construction. In the last five years, Hosmer completed an upgrade of their wastewater system. As part of that upgrade, they no longer needed the lift station for their wastewater system. Hosmer used to have a City-owned nursing home, however, the nursing home closed in 2013 and the building was bought by Boulder Hutterite Colony.

UNIQUE OR VARIED RISK ASSESSMENT

Requirement §201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

While the extent to which each jurisdiction is affected by such hazards varies slightly between the local jurisdictions, the implications are the same.

Edmunds County

There are storm shelters at the courthouse and Mina Lake Recreation Area for County residents. Most residents take shelter in their basements in the event of a tornado or high wind event.

Mina Lake is also unique in that it is not an organized municipality, but that it has a population equal to or greater than several of the communities within Edmunds County. Typically, where there is a higher concentration of people there is great risk. Mina Lake used to be a seasonal area for people but now has mostly year-round residents. Due to this change Mina Lake has had to make improvements to the water and wastewater infrastructure.

There are 4 Hutterite Colonies in Edmunds County. The colonies do have their own fire fighting equipment, generally have basements or other building in which to take shelter and generally have backup generators to power essential operations if the power is out. With the exception of Boulder Colony, which is located in the town of Hosmer, all of the other colonies are in the rural, unincorporated areas of the county.

Farmers and other rural residents are more impacted by drought than residents of municipalities. Farmers livelihoods, by nature, are dependent on the weather and drought can cause a reduction in crop yields and also impact livestock.

City of Ipswich

Ipswich has had some reoccurring issues with flash flooding in certain parts of town during heavy rain events or during periods of rapid snowmelt. They recently conducted a drainage study and are now reviewing options for mitigating the flash flooding, including cleaning out drainage creeks and expanding their storm sewer system. Right now, the only areas of town with storm sewer are along Highway 12 (which runs east-west through town) and Highway 45 (which runs north-south through town). The study identified areas of town that have a high water table or are susceptible to flash flooding.

There is a small area on the southeast part of town that is located within the floodplain. There are few houses located within the floodplain. There is a unique risk to those houses in that they are the only homes in the County that are located within a designated floodplain.

In terms of severe storms/high wind events/tornados, most homes have basements in which residents can take shelter. There are mobile homes throughout the community and they are required to have tie downs to make them more stable during high wind events. The courthouse is available as a storm shelter during tornados.

The City has backup generators at their lift station, water tower, city hall and the city shop.

City of Bowdle

As a small town, the residents are very fortunate to have a healthcare facility in Bowdle. It is unique, in that the City owns and operates the facility. This reduces the risk to their residents as healthcare access is only a few minutes away, at most.

Bowdle also has several homes on the northwest side of town that are particularly prone to heavy snow and heavy rains; which sometimes cause water in basements. However, flooding is not a major concern – except during a heavy rain event or a quick spring thaw.

City of Roscoe

Roscoe does not have its own ambulance service. Ambulance service is provided by both Bowdle (to the west) and Ipswich (to the east). This does make residents of Roscoe more vulnerable in the event of a severe hazard or emergency. There is also no medical clinic in town. Roscoe has some aging infrastructure that could be of concern, but only under extreme weather conditions that exceed the norm for the area.

Most residences in town have basements where people can take shelter in the event of a tornado or high wind event. There are only a few trailer homes in town, and those families can take shelter with their neighbors, if needed. When the school is open, residents can also take shelter there.

City of Hosmer

Like other small towns, the rural nature of Hosmer puts its residents at higher risk. During severe weather such as blizzards or other winter storms, residents who need urgent medical care may not be able to make it to the nearest hospital for urgent or emergency care. Most residences in town have basements where people can take shelter in the event of a tornado or high wind event. There are only a few trailer homes in town, and those families can take shelter with their neighbors, if needed. Hosmer has natural drainage in town, meaning there is no storm sewer system; however, they have said that flash flooding or flooding is not a problem in town.

Hosmer used to have a City-owned nursing home, however, the nursing home closed in 2013 and the building was bought by Boulder Hutterite Colony.

V. MITIGATION STRATEGY

CHANGES/REVISIONS TO THE MITIGATION SECTION:

Additional projects submitted by individual communities were added at the end of the mitigation section. Any projects that have been completed since the drafting of the 2010 PDM plan have been eliminated. The 2016 plan also had references to man made hazards. This plan focuses on natural hazards so all projects related to man made hazards were removed.

