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Executive Summary

Introduction

This plan is an update to the Franklin, Furnas, Harlan, and Red Willow Counties (Quad Counties) Multi-Jurisdictional Hazard Mitigation Plan (HMP) developed in 2010, developed in compliance with the requirements of the Disaster Mitigation Act of 2000 (DMA2000). Hazard mitigation planning is a process in which hazards are identified and profiled; people and facilities at risk are identified and assessed for threats and potential vulnerabilities; and, strategies and mitigation measures are identified. The goal of the process is to reduce risk and vulnerability, in order to lessen impacts to life, the economy, and infrastructure. Hazard mitigation planning increases the ability of communities to effectively function in the face of natural and manmade disasters.

There were 32 participants in the planning process. Participating communities and jurisdictions are listed in the table below.

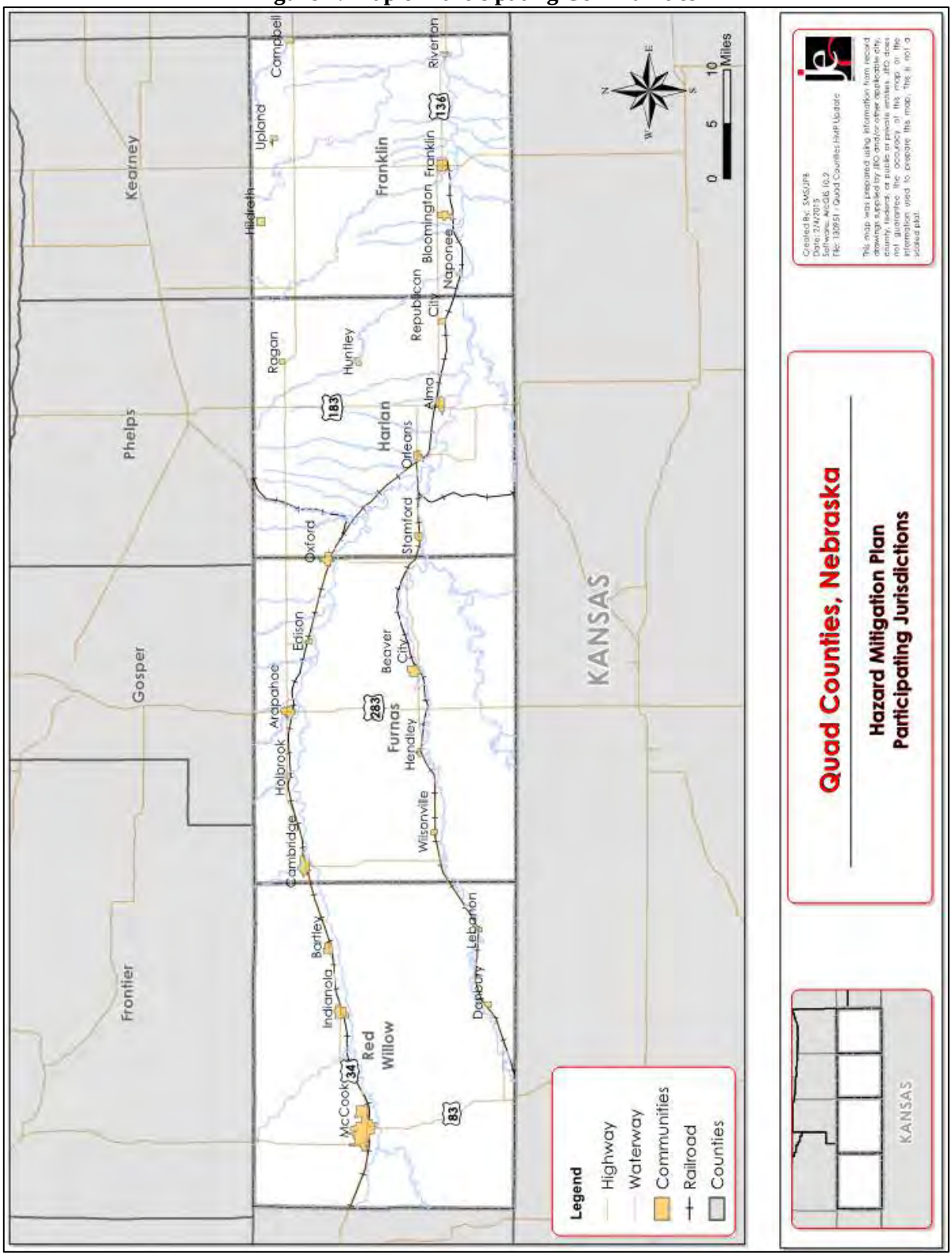
Table 1: Participating Jurisdictions

Participating Jurisdictions		
Franklin County	City of Cambridge	Village of Republican City
Village of Bloomington	Cambridge Public Schools	Village of Stamford
Village of Campbell	Village of Edison	Red Willow County
City of Franklin	Village of Holbrook	Village of Bartley
Village of Hildreth	Village of Oxford	Village of Danbury
Village of Naponee	Village of Wilsonville	City of Indianola
Village of Upland	Harlan County	Village of Lebanon
Furnas County	City of Alma	City of McCook
City of Arapahoe	Village of Huntley	Middle Republican NRD
Arapahoe Public Schools	Village of Orleans	Southwest Public Schools
City of Beaver City	Village of Ragan	-

This plan includes both natural and manmade hazards in order to maintain consistency between local and state level planning efforts. The hazards identified by the State of Nebraska Hazard Mitigation Plan 2014 were utilized as the starting point for the local planning effort. The list of hazards addressed includes:

- Agricultural Disease (Animal and Plant)
- Chemical Spills (Fixed Site and Transportation)
- Dam Failure
- Drought
- Earthquake
- Extreme Heat
- Flooding
- Grass/Wildfire
- Levee Failure
- Severe Thunderstorm
- Severe Winter Storm
- Terrorism
- Tornados

Figure 1: Map of Participating Communities



Goals and Objectives

The goals and objectives for this planning process are as follows:

Goal 1: Protect the Health and Safety of Residents

Objective 1.1: Reduce or prevent damage to property and loss of life or serious injury (overall intent of the plan).

Goal 2: Reduce Future Losses from Hazard Events

Objective 2.1: Provide protection for existing structures, future development, critical facilities, and infrastructure, services, utilities, and trees to the extent possible.

Objective 2.2: Develop hazard specific plans, conduct studies or assessments, and retrofit buildings and facilities to mitigate for hazards and minimize their impact.

Objective 2.3: Minimize and control the impact of hazard events through enacting or updating ordinances, permits, laws, or regulations.

Goal 3: Increase Public Awareness and Education Regarding Vulnerabilities to Hazards

Objective 3.1: Develop and provide information to residents and businesses about the types of hazards they are exposed to, what the effects may be, where they occur, and what they can do to better prepare for them.

Goal 4: Improve Emergency Management Capabilities

Objective 4.1: Develop or update Emergency Response Plans, procedures and abilities; increase the capability to respond.

Objective 4.2: Develop or update Evacuation Plans and procedures.

Objective 4.3: Improve warning systems and ability to communicate to residents and businesses during and following a disaster or emergency.

Goal 5: Pursue Multi-Objective Opportunities (whenever possible)

Objective 5.1: When possible, use existing resources, agencies, and programs to implement the projects.

Objective 5.2: When possible, implement projects that achieve multiple goals.

GOAL 6: ENHANCE OVERALL RESILIENCE AND PROMOTE SUSTAINABILITY

Objective 6.1: Incorporate hazard mitigation and adaptation into updating other existing planning endeavors (e.g. comprehensive plans, zoning ordinance, subdivision regulation, etc.).

Summary of Changes

The following describes how this plan has evolved from the Franklin, Furnas, Harlan, and Red Willow Counties Multi-Jurisdictional Hazard Mitigation Plan developed in 2010. This plan update: expands upon the existing risk assessment, incorporates additional hazards as identified in the 2014 State of Nebraska Hazard Mitigation Plan, incorporates a capability assessment, and identifies a greater range of mitigation strategies and project types. This update also works to unify the various planning mechanisms in place throughout the participating communities (i.e. Comprehensive Plans, Local Emergency Operation Plans, Zoning Ordinances, Building Codes, etc.) to ensure that the goals and objectives identified in those planning mechanisms are consistent with the strategies and projects included in this plan.

Plan Implementation

Various communities across the county have implemented hazard mitigation projects following the 2010 Hazard Mitigation Plan. Many of these projects are related to hazard monitoring, warning systems and/or educating community members. Examples include: backup generators for communities in Harlan County, installing or upgrading sirens in Republican City and communities in Furnas County, and assistance to remove hazardous tree limbs.

To build upon these prior successes and continue to implement mitigation projects, despite limited resources, communities will need to continue relying upon multi-agency coordination as a means of leveraging resources. Communities across the Quad Counties have been able to work with a range of entities to complete projects; potential partners for future project implementation include (but are not limited to): Lower Republican Natural Resource District, Middle Republican Natural Resource District, Silver Jackets, Franklin County, Furnas County, Harlan County, Red Willow County, Department of Natural Resources, NEMA, local industry, and others.

Hazard Profiles

The Hazard Mitigation Plan includes a description of the hazards considered, including a risk and vulnerability assessment. Data considered during the risk assessment process includes: historic occurrence and recurrence interval, historic losses (physical and monetary), impacts to the built environment (including privately owned structures, as well as critical facilities), and the local risk perception. These components were used to develop a balanced and well-rounded risk assessment. The following table provides an overview of the risk assessment for each hazard.

Table 2: Hazard Occurrence

Regional Risk Assessment			
Hazard	**Previous Occurrence Events/Years**	**Approximate Annual Probability**	**Likely Extent**
Agricultural Animal Disease	4/1.5	100%	Data unavailable
Agricultural Plant Disease	68/15	100%	Data unavailable
Chemical Fixed Sites	14/32	44%	Localized to the facilities and adjacent surroundings
Chemical Transportation	15/36	43%	Limited (<1 mile from release site)
Dam Failure	8/Unknown	~1%	Inundation of area slightly greater than floodplain
Drought	426/1104	39%	D2
Earthquakes	4/42	10%	<4.0
Extreme Heat	68 days/1	100%	>90°F
Flooding	30/19	100%	Some inundation of structures* (<1% of structures) and roads near streams. Some evacuations of people may be necessary (<1% of population)
Grass/Wildfires	513/13	100%	<100 acres
Hail	542/19	100%	H3 – H6
High Winds	299/19	100%	9 BWF
Levee Failure	0	~1%	Inundation of structures in floodplain

Regional Risk Assessment			
Hazard	**Previous Occurrence Events/Years**	**Approximate Annual Probability**	**Likely Extent**
Severe Thunderstorms	260/19	100%	≥1" rainfall
Severe Winter Storms	263/19	100%	.25 - .5" ice 20 - 40°F below zero (wind chills) 4 – 8" snow 25 – 40 mph winds
Terrorism	0	~1%	Undefined
Tornados	37/19	100%	EF0

**Quantification of vulnerable structures provided in Section Seven: Participant Sections*

Table 3: Loss Estimation for the Planning Area

Hazard Type	Total Property Loss[1]	Average Annual Property Loss[1]	Total Crop Loss[2]	Average Annual Crop Loss[2]
Agricultural Plant Disease	N/A	N/A	$506,656	$33,777
Drought	$0	$0	$246,003,599	$16,400,240
Extreme Heat	$0	$0	$61,423,203	$4,094,880
Flooding	$1,325,000	$69,737	$221,069	$14,738
Grass/Wildfires	$0	$0	$242,504[3]	$18,654[3]
Hail Events	$7,151,000	$376,368	$55,340,800	$3,689,387
High Winds	$11,697,140	$615,639	$21,102,991	$1,406,866
Severe Thunderstorms	$11,770,900	$619,521	N/A	N/A
Severe Winter Storms	$6,330,000	$333,158	$7,783,392	$518,893
Tornados	$2,124,500	$111,816	$27,388	$1,826

1 Indicates data is from NCDC (January 1996 to October 2014)
2 Indicates data is from USDA (2000 to 2013)
3 Indicates data is from NFS (2000 to 2012)

Many of the natural hazards such as agricultural disease, extreme heat, flooding, grass and wildfires, hail, high winds, severe thunderstorms, severe winter storms and tornados will occur annually. Other natural hazards like drought will occur less often. The scope of events and how they will manifest themselves locally is not known regarding hazard occurrences. Historically, severe thunderstorms, high winds, hail, and severe winter storms have resulted in the most significant property damages within the planning area. The following hazards are the hazards of most concern to the planning area. At least ten participants identified these hazards as a hazard of most concern.

Drought

Drought is generally defined as a natural hazard that results from a prolonged period of below normal precipitation. Although many erroneously consider it a rare and random event, drought is actually a normal, recurrent feature of climate. A drought often coexists with periods of extreme heat, which together can

cause significant social stress, economic losses, and environmental degradation. The Quad Counties planning area has experienced drought in 426 out of 1104 months on record. These droughts have led to $246 million dollars in crop losses.

The entire planning area is vulnerable to drought. Although agriculture is the major sector affected, impacts on rural and municipal water supplies, fish and wildlife, tourism, recreation, water quality, soil erosion, the incidence of wildfires, electricity demand, and other sectors are also significant. The indirect impacts of drought on personal and business incomes, tax revenues, unemployment, and other areas are also important.

Grass/Wildfire

Wildfires, also known as brushfires, forest fires, or wildland fires, are any uncontrolled fire that occurs in the countryside or wildland. Wildland areas may include, but are not limited to, grasslands, forests, woodlands, agricultural fields, and other vegetated areas. While some wildfires burn in remote forested regions, others can cause extensive destruction of homes and other property located in the wildland-urban interface, the zone of transition between developed areas and undeveloped wilderness. For the Quad Counties, wildfires have occurred with greater frequency than any other hazard. The magnitude of these events, however, has been minor. Typical wildfire occurrence in the Quad Counties take place in agricultural fields rather than in heavy forests. For this reason, local fire departments are prepared and able to control these events. Fire departments across the counties have mutual aid agreements in place for when a single fire department is unable to control the situation. There has been an increase in reported wildfires over the course of the last decade. 2011 and 2012 have the highest number of reported fires during the period of record (2000 – 2014).

Vulnerability related to wildfire is more geographic than demographic. Farmsteads and agricultural buildings located in rural areas are the most vulnerable groups in the Quad Counties related to wildfire. Demographics can become a concern in major, during large scale fire events which require evacuation of residents.

Hail

Hail is usually associated with severe thunderstorms. This association makes hail just as unpredictable as a severe thunderstorm. Hail events in thunderstorms differ from many other hazards in that they travel large areas and through multiple jurisdictions within a single region. Additionally, hail events in thunderstorms often occur in series, with one area having the potential to be hit multiple times in one day. Hail occurs frequently in the Quad Counties as there have been 542 hail events since 1996. These hail events have caused over $7 million in property damages and $55 million in crop losses.

Vulnerable populations include residents of mobile homes, the elderly, and those caught outside during storm events. During hail events, it is not uncommon for residents to lose power for a temporary period of time.

High Winds

High winds typically accompany severe thunderstorms and severe winter storms and can cause significant property and crop damage, downed power lines, loss of electricity, obstruction to traffic flow, and significant damage to trees and center-pivot irrigation systems. All building stock and above ground infrastructure are at risk of being damaged or affected by high winds. High wind speeds and flying debris can pose a significant threat to human life.

In the Quad Counties planning area, 299 high wind events occurred between January 1996 and April 2015. One death and two injuries were reported as the result of high winds. Moreover, these recorded events caused over $11.6 million in property damages and over $21.1 million in crop damages during that time.

High winds can impact a wide range of people and properties. People living in mobile homes are particularly susceptible to the effects of high winds. Mobile homes that are not anchored or are not anchored properly can be blown over by winds as fast as 60 to 70 mph. Other factors that may increase vulnerability to the threat posed by high winds include age, poverty levels, and home rentals.

Severe Thunderstorms

Thunderstorms differ from many other hazards in that they are generally large in magnitude, have a long duration, and travel across large areas and through multiple jurisdictions within a single region. Severe thunderstorms are most likely to occur between the months of March and August with the highest number of events occurring in June. Typical impacts resulting from severe thunderstorms include (but are not limited to): loss of power; obstruction to transportation routes; grass/wildfires starting from lightning strikes; localized flooding; damages to homes and vehicles from hail; damage to mechanical systems located outdoors; downed power lines and poles from high winds; injuries from windborne debris; downed tree limbs and trees; and destruction of crops.

Vulnerable populations related to severe thunderstorms include: residents of mobile homes, citizens with decrease mobility, and those caught outside during storm events. Most residents within the planning area are familiar with severe thunderstorms and know how to appropriately prepare and respond to events. Most participating jurisdictions have reported updates or improvements to risk communication and especially outdoor warning systems. In addition, the use of text notifications have helped decrease the human vulnerability to this hazard.

Severe Winter Storms

Severe winter storms are an annual occurrence for the Quad Counties and the State of Nebraska. Winter storms can bring extreme cold temperatures, freezing rain and ice, and heavy or drifting snow. Blizzards are particularly dangerous and can have significant impacts throughout the planning area. Severe winter storms typically occur between November and March, but early and late season storms have occurred in the past and can have dramatic impacts in the planning area. Impacts resulting from severe winter storms include (but are not limited to): hypothermia and frost bite; death to those trapped outdoors; closure of transportation routes; downed power lines and prolonged power outages; collapse of dilapidated structures; death of livestock; and closure of critical facilities.

The most vulnerable citizens within the planning area are children, elderly, individuals and families below the poverty line, and those new to the area or state. The counties have an even distribution of these segments of the population which would indicate there is not a significant difference in human vulnerability. Given the probability of occurrence and potential impacts, participating jurisdictions identified a number of strategies that can help reduce level of vulnerability related to severe winter storms. Multiple communities identified the increase of risk communication and warnings, developing a database of vulnerable populations, and improving snow routes and snow removal processes.

Tornados

Tornados occur in the Quad Counties on an annual basis. The NCDC reports 37 tornados for the Quad Counties in 19 years. Of the reported events, all were ranked between an F/EF0 and F/EF2. Approximately one-third of those tornadic events reported damages. Based on historic records for the planning area, tornados have occurred most frequently in the months of May (15 reported events), and June (10 reported events).

Vulnerable populations within the planning area include residents living in mobile homes, facilities without storm shelters which house large numbers of people (such as nursing homes, schools, factories, etc.), homeowners without storm shelters or basements, and residents with decreased mobility. All communities in the planning area have outdoor warning sirens as well as access to voluntary SMS text message warnings.

The cities of Alma, Arapahoe, Beaver City, Cambridge, Franklin, and McCook have areas that have increased vulnerability to tornados (long-term care facilities, mobile home parks, etc.). While long-term care facilities have response protocols in place, residents of the mobile home park are left to their own devices to find safe places when confronted with tornados and high winds.

Mitigation Strategies

There are a wide variety of strategies that can be used to reduce the impacts of hazards for the residents of the Quad Counties as well as the built environment. The following table shows the most common mitigation actions that can be used for each hazard.

Table 4: Key Mitigation Strategies

Goal/ Objective	Action Item #	Action Item	Summary	Hazards Addressed
Goal 1 Objective 1.1	**1.1.1**	**Hazard Tree Removal**	Identify and remove hazards limbs and/or trees.	Severe Thunderstorms, Hail, High Winds, Tornados, Severe Winter Storms
	1.1.2	**Designated Snow Routes**	Develop designated snow routes.	Severe Winter Storms
	1.1.3	**Cooling Station Database**	Work with the public to maintain a list of sites available for public use during extreme heat events. These sites should be available 24 hours per day, or be made available after normal business hours.	Extreme Heat
	1.1.4	**Stabilize/Anchor Fertilizer, Fuel and Propane Tanks**	Anchor fuel tanks to prevent movement. If left unanchored tanks could present major threat to property and safety in a tornado or high wind event.	Tornados, High Winds
	1.1.5	**Facility Monitoring**	Install security cameras in/around critical facilities and key infrastructure.	Terrorism
Goal 2 Objective 2.1	**2.1.1**	**Backup Generators**	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities and shelters.	Tornados, High Winds, Severe Winter Storms, Severe Thunderstorms
	2.1.2	**Safe Rooms**	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.	Tornados, High Winds, Severe Thunderstorms
	2.1.3	**Flood Prone Property Acquisition**	Voluntary acquisition and demolition of properties prone to flooding will reduce the general threat of flooding for communities. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.	Flooding, Dam Failure, Levee Failure
	2.1.4	**Stream Bank Stabilization/Grade Control Structure/ Channel Improvement**	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.	Flooding

Goal/ Objective	Action Item #	Action Item	Summary	Hazards Addressed
	2.1.5	**Stormwater System and Drainage Improvements**	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.	Severe Thunderstorms, Flooding
	2.1.6	**Power, Service, Electrical, and Water Distribution Lines**	Work with Public Power District and utilities department to identify vulnerable transmission and distribution lines and plan to bury lines underground or retrofit existing structures to be less vulnerable to storm events. Electrical utilities shall be required to use underground construction methods where possible for future installation of power lines.	Tornados, High Winds, Severe Winter Storms, Severe Thunderstorms
	2.1.7	**New Well**	Provide a safe backup water supply for the community; replace existing wells affected by drought, increase of demand in water, and additional water for fire protection.	All Hazards
	2.1.8	**Sewer Project**	Install new gravity flow sewer lagoon with no pumps.	All Hazards
	2.1.9	**Impact Resistant Roof Coverings**	Use roofing materials that are resistant to hail impacts for new buildings. Retrofit existing buildings with hail resistant roofing.	Hail
	2.1.10	**Updating Sewer Plant**	Design and construct a sewer treatment plant for the village.	Flooding
	2.1.11	**Incorporate Native Species into Municipal Landscapes**	Work to incorporate native species of plants into municipal landscapes when updates/improvements are implemented.	Drought
	2.1.12	**Back-up Municipal Records**	Develop protocol for back up of critical municipal records.	All Hazards
	2.1.13	**Updating Sewer Plant**	Design and construct a sewer treatment plant for the village.	Flooding
Goal 2 Objective 2.2	**2.2.1**	**Drainage Study/Storm Water Master Plan**	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.	Flooding, Severe Thunderstorms
	2.2.2	**Develop a Drought Management Plan**	Work with relevant stakeholders to develop a drought management plan. The drought management plan would identify water monitoring protocols, outline drought responses, identify opportunities to reduce water consumption, and establish the jurisdictional management procedures.	Drought

Goal/ Objective	Action Item #	Action Item	Summary	Hazards Addressed
	2.2.3	**Assess Vulnerability to Drought Risk**	The jurisdiction will review relevant plans and municipal systems to identify factors which may increase drought impacts or gaps in planning and service delivery. This may include but is not limited to: assessing water distribution system(s), reviewing well levels and identifying alternative water sources (if needed), examining water intensive consumers, review of water pricing structures, considering the need for municipal water meters, and other locally appropriate actions.	Drought
	2.2.4	**Monitor Drought Conditions**	Establish specific drought monitoring protocols. These protocols will serve as triggers for implementing drought response actions.	Drought
	2.2.5	**Source Water Contingency Plan**	Evaluate and locate new sources of groundwater to ensure adequate supplies to support the existing community and any additional growth which may occur.	Drought
	2.2.6	**Remove Flow Restrictions**	Conduct a preliminary drainage assessment and/or design bridge improvements to reduce and/or alleviate flooding. Bridges typically serve as flow restrictions along streams and rivers. Cleanout and reshaping channel segments at bridge crossings can increase conveyance, reducing the potential for flooding. Replacing/modifying bridges and other flow restrictions may be necessary to eliminate flooding threats and damages.	Flooding
	2.2.7	**Develop an Agricultural Disease Response Action Plan**	Coordinate with farmers, USDA, UNL, and other local actors to develop a plan of action to contain or respond to disease outbreaks.	Agricultural Disease
	2.2.8	**Mortality Management Plan**	Develop procedures and plan for emergency disposal of diseased animals which prevents the spread of disease.	Agricultural Disease
	2.2.9	**Groundwater/Irrigation/Water Conservation Management Plan and Practices**	Develop and implement a plan/best management practices to conserve water use and reduce total use (high water use to low water use) and consumption of groundwater resources by citizens and irrigators of agricultural land during elongated periods of drought. Identify water saving irrigation projects or improvements such as sprinklers of soil moisture monitoring. Potential restrictions on water could include limitation on lawn watering, car washing, farm irrigation restrictions, or water conservation practices such as changes in irrigation management, education on no-till agriculture and use of xeriscaping in communities.	Drought
Goal 2 Objective 2.3	**2.3.1**	**Maintain Good Standing in the NFIP**	Enable property owners to purchase insurance protection against flood losses by maintaining in good standing in the NFIP.	Flooding
	2.3.2	**Participate in the NFIP**	Participate in the NFIP to allow residents to purchase flood insurance.	Flooding