MITIGATION REQUIREMENTS

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard with particular emphasis on new and existing buildings and infrastructure.

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard with particular emphasis on new and existing buildings and infrastructure.

MITIGATION OVERVIEW

The State Hazard Mitigation Plan addresses several mitigation categories including warning and forecasting, community planning, and infrastructure reinforcement. Edmunds County and participating entity's greatest needs are for generators and storm shelters as well as public awareness. Several aspects of Edmunds County mitigation measures tie into the State's plan.

Mitigation goals were devised to best aid the County in reducing the effects of natural hazards. Projects were evaluated by acting boards in each jurisdiction and the Boards were responsible for identifying which projects have been completed, which are no longer a priority, and which projects should be kept in the plan. A *high* priority classification means that the project should be implemented as soon as possible and would minimize losses at a very efficient rate. A *moderate* classification means that the project should be carefully considered and completed after the high priority projects have been completed. Losses will be reduced, but the cost/benefit is not very good. A *low* priority means that the project should not be considered in the near future. However, it is a potential solution and should not be written off until further evaluation can be completed. It may be completed in light of failures of all other projects striving toward the same goal.

EDMUNDS COUNTY MITIGATION GOALS AND PROJECTS

Goal #1: Reduce the devastating impacts winter storms have on Edmunds County.

Project #1:

Plant shelterbelts/living snow fences around communities.

Priority: Low
Funding Sources: County/Cities/State/FEMA
Timeframe: Ongoing
Oversight: County/Cities
Cost/Benefit: Each town could expect to incur a minimum of \$10,000 expenditures planting shelterbelts of trees. Total cost would equal \$50,000. These belts would prevent excess snow from crippling communities, thereby increasing emergency access capabilities and safety for residents and travelers.

Community Lifelines: Safety and Security, Health and Medical, Transportation. Planting the shelterbelt/living snow fence would increase emergency access capabilities and safety for residents.

Project #2:

Educate the residents of Edmunds County on winter weather risks, vulnerability, and safety. Particular emphasis will be placed on encouraging residents to stock more than 1 or 2 days' worth of food supplies within their homes and encouraging residents not to venture out during severe weather.

Priority: High
Funding Sources: City/County/State/Federal
Timeframe: Ongoing
Oversight: County
Community Lifeline: Communication

Goal #2: Improve public awareness and safety regarding summer storms.

Project #1:

Educating the public is essential to mitigating severe weather. Encourage residents to attend storm spotter classes. Advise individuals as to the best locations for shelter during severe weather. Address safety issues at care facilities (schools, nursing homes, etc.) and make sure they are following evacuation and care policies.

Priority: High
Funding Sources: County/State/Federal
Timeframe: Ongoing
Oversight: County/ NWS
Community Lifeline: Communication

Goal #3: Reduce the impact of severe summer storms in the County.

Project #1:

Evaluate schools and churches and facilities to determine their usefulness as shelters. Compile a list of those shelters and make arrangements for opening of shelters when severe weather threatens.

Priority: Moderate
Funding Sources: County/State/FEMA
Timeframe: TBD
Oversight: County
Cost/Benefit: TBD
Community Lifeline: Safety and Security; Food, Water, Shelter

Project #2:

Tree removal within City limits and along highways. Aging, dead, or listing trees near county and township roads become a hazard during high winds, lightning, or ice. Trees that have potential to injure and kill motorists or pedestrians should be removed. This project would center around township roads as most county and all state highways have removed trees.

Priority: Moderate
Funding Sources: County/State/Federal
Timeframe: Ongoing
Oversight: County/Townships
Cost/Benefit: TBD
Community Lifelines: Safety and Security; Transportation

Project #3: REMOVED due to Rural Electric Cooperatives participating in the State Mitigation Plan.

~~Reduce the extent to which utility mishaps affect areas during severe weather situations. Several different areas encompass this project: advising utility companies the future construction must not pass through restrictive access areas, advising utility companies to remove trees in areas where utility lines are run, and recommend placing utility lines underground in certain situations.~~
Community Lifelines: Energy

Goal #4: Educate residents of Edmunds County regarding drought situations.

Project #1:

Disseminate information regarding water usage allowances and camping restrictions during dry weather. In addition, make information regarding hunting safety and starting fires available to the seasonal population. A hunter safety course is currently offered; this project would be integrated into that course. Distribution could also be made along with hunting licenses.