Goal/ Objective	Action Item #	Action Item	Summary	Hazards Addressed
	2.3.3	**Floodplain Management**	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.	Flooding
	2.3.4	**Floodplain Regulation Enforcements and Updates**	Continue to enforce local floodplain regulations for structures located in the 1% annual floodplain. Strict enforcement of the type of development and elevations of structures should be considered through issuance of building permits by any Nebraska city. Continue education of building inspectors or Certified Floodplain Managers.	Flooding
Goal 3 Objective 3.1	**3.1.1**	**Public Awareness / Education**	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.	All Hazards
	3.1.2	**Fire Prevention Program: Planning and Training**	Participate in the Nebraska Forest Service Wildland Fire Protection Program which provides services in wildfire suppression training, equipment, pre-suppression planning, wildfire preventions, and aerial fire suppression.	Grass/Wildfire
	3.1.3	**Develop and Distribute Drought Educational Materials**	Work to develop and distribute educational materials related to drought and drought impacts. Topics addressed may include, but are not limited to: xeriscaping, low-flow fixtures, smart irrigation systems, water collection devices/rain barrels, permeable surfaces, rain gardens, etc.	Drought
	3.1.4	**Shelter in Place**	Provide shelter-in-place training to facilities housing vulnerable populations (nursing homes, childcare facilities, schools, etc.)	All Hazards
Goal 4 Objective 4.1	**4.1.1**	**Comprehensive Disaster/Emergency Response/Rescue Plan**	Establish or update Comprehensive Village Disaster and Emergency Response/Rescue Plan	Tornados, High Winds, Severe Winter Storms, Severe Thunderstorms
	4.1.2	**Civil Service Improvements**	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's water tanks/trucks, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles and identifying and training additional personnel for emergency response.	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms, Wildfires

Goal/ Objective	Action Item #	Action Item	Summary	Hazards Addressed
	4.1.3	**Establish Formal Drought Response Protocols**	Establish a response protocol for times of drought. This may include, but is not limited to: lawn watering restrictions, requirements for water intensive businesses (i.e. car washes, golf courses, etc.) responses for local facilities (swimming pools, public fountains, etc.).	Drought
	4.1.4	**Emergency Communications**	Establish an action plan to improve communication between agencies to better assist residents and businesses during and following emergencies. Establish inner-operable communications.	All Hazards
	4.1.5	**Emergency Operations**	Identify and establish an Emergency Operations Center.	All Hazards
	4.1.6	**Emergency Exercise: Hazardous Spill**	Utilize exercise to prepare for potential explosions or hazardous spills. Ensure that nearby businesses and residents have appropriate plans in place.	Chemical Spills
	4.1.7	**Emergency Exercise: Agricultural Disease Outbreak**	Conduct an outbreak exercise with producers, emergency managers, veterinarians, extension agents, etc. to identify areas for improvement and become familiar with procedures.	Agricultural Disease
Goal 4 Objective 4.3	**4.3.1**	**Warning Systems**	Implement Code Red for the county.	All Hazards
	4.3.2	**Weather Radios**	Conduct an inventory of weather radios at schools and other critical facilities. Provide weather radios in critical facilities.	All Hazards
	4.3.3	**Alert/Warning Sirens**	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or upgraded. Install new sirens and remote activation where lacking.	All Hazards
Goal 5 Objective 5.2	**5.2.1**	**Tree City USA**	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.	High Winds, Severe Winter Storms, Severe Thunderstorms, Tornados
	5.2.2	**Infrastructure Assessment Study**	Conduct an assessment of bridges in the county and assess other potential areas of concern.	All Hazards
Goal 6 Objective 6.1	**6.1.1**	**Update Comprehensive Plan**	Update Comprehensive Plan. Integrate plan with Hazard Mitigation Plan components.	All Hazards

Summary

This document is an update to the 2010 Franklin, Furnas, Harlan, and Red Willow Counties Multi-Jurisdictional Hazard Mitigation Plan. For this update, the hazards found to be of greatest concern for participating jurisdictions include: drought, hail, high winds, grass/wildfire, severe thunderstorms, severe

winter storms, tornados. Jurisdictions have worked over recent years to reduce local vulnerabilities and have identified measures that they will incorporate in the future to continue to reduce local vulnerabilities.

Section One: Introduction

Hazard Mitigation Planning

Hazard events are inevitable. The uncertainty of its effects resides in the intensity and how well prepared the community is for such an event. Mitigation reduces risk and is a socially and economically responsible action to prevent long term risks from natural and man-made hazard events.

FEMA definition of Hazard Mitigation

"Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards."

Natural hazards, such as severe winter storms, tornados and high winds, severe thunderstorms, flooding, extreme heat, drought, agriculture diseases (plant and animal), earthquakes, and wildfires are a part of the world around us. Their occurrence is natural and inevitable, and there is little we can do to control their force and intensity. Man-made hazards are a product of the society that we live in and can occur with significant impacts to communities. Man-made hazards include levee failure, dam failure, chemical and radiological fixed site hazards, major transportation incidents, terrorism, civil disorder, and urban fire. These hazard events can occur naturally or as a result of human error. All jurisdictions participating in this planning process are vulnerable to a wide range of natural and man-made hazards that threaten the safety of residents, and have the potential to damage or destroy public and private property, cause environmental degradation, or disrupt the local economy and overall quality of life.

The Quad Counties prepared this multi-jurisdictional Hazard Mitigation Plan in an effort to reduce impacts from natural and manmade hazards, and to better protect the people and property of the region from the effects of hazards. This plan demonstrates the communities' commitment to reducing risks from hazards and serves as a tool to help decision makers establish mitigation activities and resources. This plan was developed to make the Quad Counties and participating jurisdictions eligible for federal pre-disaster funding programs and to accomplish the following objectives:

- Minimize the disruption to each jurisdiction following a disaster.
- Establish actions to reduce or eliminate future damages in order to efficiently recover from disasters.
- Investigate, review, and implement activities or actions to ensure disaster related hazards are addressed by the most efficient and appropriate solution.
- Educate citizens about potential hazards.
- Facilitate development and implementation of hazard mitigation management activities to ensure a sustainable community.

Disaster Mitigation Act of 2000

The U.S. Congress passed the DMA 2000 to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 322 of the DMA 2000 requires that state and local governments develop, adopt, and routinely update a hazard mitigation plan in order to remain eligible for pre- and post-disaster mitigation funding. These funds include the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDM), and the Flood Mitigation Assistance Program (FMA). These programs are administered by FEMA under the Department of Homeland Security (DHS).

This plan was developed in accordance with current state and federal rules and regulations governing local hazard mitigation plans. The plan shall be monitored and updated on a routine basis to maintain compliance with the legislation – Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390) and by FEMA's Final Rule (FR) published in the Federal Register on November 30, 2007, at 44 Code of Federal Regulations (CFR) Part 201.

Hazard Mitigation Assistance

On June 1, 2009, FEMA initiated the Hazard Mitigation Assistance (HMA) program integration, which aligned certain policies and timelines of the various mitigation programs. These HMA programs present a critical opportunity to minimize the risk to individuals and property from hazards while simultaneously reducing the reliance on federal disaster funds.

Each HMA program was authorized by separate legislative action, and as such, each program differs slightly in scope and intent.

> ***Mitigation** is the cornerstone of emergency management. Mitigation focuses on breaking the cycle of disaster damage, reconstruction, and repeated damage. Mitigation lessens the impact disasters have on people's lives and property through damage prevention, appropriate development standards, and affordable flood insurance. Through measures such as avoiding building in damage-prone areas, stringent building codes, and floodplain management regulations, the impact on lives and communities is lessened.*
>
> *- FEMA Mitigation Directorate*

- **Hazard Mitigation Grant Program (HMGP):** To qualify for post-disaster mitigation funds, local jurisdictions must have adopted a mitigation plan that is approved by FEMA. HMGP provides funds to states, territories, Indian tribal governments, local governments, and eligible private non-profits following a presidential disaster declaration. The DMA 2000 authorizes up to seven percent of HMGP funds available to a state after a disaster to be used for the development of state, tribal, and local mitigation plans.

- **Flood Mitigation Assistance (FMA):** To qualify to receive grant funds to implement projects such as acquisition or elevation of flood-prone homes, local jurisdictions must prepare a mitigation plan. Local jurisdictions must also be participating communities in the NFIP. The goal of FMA is to reduce or eliminate claims under the NFIP.

- **Pre-Disaster Mitigation (PDM):** To qualify for pre-disaster mitigation funds, local jurisdictions must adopt a mitigation plan that is approved by FEMA. PDM assists states, territories, Indian tribal governments, and local governments in implementing a sustained pre-disaster hazard mitigation program.

Plan Financing and Preparation

In regards to plan financing and preparation, in general, the local government (Harlan County) is the "sub-applicant" that is the eligible entity that submits a sub-application for FEMA assistance to the "Applicant". The "Applicant," in this case, is the State of Nebraska. If HMA funding is awarded, the sub-applicant becomes the "sub-grantee" and is responsible for managing the sub-grant and complying with program requirements and other applicable federal, state, territorial, tribal, and local laws and regulations.

The Quad Counties Hazard Mitigation Plan was financed through PDM in 2014, Project Number 1. The project received federal-cost share to provide 75 percent assistance for the completion of a 'multi-jurisdictional' Hazard Mitigation Plan update.

Section Two: Planning Process

Introduction

The process utilized to develop a hazard mitigation plan is often as important as the final planning document. For this planning process, the Quad Counties adapted the four step hazard mitigation planning process outlined by FEMA to fit the needs of the participating jurisdictions. The following pages will outline how the planning team was established; the function of the planning team; key project meetings and community representatives; outreach efforts to the general public, key stakeholders, and neighboring jurisdictions; general information relative to the risk assessment process; general information relative to local/regional capabilities; plan review and adoption; and ongoing plan maintenance.

***Requirement §201.6(b)**: Planning process. An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:*
(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

***Requirement §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.*

Multi-Jurisdictional Approach

According to FEMA, "A multi-jurisdictional hazard mitigation plan is a plan jointly prepared by more than one jurisdiction." The term 'jurisdiction' means 'local government'. Title 44 Part 201, Mitigation Planning in the CFR, defines a 'local government' as "any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments, regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, any rural community, unincorporated town or village, or other public entity". For the purposes of this plan, all 'taxing authority' were recognized as eligible participants.

FEMA recommends the multi-jurisdictional approach under the DMA 2000 for the following reasons:

- It provides a comprehensive approach to the mitigation of hazards that affect multiple jurisdictions;
- It allows economies of scale by leveraging individual capabilities and sharing cost and resources;
- It avoids duplication of efforts; and
- It imposes an external discipline on the process.

Both FEMA and the Nebraska Emergency Management Agency (NEMA) recommend this multi-jurisdictional approach through a combination of counties and regional emergency management districts. The Quad Counties utilized the multi-jurisdiction planning process recommended by FEMA (Local Mitigation Plan Review Guide [October 2011], Local Mitigation Planning Handbook [March 2013], and Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards [January 2013]) to develop this plan.

Hazard Mitigation Planning Process

The hazard mitigation planning process as outlined by FEMA has four general steps, which include: organization of resources; assessment of risks; development of mitigation strategies; and, implementation and annual monitoring of the plan's progress. The mitigation planning process is rarely a linear process. It is not unusual that ideas developed during the initial assessment of risks may need revision later in the

process, or that additional information may be identified while developing the mitigation plan or during the implementation of the plan that may result in new goals or additional risk assessment.

- Organization of Resources
    - Focus on the resources needed for a successful mitigation planning process. Essential steps include:
        - Organizing interested community members
        - Identifying technical expertise needed
- Assessment of Risks
    - Identify the characteristics and potential consequences of the hazard. Identify how much of the jurisdiction can be affected by specific hazards and the impacts they could have on local assets.
- Mitigation Plan Development
    - Determine priorities and identify possible solutions to avoid or minimize the undesired effects. The result is a hazard mitigation plan and strategy for implementation.
- Plan Implementation and Progress Monitoring
    - Bring the plan to life by implementing specific mitigation projects and changing day-to-day operations. It is critical that the plan remains relevant to succeed. Thus, it is important to conduct periodic evaluations and revisions, as needed.

Organization of Resources

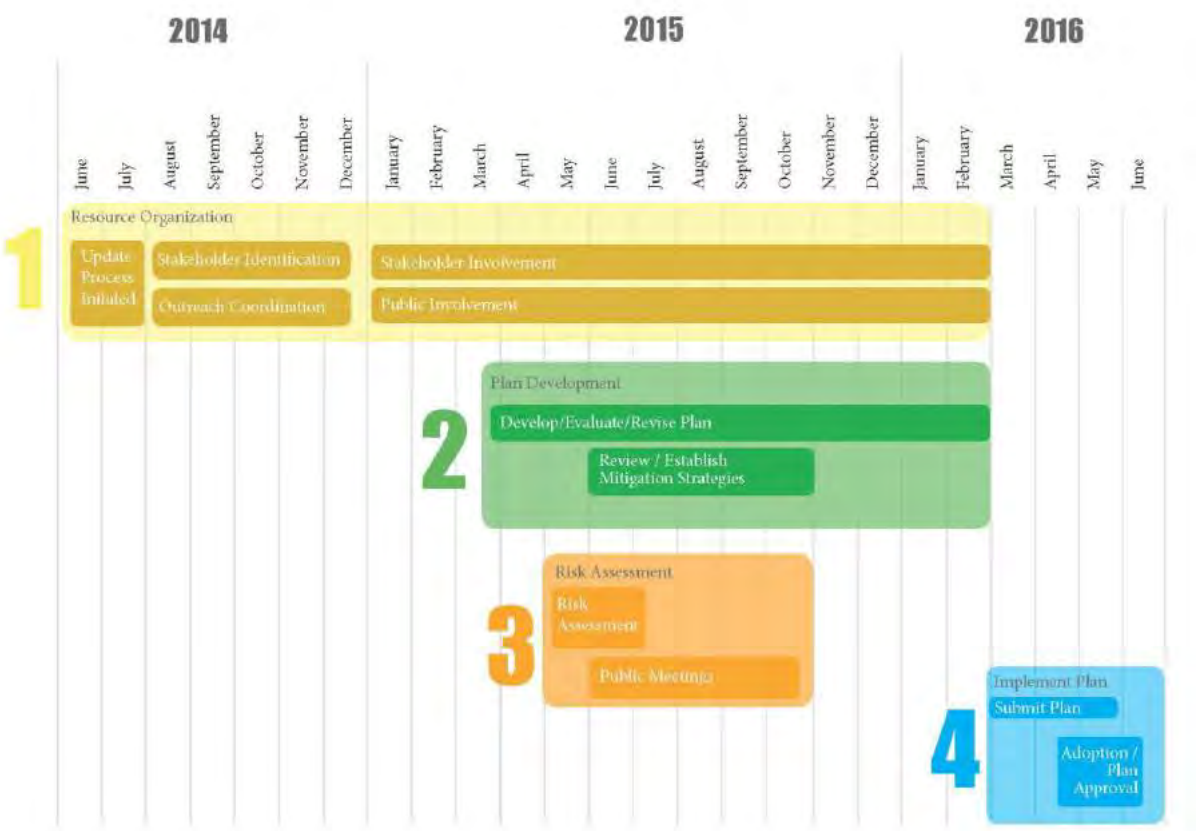
Plan Update Process

Quad Counties began the process of securing funding for their multi-jurisdictional Hazard Mitigation Plan in September 2013. JEO was contracted in January 2014 to guide and facilitate the planning process and assemble the multi-jurisdictional Hazard Mitigation Plan. For the planning area, Chris Becker led the development of the plan and served as the primary point-of-contact throughout the project.

The first activity in the development process for the Quad Counties HMP update was coordination of efforts with local, state, and federal agencies and organizations. NDNR and NEMA became involved in the planning process. Quad Counties and JEO worked together to identify elected officials and key stakeholders to lead the planning effort.

A clear timeline of this plan update progress is provided in Figure 2.

Figure 2: Project Timeline



Planning Team

At the beginning of the planning process, the planning team, comprised of local participants and the consultant, was established. The planning team guides the planning process, reviews the plan, and serves as a liaison to plan participants throughout the planning area. A list of planning team members can be found in Table 5. Additional technical support was provided to the planning team through staff from NEMA and the NDNR.

Table 5: Hazard Mitigation Planning Team

Name	Title	Jurisdiction
Chris Becker	Sheriff/Emergency Manager	Harlan County
Jerry Archer	Sheriff/Emergency Manager	Franklin County
Alan Kotschwar	Sheriff/ Emergency Manger	Red Willow County
Roger Powell	Emergency Manager	Furnas County
David Pederson	County Supervisor	Franklin County
Ed Brickman	Chief of Police	City of Franklin
Dale Casper	Police Chief/ Utility Superintendent	Village of Hildreth
Doug Wilson	City Administrator	City of Alma
David Snodgrass	Board Member	Village of Orleans

Name	Title	Jurisdiction
Diana Wilkinson	Deputy Emergency Manager	Red Willow County
Mitch Paine	Flood Mitigation Planning Coordinator	Department of Natural Resources
Mary Baker	State Hazard Mitigation Officer	Nebraska Emergency Management Agency
Nancy Ludden	Hazard Mitigation Staff	Nebraska Emergency Management Agency
Jeff Henson	Project Manager	JEO Consulting Group Inc.
Phil Luebbert	Planner	JEO Consulting Group Inc.

Table 6 shows the data and location of meetings held for the planning team.

Table 6: Planning Team Meeting Locations and Times

Location and Time	Agenda Items
March 24, 2015	
Alma, NE 2:00 PM	• Planning Process Overview • Established Planning Team • Participation Responsibilities • Updated Goals and Objectives
June 4, 2015	
Oxford, NE 5:00 PM	• Risk Assessment • Participant Section Review • Update Previous Mitigation Actions

Participant Involvement

Elected officials, key stakeholders, and residents within the Quad Counties experience the area hazards firsthand and are vital in providing local information necessary to complete the plan. Participants play a key role in reviewing goals and objectives; identifying hazards; providing a record of historical disaster occurrences and localized impacts; identification and prioritization of potential mitigation projects and strategies; and, the development of annual review procedures.

In order to be a participant in the development of this plan update, jurisdictions were strongly encouraged to have, at minimum, one representative present at the Hazard Identification and Mitigation Strategy meetings. Some jurisdictions were able to send multiple representatives to meetings. Jurisdictions also were encouraged to invite stakeholder groups from within their communities to participate in the public meetings. Sign-in sheets from all public meetings can be found in *Appendix B.*

Jurisdictions that were unable to attend the scheduled public meetings were able to request a meeting with members of the planning team that would satisfy the meeting attendance requirement. This effort enabled jurisdictions which could not attend a scheduled public meeting to participate in the planning process. These meetings were in the form of one-on-one meetings or phone calls.

Outreach to eligible jurisdictions included notification prior to all public meetings, phone call and email reminders of upcoming meetings, and invitations to complete surveys required for the planning process. Table 7 provides a summary of outreach activities utilized in this process. An example of these materials can be found in *Appendix B.*

Table 7: Outreach Efforts

Action	Intent
Planning Team Letter (30 day notification)	Informed the Planning Team of upcoming meetings.
Hazard Identification Meeting Letters (30 day notification)	Sent to participants to discuss the agenda/dates/times/locations of the first round of public meetings.
Mitigation Alternatives Meeting Letters (30 day notification)	Sent to participants to discuss the agenda/dates/times/locations of the second round of public meetings.
Neighboring Jurisdictions Letter	Informed neighboring jurisdictions about the planning effort.
Stakeholder Group Letters	Notification regarding the planning process and project meeting dates and locations.
Press Release	Sent to local newspapers to describe the purpose of the plan.
Notification Phone Calls	Potential participants were called to remind them about upcoming meetings.
Project Website	Posted Meeting Dates on the JEO Hazard Mitigation Planning Website.
Follow-up Emails and Phone Calls	Correspondence was provided to remind and assist participating jurisdictions with the collection and submission of required local data.
Meeting Flyer	Flyers were posted announcing meeting date and locations. Flyers were posted at multiple locations throughout all counties.
Word-of-Mouth	Staff discussed the plan with jurisdictions throughout the planning process.

Public Involvement and Outreach

At the beginning of the planning process, the planning team worked to identify stakeholder groups that could serve as "hubs of communication" throughout the planning process. A wide range of stakeholder groups were contacted and encouraged to participate.

The following groups were invited to participate in the planning process.

Table 8: Stakeholder Groups Contacted

Organization	Name	Title	Participation Summary
Red Cross	Ken Bruce	Board Chairperson	None
Southwest Nebraska CERT& South Central Regional CERT	Patrick Gerdes	Director	None
Franklin County Memorial Hospital	-	CEO	None
Harlan County Health	Manuela Wolf	CEO	None
McCook Community Hospital	James Ulrich	CEO	None
Tri-Valley Health System	Mark Harpst	-	Attended Hazard ID Meeting
Golden Living Center – Franklin	-	Director	None
Beaver City Manor	-	Director	None
Cambridge Manor	Joyce Deaver	Administrator	None
Tri-Valley Assisted Living	Deanna Weaver	Administrator	None

Organization	Name	Title	Participation Summary
Good Samaritan Society – Arapahoe	-	Administrator	None
Good Samaritan Society – Alma	Charles Wolfe	Environmental Services	None
Hillcrest Nursing Home	Renee Wright	B.O.M.	None
West Central Nebraska Area Agency on Aging	-	Executive Director	None
South Central Area Agency on Aging	Rod Horsley	Executive Director	None
Nebraska Resource and Referral System	Charlotte Lewis	Director	None
Twin Valleys PPD	David Custer	Director of Operation	Attended and presented at Hazard ID Meeting
Southern Power District	Rick Dean	Franklin Area Manager	None
NPPD – McCook	Stan Clouse	Account Manager	None
McCook PPD	Jim Florke	General Manager	None
South Central Economic Development	Charlie Wallace		Attended Hazard ID Meeting
Furnas/Harlan Partnership	-	Executive Director	None
McCook Economic Development Corporation	Rex Nelson	Executive Director	None
McCook Chamber of Commerce	Tacie Fawver	Executive Director	None
Cambridge Chamber of Commerce	Pam Westadt/Lisa Ruf	Co-President	None
Alma Chamber of Commerce	Tom Moultin	President	None
Arapahoe Chamber of Commerce	Lori Moor	President	None
Orleans Chamber of Commerce	-	President	None
St. Patrick Elementary	Rebecca Redl	Principal	None
Victory Christian Academy	-	Principal	None

Assessment of Risk

Hazard Identification

Quad Counties is vulnerable to a wide array of natural and man-made or technological hazards that threaten life and property. At the hazard identification meetings, the planning team reviewed a number of hazards consistent with the Nebraska State Hazard Mitigation Plan to conduct further risk and vulnerability assessments based on these hazards' previous occurrence and the communities' exposure to the various hazards (for a complete list of hazards reviewed see *Section Four*).

Table 9 shows the date and location of meetings held for the Hazard Identification phase of the project.

Table 9: Hazard Identification Meeting

Location and Time	Agenda Items
June 4, 2015	
Oxford, NE 7 PM	General overview of the HMP planning process, discuss participation requirements, begin the process of risk assessment and impact reporting, and update critical facilities

June 25, 2015	
Bartley, NE 1 PM	General overview of the HMP planning process, discuss participation requirements, begin the process of risk assessment and impact reporting, and update critical facilities

The intent of these meetings was to provide the public and jurisdictional representatives with an overview of the work to be completed over the next several months and discuss what types of information would need to be provided to complete the plan. Information regarding the completion of project worksheets, data required for the update process, and the project schedule was provided to each jurisdiction. This information was distributed to provide an opportunity to gather input on the identification of hazards, records of historical occurrences, establishment of goals and objectives, and potential mitigation alternatives from jurisdictional representatives (refer to *Appendix B*). Meeting attendees are identified in Table 10. Communities that were unable to attend the Hazard Identification Meetings attended make up meetings in-person or over the phone.

Table 10: Hazard Identification Meeting Attendees

Name	Jurisdiction	Title
Ed Brickman	City of Franklin	Chief of Police
Jerry Archer	Franklin County	Sheriff/ Emergency Manager
David Pedersen	Franklin County	County Supervisor
Duane Hoffman	Village of Oxford	Public Works Director
Richard Blake	Village of Naponee	Board Chairman
Lonny Hanna	Harlan County	County Supervisor
Doug Wilson	City of Alma	City Administrator
Chris Becker	Harlan County	Sheriff/ Emergency Manager
Charlie Curyn	Arapahoe Public Schools	Superintendent
Dale Fults	Twin Valleys PPD	Board Member
Charles Wolfe	Alma Good Samaritan Society	Environmental Services
Diana Wilkinson	Red Willow County	Deputy Emergency Manager
Alan Kotschwar	Red Willow County	Emergency Manager
Roger Powell	Furnas County	Emergency Manager
Ron Brown	Village of Holbrook	Superintendent
Tiffany Hock	Village of Holbrook	Clerk/Treasurer
Shirley Axtell	Village of Danbury	Clerk/Treasurer
Eugene Axtell	Village of Danbury	Board Chairperson
Gary Crawford	Village of Republican City	Board Member
David Custer	Twin Valley PPD	Director of Operations
Angie Woodring	City of Beaver City	Clerk
Kelly Winz	Village of Ragan	Board Chairperson
Marc Harpham	City of McCook	Fire Chief
Charlie Wallace	South Central Economic Development Department	Community Consultant
Mark Harpst	City of Cambridge/Tri-Valley Health System	Mayor

Mitigation Plan Development

Prioritization of Mitigation Measures and Capabilities Assessment

The identification and prioritization of mitigation measures are essential components in developing effective hazard mitigation plans. At the mitigation strategies meetings, participating jurisdictions reviewed mitigation strategies identified in previous planning efforts, as well as new actions identified as needs during this planning process. In addition to reviewing and prioritizing mitigation strategies, participating jurisdictions reviewed their capacity to implement these strategies.

Participating jurisdictions were also asked to review the information collected related to their community through this planning process. Local planning teams were asked to ensure all information included was up to date and accurate. Information/data reviewed include (but was not limited to): local risk assessment results; identified critical facilities and their location within the community; concentrations of populations identified as 'highly vulnerable'; future development areas; and expected growth trends (refer to *Appendix C*).

Table 11 shows the date and location of the meeting held for the Mitigation Strategies phase of this plan.

Table 11: Mitigation Strategy Meeting

Location and Time	Agenda Items
October 20, 2015	
Oxford, NE 6 PM	Review of previously selected mitigation actions, identification mitigation actions, capabilities assessment, review of local data

Meeting attendees are identified in Table 12. Communities that were unable to attend the Mitigation Strategy Meeting attended make up meetings in-person or over the phone.

Table 12: Mitigation Strategy Meeting Attendees

Name	Jurisdiction	Title
Marc Harpham	City of McCook	Fire Chief
Alan Kotschwar	Red Willow County	Sheriff/Emergency Manager
Diana Wilkinson	Red Willow County	Deputy Emergency Manager
Angie Woodring	City of Beaver City	City Clerk
Roger Powell	Furnas County	Emergency Manager
Missy Waldo	Republican City	Clerk/Treasurer
Kent Tidyman	Village of Edison	Mayor
Duane Hoffman	Village of Oxford	Public Works Director
Chris Becker	Harlan County	Emergency Manager
Dale Sprague	Village of Huntley	Board Member
Doug Wilson	City of Alma	City Administrator
Dale Casper	City of Hildreth	Superintendent
Leighton Schmidt	City of Beaver City	Mayor
Kandra Kinne	City of Cambridge	City Clerk
David Houghtelling	City of Cambridge	Utility Supervisor
Mark Harpst	City of Cambridge	Mayor
Mike Ingram	City of Franklin	Highway Superintendent
Lisa Howsden	Village of Huntley	Treasurer
David Snodgrass	Village of Orleans	Board Member
Jerry Archer	Franklin County	Sheriff/Emergency Manager
Charlie Curnyn	City of Arapahoe	Arapahoe Public Schools
Donn Williamson	Village of Stamford	Board Member
Richard Blake	Village of Naponee	Board Chair

Name	Jurisdiction	Title
Lana Dake	Village of Orleans	Board Chair
Ed Brickman	City of Franklin	Police Chief
Nate Schneider	City of McCook	City Manager

Plan Integration

Effective hazard mitigation planning requires the review and inclusion of a wide range of data, documents, plans, and studies. The following table identifies many of the sources utilized during this planning process.

Table 13: General Plans, Documents, and Information

Documents	Source
Disaster Mitigation Act of 2000 (DMA)	http://www.fema.gov/media-library/assets/documents/4596?id=1935
Final Rule (2007)	http://www.fema.gov
Local Mitigation Planning Handbook (2013)	http://www.fema.gov/media-library-data/20130726-1910-25045-9160/fema_local_mitigation_handbook.pdf
Hazard Mitigation Assistance Unified Guidance (2015)	https://www.fema.gov/media-library/assets/documents/103279
What is a Benefit: Guidance on Benefit-Cost Analysis on Hazard Mitigation Projects	http://www.fema.gov/benefit-cost-analysis
The Census of Agriculture (2012)	http://www.agcensus.usda.gov/
National Flood Insurance Program Community Status Book (2014)	http://www.fema.gov/cis/NE.html
Local Mitigation Plan Review Guide (2013)	http://www.fema.gov
Plans/Studies	**Source**
Nebraska Drought Mitigation and Response Plan (2000)	http://carc.nebraska.gov/docs/NebraskaDrought.pdf
State of Nebraska Hazard Mitigation Plan (2014)	http://www.nema.ne.gov/pdf/hazmitplan.pdf
Nebraska Geological Survey Landslide Study (2006)	http://snr.unl.edu/csd/surveyareas/geology.asp
Community Comprehensive Plans/Zoning and Subdivision regulations	From respective communities
Data Sources/Technical Resources	**Source**
Federal Emergency Management Agency	http://www.fema.gov
United States Department of Commerce	http://www.commerce.gov/
National Oceanic Atmospheric Administration	http://www.noaa.gov/
National Environmental Satellite, Data, and Information Service	http://www.nesdis.noaa.gov/
National Climatic Data Center	http://www.ncdc.noaa.gov
Storm Prediction Center Statistics	http://www.spc.noaa.gov
United States Geological Survey	http://www.usgs.gov/
United States Department of Agriculture	http://www.usda.gov
United States Department of Agriculture – Risk Assessment Agency	http://www.rma.usda.gov
National Agricultural Statistics Service	http://www.nass.usda.gov/
High Plains Regional Climate Center	http://www.hprcc.unl.edu
United States Census Bureau	http://www.census.gov
National Flood Insurance Program	http://www.fema.gov http://dnrdata.dnr.ne.gov

National Flood Insurance Program Bureau and Statistical Agent	http://www.fema.gov/national-flood-insurance-program
FEMA Map Service Center	http://www.msc.fema.gov
National Drought Mitigation Center – Drought Monitor	http://drought.unl.edu/dm/monitor.html
National Drought Mitigation Center – Drought Impact Reporter	http://www.droughtreporter.unl.edu
National Historic Registry	http://www.nps.gov/nr
United States Small Business Administration	http://www.sba.gov
Nebraska Emergency Management Agency	http://www.nema.ne.gov
Nebraska Climate Assessment Response Committee	http://carc.agr.ne.gov
Nebraska Department of Natural Resources	http://www.dnr.ne.gov
Nebraska Department of Natural Resource – GIS	http://dnrdata.dnr.ne.gov
Nebraska Department of Natural Resources – Dam Inventory	http://dnrdata.dnr.ne.gov/Dams/Search.aspx?mode=county
Nebraska Department of Natural Resources – Soils Data	http://www.dnr.ne.gov/databank/soilsall.html
Natural Resources Conservation Service	www.ne.nrcs.usda.gov
Nebraska Forest Service	http://www.nfs.unl.edu/
Nebraska Forest Service – Wildland Fire Protection Program	http://nfs.unl.edu/program-wildlandfireprotection.asp
Nebraska Association of Resources Districts	http://www.nrdnet.org
Nebraska Public Power District Service	http://sites.nppd.com
Nebraska Department of Revenue – Property Assessment Division	www.revenue.ne.gov/PAD
UNL – College of Agricultural Sciences and Natural Resources – Schools of Natural Resources	http://casnr.unl.edu
High Hazard Dam Inundation Area/Information	http://dnr.ne.gov/website

Plan Adoption

Based on FEMA requirements, this multi-jurisdictional Hazard Mitigation Plan must be formally adopted by each participant through approval of a resolution. This approval will create individual ownership of the plan by each participant. Formal adoption provides evidence of a participant's full commitment to implement the plan's goals and objectives and action items.

> ***Requirement §201.6(c)(5)****: For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.*

Once adopted, participants are responsible for implementing and updating the plan every five years. In addition, the plan will need to be reviewed and updated annually or when a hazard event occurs that significantly affects the area or individual participants. Copies of resolutions approved by each participant are located in *Appendix A.*

Plan Implementation and Progress Monitoring

Hazard mitigation plans need to be living documents. To ensure this, the plan must be monitored, evaluated, and updated on a five-year or less cycle. This includes incorporating the mitigation plan into county and local comprehensive or capital improvement plans as they are developed. *Section Six* describes the system that participating jurisdictions in the Quad Counties have established to monitor the plan; provides a description of how, when, and by whom the HMP process and mitigation actions will be evaluated; presents the criteria used to evaluate the plan; and explains how the plan will be maintained and updated.

Section Three: Regional Profile and Asset Inventory

INTRODUCTION

It is vitally important to understand the people and built environment within the planning area in order to identify vulnerabilities. This section provides an overall profile of the planning area including: geography, demographics, structural inventory, and agricultural assets.

PLANNING AREA GEOGRAPHIC SUMMARY

The planning area covers a total of 2,589 square miles in south central Nebraska. The planning area includes Franklin, Furnas, Harlan, and Red Willow counties. These counties are located in the southern plains of Nebraska. The planning area is comprised of two different topographic regions: dissected plains, and plains. Dissected plains are represented by hilly lands with moderate to steep slopes and sharp ridge crests. They are remnant of the old plain eroded by water and wind. These flat lying lands above the valley are made from materials of sandstone or stream-deposited silt, clay sand, and gravel overlain by wind-deposited silt. Plains are represented by flat-lying land above the valley are made from materials of sandstone or stream-deposited silt, clay sand and gravel overlain by wind-deposited silt. The planning area is part of the Republican River Basin. This region has proven it can be used for crop agriculture when irrigation is available, and supports ranching and cattle operations.

DEMOGRAPHICS

Demographic and asset information can be used to determine differing levels of vulnerability by analyzing data on population and housing, structural inventories and valuations, critical facilities, and highly vulnerable areas and populations for each participating jurisdiction.

DEMOGRAPHIC CHANGES

As populations change, either growing or declining, the vulnerability of the community is impacted. If a community experiences rapid growth it may lack sufficient resources to adequately provide services for all members of the community in a reasonable timeframe. Examples of potential growth related complications include: insufficient snow removal and roadway maintenance; lack of emergency storm shelters in vulnerable areas; inability to complete repairs to damaged infrastructure; and difficulty tracking the location of vulnerable populations. Communities experiencing population decline may be more vulnerable to hazards due to: vacant and/or dilapidated structures; an inability to properly maintain critical facilities and/or infrastructure; and higher levels of unemployment and populations living in poverty. It is important for communities to monitor their population changes and ensure that those issues are incorporated into hazard mitigation plans, as well as other planning mechanisms within the community, such as comprehensive plans.

The following tables summarize various population characteristics such as: population trends; population by age; at risk populations; care facilities; and educational facilities.

In general, the planning area is rural with some urban areas. According to the US Census, the regional population for 2010 was 22,662 persons. This represents a decline of more than six percent from the 2000 census. The region accounts for just over one percent the total population for the state (2010 census).

Table 14 provides a summary of population from 2000, 2010, and an estimate for 2014. The percent change (2000 - 2010) was utilized to project the population for 2020. This is a relatively simple method to predict

population change and it does not account for predominant age cohorts in the community, birth and death rates, or in and out migration which will likely impact the rate of growth or decline.

Table 14: Population Trends 2000-2010

Jurisdiction	2000 Population	2010 Population	2014 Population (estimated)	% Change (2000 – 2010)	2020 Projected Population
Franklin County (Total)	3,574	3,225	3,076	-9.8%	2,909
Bloomington	124	103	-	-16.9%	86
Campbell	387	347	-	-10.3%	311
Franklin	1,026	1,000	-	-2.5%	975
Hildreth	370	378	-	2.2%	386
Naponee	132	106	-	-19.7%	85
Riverton	145	89	-	-38.6%	34
Upland	179	143	-	-20.1%	114
Furnas County (Total)	5,324	4,959	4,888	-7%	4,612
Arapahoe	1,028	1,026	-	-0.2%	1,024
Beaver City	641	609	-	-5%	579
Cambridge	1,041	1,063	-	2.1%	1,085
Edison	154	133	-	-13.6%	115
Holbrook	225	207	-	-8%	190
Oxford	876	779	-	-11.1%	693
Wilsonville	118	93	-	-21.2%	73
Harlan County (Total)	3,786	3,423	3,492	-9.6%	3,094
Alma	1,214	1,133	-	-6.7%	1,057
Huntley	67	44	-	-34.3%	29
Orleans	425	386	-	-9.2%	350
Ragan	46	38	-	-17.4%	31
Republican City	209	150	-	-28.2%	108
Stamford	202	183	-	-9.4%	166
Red Willow County (Total)	11,448	11,055	10,867	-3.4%	10,679
Bartley	355	283	-	-20.2%	226
Danbury	127	101	-	-20.5%	80
Indianola	642	584	-	-9%	531
Lebanon	70	80	-	14.3%	91
McCook	7,994	7,698	-	-3.7%	286
County Totals	**24,132**	**22,662**	**22,323**	**-6.1**	**21,280**

Source: United States Census Bureau – 2000, 2010

Across the planning area 13 of the 28 jurisdictions (Bloomington, Campbell, Naponee Riverton, Upland Edison, Oxford, Wilsonville, Huntley, Ragan, Republican City, Bartley, and Danbury) have experienced population decline greater than 10 percent. Of those 13, seven jurisdictions (Riverton, Upland Wilsonville, Huntley, Republican City, Bartley, and Danbury) are experiencing population decline greater than 20 percent. Two of the jurisdictions (Riverton and Huntley) are experiencing population decline greater than 30 percent. As communities experience rapid population decline, they become more vulnerable to the impacts from hazards. Declining populations often result in higher rates of empty or vacant properties, declining or poorly maintained infrastructure, and reduced response and recovery capabilities.

Across the planning area only one of the 28 jurisdictions (Lebanon) is experiencing population growth greater than 10 percent.

AT RISK POPULATIONS

In general, at risk populations may have difficulty with medical issues, poverty, extremes in age, and communications due to language barriers. Several principles may be considered when discussing potentially at risk populations, including:

- Not all people who are considered "at risk" are at risk
- Outward appearance does not necessarily mark a person as at risk
- A hazard event will, in many cases, impact at risk populations in different ways

The National Response Framework defines at risk populations as "…populations whose members may have additional needs before, during, and after an incident in functional areas, including but not limited to: maintaining independence, communication, transportation, supervision, and medical care."

Table 15 provides a breakdown of the population by age. The table shows that the largest demographic cohort for the planning area is that of residents between the ages of 35 and 54 years. Minors (ages 0 to 19) constitute an estimated 25 percent of the population while seniors (ages 65 and older) comprise approximately 22 percent of the total population.

Table 15: Population by Age

Jurisdiction	< 9	10 -19	20 - 34	35 - 54	55 - 64	65 - 84	> 85	Median	Total
Franklin County	349	410	379	838	477	643	129	48.4	3,225
	11%	13%	12%	26%	15%	20%	4%		100%
Bloomington	11	7	13	26	20	24	2	51.5	103
	11%	7%	13%	25%	19%	23%	2%		100%
Campbell	43	34	47	80	46	76	21	49.3	347
	12%	10%	14%	23%	13%	22%	6%		100%
Franklin	124	130	112	226	133	206	69	48.5	1,000
	12%	13%	11%	23%	13%	21%	7%		100%
Hildreth	37	46	63	101	63	70	8	46.4	378
	10%	12%	17%	27%	17%	19%	2%		100%
Naponee	6	13	12	27	13	32	3	52	106
	6%	12%	11%	25%	12%	30%	3%		100%
Riverton	6	11	9	22	17	23	1	51.8	89

Jurisdiction	< 9	10 -19	20 - 34	35 - 54	55 - 64	65 - 84	> 85	Median	Total
	7%	12%	10%	25%	19%	26%	1%		100%
Upland	16	25	18	49	19	16	0	42.5	143
	11%	17%	13%	34%	13%	11%	0%		100%
Furnas County	570	685	552	1,262	763	933	194	47.4	4,959
	11%	14%	11%	25%	15%	19%	4%		100%
Arapahoe	122	148	133	264	117	178	64	46.3	1,026
	12%	14%	13%	26%	11%	17%	6%		100%
Beaver City	79	76	76	130	90	130	28	47.1	609
	13%	12%	12%	21%	15%	21%	5%		100%
Cambridge	136	129	121	234	164	214	65	47.6	1,063
	13%	12%	11%	22%	15%	20%	6%		100%
Edison	18	15	20	39	19	20	2	45.4	133
	14%	11%	15%	29%	14%	15%	2%		100%
Holbrook	25	21	40	51	32	35	3	43.8	207
	12%	10%	19%	25%	15%	17%	1%		100%
Oxford	90	118	93	221	103	102	18		779
	12%	15%	12%	28%	13%	13%	2%		100%
Wilsonville	4	13	7	26	21	21	1	54.1	93
	4%	14%	8%	28%	23%	23%	1%		100%
Harlan County	368	429	388	880	553	683	122	49.2	3,423
	11%	13%	11%	26%	16%	20%	4%		100%
Alma	133	139	115	266	161	248	71	49.6	1,133
	12%	12%	10%	23%	14%	22%	6%		100%
Huntley	2	10	4	20	8	0	0	47	44
	5%	23%	9%	45%	18%	0%	0%		100%
Orleans	30	41	46	104	56	94	15	50	386
	8%	11%	12%	27%	15%	24%	4%		100%
Ragan	1	6	1	17	6	7	0	50.5	38
	3%	16%	3%	45%	16%	18%	0%		100%
Republican City	11	11	15	21	34	53	5	59.8	150
	7%	7%	10%	14%	23%	35%	3%		100%
Stamford	21	32	16	46	19	42	7	45.5	183
	11%	17%	9%	25%	10%	23%	4%		100%
Red Willow County	1,377	1,525	1,870	2,819	1,392	1,720	352	41.8	11,055
	12%	14%	17%	25%	13%	16%	3%		100%
Bartley	27	36	43	71	34	59	13	47.4	283

Jurisdiction	< 9	10 -19	20 - 34	35 - 54	55 - 64	65 - 84	> 85	Median	Total
	10%	13%	15%	25%	12%	21%	5%		100%
Danbury	11	11	10	32	13	21	3	48.3	101
	11%	11%	10%	32%	13%	21%	3%		100%
Indianola	64	93	79	165	90	88	5	42.8	584
	11%	16%	14%	28%	15%	15%	1%		100%
Lebanon	11	11	17	21	11	9	0	36.5	80
	14%	14%	21%	26%	14%	11%	0%		100%
McCook	1,019	1,017	1,386	1,864	908	1,194	310	40.7	7,698
	13%	13%	18%	24%	12%	16%	4%		100%
Total	***2,664***	***3,049***	***3,189***	***5,799***	***3,185***	***3,979***	***797***	***46.7***	***22,662***
	12%	***13%***	***14%***	***26%***	***14%***	***18%***	***4%***		***100%***

Source: United States Census Bureau – 2010

Community specific demographics that have a significant deviation from the regional data include the village of Naponee which has an approximate 33 percent of their population age 65 or greater, and the village of Republican City which has an approximate 38 percent of their population age 65 or greater,

Residents under the age of 18 experience higher levels of vulnerability related to hazards for a range of reasons. General vulnerabilities that can be identified for this group include: lack of independent transportation, significant concentrations of the demographic during daytime hours (attending schools), and the potential for greater impacts resulting from environmental stimuli (chemical release, extreme temperatures, contamination of air/water). As a result this demographic group experiences increased vulnerability to the following list of hazards: tornados (especially daytime events), severe thunderstorms, severe winter storms, extreme heat, water shortage created by drought, and chemical releases. Lack of awareness can be a concern for people in this age range as well as an inability to evaluate and respond to environmental stimuli. This lack of awareness could lead to increased vulnerability to flooding (especially flash flooding).

There are a number of school districts within the planning area. Schools house a high number of "at risk" residents within the planning area during the daytime hours of weekdays as well as during special events on evenings and weekends. The following table identifies the various schools located within the planning area.

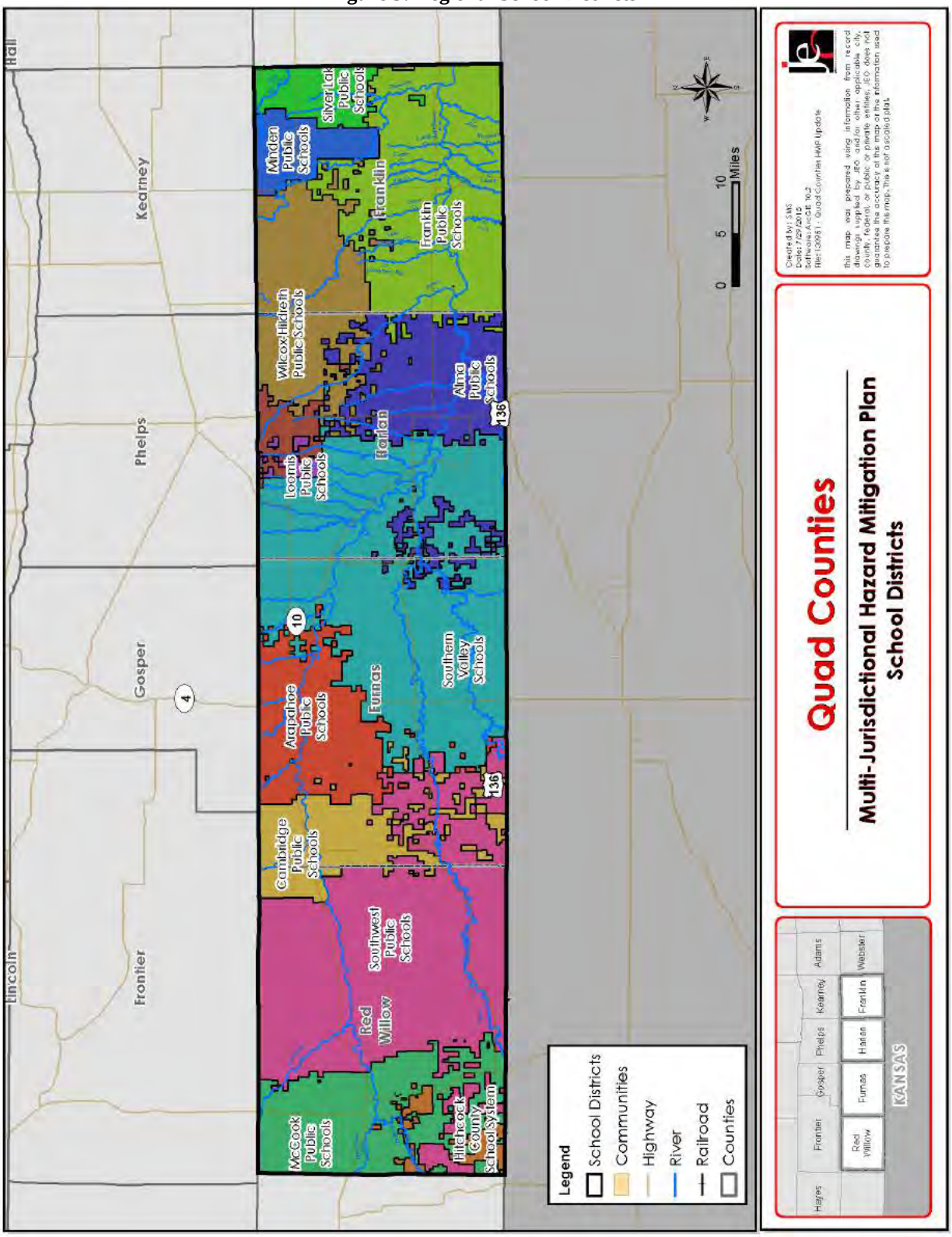
Table 16: School Inventory

School, College, or University	Total Enrollment (2014-2015 School Year)	Staff and Faculty (2014-2015 School Year)	Structural Valuation (2014-2015 School Year)
Franklin County			
Franklin Secondary School	159	21	$6,861,100
Franklin Elementary School	148	16	$6,861,100
Furnas County			
Arapahoe High School	131	35	$6,254,696.50
Arapahoe Elementary School	200	35	$6,254,696.50
Cambridge High School	162	22	$8,887,800

School, College, or University	Total Enrollment (2014-2015 School Year)	Staff and Faculty (2014-2015 School Year)	Structural Valuation (2014-2015 School Year)
Cambridge Elementary School	166	17	$8,887,800
Southern Valley Jr/Sr High	230	23	$13,592,167
Southern Valley Elementary School	232	20	$13,592,167
Harlan County			
Alma High School	119	15	$7,209,540
Alma Elementary School	160	19	$7,209,540
Red Willow			
McCook Senior High School	484	34	$9,0468,968
McCook Junior High School	315	28	$9,0468,968
McCook Elementary School	425	35	$9,0468,968
Central Elementary School	213	16	$9,0468,968
Southwest Elementary – Indianola	155	30	$9,502,010
Southwest Jr/Sr High School	144	35	$9,502,010
St. Patrick's Elementary School	182	17	Unknown
McCook Community College	851*	121	Unknown

**Students enrolled as full time at Mid-Plains Community College of which McCook Community College is a part.*
Source: Nebraska Department of Education

Figure 3: Regional School Districts



Like minors, seniors (age 65 and greater) are often times more significantly impacted by temperature extremes. During prolonged heat waves seniors may lack resources to effectively address the hazards and as a result may incur injury or potentially death. Prolonged power outages (either standalone events or as the result of other contributing factors) can have significant impacts on any citizen relying on medical devices for proper bodily functions. One study conducted by the Center for Injury Research and Policy found increases in vulnerability related to severe winter storms (with significant snow accumulations) beginning at age 55. The 2011 study found that on average there are 11,500 injuries and 100 deaths annually related to snow removal. People, especially males, over the age of 55 are 4.25 times more likely to experience cardiac distress symptoms during snow removal.