Priority: High
Funding sources: City, County, Private enterprises
Timeframe: Annually
Oversight: County/State
Cost/Benefit: A small distribution cost will be incurred. This project has the potential to decrease fires and therefore reduce damage to cropland and property.
Community Lifelines: Safety and Security; Communications

~~Goal #5: Increase fire fighting capabilities.~~

~~Project #1: Hold training courses for volunteers. Fire departments within Edmunds County are entirely volunteer. More volunteers are always needed.~~

While this is still an important project, it is being removed from the mitigation plan because it falls more under Preparedness rather than Mitigation.

~~Project #2: Provide paid training or reimbursement for training time. The County's fire department is entirely volunteer. When individuals are away at a training (which is necessary), their income suffers. Some form of reimbursement needs to be determined.~~

While this is still an important project, it is being removed from the mitigation plan because it falls more under Preparedness rather than Mitigation.

~~Goal #6: Reduce drought effects.~~

This goal is being removed, not because there are few mitigation actions that the County has authority to complete in regards to reducing the effects of drought. Public education remains the best method (see project #1 above).

Goal #7: Mitigate against flooding in susceptible areas of the county.

Project #1: Improve, upgrade culverts, raise roads to prevent flooding during spring thaw and summer rains.

Priority:	High
Funding Sources:	County/State/Federal
Timeframe:	Ongoing
Oversight:	County
Cost Benefit:	Having passable roads in the county and townships is vital to the primarily agricultural economy in Edmunds County. There is extremely high volume of truck traffic on most of the roads and thus the cost of the project, while expensive, is outweighed by the benefit due to the extreme economic impact impassable roads have on the County.

Community Lifelines: Transportation

Mitigation Activities for Man-Made Hazards

Previous versions of the Edmunds County Mitigation Plan have included Mitigation Projects for Man-Made Hazards. The 2021 update of the plan doesn't include any risk assessment or description of man-made hazards; therefore, the projects addressing man-made hazards are being removed.

~~**Goal #1: Educate the public as to the potential for aviation mishaps, terrorism incidents, highway hazards, and hazardous material incidents.**~~

~~Project #1: Hold classes to inform the public regarding these issues. Distribute literature countywide on evacuation procedures, response tactics, residential vigilance, and common sense.~~

Priority: _____ **High**
Funding: _____ County/Federal
Timeframe: _____ ongoing
Oversight: _____ County
Cost/Benefit: _____ There is little cost in education. Official time and material copying would be a slight cost in comparison to advising the public of safety and loss prevention measures.

~~Project #2: Survey and reorganize the intersection of Highway 47 and Highway 12 in the city of Bowdle.~~

Priority: _____ **High**
Funding sources: _____ DOT, State, Federal
Timeframe: _____ 2013
Oversight: _____ DOT
Cost/Benefit: _____ The 4 lane Highway 12 at that spot is dangerous and there have been an increasing number of accidents. A high cost would be incurred, upwards of \$300,000, with the benefit of saving lives and reducing injuries and property loss. A study would need to be conducted to determine the best course of action for this intersection.

BOWDLE MITIGATION GOALS AND PROJECTS:

Goal #1: Reduce the impact of severe winter and summer storms on the community.

~~COMPLETED: Project #1: Purchase a backup generator for designated emergency shelter and critical facilities such as the water tower (Lift Station backup generator has been completed). Ensure to include a space and plan for a backup generator in the clinic expansion project. Project Completed.~~

~~COMPLETED: Project #2: Increase capacity of backup generator at the hospital; with the addition of the nursing home the existing generator is undersized to meet the needs of the building. Project Completed.~~

Discussion: Projects #3,4, and 5 below are all to reduce the amount of drifting snow on city streets. With fewer (or smaller) snow drifts, the access for emergency vehicles will increase which will lead to better access and safety for residents.

Project #3: Plant a living snow fence in the northwest part of town

Priority:	Low
Funding:	City, State, FEMA
Timeframe:	Ongoing
Estimated Cost:	\$30,000
Oversight:	City
Cost/Benefit:	TBD

Critical Facilities Affected: Streets. Planting the shelterbelt/living snow fence would increase emergency access capabilities and safety for residents.