While the previously identified populations live throughout the planning area, there is the potential that they will be located in higher concentrations at care facilities. The following table identifies the location and capacity of care facilities throughout the planning area.

Table 17: Inventory of Care Facilities

Jurisdiction	Number of Hospitals	Number of Hospital Beds	Adult Care Home	Adult Care Beds	Assisted Living Homes	Assisted Living Beds	Child Care Facilities/ Preschools
Franklin County	1	14	1	42	1	18	4
Furnas County	1	25	3	92	3	51	6
Harlan County	1	19	1	53	1	16	3
Red Willow County	1	25	1	100	3	74	34

Source: Nebraska Department of Health and Human Services

In addition to residents classified as at risk by age, there are other specific groups within the planning area that experience vulnerabilities related to their ability to communicate or their economic status. Table 18 provides statistics per county regarding households with English as a second language (ESL) and population reported as in poverty within the past 12 months.

Table 18: At Risk Populations

County	English as a Second Language	Percent of Total Population	Population Below Poverty Level	Percent of Total Population
Franklin County	58	1.9%	411	12.9%
Furnas County	99	2.1%	798	16.2%
Harlan County	89	2.7%	417	12.1%
Red Willow County	269	2.6%	1,399	12.7%

Source: Language Spoken at Home: 2009 – 2013 ACS 5-year estimate, Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate

Residents who speak English as a second language may struggle with a range of issues before, during, and after hazard events. General vulnerabilities revolve around what could be an inability to effectively communicate with others or an inability to comprehend materials aimed at notification and/or education. When presented with a hazardous situation it is important that all community members are able to receive, decipher, and act on relevant information. An inability to understand warnings and notifications may prevent not native English speakers from reacting in a timely manner. Further, often times educational materials related to regional hazards are developed in the dominant language for the area. The planning area's dominant language is English. Residents who struggle with English in the written form may not have

sufficient information related to local concerns to effectively mitigate potential impacts. Residents with limited English proficiency are at an increased vulnerability to all hazards within the planning area.

Residents living below the poverty line may lack resources to prepare for, respond to, and/or recover from hazard events. Residents with limited economic resources may struggle to prioritize the implementation of mitigation measures over more immediate needs. Further, residents with limited economic resources are more likely to live in older, more vulnerable structures. These structures could be: mobile homes; located in the floodplain; located near known hazard sites (i.e. chemical storage areas); or older poorly maintained structures. Residents living below the poverty line will be more vulnerable to all hazards within the planning area.

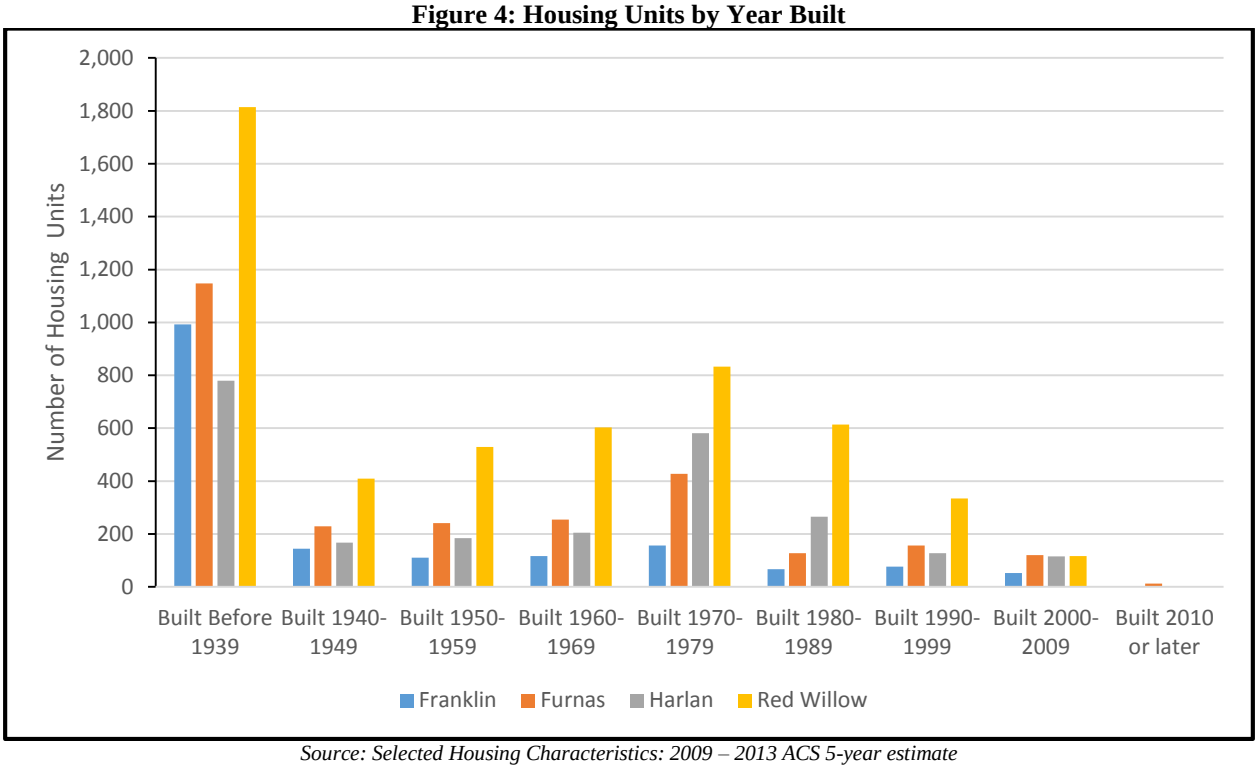
BUILT ENVIRONMENT AND STRUCTURAL INVENTORY

Data related to the built environment is an important component of a hazard mitigation plan. It is essential that during the planning process communities and participating jurisdictions display an understanding of their built environment and work to identify needs that may exist within their planning area. This section includes: inventory of housing units by year built; percent of owner occupied housing; percent of renter occupied housing; percent of vacant housing; selected housing characteristics; properties included on the National Historic Registry; regional inventory of critical facilities; state and federally owned properties; and community specific structural inventories.

HOUSING STATISTICS

Figure 4 displays the age of housing units across the planning area. Over 65 percent of the housing units within the planning area were constructed before 1960s. The first state building codes were adopted in 1987. Prior to this time, codes and building standards were established (or not) by each county and community. The State of Nebraska later adopted the IBC 2000 codes (adopted in 2003) and most recently updated code requirements to the IBC 2009 codes (adopted in 2010). Structures built prior to 1987 (or 1990 for the data provided in this document) may have been built to standards less restrictive and potentially less sturdy than what is required for structures since that time. According to the Department of Housing and Urban Development (HUD), older homes are at greater risk of poor repair and dilapidation resulting in blighted or substandard properties. This is significant in assessing hazard vulnerability because these housing units may result in living quarters that are prone to higher damages during disaster events which include high winds, tornados, hail, severe thunderstorms, and severe winter storms. For the planning area 96 percent of housing units were built prior to 1990 when IBC codes were first introduced across the state.

Figure 4: Housing Units by Year Built



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Housing occupancy has a direct correlation to mitigation planning. It is generally accepted that housing units that are occupied are better maintained and less likely to contribute to dangerous or hazardous situations. Owner occupied is generally better maintained and updated. Rental housing may not receive many of the updates and retrofits required for hazard resilience. Multi-family rental units may present specific concerns (such as lack of storm shelters). Vacant homes are more likely to become derelict or fall into disrepair over time. This tendency can result in higher levels of vulnerability for communities. If vacant homes deteriorate, they can be more easily damaged or destroyed during hazard events (specifically high winds, thunderstorms, and tornados). This can result in materials that were once homes becoming projectiles and wind-borne debris. Wind-borne debris can injury people, damage vehicles and other structures, as well as creating a post impact environment where debris management is intensified.

Table 19 provides occupancy and tenure for housing units in the planning area. According to 2009-2013 ACS 5 year estimates, there are 12,117 housing units in the planning area. Of the 12,117 housing units, 82 percent of housing units are occupied. Of the occupied housing units, more than 25 percent are renter occupied.

Table 19: Housing Occupancy and Tenure

Jurisdiction	Total Housing Units				Occupied Housing Units			
	Occupied		Vacant		Owner		Renter	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Franklin County	1,398	81.2%	323	18.8%	1,149	82.2%	249	17.8%
Bloomington	58	90.6%	6	9.4%	35	60.3%	23	39.7%
Campbell	123	69.9%	53	30.1%	101	82.1%	22	7.9%

Jurisdiction	Total Housing Units				Occupied Housing Units			
	Occupied		Vacant		Owner		Renter	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Franklin	454	86.8%	69	13.2%	376	82.8%	78	17.2%
Hildreth	199	84.7%	36	15.3%	175	87.9%	24	12.1%
Naponee	51	56%	40	44%	40	78.4%	11	21.6%
Riverton	60	84.5%	11	15.5%	52	86.7%	8	13.3%
Upland	60	77.9%	17	22.1%	55	91.7%	5	8.3%
Furnas County	2,215	81.6%	501	18.4%	1,602	72.3%	613	27.7%
Arapahoe	454	90.8%	46	9.2%	315	69.4%	139	30.6%
Beaver City	287	72.5%	109	27.5%	216	75.3%	71	24.7%
Cambridge	506	87.1%	75	12.9%	331	65.4%	175	34.6%
Edison	40	50.6%	39	49.4%	35	87.5%	5	12.5%
Hendley	18	90%	2	10%	16	88.9%	2	11.1%
Holbrook	62	81.6%	14	18.4%	52	83.9%	10	16.1%
Oxford	416	83.9%	80	16.1%	316	76%	100	24%
Wilsonville	53	47.7%	58	52.3%	53	100%	0	0%
Harlan County	1,573	64.8%	853	35.2%	1,226	77.9%	347	27.7%
Alma	528	87.9%	73	12.1%	387	73.3%	141	26.7%
Huntley	13	37.1%	22	62.9%	13	100%	0	0%
Orleans	191	75.2%	63	24.8%	151	79.1%	40	20.9%
Ragan	16	88.9%	2	11.1%	11	68.8%	5	31.3%
Republican City	109	46.2%	127	53.8%	93	85.3%	16	14.7%
Stamford	87	82.9%	18	17.1%	80	92%	7	8%
Red Willow County	4,732	90.1%	522	9.9%	3,377	71.4%	1,355	28.6%
Bartley	124	74.3%	43	25.7%	101	81.5%	23	18.5%
Danbury	47	83.9%	9	16.1%	44	93.6%	3	6.4%
Indianola	309	85.6%	52	14.4%	241	78%	68	22%
Lebanon	29	56.9%	22	43.1%	21	72.4%	8	27.6%
McCook	3,345	93.1%	248	6.9%	2,279	68.1%	1,066	31.9%
Total	**9,918**	**81.9%**	**2,199**	**18.1%**	**7,354**	**74.2%**	**2,564**	**25.8%**

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

The Census provides some additional information related to housing units and potential areas of vulnerability. This information is taken from the 2009 – 2013 ACS 5-year estimate data regarding selected housing characteristics. The selected characteristic examined in Table 20 include: lack of complete

plumbing facilities, lacking complete kitchen facilities, no telephone service available, housing units that are mobile homes, and housing units with no vehicles.

Table 20: Selected Housing Characteristics

	Franklin County	Furnas County	Harlan County	Red Willow County	Total
Occupied housing units	**1,149**	**1,602**	**1,226**	**3,377**	**7,354**
Lacking complete plumbing facilities	13 (0.9%)	8 (0.4%)	2 (0.1%)	21 (0.4%)	44 (0.6%)
Lacking complete kitchen facilities	18 (1.3%)	31 (1.4%)	2 (0.1%)	51 (1.1%)	102 (1.4%)
No telephone service available	25 (1.8%)	33 (1.5%)	32 (2.0%)	57 (1.2%)	147 (2.0%)
Mobile Homes*	60 (3.5%)	104 (3.8%)	557 (23.0%)	328 (6.2%)	1,049 (8.7%)
Housing Unit with No vehicles available	52 (3.7%)	112 (5.1%)	51 (3.2%)	127 (2.7%)	342 (4.7%)

**Indicated percentage is determined based on total housing units*
Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Approximately two percent of housing units lack access to landline telephone service. This does not necessarily indicate that there is not a phone in the housing unit, as cellular telephones are increasingly a primary form of telephone service. However, this lack of access to landline telephone service does represent a population at increased risk to disaster impacts. Franklin, Furnas, and Harlan Counties offer the Code Red Program for their residents. One advantage of Code Red over a Reverse 911 system is the ability to add cellular telephones to the database to provide warnings to those who sign up for the program.

Approximately five percent of housing units have no vehicle available. The lack of a vehicle can cause evacuation to be difficult. Households without a vehicle will need transportation provided by the local jurisdictions or they will not be able to evacuate during a hazard event. The lack of a vehicle also makes it difficult to acquire resources when needed.

Over eight percent of housing units in the planning area are mobile homes. Mobile homes are at a higher risk of sustaining damages during high wind events, tornados, severe thunderstorms, and severe winter storms. Mobile homes that are either not anchored or are anchored incorrectly can be overturned by 60 mph winds. A thunderstorm is classified as severe when wind speeds exceed 58 mph, placing improperly anchored mobile homes at risk.

NATIONAL HISTORIC REGISTRY

According to the National Register of Historic Places, below is a summary list of the historic sites located within the planning area. Detailed information of the historic sites is presented in *Section Seven: Participant Section* by participants. Structures identified as cultural or historic resources represent assets that are unique to the planning area and are, in many situations, irreplaceable and have local significance.

Table 21: National Historic Registry

County	Buildings	Site	Structure
Franklin	4	1	1
Furnas	1	0	1
Harlan	1	0	3
Red Willow	6	1	1

Source: Nebraska National Register

CRITICAL INFRASTRUCTURE/KEY RESOURCES

According to FEMA, "A critical facility is a structure that, if flooded (or damaged), would present an immediate threat to life, public health, and safety." Examples of critical facilities include hospitals, emergency operations centers, schools, wells, and sanitary sewer lift stations, etc.

Each participating jurisdiction identified critical facilities as vital for disaster response, providing shelter to the public, and as essential for returning the jurisdiction's functions to normal during and after a disaster. Critical facilities were identified during the last hazard mitigation plan development. As an update of the previous efforts, a critical facilities' survey was conducted at the 'hazard identification' public meetings through the meeting worksheets (refer to *Appendix C*) to verify whether critical facilities identified from the last plan were still current or required any removals or additions. Below is a summary of the critical facilities for the entire planning area. To view jurisdiction specific critical facility maps refer to *Section 7: Participant Sections*.

Table 22: Summary of Critical Facilities

Critical Infrastructure	# Identified	Critical Facility	# Identified
Dam	1	FSA/SCS Office	2
Power Plant/Light Plant	8	Fueling Station/Propane Storage	3
Public Power/Substation	9	Grain Elevator/Production Services	5
Pump/Transfer/Lift Station	13	Grocery Store	1
Waste Water Treatment	2	Hazardous Waste	1
Water Tower	15	Hotel	1
Well	20	Hunt Nebraska	1
Critical Facility	**# Identified**	Industry	1
4-H Building/Fairgrounds	4	Legion Hall	1
911 Center	1	Library/Museum	9
Agricultural Distribution/ Fertilizer Plant	8	MCC Campus/Dorm	2
Airport	2	Medical Office/Hospital/Clinic/ Health System	11
Auditorium/Theatre	2	Nursing Home/Senior Center	10
Ball Field/Park/Pool	5	Post Office	17
Bus Depot	2	Public Safety Center	1
Café	1	Roads Department/Building	2
Cattle Company	1	RV Park	1
Church/Hall	61	School/Development Center	22
City Hall/Village Offices	11	Shop/Maintenance/Equipment Storage	8
Courthouse	3	Soil Office	1
Dairy	1	Teaching/Friendship Center	2
Daycare	1	Telephone	1
Department of Natural Resources Field Office	1	Trailers	1
Feedlot/Feedmill	3	Water Storage	1
Fire/Rescue	19	Levee	3

STATE AND FEDERALLY OWNED PROPERTIES

The following table provides an inventory of state and federally owned properties within the planning area by county.

Table 23: State and Federally Owned Facilities

County	Facility	Nearest Community	Function
Franklin	Limestone Bluff State Wildlife Management Area	Riverton	Wildlife Management
Furnas	Oxford State Wildlife Management Area	Oxford	Wildlife Management
Harlan	Harlan County Lake	Alma	Flood Control
Harlan	South East Sacramento Wildlife Management Area	Wilcox	Wildlife Management
Harlan	South Sacramento State Wildlife Management Area	Wilcox	Wildlife Management
Red Willow	Red Willow State Wildlife Management Area	McCook	Wildlife Management

STRUCTURAL INVENTORY

The planning team requested GIS parcel data from the Assessor for each county. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in the Table 24.

Table 24: Parcel Improvements

Jurisdiction	Number of Parcels with Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Value of Improvements in Floodplain
Franklin County	1,641	$77,074,876	$46,968	$18,481,340
Bloomington	87	$1,897,335	$21,808	$66,755
Campbell	171	$5,689,061	$33,269	$83,405
Franklin	480	$18,142,190	$37,796	$1,348,375
Hildreth	185	$10,758,205	$58,152	$192,850
Naponee	82	$1,775,310	$21,650	$43,605
Riverton	68	$712,795	$10,482	$316,200
Upland	76	$2,181,370	$28,702	$0
Red Willow County	4,964	$395,185,392	$79,610	$48,269,644
Bartley	199	$13,409,180	$67,383	$6,203,263
Danbury	80	$1,752,227	$21,903	$0
Indianola	317	$13,809,199	$43,562	$10,167,075
Lebanon	57	$734,359	$12,883	$78,774
McCook	3,349	$282,705,852	$84,415	$7,342,441
Harlan County	2,381	$159,462,725	$66,973	$21,121,745

Jurisdiction	Number of Parcels with Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Value of Improvements in Floodplain
Alma	648	$36,512,975	$56,347	$144,130
Huntley	41	$1,360,790	$33,190	$160,805
Orleans	229	$8,716,395	$38,063	$237,485
Oxford*	111	$5,473,410	$49,310	Area not included in DFIRM mapping
Ragan	38	$2,983,895	$78,524	$0
Republican City	248	$10,929,225	$44,069	$0
Stamford	127	$3,216,915	$25,330	$0

Sources: Franklin County Assessor, Harlan County Assessor, Red Willow County Assessor
**Oxford sits on the county line between Harlan and Furnas Counties, included is only analysis from Harlan County*

GIS parcel data was not available for Furnas County. Data from the Nebraska Department of Revenue Property Assessment Division that provides valuations of property by sector was used for Furnas County.

Structures are categorized into the following classifications:

- **Residential**, including all residential structures: single-family dwellings, multi-family dwellings (duplexes, townhomes, and apartments), trailer homes, and retirement villages. High-Density Residential buildings, such as apartment buildings, were also identified. In this process, these were treated as residential structures.
- **Commercial/Industrial**, including all structures associated with commercial or industrial uses, such as motels, restaurants, gas stations, storage facilities, hair salons, manufacturing facilities, grain elevators, etc.
- **Public/Quasi Public**, including structures that are a part of any government facility, religious facility, non-profit organization, or community facility, such as post offices, county buildings, courthouses, city halls, fire stations, schools, churches, water treatment facilities, park facilities, etc.
- **Agricultural**, including buildings used solely for agricultural purposes in which the use is exclusively in connection with the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising of livestock.

Table 25 displays the structural valuation summaries for both the Furnas County and the jurisdictions within the county. An inventory for each jurisdiction can be found in the *Section Seven: Participant Section*.

Table 25: Furnas County Structural Valuation

Jurisdiction	Commercial/Industrial	Agriculture	Residential	Public/Quasi Public	Total
Furnas County	$24,770,560	$24,502,590	$112,912,940	$1,425,975	$163,612,065
Arapahoe	$6,531,292	$258,000	$20,582,749	$898,729	$28,270,770
Beaver City	$2,020,002	$288,000	$9,094,784	$372,098	$11,774,884
Cambridge	$4,516,566	$84,000	$24,037,291	$749,974	$29,387,831
Edison	$3,750,061	$78,000	$1382,160	$330,614	$5,540,835
Holbrook	$1,132,852	$36,000	$2,346,703	$146,548	$3,662,103

Jurisdiction	Commercial/Industrial	Agriculture	Residential	Public/Quasi Public	Total
Oxford	$4,431,946	$102,000	$14,993,004	$331,979	$19,858,929
Wilsonville	$330,134	$120,000	$1,314,919	$85,263	$1,850,316

Source: Nebraska State Property Assessment Data - 2014

AGRICULTURAL ASSET INVENTORY

Agriculture is a major component of the economy for the planning area and the rest of the state. According to the Nebraska Department of Agriculture:

- The livestock industry contributes more than $6 billion annually to the state's economy
- Farmlands across the state accounted for 92% of the state's total land area
- More than 8.3 million acres of farmland are irrigated (44% of all farmland) in 2012
- 1 in 4 jobs are related to agriculture

Identifying the agricultural assets of the planning area leads to a greater understanding of the potential impacts and extent of agricultural disease. The following tables present information from the USDA 2007 and 2012 Agricultural Census. All the counties except Harlan County experienced an increase in the number of farms from 2007 to 2012. During this same period, all counties experienced a decrease in the size of farms.

Table 26: Regional Farm Data

County	Number of Farms, 2007	Number of Farms, 2012	Percent Change	Farm Acreage, 2007	Farm Acreage, 2012	Percent Change
Franklin County	312	338	8.3%	291,515	287,684	-1.3%
Furnas County	365	389	6.6%	445,844	435,711	-2.3%
Harlan County	384	360	-6.3%	350,947	312,759	-10%
Red Willow County	386	405	4.9%	446,479	419,608	-6%
Total	**1,447**	**1,492**	**3.1%**	**1,534,785**	**1,455,762**	**-5.1%**

Source: USDA Census of Agriculture, 2012

CROP INVENTORY

The following table provide information related to the crops grown within the planning area. The data was collected from the 2012 USDA Agricultural Census. The most common crops in the area are corn, soybeans and wheat.

Table 27: Crops by County

County	Wheat (acres)	Sorghum (acres)	Soybeans (acres)	Forage (acres)	Corn (acres)
Franklin County	28,577	567	49,066	10,835	62,218
Furnas County	17,554	3,160	34,689	12,695	179,143
Harlan County	24,624	1,497	51,385	11,796	96,505
Red Willow County	55,787	5,412	16,768	18,531	71,155

Source: USDA Census of Agriculture, 2012

LIVESTOCK INVENTORY

The following table provide information related to the livestock within the planning area. The data was collected from the 2012 USDA Agricultural Census.