Project #4: Increase the use of ridging for snow management in the northwest part of town

Discussion: When it snows, they take the snow plow out into the fields and make a ridge of the snow. Each time it snows, they follow the same procedure, in the same area, which increases the size of the ridge. The ridges then serve as a natural snow fence. As the winter progresses, and snows continue, the ridges also get higher, continuing to provide the benefits of the ridges/natural, growing snow fence.

Project #5: Explore the option of leaving a few rows of unharvested crop on the northwest side of town to provide a natural snow fence

Goal #2: Reduce flood risk throughout town

Project #1: Increase the capacity of storm sewer throughout town.

Priority:	High
Funding sources:	City, DENR, FEMA, USDA
Timeframe:	1-3 years
Oversight:	City
Cost/Benefit:	TBD

Other: Bowdle is gearing up for a road/water/wastewater project and is looking at adding a storm sewer component to the project.

CITY OF HOSMER MITIGATION GOALS AND PROJECTS

Goal #1: Protect the citizens of the community from the devastating effects of severe winter storms

~~COMPETED: Project #1: Purchase two backup generators to provide energy to the water plant and the lift stations in the event of a power shortage/outage~~

~~Estimated Cost: \$45,000 each~~

~~Estimated people affected: 286~~

~~Area Affected: 1 square mile~~

~~Critical Facilities affected: 9~~

In the last five years, Hosmer completed an upgrade of their wastewater system. As part of that upgrade, they no longer needed the lift station for their wastewater system.

Project #2: Plant Shelterbelts in and around existing shelterbelts on the outer edges of city limits to act as a living snow fence and keep roads more open for emergency vehicles during severe winter storm events.

Priority: Low

Funding: City, State, FEMA

Timeframe: Ongoing

Estimated Cost: \$30,000

Oversight: City

Cost/Benefit: TBD

Critical Facilities Affected: Streets. Planting the shelterbelt would increase emergency access capabilities and safety for residents.

Goal #2: Reduce effects of severe summer storms, high winds, and wildfires

Project #1: Continue to enforce ordinances such as burn ban, noxious weeds, and dilapidated properties.

Priority: Moderate

Funding: City

Timeframe: Ongoing

Estimated Cost: Existing staff time

Oversight: City

Cost/Benefit: TBD

CITY OF IPSWICH MITIGATION GOALS AND PROJECTS

Goal #1: Reduce impact of severe winter weather and heavy snow on the community

Project #1: Plant living snow fences on the edge of town

Priority: Low
Funding: City, State, FEMA
Timeframe: Ongoing
Estimated Cost: \$30,000
Oversight: City
Cost/Benefit: TBD
Critical Facilities Affected: Streets. Planting the shelterbelt/living snow fence would increase emergency access capabilities and safety for residents.

Project #2: Purchase permanent generators to operate the lift stations in the event of power shortage/outage. The main lift station currently has a permanent backup generator. The other lift stations have portable generators.

Priority: Moderate
Funding: City, State, FEMA
Timeframe: Ongoing
Estimated Cost: TBD
Oversight: City
Cost/Benefit: TBD

Goal #2: Reduce the impact of strong winds and tornadoes on the residents of the community.

Project #1: Construct a storm shelter for summer storms and high wind events. Alternatively, the City could evaluate existing buildings to determine usefulness (and accessibility) as a storm shelter. Retrofitting certain buildings should be considered; however, other buildings could be costly as handicap accessibility and safety codes would need to be adhered to.

Priority: Moderate
Funding sources: City, State, FEMA
Timeframe: TBD
Oversight: City
Cost/Benefit: TBD

Goal #3: Reduce the impact of flash flooding/flooding on the residents of the community

Project #1: Reduce the flooding potential throughout town by cleaning out drainage channels and creeks.

Priority: High
Funding sources: City, State, FEMA
Timeframe: 1-3 years
Oversight: City
Cost/Benefit: TBD
Other: Stockwell Engineers completed a drainage study in early 2021. The city then hired Stockwell Engineers to prepare a proposal for cleaning drainage ditches in July 2021.

Project #2: Install storm sewers throughout town

Priority:	High
Funding sources:	City, DENR, FEMA, USDA
Timeframe:	1-3 years
Oversight:	City
Cost/Benefit:	TBD
Other:	Stockwell Engineers completed a drainage study in early 2021. The recommendations from that study included adding storm sewer in certain areas throughout town.

CITY OF ROSCOE MITIGATION GOALS AND PROJECTS

Goal #1: Reduce the devastating effects of severe winter storms on the community

Project #1: Purchase generator for well house to pump water to the water tower in the event of a power shortage/outage. Purchase generators for City Hall and City Shop to continue critical services in the event of a power outage.

Priority: High
Funding Sources: City, State, FEMA (BRIC)
Timeframe: Ongoing
Estimated Cost: Unknown at this time
Oversight: City
Cost/Benefit: TBD
Critical Facilities Affected: all (water towers, well house, schools, residences, churches, businesses.) Having a generator would ensure the availability of water if the city were to lose power.

Project #2: Plant Shelterbelts in and around existing shelterbelts on the outer edges of city limits to act as a living snowfence and keep roads more open for emergency vehicles during severe winter storm events.

Priority: Low
Funding: City, State, FEMA
Timeframe: Ongoing
Estimated Cost: \$30,000
Oversight: City
Cost/Benefit: TBD
Critical Facilities Affected: Streets. Planting the shelterbelt would increase emergency access capabilities and safety for residents.

Goal #2: Reduce the impact of summer storms in Roscoe

Project #1: Construct a storm shelter for summer storms and high wind events. Alternatively, the City could evaluate existing buildings to determine usefulness (and accessibility) as a storm shelter. Retrofitting certain buildings should be considered; however, other buildings could be costly as handicap accessibility and safety codes would need to be adhered to.

Priority: Moderate
Funding sources: City, State, FEMA
Timeframe: TBD
Oversight: City
Cost/Benefit: TBD

NATIONAL FLOOD INSURANCE PROGRAM PARTICIPATION

Requirement: §201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Edmunds County participates in the National Flood Insurance Program. There is one community located in Edmunds County that does not participate in NFIP. That community is Bowdle. Mina Lake has previously been listed as a Non-participant; however, Mina Lake is an unincorporated area of Edmunds County. All of the other jurisdictions participate in NFIP. Those who participate include Edmunds County, Hosmer, Ipswich, and Roscoe. The county will continue to participate and ensure compliance of the participating local jurisdictions located within the flood plain.

5.1 EDMUNDS COUNTY NFIP PARTICPATION			
Community	Community ID	Participating	Current Map Effective Date
Edmunds County	460264	Yes	NSFHA
Bowdle	N/A	No	N/A
Hosmer	460117	Yes	NSFHA
Ipswich	460184	Yes	12/18/85 (no elevation determined)
Roscoe	460136	Yes	NSFHA

While Edmunds County, Hosmer, Ipswich, and Roscoe all participate and have adopted floodplain ordinances, there is little development taking place in the entire county as a whole which also leads to the belief that there is no activity or development taking place in the flood plain either. The floodplain ordinances which have been adopted are supposed to regulate and monitor the activity in the floodplain but since there is little development taking place, the ordinances are more of a formality than a working document that is utilized on a weekly, monthly, or yearly basis. Flood insurance is available to those who want it, but very few people opt to purchase flood insurance.

One problem the County faces is that Edmunds County, Roscoe, and Hosmer have FIRMS that were drafted in the 1970's and no Special Flood Hazard Areas (SFHA) have been identified. Ipswich was mapped in the mid 1980's and has two areas that are Zone A, areas of 100-year flood; but base flood elevations and flood hazard factors have not been determined. Bowdle has never been mapped. The quality of the data available to the County is not that great. However, even if the County did have better data available to them, such as DFIRMS, the likelihood of having personnel trained to use the data and the technology required to utilize such data is very low.

Goal #1: Continue participation in the NFIP program

Action #1: Educate city and county officials as well as planning and zoning personnel in the requirements for NFIP.

Action#2: Re-evaluate the existing floodplain ordinances and ensure that no changes are needed. If changes are needed, draft the necessary changes and adopt the new ordinance.

Action #3: Inquire to the State Office of Emergency Management and FEMA about getting updated maps that identify Special Flood Hazard Areas (if any).

Action#4: Educate the citizens of the County about the NFIP program and the benefits of purchasing flood insurance.