Table 28: Livestock Inventory by County

County	Cattle and Calves	Hogs and Pigs	Horse and Ponies	Sheep and Lambs
Franklin County	23,306	617	370	569
Furnas County	34,501	-	278	-
Harlan County	44,133	-	460	454
Red Willow County	63,124	-	427	275

Source: USDA Census of Agriculture, 2012

AGRICULTURAL VALUATION PER COUNTY

The following table provide information related to the market value of agricultural resources located within the planning area. The data was collected from the 2012 USDA Agricultural Census. The market value of agricultural products sold increased significantly throughout the planning area.

Table 29: Market Value of Agricultural Products Sold

County	Market Value of Products Sold, 2007	Market Value of Products Sold, 2012	Percent Change
Franklin County	$78,295,000	$119,127,000	52.2%
Furnas County	$141,947,000	$181,554,000	27.9%
Harlan County	$134,346,000	$223,498,000	66.4%
Red Willow County	$166,006,000	$180,509,000	8.7%

Source: USDA Census of Agriculture, 2012

Section Four: Risk Assessment

INTRODUCTION

The ultimate purpose of this Hazard Mitigation Plan is to minimize the loss of life and property across the planning area. The foundation the planning process is the regional and local risk assessment. This section contains a description of potential hazards, regional vulnerabilities and exposures, probability of future occurrences, and potential impacts and losses. By conducting a regional and local risk assessment, participating jurisdictions are able to develop specific strategies to address areas of concern identified through this process. The following table defines terms that will be used throughout this section of the plan.

Table 30: Defined Terms

Term	Definition
Hazard	A potential source of injury, death, or damages
Asset	People, structures, facilities, and systems that have value to the community
Risk	The potential for damages, loss, or other impacts created by the interaction of hazards and assets
Vulnerability	Susceptibility to injury, death, or damages to a specific hazard
Impact	The consequence or effect of a hazard on the community or assets
Historical Occurrence	The number of hazard events reported during a defined period of time
Extent	The strength or magnitude relative to a specific hazard
Probability	Likelihood of a hazard occurring in the future

METHODOLOGY

The risk assessment methodology utilized for this plan follows the risk assessment methodology outlined in the FEMA Local Mitigation Planning Handbook (March 2013). This process consist of four primary steps: 1) Describe the hazard; 2) Identify vulnerable community assets; 3) Analyze Risk; and 4) Summarize vulnerability.

When describing the hazard, this plan will examine the following items: previous occurrences of the hazard within the planning area; locations where the hazard has occurred in the past or is likely to occur in the future; extent of past events and likely extent for future occurrences; and probability of future occurrences. The identification of vulnerable assets will be across the entire planning area, *Section Seven* will include a discussion of community specific assets at risk for relevant hazards.

Analysis for regional risk will examine historic impacts and losses and what is possible should the hazard occur in the future. Risk

Requirement §201.6(c)(2): Risk assessment. The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Requirement §201.6(c)(2)(i): The risk assessment shall include a] description of the type … of all natural hazards that can affect the jurisdiction.

Requirement §201.6(c)(2)(i): The risk assessment shall include a] description 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.

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.

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

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.

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.

analysis will include both qualitative (i.e. description of historic or potential impacts) and quantitative data (i.e. assigning values and measurements for potential loss of assets).

For each of the hazards profiled the best and most appropriate data available will be considered. The following table outlines the data sources utilized to examine each individual hazard. Further discussion relative to each hazard is discussed in the hazard profile portion of this section.

Table 31: Risk Assessment Data Sources

Type of Data	Data Source
Property Damage*	NCDC Storm Events Database
Crop Damage	USDA RMA
Sperry-Piltz Ice Accumulation Index (SPIA)	National Weather Service
Temperature, Precipitation, Snowfall	Weather Stations
TORRO Hailstone Scale	The Tornado and Storm Research Organization
Monthly Tornado Averages	NOAA
Tornado Time of Occurrence	NOAA
Tornado Activity in the United States	NOAA
Wind Zones in the United States	FEMA
Beaufort Wind Force Rankings	NWS
Historical Drought Intensity	National Drought Mitigation Center, University of Nebraska-Lincoln
Palmer Drought Severity Index	National Oceanic Atmospheric Administration, High Plains Regional Climate Center
USDA Secretarial Disaster Designations	US Department of Agriculture
Heat Index	NOAA
Number of Wildfires by Cause in Nebraska 2004-2010	Nebraska Forest Service
Acres Burned by Cause in Nebraska 2004-2010	Nebraska Forest Service
Wildfire Risk Potential Map	USDA Forest Service 2013
NFIP Status	Nebraska Department of Natural Resources, National Flood Insurance Program
NFIP Policies - December 2012	Nebraska Department of Natural Resources, National Flood Insurance Program
2013 Recorded Animal Diseases	Nebraska Department of Agriculture
High Hazard Dams in the Planning Area	Nebraska Department of Natural Resources
Fault Lines in Nebraska	Nebraska Department of Natural Resources
Richter Scale	Federal Emergency Management Agency
Modified Mercalli Intensity Scale	Federal Emergency Management Agency
Nebraska Seismic Hazard Map	United States Geological Survey
Urban Fires by Type and Community	Nebraska State Fire Marshal
Fire Death Rates for the State of Nebraska	US Fire Administration
Chemical Spills from 1975 to 2012	Pipeline and Hazardous Materials Safety Administration
Chemical Spills from 1982 to 2014	The Right-To-Know Network

*NCDC data was used for property damage, unless otherwise noted.

COMMUNITY BASED RISK ASSESSMENT

Participating jurisdictions completed a risk assessment for their community/jurisdiction. The local planning teams were asked to prioritize hazards based on local occurrences and impacts. Participants were encouraged to consider: historic events; probability of future events; specific vulnerable populations; properties that may be at higher levels of risk related to hazards; potential impacts to critical facilities and critical services; and potential economic losses. The information developed during the community based risk assessment is presented in *Section Seven: Participant Sections.*

FUTURE DEVELOPMENT

Future development in relation to vulnerability to hazards will be addressed in *Section Seven: Participant Sections.*

AVERAGE ANNUAL DAMAGES AND FREQUENCY

FEMA ***Requirement §201.6(c)(2)(ii) (B)*** suggests that when the appropriate data is available, hazard mitigation plans should also provide an estimate of potential dollar losses for structures in vulnerable areas. This risk assessment methodology includes an overview of assets at risk and provides historic average annual dollar losses for all hazards for which historic event data is available. Additional loss estimates are provided separately for those hazards for which sufficient data is available. These estimates can be found within the relevant hazard profiles.

Average annual losses from historical occurrences can be calculated for those hazards for which there is a robust historic record and for which monetary damages are recorded. There are three main pieces of data that are used throughout this formula.

- **Total Damages in Dollars:** This is the total dollar amount of all property damages and crop damages as recorded in federal, state, and local data sources. The limitation to these data sources is that dollar figures often do not include all damages from every event, but rather only officially recorded damages from reported events.
- **Total Years of Record:** This is the span of years there is data available for recorded events. Vetted and cleaned up NCDC data is available for 1996 to 2014. Although some data is available back to 1950, this plan update utilizes only the most current and most accurate data available.
- **Number of Hazard Events:** This shows how often an event occurs. The frequency of a hazard event will affect how a jurisdiction responds. A thunderstorm may not cause much damage each time, but multiple storms can have an incremental effort on housing and utilities. In contrast, a rare tornado can have a widespread, immediate effect on a city.

An example of the Event Damage Estimate is found below:

$$\textbf{Annual Frequency}\ (\#) = \frac{Total\ Events\ Recorded\ (\#)}{Total\ Year\ Recorded\ (\#)}$$

$$\textbf{Average Annual Damages}\ (\$) = \frac{Total\ Damages\ in\ Dollars\ (\$)}{Total\ Year\ Recorded\ (\#)}$$

HAZARD ELIMINATION

Given the location and history of the planning area, the following hazards were eliminated from further review. An explanation of how and why the hazards were eliminated is provided below.

Avalanche: No historic occurrence; due to topography of the planning area this type of hazard has a very low probability of future occurrence.

Civil Disorder: For the entire state there have been a small number of civil disorder events reported, most reported events date back to the 1960s. The absence of civil unrest in recent years does not necessarily indicate there will not be events in the future, but there are other planning mechanism in place to address this concern. This approach is consistent with the 2014 Nebraska State Hazard Mitigation Plan.

Coastal Erosion: While it is likely that the planning area will be impacted by a changing climate there is no coast line located in the planning area, for this reason this hazard has been eliminated.

Expansive Soils: Consistent with the 2014 Nebraska State Hazard Mitigation Plan this hazard has been eliminated from further examination. There is not sufficient data available to examine historic impacts or project future probability or losses. Any impact from expansive soils in Nebraska (and the planning area) are likely to be manifest as localized flooding and will be reported as such. This approach is consistent with the 2014 Nebraska State Hazard Mitigation Plan.

Hurricane: Given the location of the planning area in the central plains, hurricanes are not expected to occur. This is supported by the historical record.

Land Subsistence (Sinkholes): Land subsistence is common in areas of karst topography, there are no recognized areas of true karst topography in planning area or even in Nebraska. This approach is consistent with the 2014 Nebraska State Hazard Mitigation Plan.

Landslides: While there is data available related to landslide which have occurred across the state, the database has not been maintained in recent years. Further, landslides that have occurred across the planning area have resulted in no reported damages. The following table shows the recorded landslides within the planning area. This is consistent with the 2014 Nebraska State Hazard Mitigation Plan.

Table 32: Known Number of Landslides in the Planning Area by County

County	Number of Landslides
Franklin	2
Furnas	1
Harlan	0
Red Willow	0

Source: Database of Nebraska Landslides

Radiological Fixed Sites: Both state and local agencies have developed appropriate and extensive plans and protocols relative to the two nuclear facilities located in the state. The existing plans and protocols are reviewed, updated, and exercised on a regular basis. Due to the extensive planning and regulations related to this threat it will not be further profiled in this plan. This approach is consistent with the 2014 Nebraska State Hazard Mitigation Plan.

Radiological Transportation: There have been no incidents reported in the planning area or the state that have required assistance beyond what is considered regular roadside services. Further, the transportation of radiological materials is heavily regulated and monitored. There are other plans across the state that have thoroughly addressed this threat, therefore it will not be profiled further for this plan. This approach is consistent with the 2014 Nebraska State Hazard Mitigation Plan.

Tsunami: Given the location of the planning area in the central plains tsunami are not expected to occur. This is supported by the historical record.

Urban Fires: The following table provides the data available from the Nebraska State Fire Marshal relevant for the planning area from 2008 to 2012. The provided data suggests that the planning area has, and will continue to experience fires in urban areas. Fire departments within the planning area have mutual aid agreements in place to address this threat, typically this hazard is addressed through existing plans and resources. Urban fire will not be fully profiled for this plan. Discussion relative to fire will be focused on wildfire and the potential impacts they could have on the built environment. This approach is consistent with the 2014 Nebraska State Hazard Mitigation Plan.

Table 33: Fire Department Calls, 2008-2012

Fire Department	Fires	Overpressure Rupture	Rescue/ EMS	Hazardous Materials	Service Calls	Severe Weather Calls	Special Incidents
Franklin County	122	2	20	5	0	0	0
Franklin	73	2	20	5	0	0	0
Hildreth	46	0	0	0	0	0	0
Naponee	3	0	0	0	0	0	0
Upland	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Furnas County	154	0	23	14	11	0	2
Arapahoe	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Beaver City	4	0	1	4	2	0	0
Cambridge	132	0	22	10	9	0	2
Edison	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Holbrook	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oxford	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wilsonville	18	0	0	0	0	0	0
Harlan County	117	0	15	7	6	0	0
Alma	67	0	2	4	6	0	0
Orleans	44	0	3	2	0	0	0
Republican City	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Stamford	6	0	10	1	0	0	0
Red Willow County	118	2	2,218	79	86	1	0
Bartley	2	0	0	0	0	0	0
Indianola	23	0	0	0	0	0	0
McCook	93	2	2,218	79	86	1	0

Source: Nebraska State Fire Marshal 2008-2012

RISK ASSESSMENT SUMMARY TABLES

The following table provides an overview of the data contained in the hazard profiles. Hazards listed in this table and throughout the section are in alphabetical order. This table is intended to be a quick reference for people using the plan and does not contain source information nor are full discussion of individual hazards included in this section.

Table 34: Regional Risk Assessment

Regional Risk Assessment			
Hazard	**Previous Occurrence Events/Years**	**Approximate Annual Probability**	**Likely Extent**
Agricultural Animal Disease	4/1.5	100%	Data unavailable
Agricultural Plant Disease	68/15	100%	Data unavailable
Chemical Fixed Sites	14/32	44%	Localized to the facilities and adjacent surroundings
Chemical Transportation	15/36	43%	Limited (<1 mile from release site)
Dam Failure	8/Unknown	~1%	Inundation of area slightly greater than floodplain
Drought	426/1104	39%	D2
Earthquakes	4/42	10%	<4.0
Extreme Heat	68 days/1	100%	>90°F
Flooding	30/19	100%	Some inundation of structures* (<1% of structures) and roads near streams. Some evacuations of people may be necessary (<1% of population)
Grass/Wildfires	513/13	100%	<100 acres
Hail	542/19	100%	H3 – H6
High Winds	299/19	100%	9 BWF
Levee Failure	0	~1%	Inundation of structures in floodplain
Severe Thunderstorms	260/19	100%	≥1" rainfall
Severe Winter Storms	263/19	100%	.25 - .5" ice 20 - 40°F below zero (wind chills) 4 – 8" snow 25 – 40 mph winds
Terrorism	0	~1%	Undefined
Tornadoes	37/19	100%	EF0

**Quantification of vulnerable structures provided in Section Seven: Participant Sections*

Table 35: Loss Estimation for the Planning Area

Hazard Type	Total Property Loss[1]	Average Annual Property Loss[1]	Total Crop Loss[2]	Average Annual Crop Loss[2]
Agricultural Plant Disease	N/A	N/A	$506,656	$33,777
Drought	$0	$0	$246,003,599	$16,400,240
Extreme Heat	$0	$0	$61,423,203	$4,094,880
Flooding	$1,325,000	$69,737	$221,069	$14,738
Grass/Wildfires	$0	$0	$242,504[3]	$18,654[3]

Hail Events	$7,151,000	$376,368	$55,340,800	$3,689,387
High Winds	$11,697,140	$615,639	$21,102,991	$1,406,866
Severe Thunderstorms	$11,770,900	$619,521	N/A	N/A
Severe Winter Storms	$6,330,000	$333,158	$7,783,392	$518,893
Tornadoes	$2,124,500	$111,816	$27,388	$1,826

1 Indicates data is from NCDC (January 1996 to October 2014)
2 Indicates data is from USDA (2000 to 2013)
3 Indicates data is from NFS (2000 to 2012)

HISTORICAL DISASTER DECLARATIONS

The following tables show disaster declarations that have been granted within the planning area in the past.

FARM SERVICE AGENCY SMALL BUSINESS ADMINISTRATION DISASTERS

The US Small Business Administration (SBA) was created in 1953 as an independent agency of the federal government to aid, counsel, assist, and protect the interests of small business concerns, to preserve free competitive enterprise, and maintain and strengthen the overall economy of our nation. A program of the SBA includes disaster assistance for those affected by major natural disasters. The following table summarizes the SBA Disasters involving the planning area.

Table 36: SBA Declaration

Declared	Disaster Number	Incident	Primary Counties	Contiguous Counties
1/18/2015	NE-00059	Drought	Furnas	Franklin, Harlan, Red Willow
7/24/2014	NE-00062	Severe Storms, Tornados, Straight-line Winds, and Flooding	Franklin, Furnas, Harlan	-
12/9/2014	NE-00056	Drought	Red Willow	Furnas
12/10/2013	NE-00053	Drought	Franklin, Furnas, Harlan, Red Willow	-
4/8/2013	NE-00050	Drought	-	Franklin
4/1/2013	NE-00049	Drought	Franklin, Harlan	Furnas
3/12/2013	NE-00047	Severe Storms, Tornados, Straight-line Winds, and Flooding	Furnas, Red Willow	Harlan
11/9/2011	NE-00046	Severe Storms with Excessive Rain, Flash Flooding, Hail, and High Winds	-	Red Willow
8/25/2011	NE-00044	Severe Storms, Flooding, and Tornados	Furnas, Red Willow	-
7/15/2010	NE-00038	Severe Storms, Flooding, and Tornados	Harlan	-

2/25/2010	NE-00033	Severe Storms, Flooding, and Tornados	Fillmore, Furnas, Harlan,	-
6/20/2008	NE-00021	Severe Storms, Flooding, and Tornados	Fillmore, Furnas, Red Willow	-
6/20/2008	NE-00020	Severe Storms, Flooding, and Tornados	-	Fillmore, Franklin, Harlan,
1/7/2007	NE-00011	Severe Winter Storms	Fillmore, Franklin, Furnas, Harlan, Red Willow	-
1/26/2006	NE-00005	Severe Winter Storm	Furnas, Red Willow,	-

Source: United States Small Business Administration

PRESIDENTIAL DISASTER DECLARATIONS

The presidential disaster declarations involving the planning area through July 2015 are summarized in the following table. Declarations prior to 1962 are available on the FEMA website, but do not list designated counties.

Table 37: Presidential Disaster Declarations

Disaster Declaration Number	Declaration Date	Disaster Type	Declared County/Area
4183	7/24/2014	Severe Storms, Tornados, Straight-line Winds, Flooding	Furnas, Harlan, Franklin
4014	8/12/2011	Severe Storms, Tornados, Straight-line Winds, Flooding	Furnas, Red Willow
1924	7/15/2010	Severe Storms and Flooding	Harlan
1878	2/25/2010	Severe Winter Storms	Furnas, Harlan
1770	6/20/2008	Severe Storms, Tornados, and Flooding	Furnas, Red Willow
1674	1/7/2007	Severe Winter Storms	Franklin, Furnas, Harlan, Red Willow
1627	1/26/2006	Severe Winter Storm	Furnas, Red Willow
3245	9/13/2005	Hurricane Katrina Evacuees	Franklin, Furnas, Harlan, Red Willow
1517	5/25/2004	Severe Storms, Tornados, Flooding	Franklin, Red Willow
1190	11/1/1997	Severe Snow Storms, Rain, and Strong Winds	Franklin, Furnas, Harlan, Red Willow
1027	5/9/1994	Severe Snow and Ice Storm	Furnas, Harlan, Red Willow
998	7/19/1993	Severe Storms and Flooding	Franklin, Furnas, Harlan
228	7/18/1967	Severe Storms and Flooding	Franklin, Furnas, Harlan

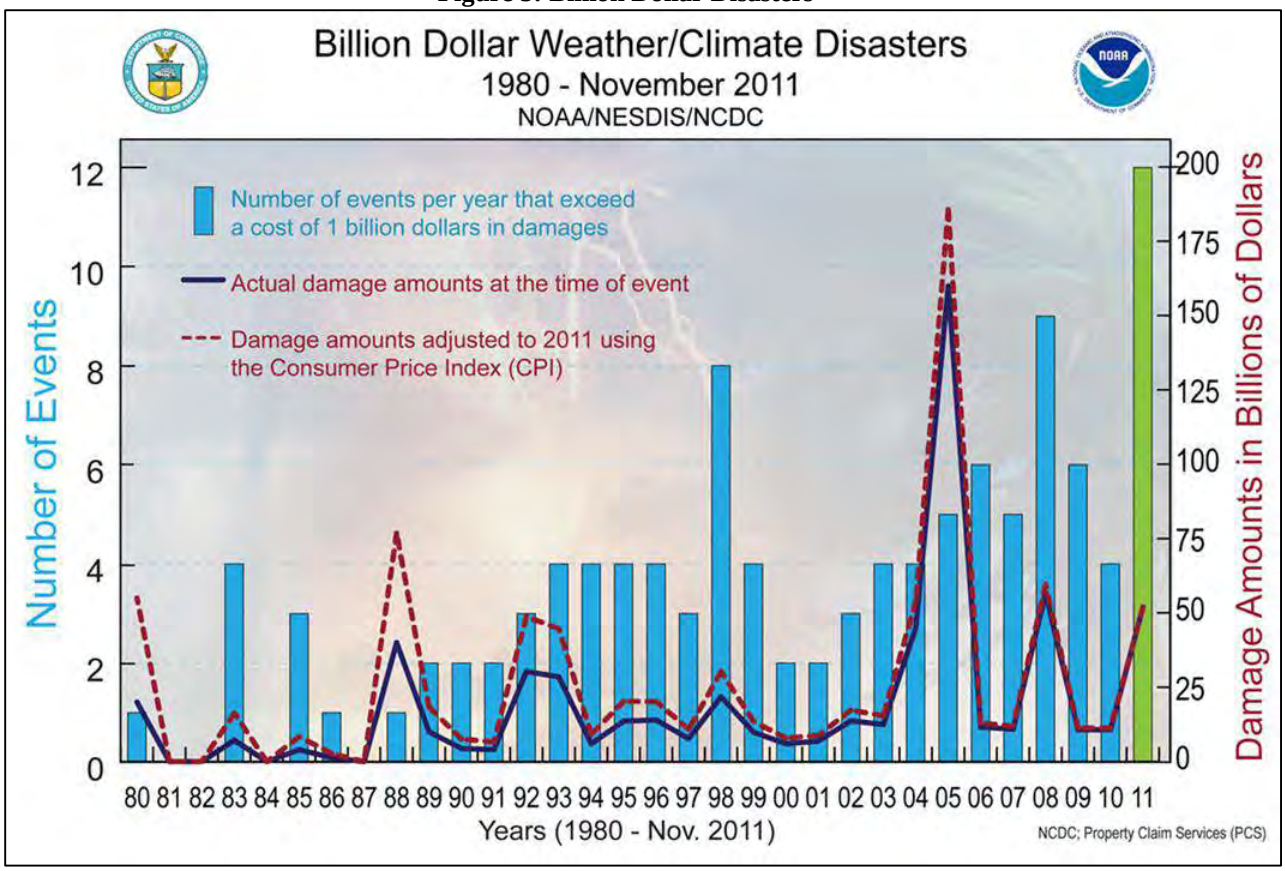
Source: Federal Emergency Management Agency

CLIMATE ADAPTATION

Long term climate trends have and will continue to increase the risk to hazards within the planning area. The planet is warming due to a number of natural and anthropogenic forcings. This trend will have a number of significant economic, social, and environmental impacts on humans globally. This trend will also lead to an increase in the frequency and intensity of hazardous events.

As seen in Figure 5, the United States is experiencing an increase in the number of billion dollar natural disasters. Regardless of whether this trend is due to a change in weather patterns or due to increased development, the trend exists.

Figure 5: Billion Dollar Disasters



Source: NOAA

According to a recent University of Nebraska report, Nebraskan's can expect the following from the future climate:

- Increase in extreme heat events
- Decrease in soil moisture by 5-10%
- Increase in drought frequency and severity
- Increase in heavy rainfall events
- Increase in flood magnitude
- Decrease in water flow in rivers due to reduced snowpack in Rocky Mountains
- Additional 30-40 days in the frost-free season

The planning area will have to adapt to these changes, or experience an increase in economic losses, loss of life, property damages, and crop damages. This Hazard Mitigation Plan includes strategies for the planning area to address these changes, increase resiliency and adapt to the future climate.

HAZARD PROFILES

Based on research and the experiences of the participating jurisdictions the following hazards were determined to either have a historical record of occurrence or the potential for occurrence in the future. As the planning area is generally uniform in climate, topography, building characteristics, and development trends, overall hazards and vulnerability do not vary greatly across the planning area. The following profiles will examine the identified hazards across the region. Local concerns or deviations from the regional risk assessment will be addressed in *Section Seven* of this plan.

AGRICULTURAL DISEASE (ANIMAL AND PLANT DISEASE)

HAZARD PROFILE

Animal and plant diseases are any biological disease or infection that can reduce the quality or quantity of either livestock or vegetative crops. This section looks at animal disease and plant disease as both make up a significant portion of Nebraska's, and the planning area's economy.

LOCATION

Mostly rural and agricultural areas are at risk related to agricultural diseases. It is possible that developed/incorporated areas could be impacted more seriously if roadways were closed to limit the transportation of potentially infected livestock.

Given the planning area's agricultural economy, the majority of the planning area would be drastically impacted by any disease affecting crops or livestock.

EXTENT

The likely extent of crop or livestock disease would be minor. Based on reports from participating jurisdictions most occurrences are limited in scope and geographic area. It is possible that large scale events could occur. Future updates could include additional statistics to provide a better quantification of extent related to agricultural diseases as they are developed.