IMPLEMENTATION OF MITIGATION ACTIONS

Requirement: §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Upon adoption of the updated Edmunds County PDM plan, each jurisdiction will become responsible for implementing its own mitigation actions. The planning required for implementation is the sole responsibility of the local jurisdictions and private businesses that have participated in the plan update. All of the municipalities have indicated that they do not have the financial capability to move forward with projects identified in the plan at this time, however, all will consider applying for funds through the State and Federal Agencies once such funds become available. If and when the municipalities are able to secure funding for the mitigation projects, they will move forward with the projects identified. All participants of the plan will prioritize projects/actions in a manner that will ensure benefit is maximized to the greatest extent possible. A benefit cost analysis will be conducted on an individual basis after the decision is made to move forward with a project.

VI. PLAN MAINTENANCE

CHANGES/REVISIONS TO PLAN MAINTENANCE:

Minor Updates have been made to this section.

MONITORING, EVALUATING, AND UPDATING THE PLAN

Requirement §201.6(c)(4)(i): [the plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Edmunds County and all of the participating local jurisdictions thereof will incorporate the findings and projects of the PDM in all planning areas as appropriate. Periodic monitoring and reporting of the plan is required to ensure that the goals and objectives for the Edmunds County plan are kept current and that local mitigation efforts are being carried out.

During the process of implementing mitigation strategies, the county or communities within the county may experience lack of funding, budget cuts, staff turnover, and/or a general failure of projects. These scenarios are not in themselves a reason to discontinue and fail to update the Pre-Disaster Mitigation Plan. A good plan needs to provide for periodic monitoring and evaluation of its successes and failures and allow for appropriate changes to be made.

ANNUAL REPORTING PROCEDURES

The plan shall be reviewed annually, as required by the County Emergency Manager, or as the situation dictates such as following a disaster declaration. The Edmunds County Emergency Manager will review the plan annually in November and ensure the following:

1. The County Elected body will receive an annual report and/or presentation on the implementation status of the plan;
2. The report will include an evaluation of the effectiveness and appropriateness of the mitigation actions proposed in the plan; and
3. The report will recommend, as appropriate, any required changes or amendments to the plan.
- 4.

FIVE YEAR PLAN REVIEW

Every five years the plan will be reviewed and a complete update will be initiated. All information in the plan will be evaluated for completeness and accuracy based on new information or data sources. New property development activities will be added to the plan and evaluated for impacts. New or improved sources of hazard related data will also be included.

In future years, if the County relies on grant dollars to hire a contractor to write the PDM plan update, the County will initiate the process of applying for and securing such funding in the third year of the plan to ensure the funding is in place by the fourth year of the plan. The fifth year will then be used to write the plan update, which in turn will prevent any lapse in time where the county does not have a current approved plan on file.

The goals, objectives, and mitigation strategies will be readdressed and amended as necessary based on new information, additional experience, and the implementation progress of the plan. The approach to this plan update effort will be essentially the same as the one used for the original plan development.

The Emergency Manager will meet with the PDM Steering committee for review and approval prior to final submission of the updated plan.

PLAN AMENDMENTS

Plan amendments will be considered by the Edmunds County Emergency Manager, during the plan's annual review to take place the end of each county fiscal year. All affected local jurisdictions (cities, towns, and counties) will be required to hold a public hearing and adopt the recommended amendment by resolution prior to considerations by the Steering committee.

INCORPORATION INTO EXISTING PLANNING MECHANISMS

Requirement: §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Ipswich, Bowdle, and Edmunds County all utilize comprehensive or capital improvements plan when dealing with planning and zoning, especially when issuing building permits. The other jurisdictions, Roscoe and Hosmer, do not have the resources, staff, or funding, needed to maintain such planning mechanisms.

The City of Ipswich will consider the mitigation requirements, goals, actions, and projects when it considers and reviews the other existing planning documents such as the capital improvements plan. The Ipswich mitigation projects will be considered and prioritized in conjunction with non-mitigation projects, such as water and wastewater infrastructure improvements, new construction of schools, libraries, parks, etc.

The rest of the local jurisdictions cannot incorporate the requirements of the mitigation plan into other planning mechanisms because they do not have any other planning mechanisms that currently exist. The risk assessment which was conducted for the purpose of this plan is specific to mitigation actions and projects included in the Plan and thus is not tied into any other mechanisms that would initiate conversations or actions by the city councils to move forward with actions or projects outlined in the Plan. Absence of such mechanisms creates a problem for the local jurisdictions because ideas, projects, and actions identified as a result of the PDM Plan update process often never move forward because they are forgotten about and no mechanism exists to initiate the process of completing such projects. Thus, the local jurisdictions identified one unrelated mechanism that could be used to remedy the problem of mitigation projects getting lost in a bookshelf. Municipalities are required by State law to prepare budgets for the upcoming year and typically consider any expenditure for the upcoming year at that time. South Dakota Codified Law 9-21-2 provides that:

The governing body of each municipality shall, no later than its first regular meeting in September of each year or within ten days thereafter, introduce the annual appropriation ordinance for the ensuing fiscal year, in which it shall appropriate the sums of money necessary to meet all lawful expenses and liabilities of the municipality....an annual budget for these funds shall be developed and published no later than December thirty-first of each year.

Since all of the local jurisdictions lack planning mechanisms in which to incorporate the mitigation actions identified in this plan, it was determined that each year when the budget is prepared the municipalities will also consider the mitigation actions at that time. The local jurisdictions will post a permanent memo to their files as a reminder for them to incorporate their annual review of the mitigation actions identified into the budget preparation process. This does not require the projects be included in the budget, it merely serves as a reminder to the City officials that they have identified mitigation projects in the PDM plan that should be considered if the budget allows for it.

POTENTIAL FUNDING SOURCES

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. None of the local jurisdictions have the funds available to move forward with mitigation projects at this time, thus, the Potential Funding Sources section was included so that the local jurisdictions can work towards securing funding for the projects. Inevitably, due to the small tax base and small population most of the local jurisdictions do not have the ability to generate enough revenue to support anything beyond the basic needs of the community. Thus, mitigation projects will not be completed without a large amount of funding support from State or Federal programs.

The Edmunds County jurisdictions will continue to seek outside funding assistance for mitigation projects in both the pre- and post-disaster environment. Primary Federal and State grant programs have been identified and briefly discussed, along with local and non-governmental funding sources, as a resource for the local jurisdictions

Federal

The following federal grant programs have been identified as funding sources which specifically target hazard mitigation projects:

<p>Title: Building Resilient Infrastructure and Communities (BRIC) Grant Program Agency: Federal Emergency Management Agency</p> <p>The BRIC program supports states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the existing Pre-Disaster Mitigation (PDM) program. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.</p>
<p>Title: Pre-Disaster Mitigation Program Agency: Federal Emergency Management Agency</p> <p>Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential Disaster Declaration. The Pre-Disaster Mitigation (PDM) program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program and reduce injuries, loss of life, and damage and destruction of property.</p> <p>The funding is based upon a 75% Federal share and 25% non-Federal share. The non-Federal match can be fully in-kind or cash, or a combination. Special accommodations will be made for "small and impoverished communities", who will be eligible for 90% Federal share/10% non-Federal.</p> <p>FEMA provides PDM grants to states that, in turn, can provide sub-grants to local governments</p>

for accomplishing the following eligible mitigation activities: State and local hazard mitigation planning,
Technical assistance (e.g., risk assessments, project development), Mitigation Projects,
Acquisition or relocation of vulnerable properties, Hazard retrofits, Minor structural hazard control or protection projects
Community outreach and education (up to 10% of State allocation)

Title: Flood Mitigation Assistance Program

Agency: Federal Emergency Management Agency

FEMA's Flood Mitigation Assistance program (FMA) provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP). FMA was created as part of the National Flood Insurance Reform Act of 1994 (42 USC 4101) with the goal of reducing or eliminating claims under the NFIP.

FMA is a pre-disaster grant program, and is available to states on an annual basis. This funding is available for mitigation planning and implementation of mitigation measures only, and is based upon a 75% Federal share/25% non-Federal share. States administer the FMA program and are responsible for selecting projects for funding from the applications submitted by all communities within the state. The state then forwards selected applications to FEMA for an eligibility determination. Although individuals cannot apply directly for FMA funds, their local government may submit an application on their behalf.

Title: Hazard Mitigation Grant Program

Agency: Federal Emergency Management Agency

The Hazard Mitigation Grant Program (HMGP) was created in November 1988 through Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The HMGP assists states and local communities in implementing long-term mitigation measures following a Presidential disaster declaration.

To meet these objectives, FEMA can fund up to 75% of the eligible costs of each project. The state or local cost-share match does not need to be cash; in-kind services or materials may also be used. With the passage of the Hazard Mitigation and Relocation Assistance Act of 1993, federal funding under the HMGP is now based on 15% of the federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster.