HISTORICAL OCCURRENCES

According to the 2014 Nebraska Hazard Mitigation Plan Update and the Department of Agriculture Disease, the following four diseases were reported as having occurred throughout the 93 counties in Nebraska impacting livestock:

- **Chronic Wasting Disease (CWD)** – This disease was first reported in mule deer, white-tailed deer, black-tailed deer, and elk populations in the state's panhandle region beginning in 1998. Symptoms of the disease include weight loss, as well as incessant drinking and urination. An infected animal often stands listlessly, head down and ears drooping, with saliva dripping from its mouth. Between the years of 1997 and 2006 the Nebraska Game and Parks Commission confirmed 117 positive tests of CWD statewide. The livestock within the state have had no confirmed cases of the disease.

- **Vesicular Stomatitis (VS)** – In 2005, Nebraska had three horses test positive for VS. VS primarily affects cattle, horses, and swine. It causes blisters on lips, tongues, and coronary bands. The blisters enlarge and break, leaving raw tissue that is so painful the animals refuse to eat or drink, and they become lame. Severe weight loss usually follows. In a herd affected by VS, nearly 90% of the animals may show clinical signs and nearly all develop antibodies. The disease is spread through direct contact between animals as well as through biting insects. If not properly handled, VS can be spread to humans and cause acute influenza like symptoms for four to seven days. There have been no new confirmed reports of VS in Nebraska since 2005.

- **Epizootic Hemorrhagic Disease (EHD)** – Commonly known as "blue tongue," EHD is an acute, infectious, often fatal viral disease of some wild ruminants. It is characterized by extensive hemorrhaging, and has been responsible for significant epizootics in deer in the northern United States and southern Canada. There have been ongoing confirmed reports of periodic outbreaks over the last fifty years in the state's deer population since the disease was first identified in 1955. All documented outbreaks of EHD have occurred during the late summer or early fall. Deer in the state's panhandle appear to be the most at risk when compared to other areas of the state. There have been no reports of EHD among the state's livestock; only wild game has been affected. The

economic impact from such outbreaks could negatively impact businesses and communities that are reliant upon hunting for the majority of their sales or income.

- **Bovine Tuberculosis** – In the later stages of the disease, the clinical symptoms of Bovine Tuberculosis become apparent. Bovine Tuberculosis primarily affects cattle but can be passed easily to any warm-blooded animal. In certain, but rare, conditions the disease can effect humans. According to the USDA, symptoms include: emaciation, lethargy, weakness, anorexia, low-grade fever, and pneumonia with a chronic, moist cough. Enlarged lymph nodes may also be present. Bovine Tuberculosis can be spread through the respiration of bacteria aerosols, contaminated feed or watering sites, or by drinking milk that is unpasteurized from infected animals. There is a high risk of contamination in enclosed areas such as barns that have poor ventilation. In June of 2009, two beef cows in Rock County tested positive for the disease. In response to the findings, Nebraska Department of Agriculture (NDA) staff coordinated with federal animal disease officials to properly respond. The NDA with the help of federal officials tested 21,764 head of cattle in association with the investigation. As the NDA traced cattle movement into and out of the affected herd, 61 herds of cattle were quarantined in 20 of Nebraska's 93 counties. By April 7, 2010 all but three of those herds were released from quarantine. The herd that was initially affected was also released from quarantine and endured tests that are part of the USDA federal test and remove strategy.

- **Avian Influenza –** In the spring of 2015, the Nebraska Department of Agriculture confirmed the presence of highly pathogenic H5N2 avian influenza in commercial flocks in northeast Nebraska. This resulted in the Governor issuing a state of emergency declaration on May 12, 2015. As of the summer of 2015, the impacted farms disposed of approximately 4.9 million chickens.

Table 38 shows the population of livestock within the planning area. This count does not include wild populations that are also at risk from animal diseases.

Table 38: Livestock Inventory

County	Cattle and Calves	Hogs and Pigs	Horse and Ponies	Sheep and Lambs
Franklin County	23,306	617	370	569
Furnas County	34,501	-	278	-
Harlan County	44,133	-	460	454
Red Willow County	63,124	-	427	275

Source: 2012 U.S. Census of Agriculture

In regard to diseases involving animals, the NDA provides reports on diseases occurring in the planning area. Table 39 includes those diseases and the number of occurrences within the planning area between January 1, 2014, and June 30, 2015.

Table 39: Animal Disease Reported to the Nebraska Department of Agriculture

Disease	Species Impacted	Number Of Occurrences
Bovine Viral Diarrhea	Cattle	1
Paratuberculosis	Cattle	1
Blue Tongue	Cattle	1
Porcine Reproductive and Respiratory Syndrome	Hogs	1

Source: Nebraska Department of Agriculture

The diseases listed above are only a sampling of the possible diseases that could impact animals. Data related to diseases and rates of disease among "free range game" is limited due to lack of laboratory testing, reporting, and field study.

According to the NDA, the primary crops grown throughout the state include alfalfa, corn, sorghum, soybeans, and wheat. The following table provides the value and acres of land in farms in the planning area.

Table 40: Land and Value of Farms in the Planning Area

County	Number of Farms	Land in Farms	Market Value of 2012 Crop Sales
Franklin	338	287,684	$103,687,000
Furnas	389	435,711	$98,374,000
Harlan	360	312,759	$126,402,000
Red Willow	405	419,608	$82,467,000

Source: 2012 U.S. Census of Agriculture

Table 41: Market Value of Agricultural Products Sold

County	Market Value of Products Sold, 2007	Market Value of Products Sold, 2012	Percent Change
Franklin County	$78,295,000	$119,127,000	52.2%
Furnas County	$141,947,000	$181,554,000	27.9%
Harlan County	$134,346,000	$223,498,000	66.4%
Red Willow County	$166,006,000	$180,509,000	8.7%

Source: 2012 U.S. Census of Agriculture

The above list does not account for all crops in the region as there are others such as sugar beets, dry beans, sunflowers, and chickpeas. There are many diseases that can impact crops that vary from year to year, the most common of which are listed in Table 42.

Table 42: Common Crop Diseases in Nebraska by Crop Types

Crop	Diseases	
Corn	• Anthracnose • Bacterial Stalk Rot • Common Rust • Fusarium Stalk Rot • Fusarium Root Rot • Gray Leaf Spot • Maize Chlorotic Mottle Virus	• Southern Rust • Stewart's Wilt • Common Smut • Goss's Wilt • Head Smut • Physoderma
Soybeans	• Anthracnose • Bacterial Blight • Bean Pod Mottle • Brown Spot • Brown Stem Rot • Charcoal Rot • Frogeye Leaf Spot • Phytophthora Root and Stem Rot • Pod and Stem Blight	• Purple Seed Stain • Rhizoctonia Root Rot • Sclerotinia Stem Rot • Soybean Mosaic Virus • Soybean Rust • Stem Canker • Sudden Death Syndrome
Wheat	• Barley Yellow Dwarf • Black Chaff • Crown and Root Rot • Fusarium Head Blight	• Leaf Rust • Tan Spot • Wheat Soil-borne Mosaic • Wheat Streak Mosaic
Sorghum	• Ergot • Sooty Stripe	

Crop	Diseases
	• Zonate Leaf Spot

Source: Nebraska Department of Agriculture

In addition to the viral and bacterial diseases that could impact crops, pests can also result in crop loss or decreased crop quality. Those pests include:

- Grasshoppers
- Western Bean Cutworm
- European Corn Borer
- Corn Rootworm
- Corn Nematodes
- Bean Weevil
- Mexican Bean Beatle
- Soybean Aphids
- Rootworm Beatles

AVERAGE ANNUAL DAMAGES

Using data from the USDA, RMA annual crop losses can be estimated for crop disease. The RMA does not track losses for livestock, so it is not possible to estimate losses due to animal disease.

Table 43: Crop Loss Estimation

Hazard Type	Number of Events	Total Crop Loss	Average Annual Crop Loss
Plant Disease	68	$506,656	$33,777
Insects	53	$224,963	$14,998

Source: USDA RMA, 2000-2015

PROBABILITY

Given the historical record, agricultural disease will likely occur annually in the planning area.

VULNERABILITY ASSESSMENT

The historical occurrence of animal disease is low overall. Usually, animal disease impacts a relatively small number of livestock. As for plant disease, it is difficult to track the historical occurrence of plant disease for the planning area. There are occurrences of plant disease in most growing seasons, but few result in significant impacts, economic or otherwise.

MITIGATION ALTERNATIVES

Hazard mitigation options for agricultural diseases focus primarily on education and outreach. Some of the options for the outreach include talking with the local extension agents about the types of plant and animal disease most common in the planning area. The NDA developed the Livestock Emergency Disease Reporting System which has a Veterinary Corps, and it offers training on managing livestock disease.

- Education of local farmers regarding common diseases and any potential for new diseases
- Encourage farmers/ranchers to purchase crop insurance
- Develop early warning and response protocols for the agricultural sector
- Conduct an emergency management exercise related to agricultural disease outbreaks
- Quarantine farms that have an outbreak of certain diseases until all animals test negative for the disease

CHEMICAL SPILLS (FIXED SITES)

HAZARD PROFILE

Chemicals are a common staple of American life. They are used to purify drinking water and pools, promote the growth of crops, eradicate pests that can damage crops, infest homes, and spread disease, produce energy, manufacture goods. But these chemicals can also be hazardous to humans and the environment if used or released improperly. Such hazards can occur during the production, storage, transportation, use, or disposal of chemicals.

From a toxicology perspective, the dose of any substance determines the poison potency, but some substances are inherently more dangerous to humans than others. The US Occupational Safety and Health Administration (OSHA) defines a hazardous chemical as any chemical that represents a health hazard or a physical hazard.

Per OSHA guidelines, a chemical represents a health hazard if there is statistically significant evidence, established in scientific research, that persons exposed to the chemical may experience acute or chronic health effects as a consequence of exposure. Chemicals posing a health hazard include carcinogens, toxic agents, reproductive toxins, irritants, and many other substances that can harm human organs or vital biological processes.

OSHA considers a chemical to represent a physical hazard if there is substantial evidence that the chemical is a combustible liquid, a compressed gas, or an explosive, flammable, or unstable substance. This includes radioactive material.

According to FEMA, there are 4.5 million facilities in the United States that produce, use, or store hazardous *materials*, including manufacturing plants, dry cleaners, and gardening supply stores. These chemicals are also stored in hospitals, gas stations, and farm supply stores, and in people's homes and farms, and transported via highways, railroads, waterways, and pipelines. Releases of these materials can occur during transportation accidents, natural disasters, ruptures or spills, manufacturing accidents, negligence, or deliberate actions, resulting in serious injury or death, chronic and acute health effects, or damage to the built or natural environment.

Hazardous material incidents are technological (meaning non-natural hazards created or influenced by humans) events that involve large-scale releases of chemical, biological or radiological materials. Hazardous materials incidents generally involve releases at fixed-site facilities that manufacture, store, process or otherwise handle hazardous materials or along transportation routes such as major highways, railways, navigable waterways and pipelines.

In response to the Union Carbide disaster in Bhopal, India in 1984, in which 2,000 people were killed or injured by a chemical release, and a release of hazardous chemicals in West Virginia in 1985, Congress passed the Emergency Planning and Community Right-to-Know Act (EPCRA), requiring all facilities, such as manufacturing plants, mining operations, electric power utilities, waste treatment facilities, and other facilities that manufacture, process, or use at least one of 650 different reportable chemicals to annually report this usage to the Toxic Release Inventory, or TRI. Reportable chemicals are those that are carcinogenic or cause other chronic illnesses, cause acute illnesses, or able to cause significant environmental effects.

The EPA requires industries to report information on toxic chemical releases and water management activities, through the Toxics Release Inventory (TRI) Program. In the previous decade, TRI reporting requirements were lessened; thereby limiting available data on chemical releases and disposal. The federal government in recent years reinstated stricter reporting requirements for industrial and federal facilities that

release toxic substances with potential to threaten human health and the environment. Those requirements went into effect in April of 2009 and data from these reports is now available.

The EPA also requires the submission of the types and locations of hazardous chemicals stored in all facilities within the state over the previous calendar year. This is completed by submitting a Tier II form to the EPA as a requirement of the Emergency Planning and Community Right-to-Know Act of 1986. The difference between a Tier II form and a TRI report is a TRI report requires a toxic material to be released, while a Tier II form is simply stating the location and type of chemicals present.

Fixed-sites are those that involve chemical manufacturing sites and stationary storage facilities. The following table demonstrates the nine classes of hazardous material according to the 2012 Emergency Response Guidebook.

Table 44: Hazardous Material Classes

Class	Type of Material	Divisions
1	Explosives	Division 1.1 – Explosives with a mass explosion hazard Division 1.2 – Explosives with a projection hazard Division 1.3 – Explosives predominantly a fire hazard Division 1.4 – Explosives with no significant blast hazard Division 1.5 – Very insensitive explosives with a mass explosion hazard Division 1.6 – Extremely insensitive articles
2	Gases	Division 2.1 – Flammable gases Division 2.2 – Non-flammable, non-toxic gases Division 2.3 – Toxic gases
3	Flammable liquids (and Combustible liquids)	
4	Flammable solids; Spontaneously combustible materials	Division 4.1 – Flammable solids Division 4.2 – Spontaneously combustible materials Division 4.3 – Water-reactive substances/Dangerous when wet materials
5	Oxidizing substances and Organic peroxides	Division 5.1 – Oxidizing substances Division 5.2 – Organic peroxides
6	Toxic substances and infections substances	Division 6.1 – Toxic substances Division 6.2 – Infectious substances
7	Radioactive materials	
8	Corrosive materials	
9	Miscellaneous hazardous materials/products, substances, or organisms	

Source: Emergency Response Guidebook, 2012

LOCATION

There are dozens of locations across the planning area that house hazardous materials, according to the Tier II reports submitted to the Nebraska Department of Environmental Quality (NDEQ) in 2013. A listing of chemical storage sites can be found in *Section Seven: Participant Sections* for each jurisdiction.

EXTENT

A chemical fixed site spill would likely be localized to the facilities and adjacent surroundings. The average fixed site chemical release in the planning area on record is 2,004 gallons, and 1,425 pounds.

HISTORICAL OCCURRENCES

The Right-To-Know Network compile chemical release data from the U.S. Coast Guard's National Response Center (NRC) database. According to this database, there have been 14 spills in the planning area

since 1982. The following table summarizes the chemical fixed site releases that have occurred in the planning area.

Table 45: Chemical Fixed Site Releases

Date	Location	Material	Quantity
9/5/1992	Edison	Ethylene Glycol	1000 Gallons
1/18/1996	McCook	Isopropyl Alcohol	20 Gallons
6/19/1996	McCook	Anhydrous Ammonia	250 Pounds
6/19/1996	Campbell	Transformer Oil	0.5 Gallons
8/4/1996	Indianola	Anhydrous Ammonia	630 Pounds
8/22/1997	Oxford	Anhydrous Ammonia	500 Pounds
10/14/1997	Campbell	Anhydrous Ammonia	Unknown
1/19/2000	Wilsonville	Crude Oil	Unknown
11/14/2001	Orleans	Oil	Unknown
11/19/2001	Franklin	Anhydrous Ammonia	4320 Pounds
11/4/2003	McCook	Water from oil well	3000 Gallons
4/16/2003	McCook	Oil	Unknown
8/11/2005	Alma	Liquid Nitrogen Solution	6000 Gallons
8/6/2014	Republican City	Sewage	Unknown

Source: The Right-To-Know Network

AVERAGE ANNUAL DAMAGES

Due to a lack of data regarding property damages, the average annual damages could not be calculated for this hazard.

PROBABILITY

There have been 14 spills recorded in the planning area in 32 years. The historical record would indicate there is a 43 percent chance of a chemical release at a fixed site storage facility occurring within the planning area each year.

VULNERABILITY ASSESSMENT

Individuals in close proximity to an incident could see minor to severe health impacts, including death depending upon the extent of the incident. Vulnerable populations, which are defined as the people who are at the most risk in regards to this hazard, may include the elderly and facilities with populations with low mobility such as hospitals, nursing homes, and housing units. The most common injury that might occur would be chemical burns from coming into contact with the substance that spilled. Breathing in the chemicals may lead to injuries or deaths if the spilled chemical is toxic. Fires or explosions are also possible with these spills and could cause injuries.

MITIGATION ALTERNATIVES

Possible mitigation alternatives for this hazard include training; outreach and education; and planning to ensure that critical facilities are placed in lower risk areas when possible.

- Maintain a database of vulnerable populations
- Conduct training exercises on how to respond to an event
- Have all hazard weather radios in critical facilities
- Ensure emergency alert sirens are in working order

CHEMICAL SPILLS (TRANSPORTATION)

HAZARD PROFILE

Hazardous materials are defined by the US Pipeline and Hazardous Materials Safety Administration (PHMSA) as a substance that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce.

These items can be transported by highway, rail, or pipeline, and can include anhydrous ammonia, chlorine gas, hydrochloric acid, natural gas liquids, derivatives of petroleum, white phosphorous, pesticides, solvents, and many other corrosive, toxic, unstable, or explosive chemicals and materials. Hazardous material releases can occur from vehicle accidents, defective values or hoses on tankers, train derailments, pipeline ruptures or explosions, storage tank overtopping during delivery of products, and many other scenarios.

According to the US Pipeline and Hazardous Materials Safety Administration (PHMSA), hazardous materials traffic in the US now exceeds 800,000 shipments per day, transporting 3.1 billion tons of hazardous materials annually.

Nationally, according to the US Pipeline and Hazard Materials Safety Administration (PHMSA), the US averages 28 deaths per year due to accidents resulting from the transportation of hazardous materials, or an average of about one death per every 12 million Americans. While such fatalities are a low probability risk, even one event can harm many people. Even if no fatalities result, events such as pipeline ruptures and tanker car derailments can cause several thousands of dollars in damage, and harm built and natural environments.

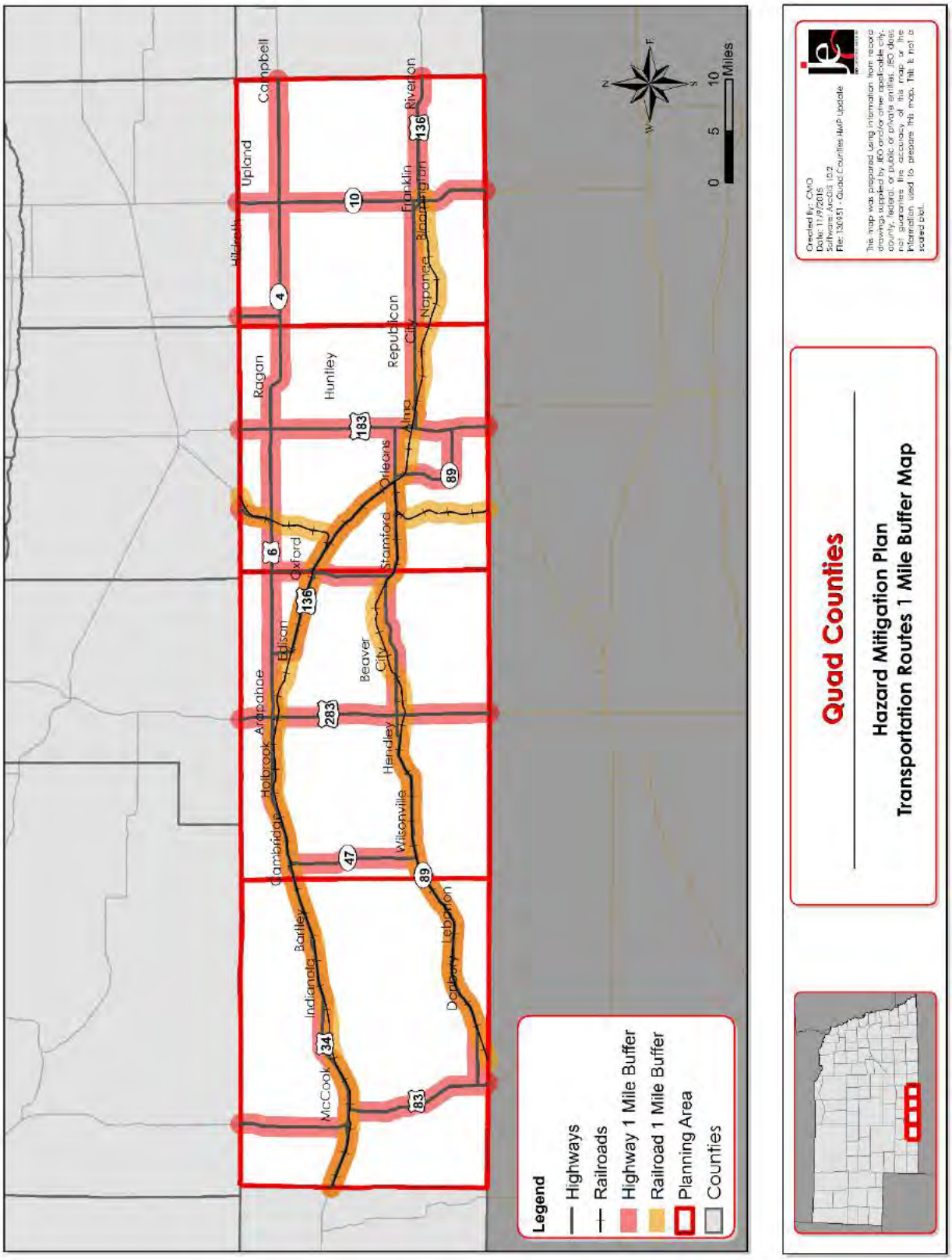
The US Department of Transportation, through PHMSA, has broad jurisdiction to regulate the transportation of hazardous materials, including the discretion to decide which materials shall be classified as hazardous. These materials are placed into one of nine hazard classes based on their chemical and physical properties. The hazard schedules may be further subdivided into divisions based on their characteristics.

Additionally, some hazardous materials may be re-classified as combustible materials or "other regulated materials" (ORM-D), because they pose a somewhat lesser, but still extant, hazard during transport. It is important for response personnel to understand the hazard classes and their divisions, and re-classified materials, because properties and characteristics are crucial in understanding the dynamics of a spill during a traffic incident.

LOCATION

Chemical releases are more likely to occur during transportation primarily on major transportation routes as identified in Figure 6. Participating communities specifically reported transportation along railroads as having the potential to impact communities. It was also reported, however, that railroads providing service through the planning area have already developed plans to respond to chemical release along rail routes.

Figure 6: Major Transportation Routes with One Mile Buffer



EXTENT

Probable extent related to chemical release is difficult to anticipate. Releases that have occurred in the planning area range from less than 1 Liquid Gallon (LGA) to 3,980 LGAs. Based on historic records, it is likely that any spill involving hazardous materials will not affect an area larger than one mile around the spill.

HISTORICAL OCCURRENCES

According to the Pipeline and Hazardous Materials Safety Administration, in the State of Nebraska there have been 2,525 incidents involving hazardous materials being transported by air, highway, railway and water. These incidents involved at least 276 various forms of toxic materials across the classifications described by the Emergency Response Guidebook.

Of these 2,525 incidents, 15 occurred within the planning area. The first incident was reported on January 10, 1980 and the most recent occurred on October 4, 2012. During these events, there was one fatality, three minor injuries, and $10,077 in damages from the spills.

The following table shows transportation incidents involving hazardous materials in the planning area.

Table 46: Chemical Spills 1980 – 2015

Date of Event	Location of Release	Material Involved	Method of Transportation	Total Damage
1/10/1980	McCook, NE	1 LGA Flammable Liquids Including Paint Thinner	Highway	$0
3/3/1981	McCook, NE	1 LGA Flammable Liquids N.O.S.	Highway	$0
8/8/1981	Alma, NE	Unknown Amount of Black Powder Igniter	Highway	1 death, 2 injuries, $0
8/5/1985	McCook, NE	3,980 LGA Petroleum Crude Oil	Highway	$0
7/9/1988	McCook, NE	182 LGA Gasoline	Highway	$0
6/23/1989	McCook, NE	3 LGA N.O.S.	Highway	$0
6/22/1995	McCook, NE	0.06 LGA Bipyridilium Pesticide	Highway	$150
4/9/1996	McCook, NE	.007 LGA Organophosphorus Pesticide	Highway	$25
6/19/1996	McCook, NE	37.5 LGA Ammonia Anhydrous	Highway	$40
7/2/1996	Upland, NE	10 LGA Methyl Parathion Liquid	Highway	$2,000
7/14/1998	McCook, NE	.13 LGA Halogenated Irritating Liquids N.O.S.	Highway	$32
7/29/1998	McCook, NE	.05 LGA Potassium Hydroxide Solution	Highway	$30

5/12/2005	McCook, NE	.02 LGA Isopropyl Alcohol	Highway	$0
2/27/2010	McCook, NE	20 LGA Potassium Hydroxide Solution	Rail	1 injury, $3,800
10/4/2012	McCook, NE	20 LGA N.O.S.	Highway	$4,000

Source: PHMSA January 1980 – August 2015
N.O.S. = Not otherwise specified

AVERAGE ANNUAL DAMAGES

The average damage per event estimate was determined based upon PHMSA's Incidents Reports since 1980 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. It caused an average of $288 per year in damages.