The HMGP can be used to fund projects to protect either public or private property, so long as the projects in question fit within the state and local governments overall mitigation strategy for the disaster area, and comply with program guidelines. Examples of projects that may be funded include the acquisition or relocation of structures from hazard-prone areas, the retrofitting of existing structures to protect them from future damages; and the development of state or local standards designed to protect buildings from future damages.

Eligibility for funding under the HMGP is limited to state and local governments, certain private nonprofit organizations or institutions that serve a public function, Indian tribes and authorized tribal organizations. These organizations must apply for HMPG project funding on behalf of their citizens. In turn, applicants must work through their state, since the state is responsible for setting priorities for funding and administering the program.

Title: Public Assistance (Infrastructure) Program, Section 406

Agency: Federal Emergency Management Agency

FEMA's Public Assistance Program, through Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, provides funding to local governments following a Presidential Disaster Declaration for mitigation measures in conjunction with the repair of damaged public facilities and infrastructure. The mitigation measures must be related to eligible disaster related damages and must directly reduce the potential for future, similar disaster damages to the eligible facility. These opportunities usually present themselves during the repair/replacement efforts.

Proposed projects must be approved by FEMA prior to funding. They will be evaluated for cost effectiveness, technical feasibility, and compliance with statutory, regulatory, and executive order requirements. In addition, the evaluation must ensure that the mitigation measures do not negatively impact a facility's operation or risk from another hazard.

Public facilities are operated by state and local governments, Indian tribes or authorized tribal organizations and include:

*Roads, bridges & culverts

*Water, power & sanitary systems

*Draining & irrigation channels

*Airports & parks

*Schools, city halls & other buildings

Private nonprofit organizations are groups that own or operate facilities that provide services otherwise performed by a government agency and include, but are not limited to the following:

*Universities and other schools

*Power cooperatives & other utilities

*Hospitals & clinics

*Custodial care & retirement facilities

*Volunteer fire & ambulance

*Museums & community centers

Title: SBA Disaster Assistance Program

Agency: US Small Business Administration

The SBA Disaster Assistance Program provides low-interest loans to businesses following a Presidential disaster declaration. The loans target businesses to repair or replace uninsured disaster damages to property owned by the business, including real estate, machinery and equipment, inventory, and supplies. Businesses of any size are eligible, along with non-profit organizations. SBA loans can be utilized by their recipients to incorporate mitigation techniques into the repair and restoration of their business.

Title: Community Development Block Grants

Agency: US Department of Housing and Urban Development

The community Development Block Grant (CDBG) program provides grants to local governments for community and economic development projects that primarily benefit low- and moderate-income people. The CDBG program also provides grants for post-disaster hazard mitigation and recovery following a Presidential disaster declaration. Funds can be used for activities such as acquisition, rehabilitation or reconstruction of damaged properties and facilities and for the redevelopment of disaster areas.

Local

Local governments depend upon local property taxes as their primary source of revenue. These taxes are typically used to finance services that must be available and delivered on a routine and regular basis to the general public. If local budgets allow, these funds are used to match Federal or State grant programs when required for large-scale projects.

Non-Governmental

Another potential source of revenue for implementing local mitigation projects are monetary contributions from non-governmental organizations, such as private sector companies, churches, charities, community relief funds, the Red Cross, hospitals, Land Trusts, and other non-profit organizations.

CONTINUED PUBLIC PARTICIPATION/INVOLVEMENT

Requirement: §201.6(c)(4)(iii): [the plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

During interim periods between the five year re-write, efforts will be continued to encourage and facilitate public involvement and input. The plan will be available for public view and comment at the Edmunds County Emergency Management Office, the NECOG office and the Edmunds County Auditor's Office. Comments will always be received whether orally, written or by e-mail.

All ongoing workshops and trainings will be open to the public and appropriately advertised. Ongoing press releases and interviews will help disseminate information to the general public and encourage participation.

As implementation of the mitigation strategies continues in each local jurisdiction, the primary means of public involvement will be the jurisdiction's own public comment and hearing process. State law as it applies to municipalities and counties requires this as a minimum for many of the proposed implementation measures. Effort will be made to encourage cities, towns, and counties to go beyond the minimum required to receive public input and engage stakeholders.