Table 47: Chemical Releases

Hazard Type	Number of Events	Total Property Loss	Average Annual Property Loss
Transportation: Chemical Release	15	$10,077	$288

Source: PHMSA January 1980 – August 2015

PROBABILITY

The historical record indicates that chemical releases during transport have a 43 percent chance of occurring annually. There were 15 reported events from 1980 to 2015 within the planning area.

VULNERABILITY ASSESSMENT

While transportation accidents can occur anywhere in the planning area, communities and households adjacent to major highway and rail corridors may be more vulnerable. If an incident were to occur and necessitate an evacuation, the particular population that may be especially vulnerable is households without access to a vehicle. The elderly, and facilities with populations with low mobility like hospitals, nursing homes, and housing units are more vulnerable than others. Fires or explosions are also possible with transportation incidents and that could cause injuries as well.

MITIGATION ALTERNATIVES

Possible mitigation actions related to this threat include:

- Drills and exercises within potential impact zones
- Studies to identify the primary hazardous materials transported along specific routes;
- Restrict transportation of hazardous materials at high traffic times or in high traffic areas; and
- Provide shelter-in-place kits and training for vulnerable populations such as child care and nursing homes

DAM FAILURE

HAZARD PROFILE

According to the Nebraska Administrative Code, Title 458, Chapter 1, Part 001.09, dams are "any artificial barrier, including appurtenant works, with the ability to impound water, wastewater, or liquid-borne materials and which is:

- twenty-five feet or more in height from the natural bed of the stream or watercourse measured at the downstream toe of the barrier, or from the lowest elevation of the outside limit of the barrier if it is not across a stream channel or watercourse, to the maximum storage elevation or
- has an impounding capacity at maximum storage elevation of fifty acre- feet or more, except that any barrier described in this subsection which is not in excess of six feet in height or which has an impounding capacity at maximum storage elevation of not greater than fifteen acre-feet shall be exempt, unless such barrier, due to its location or other physical characteristics, is classified as a high hazard potential dam. Dam does not include:
    - an obstruction in a canal used to raise or lower water;
    - a fill or structure for highway or railroad use, but if such structure serves, either primarily or secondarily, additional purposes commonly associated with dams it shall be subject to review by the department;
    - canals, including the diversion structure, and levees; or
    - water storage or evaporation ponds regulated by the United States Nuclear Regulatory Commission."

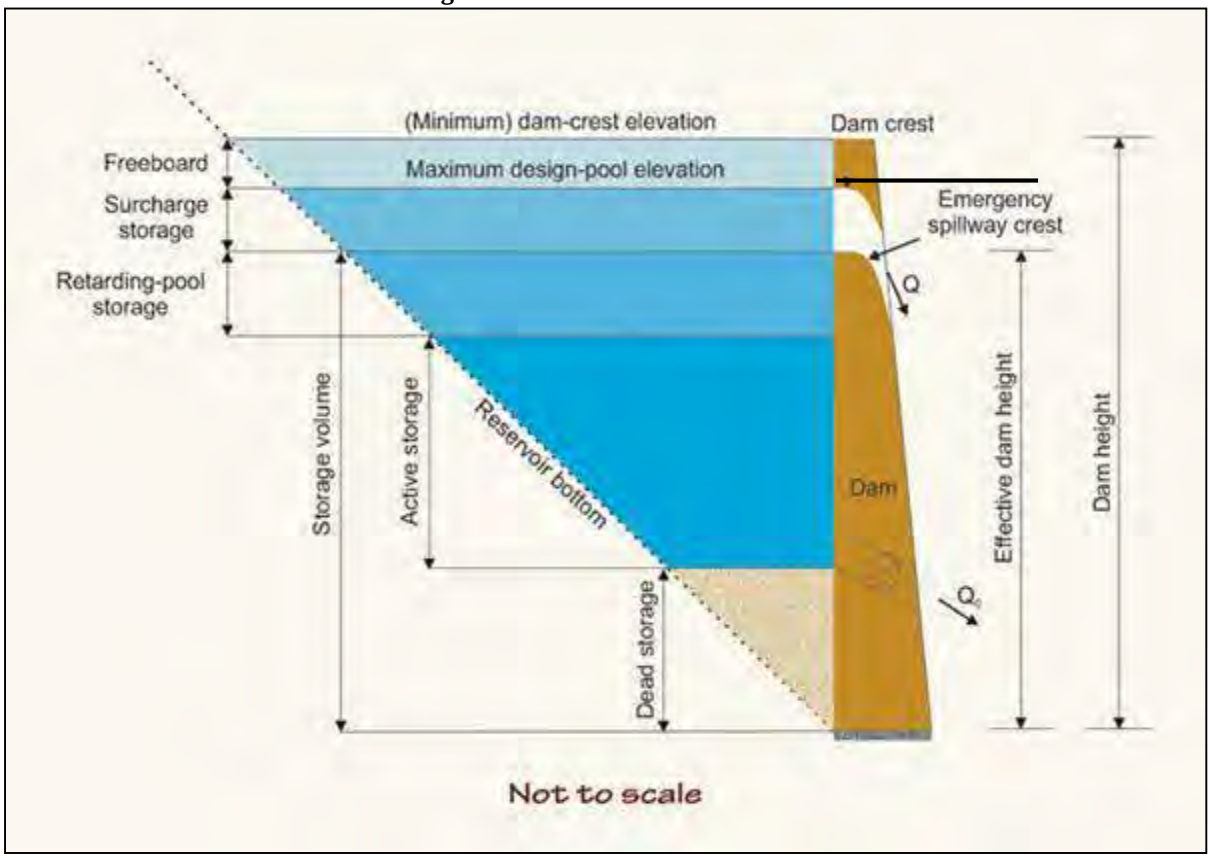
The Department of Natural Resources uses a classification system for dams throughout the State including those areas participating in this plan. The classification system includes three classes such as Small, Intermediate, and Large, which are defined as:

Table 48: Dam Size Classification

Size	Effective Height (feet) x Effective Storage (acre-feet)	Effective Height
Small	$\leq$ 3,000 acre-feet	and $\leq$ 35 feet
Intermediate	> 3,000 acre-feet to < 30,000 acre-feet	or > 35 feet
Large	$\geq$ 30,000 acre-feet	Regardless of Height

The effective height of a dam is defined as the difference in elevation in feet between the natural bed of the stream or watercourse measured at the downstream toe (or from the lowest elevation of the outside limit of the barrier if it is not across stream) to the auxiliary spillway crest. Figure 7 shows a cross section of a dam. The effective height of the dam is shown as being from the base of the dam to the top of the emergency spillway crest. The effective storage is defined as the total storage volume in acre-feet in the reservoir below the elevation of the crest of the auxiliary spillway. If the dam does not have an auxiliary spillway, the effective height and effective storage should be measured at the top of dam elevation.

Figure 7: Cross-Section of a Dam



Source: http://ponce.sdsu.edu/first_project_report_080229.html

Dam failure, as a hazard, is described as a structural failure of a water impounding structure. Structural failure can occur during extreme conditions, which include but are not limited to:

- Reservoir inflows in excess of design flows
- Flood pools higher than previously attained
- Unexpected drop in pool level
- Pool near maximum level and rising
- Excessive rainfall or snowmelt
- Large discharge through spillway
- Erosion, landslide, seepage, settlement, and cracks in the dam or area
- Earthquakes

In total, there are 175 dams located within the planning area with classifications ranging from Minimal to High. Most of the dams, 158, are rated low or minimal, three are significant, and two are rated a high hazard dam. The high hazard dams are listed in Table 49.

Table 49: Dams in the Planning Area

Jurisdiction	Total Number of Dams	Classification - Downstream Hazard Potential			
		High	Significant	Low	Minimal
Franklin	45	-	-	37	16
Furnas	50	-	3	25	7
Harlan	46	1	-	35	7
Red Willow	34	1	-	27	4
Quad Counties Planning area	175	2	3	124	34

Source: NDNR

NDNR regulates dam safety and has classified dams by the potential hazard each poses to human life and economic loss. The following are classifications and descriptions for each hazard class:

- **Minimal Hazard Potential** - failure of the dam expected to result in no economic loss beyond the cost of the structure itself and losses principally limited to the owner's property.

- **Low Hazard Potential** - failure of the dam expected to result in no probable loss of human life and in low economic loss. Failure may damage storage buildings, agricultural land, and county roads.

- **Significant Hazard Potential** - failure of the dam expected to result in no probable loss of human life but could result in major economic loss, environmental damage, or disruption of lifeline facilities. Failure may result in shallow flooding of homes and commercial buildings or damage to main highways, minor railroads, or important public utilities.

- **High Hazard Potential** - failure of the dam expected to result in loss of human life is probable. Failure may cause serious damage to homes, industrial or commercial buildings, four-lane highways, or major railroads. Failure may cause shallow flooding of hospitals, nursing homes, or schools.

Dams that are classified with high hazard potential require the creation of an Emergency Action Plan (EAP). The EAP defines responsibilities and provides procedures designed to identify unusual and unlikely conditions which may endanger the structural integrity of the dam within sufficient time to take mitigating actions and to notify the appropriate emergency management officials of possible, impending, or actual failure of the dam. The EAP may also be used to provide notification when dam releases will create major flooding. An emergency situation can occur at any time; however, emergencies are more likely to happen when extreme conditions are present. The EAP includes information regarding the efficiency of emergency response entities so that proper action can be taken to prevent the loss of life and property. Local emergency response entities generally included in an EAP include but are not limited to 911 Dispatch, County Sheriffs, Local Fire Departments, Emergency Management Agency Director, County Highway Department, and the NWS. Table 50Table 50 lists those dams classified as “High Hazard Potential.”

Table 50: High Hazard Dams

NIDID	Name	County	Purpose	Dam Height (ft.)	Maximum Storage (acre-feet)	Last Inspection Date
NE01066	Harlan County Dam	Harlan	Flood Control	107	840,561	6/9/2010
NE01073*	Medicine Creek Dam	Frontier	Irrigation	115	195,997	7/10/2012
NE01076*	Red Willow Dam	Frontier	Irrigation	123	163,415	7/11/2012
NE01078*	Trenton Dam	Hitchcock	Irrigation	100	353,901	9/13/2011
NE01672	Kelly Creek West Dam	Red Willow	Flood Control	34	1,183	8/19/2014

**Indicates the dam is located outside of the planning area but may still affect the planning area*
Source: NDNR

UPSTREAM DAMS
There are four high hazard dams located outside of the four county planning area that may affect the planning area in the event of a dam failure. These dams are: Enders Dam, Medicine Creek Dam, Red Willow Dam, and Trenton Dam.

LOCATION
For the purposes of this plan, inundation areas for each of the dams identified in this plan are called breach routings. Breach routings are used to help delineate the area downstream of a dam potentially impacted by inundation should that dam fail. Breach routings can be used in determining the dam's hazard potential. Breach routings used in conjunction with survey and topographic data can be used to determine the anticipated depth of flooding at specific structures or facilities. Due to the sensitive nature of this threat, breach mapping will not be included in this document. If members of the public wish to view EAP and breach maps for dams in the planning area, a request can be made to the county emergency managers, or NDNR.

EXTENT
The breach of a high hazard dam would certainly impact those in breach areas. The total number of people and property exposed to this threat is significant. Dam failure could lead to inundation in an area slightly greater than the 100 year floodplain. The potential inundation areas include approximately: 12 percent of the population of Franklin County, 40 percent of the population of Furnas County, 3 percent of the population of Harlan County, and 25 percent of the population of Red Willow County.

HISTORICAL OCCURRENCES
According to the NDNR, there have been eight dam breaches in the planning area.

AVERAGE ANNUAL DAMAGES
Due to lack of data and the sensitive nature of this hazard, potential losses are not being calculated for this threat. Community members in the planning area that wish to quantify the threat of dam failure should contact the county emergency management, or the NDNR to view EAPs and breach inundation area maps.

PROBABILITY

Dam failure has a low probability of occurring in the future. Even with eight reported incidents in the past, it is unlikely that dam failure will occur. For the purpose of this plan, the probability of dam failure will be stated as one percent annually as the period of record for dam failure occurrences is unknown.

VULNERABILITY ASSESSMENT

The definition of dam failure for the purposes of this plan was considered 'sunny day failure,' of a full dam. A sunny day failure is a total dam failure in which the impounded water all flows downstream.

A sunny day failure model was used because inundation maps are generated using this assumption. Overall throughout the planning area, if a high hazard dam failure occurred, the majority of people and structures downstream of the failure would not be affected by an inundation that occurred as a result of a dam failure.

According to the NDNR dam database, there are two high hazard dams in the planning area and four high hazard dams upstream that could impact the planning area. The vulnerability assessment for dam failure is discussed more specifically regarding dam failures in each jurisdiction's respective participant section. It shall be noted that the inundation maps for the high hazard dams in Nebraska are not available for public viewing because it is sensitive information. More detailed information can be sought after through the county emergency management agencies in which the dams are located. In addition, there are existing plans in place for the monitoring and inspection of dams.

All dams are inspected on a regular basis and after extreme conditions have occurred. If problems are found during an inspection, the proper course of action is taken to ensure the structural integrity of the dam is preserved. In the event that dam failure is imminent, the EAP for the dam governs the course of action.

The unique characteristics of different jurisdictions allow dam failure to impact them differently. Villages, cities and SIDs are vulnerable in that structures could be inundated or destroyed, and a loss of life or injury could occur. Residents in the rural areas of the counties can be affected by dam failure in the same way that incorporated communities are affected.

MITIGATION ALTERNATIVES

There are many options that can be done to mitigate the impacts of a dam failure.

- Evacuation Plan
- Land-use regulations preventing development in area protected by existing dams
- Encourage structures protected by dams to purchase flood insurance
- Education on the potential impacts of a dam failure
- Dam failure emergency exercises

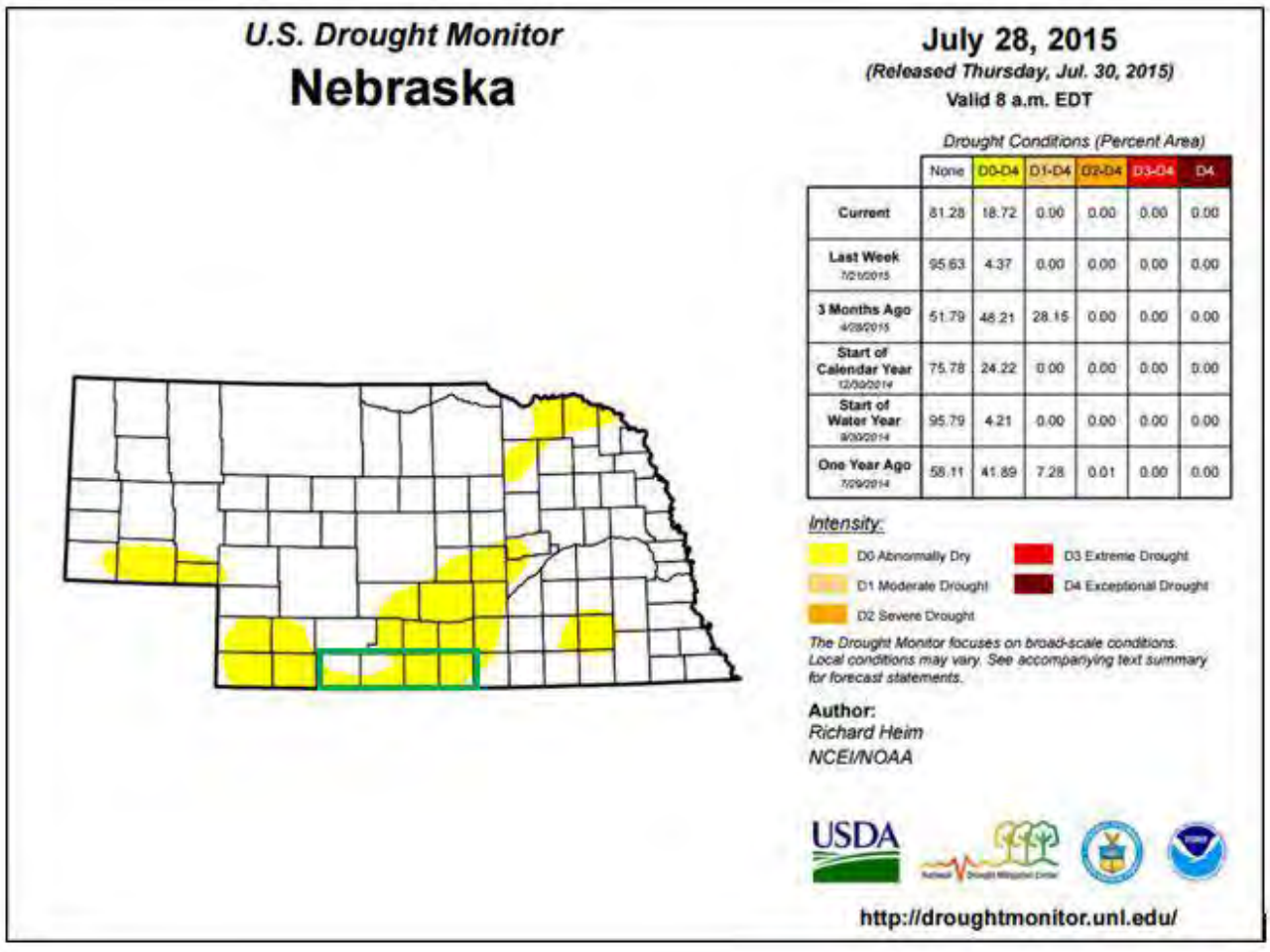
DROUGHT

HAZARD PROFILE

Drought is generally defined as a natural hazard that results from a prolonged period of below normal precipitation. Although many erroneously consider it a rare and random event, drought is actually a normal, recurrent feature of climate. It occurs in virtually all climatic zones, but its characteristics vary significantly from one region to another. A drought often coexists with periods of extreme heat, which together can cause significant social stress, economic losses, and environmental degradation.

> *According to the National Drought Mitigation Center, "**drought** is a normal, recurrent feature of climate, although many erroneously consider it a rare and random event. It occurs in virtually all climatic zones, but its characteristics vary significantly from one region to another."*

Figure 8: Drought Monitor for Nebraska (July 28, 2015)



Source: National Drought Mitigation Center

Drought is a slow-onset, creeping phenomenon and its impacts are largely non-structural. Drought normally affects more people than other natural hazards, and its impacts are spread over a larger geographical area. As a result, the detection and early warning signs of drought conditions and assessment of impacts are more difficult to identify than quick-onset natural hazards (e.g., flood and storm) that results in more visible impacts. In addition, drought has more than 150 definitions and this lack of a universal definition makes it

even harder to indicate the onset and ending. According to the National Drought Mitigation Center (NDMC), droughts are classified into four major types:

- **Meteorological Drought** – is defined based on the degree of dryness and the duration of the dry period. Meteorological drought is often the first type of drought to be identified and should be defined regionally as precipitation rates and frequencies ("norms") vary.

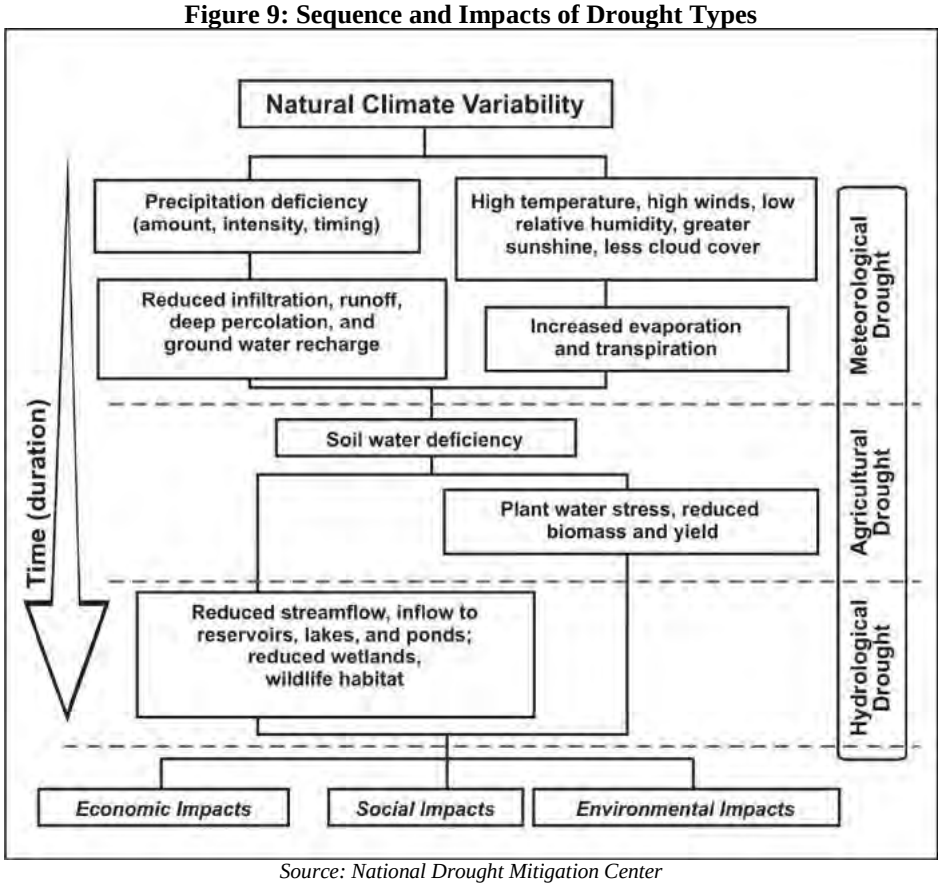
- **Agricultural Drought** – occurs when there is deficient moisture that hinders planting germination, leading to low plant population per hectare and a reduction of final yield. Agricultural drought is closely linked with meteorological and hydrological drought, as agricultural water supplies are contingent upon the two sectors.

- **Hydrological Drought** – occurs when water available in aquifers, lakes, and reservoirs falls below the statistical average. This situation can arise even when the area of interest receives average precipitation. This is due to the reserves diminishing from increased water usage, usually from agricultural use or high levels of evapotranspiration, resulting from prolonged high temperatures. Hydrological drought often is identified later than meteorological and agricultural drought. Impacts from hydrological drought may manifest themselves in decreased hydropower production and loss of water based recreation.

- **Socioeconomic Drought**– occurs when the demand for an economic good exceeds supply due to a weather-related shortfall in water supply. The supply of many economic goods include, but are not limited to, water, forage, food grains, fish, and hydroelectric power.

The following figure indicates different types of droughts, their temporal sequence, and the various types of effects they can have on a community.

Figure 9: Sequence and Impacts of Drought Types



Source: National Drought Mitigation Center

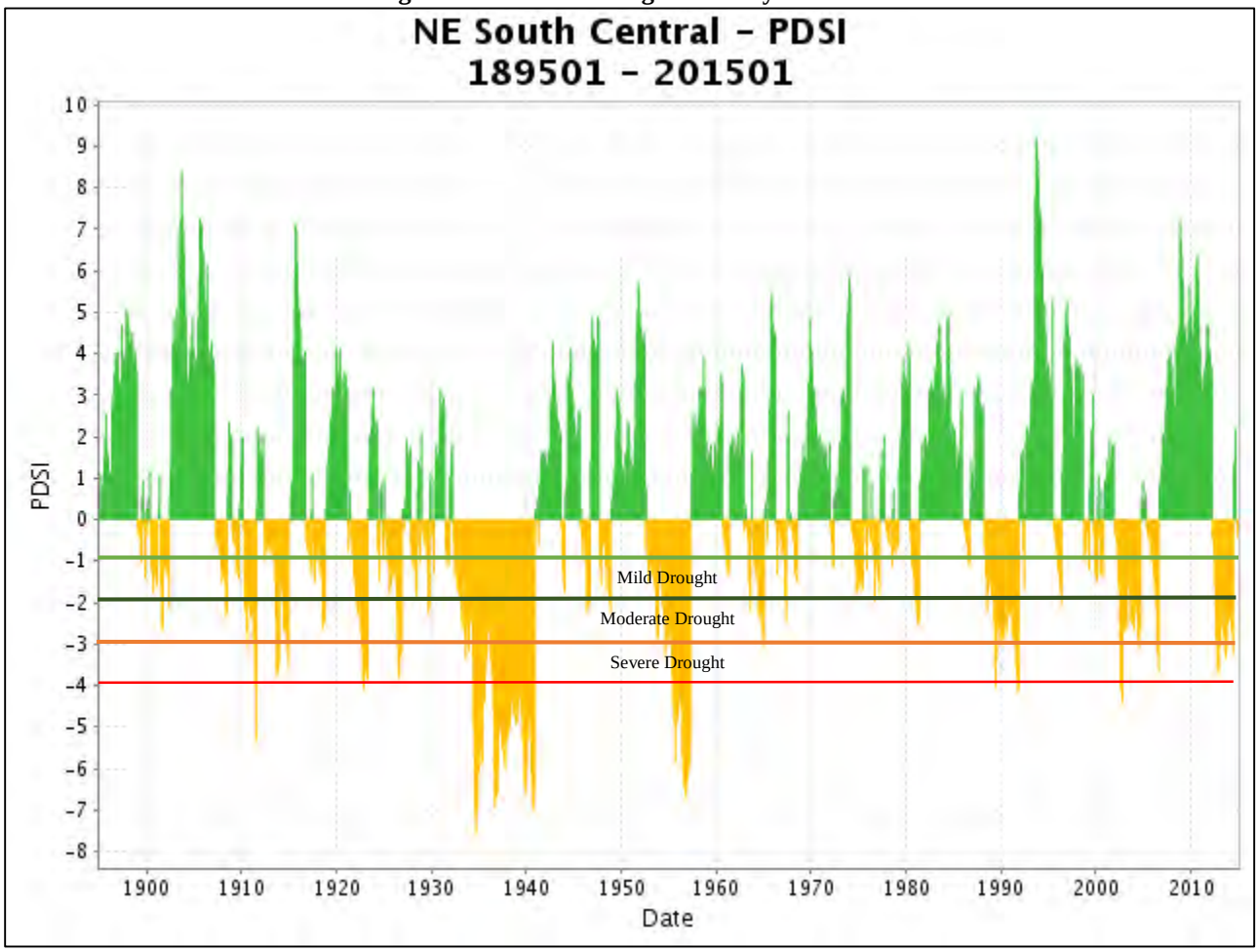
LOCATION

The entire planning area is susceptible to the impacts resulting from drought. Agricultural areas and producers may experience greater impacts than incorporated areas.

EXTENT

Due to drought's unique nature and characteristics, there is not one best way to predict and monitor drought. Among the various indices, the Palmer Drought Severity Index (PDSI) has been widely used by state and local governments in the U.S. The USDA uses the U.S. Drought Monitor in determining when to grant emergency drought assistance. Figure 10 is the PDSI with data from the NCDC. The graph illustrates historical drought information for Division 8 – South-Central Nebraska, which includes the planning area, between the years of 1895 and 2015. The negative Y axis represents a drought, for which '-2' indicates a moderate drought, '-3' a severe drought, and '-4' an extreme drought. Table 51 shows the details of the PDSI classifications. According to this dataset, exceptional droughts were recorded in a number of years dating back to 1895. The planning area has seen at least a severe drought in nine of the last twelve decades. Major events include the Dust Bowl in the 1930s and the 1950s and the recent 2003 drought.

Figure 10: Palmer Drought Severity Index



Source: NCDC

Table 51: Palmer Drought Severity Index Classification

Numerical Value	Description	Numerical Value	Description
4.0 or more	Extremely wet	-0.5 to -0.99	Incipient dry spell
3.0 to 3.99	Very wet	-1.0 to -1.99	Mild drought
2.0 to 2.99	Moderately wet	-2.0 to -2.99	Moderate drought
1.0 to 1.99	Slightly wet	-3.0 to -3.99	Severe drought
0.5 to 0.99	Incipient wet spell	-4.0 or less	Extreme drought
0.49 to -0.49	Near normal	--	--

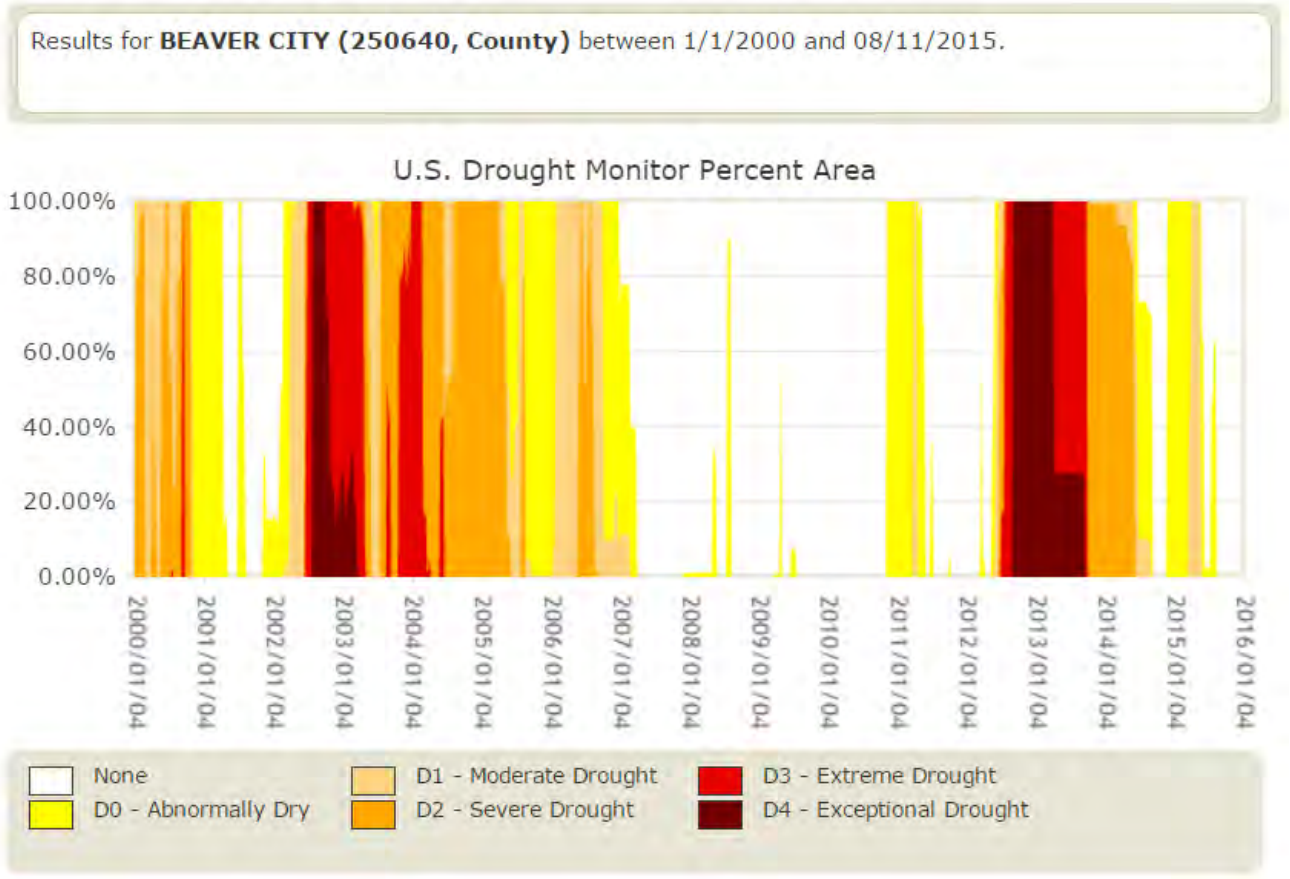
Source: Climate Prediction Center

HISTORICAL OCCURRENCE

The extreme heat and drought event that started in the summer of 2012 was substantial but did not warrant a presidential disaster declaration within Nebraska. Figure 11 summarizes the historical drought conditions for the Beaver City area by intensity and percent area since 2000. These conditions are similar to those throughout the planning area. According to the data acquired from NDMC, the planning area experienced two periods of extreme drought since 2000, the first beginning in the summer of 2002 and leading to

extreme and severe drought conditions in the following summer. A decade later, beginning in July of 2012 the second exceptional drought occurred. It finally fell to the moderate drought category in the summer of 2014. Table 52 shows the classification for the Drought Monitor.

Figure 11: Historic Drought Conditions at Beaver City Station



Source: NDMC

Table 52: United States Drought Monitor Classification

Category	Description	PDSI Ranges	Possible Impacts
D0	Abnormally Dry	-1.0 to -1.9	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.
D1	Moderate Drought	-2.0 to -2.9	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested
D2	Severe Drought	-3.0 to -3.9	Crop or pasture losses likely, water shortages common; water restrictions imposed
D3	Extreme Drought	-4.0 to -4.9	Major crop/pasture losses; widespread water shortages or restrictions
D4	Exceptional Drought	-5.0 or less	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams and wells creating water emergencies.

Source: NDMC

AVERAGE ANNUAL DAMAGES

The annual property estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. The annual crop loss was determined based upon the RMA Cause of Loss Historical Database since 2000. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. There have been no recorded property damages due to drought for the planning area. Crop damages would average around $16,400,240 per year due to drought events for the planning area.

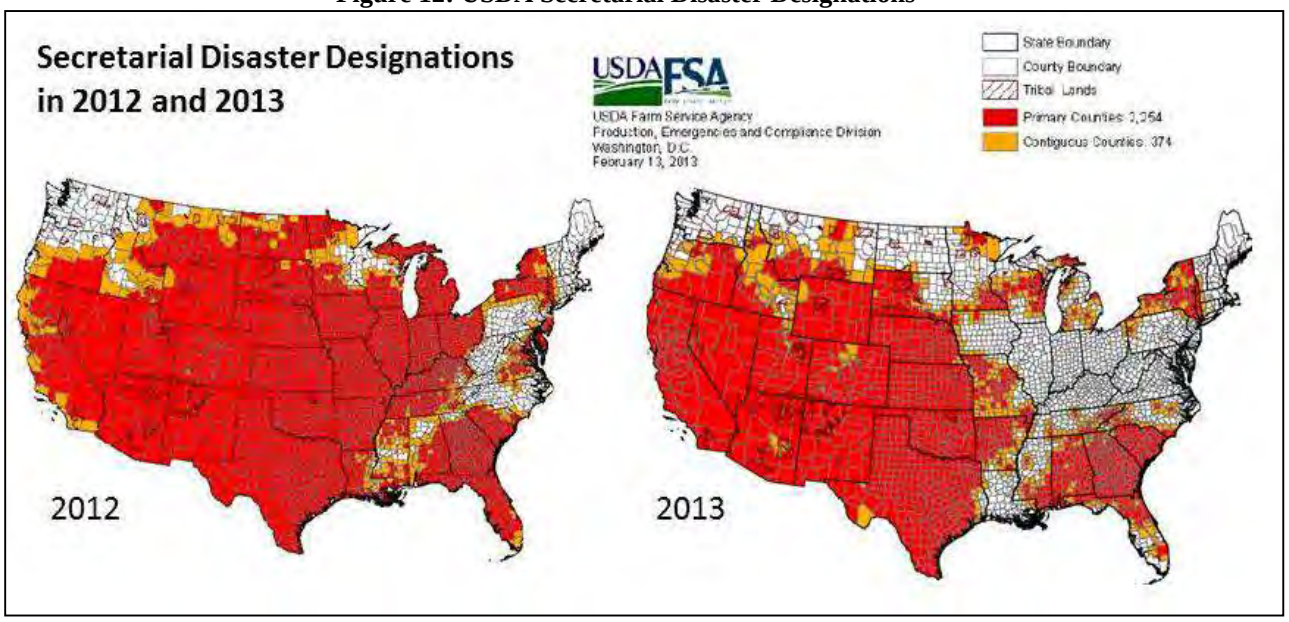
Table 53: Loss Estimate for Drought

Hazard Type	Number of Months of Drought / Total Months of Record[3]	Total Property Loss[1]	Average Annual Property Loss [1]	Total Crop Loss[2]	Average Annual Crop Loss [2]
Drought	426/1104	$0	$0	$246,003,599	$16,400,240

1 Indicates the data is from NCDC (January 1996 to April 2015); 2 Indicates data is from USDA RMA (2000 to 2014); 3 Indicates the data is from NDMC (January 1921 to December 2012)

The severe drought in 2012 significantly affected the agricultural sector of the state. Although the full impacts are yet to be studied, the USDA reported a total of $139,957,809 in drought relief to Nebraska from 2008 to 2011 for all five disaster programs: Supplemental Revenue Assistance Payments (SURE), Livestock Forage Disaster Assistance Program (LFD), Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish Program (ELAP), Livestock Indemnity Program (LIP), and Tree Assistance Program (TAP). Figure 12 shows the drought disaster designations by USDA in 2012 and 2013. The whole state of Nebraska is in the red zone, indicating that Nebraska, including the planning area, has a high probability of a drought disaster in the time period shown.

Figure 12: USDA Secretarial Disaster Designations



Source: U.S. Department of Agriculture

PROBABILITY

Probability for drought is calculated by dividing the number of months in recorded drought by the months of record. The planning area experienced drought in 426 months of the 1,104 months on record. This results in a 39 percent chance of drought every year.

VULNERABILITY ASSESSMENT

As identified in Nebraska's Drought Mitigation and Response Plan, drought is a common feature of the Nebraska landscape and often causes significant economic, environmental, and social impacts. Although agriculture is the major sector affected, impacts on rural and municipal water supplies, fish and wildlife, tourism, recreation, water quality, soil erosion, the incidence of wildfires, electricity demand, and other sectors are also significant. Also, the indirect impacts of drought on personal and business incomes, tax revenues, unemployment, and other areas are also important. In general, drought produces a complex web of impacts that ripple through many sectors of the economy. This is largely due to the dependence of myriad sectors on water for producing goods and providing services. It is impossible to predict all the potential impacts, but the common impacts of drought have been compiled by the NDMC and are illustrated in Table 54.

Table 54: Classification of Drought-Related Impacts

Problem Sectors	Impacts
Economic	• Loss from crop production ▪ Annual and perennial crop losses; damage to crop quality ▪ Reduced productivity of cropland (wind erosion, etc.) ▪ Insect infestation ▪ Plant disease ▪ Wildlife damage to crops • Loss from dairy and livestock production ▪ Reduced productivity of range land ▪ Forced reduction of foundation stock ▪ Closure/limitation of public lands to grazing ▪ High cost/unavailability of water for livestock ▪ High cost/unavailability of feed for livestock ▪ High livestock mortality rates ▪ Increased predation ▪ Range fires • Loss from timber production ▪ Forest fires ▪ Tree disease ▪ Insect infestation ▪ Impaired productivity of forest land • Loss from fishery production ▪ Damage to fish habitat ▪ Loss of young fish due to decreased flows • Loss of national economic growth, hindrance of economic development • Income loss for farmers and others directly affected • Loss of farmers through bankruptcy • Loss to recreational and tourism industry • Loss to manufacturers and sellers of recreational equipment • Increased energy demand and reduced supply because of drought-related power curtailments • Costs to energy industry and consumers associated with substituting more expensive fuels (oil) for Hydroelectric power • Loss to industries directly dependent on agricultural production (e.g., machinery and • Decline in food production/disrupted food supply ▪ Increase in food prices ▪ Increased importation of food (higher costs) • Disruption of water supplies • Unemployment from drought-related production declines • Strain on financial institutions (foreclosures, greater credit risk s, capital shortfalls, etc.) • Revenue losses to federal, state, and local governments (from reduced tax base)

Problem Sectors	Impacts
	• Deterred capital investment, expansion • Dislocation of businesses • Revenues to water supply firms • Loss from impaired navigability of streams, rivers, and canals • Cost of water transport or transfer • Cost of new or supplemental water resource development
Environmental	• Damage to animal species ▪ Reduction and degradation of fish and wildlife habitat ▪ Lack of feed and drinking water ▪ Disease ▪ Increased vulnerability to predation (e.g., from species concentration near water) • Loss of biodiversity • Wind and water erosion of soils • Reservoir and lake drawdown • Damage to plant species • Water quality effects (e.g., salt concentration, increased water temperatures, pH, dissolved oxygen) • Air quality effects (dust, pollutants) • Visual landscape quality (dust, vegetative cover, etc.) • Increased fire hazard • Estuarine impacts; changes in salinity levels, reduced flushing
Social	• Increased groundwater depletion (mining), land subsidence • Loss of wetlands • Loss of cultural sites • Insect infestation • Food shortages (decreased nutritional level, malnutrition, famine) • Loss of human life (e.g., food shortages, heat) • Public safety from forest and range fires • Conflicts between water users, public policy conflicts • Increased anxiety • Loss of aesthetic values • Health-related low flow problems (e.g., diminished sewage flows, increased pollutant concentrations, etc.) • Recognition of institutional constraints on water use • Inequity in the distribution of drought impacts/relief • Decreased quality of life in rural areas • Increased poverty • Reduced quality of life, changes in lifestyle • Social unrest, civil strife • Population migration (rural to urban areas) • Reevaluation of social values • Increased data/information needs, coordination of dissemination activities • Loss of confidence in government officials • Recreational impacts

MITIGATION ALTERNATIVES

The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of drought. Some of these strategies are already in place in the planning area. The following were identified as potential mitigation actions for drought:

- Participate in the Tree City USA program
- Expand water storage capacity
- Identify locations and drill new municipal wells
- Establish a source water contingency plan

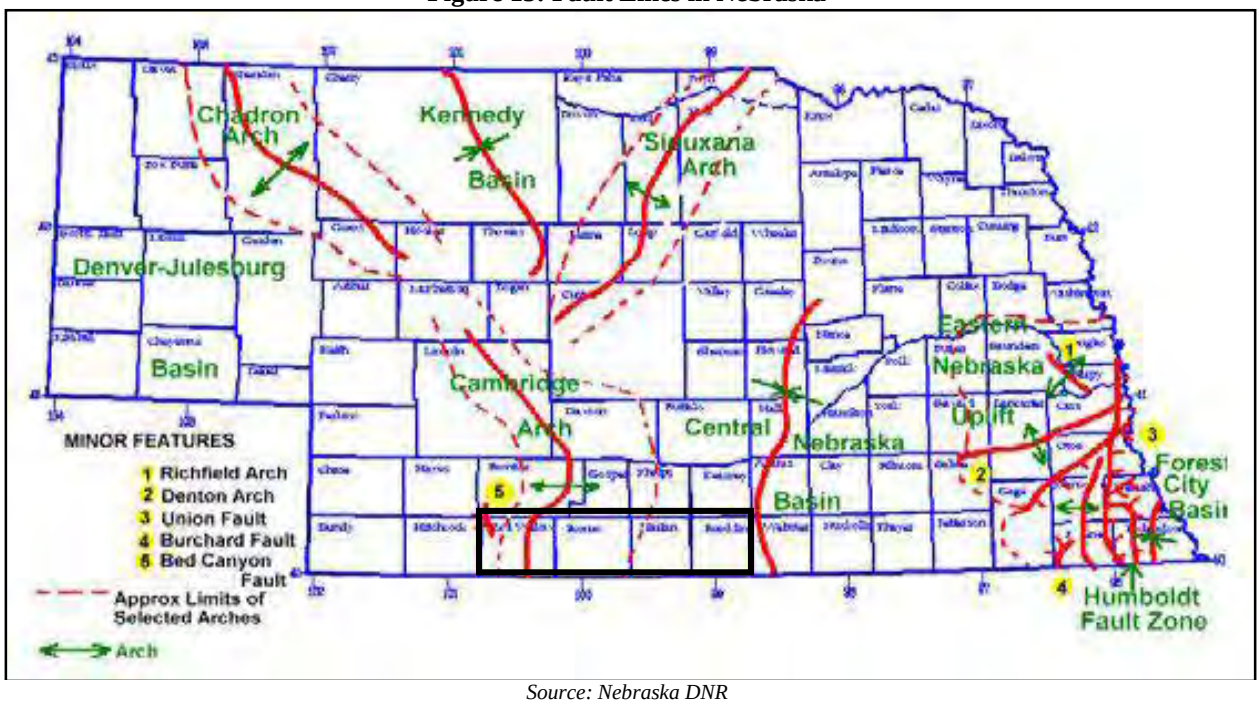
- Establish an irrigation/ groundwater management plan
- Encourage agricultural businesses to purchase crop insurance as appropriate
- Drought education programs (residential and agricultural)
- Assess Drought Vulnerability (identify factors that affect drought severity for local jurisdictions)
- Establish a Drought Monitoring Board and drought reporting procedures
- Establish monitoring procedures for municipal water supply and distribution systems
- Develop drought specific plans (this may include water conservation plans, drought preparedness plans, and wellhead protection plans)
- Establish municipal water conservation programs
- Establish agricultural policies (agricultural irrigation standards, grazing policies, etc.)
- Enhanced residential landscape standards (xeriscaping, irrigation systems requirements, etc.)
- Enhanced building codes to require low-flow fixtures in new construction
- Incentives to retrofit structures with low-flow fixtures
- Incorporate permeable surfaces into municipal designs
- Investigate alternative water supply options

EARTHQUAKES

HAZARD PROFILE

An earthquake is the result of a sudden release of energy in the Earth's tectonic plates that creates seismic waves. The seismic activity of an area refers to the frequency, type, and size of earthquakes experienced over a period of time. Although rather uncommon, earthquakes do occur in Nebraska, and are usually small, generally not felt, and cause little to no damage. Figure 13 shows the fault lines in Nebraska, and the planning area is outlined in black.

Figure 13: Fault Lines in Nebraska



Source: Nebraska DNR

LOCATION

The primary fault line in the planning areas is the Cambridge Arch. The Cambridge Arch runs from north to south through Red Willow County and extends north into west central Nebraska and south into Kansas. Though a minor feature, the Bed Canyon Fault rests in the northwest corner of Red Willow County. Just outside of the boundaries of the planning area, the Central Nebraska Basin line runs along the eastern Franklin County border.

EXTENT

Earthquakes are measured by magnitude and intensity. Magnitude is measured by the Richter scale, a base-10 logarithmic scale, which uses seismographs around the world to measure the amount of energy released by an earthquake. Intensity is measured by the Modified Mercalli Intensity Scale, which determines the intensity of an earthquake by comparing actual damage against damage patterns of earthquakes with known intensities. Table 55 and Table 56 summarize the Richter scale and Modified Mercalli scale.

Table 55: Richter Scale

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt, but recorded.
3.5 – 5.4	Often felt, but rarely causes damage.
Under 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 – 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 – 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or greater	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: Federal Emergency Management Agency

Table 56: Modified Mercalli Scale

Scale	Intensity	Description of Effects	Corresponding Richter Scale Magnitude
I	Instrumental	Detected only on seismographs	
II	Feeble	Some people feel it	< 4.2
III	Slight	Felt by people resting, like a truck rumbling by	
IV	Moderate	Felt by people walking	
V	Slightly Strong	Sleepers awake; church bells ring	< 4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves	< 5.4
VII	Very Strong	Mild Alarm; walls crack; plaster falls	< 6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open	< 6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread	< 7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards	< 8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves	> 8.1

Source: Federal Emergency Management Agency

Based on historical record it is likely to see an earthquake in the planning area. If an earthquake occurs, it is likely to be under 4.0 on the Richter scale.

HISTORICAL OCCURRENCES

The following table displays historical occurrences of earthquakes in and around the planning area. The information displayed is from the NEIC Earthquake Search database provided by the United States Geological Survey (USGS) Earthquake Hazards Program. During the period of 1973 to 2014, there were four earthquakes recorded in the planning area. The most recent earthquake occurred in 2012 in Furnas County, south of Holbrook.

Table 57: Historical Earthquakes

Date	Magnitude	Depth	Location	Location Description
6/6/1979	M2.7	5.0 KM	40.231° N 100.403°W	Epicenter east of Indianola
7/16/1979	M3.2	5.0KM	40.184° N 100.378°W	Epicenter southeast of Indianola
11/13/2001	M3.3	5.0KM	39.996° N 100.288°W	Epicenter located on Kansas-Nebraska border. Felt in Danbury, Lebanon and McCook
2/13/2012	M2.9	5.0KM	40.237° N 100.022°W	Epicenter south of Holbrook. Felt in Beaver City, Edison and Oxford

Source: USGS

Figure 14: Historical Earthquakes

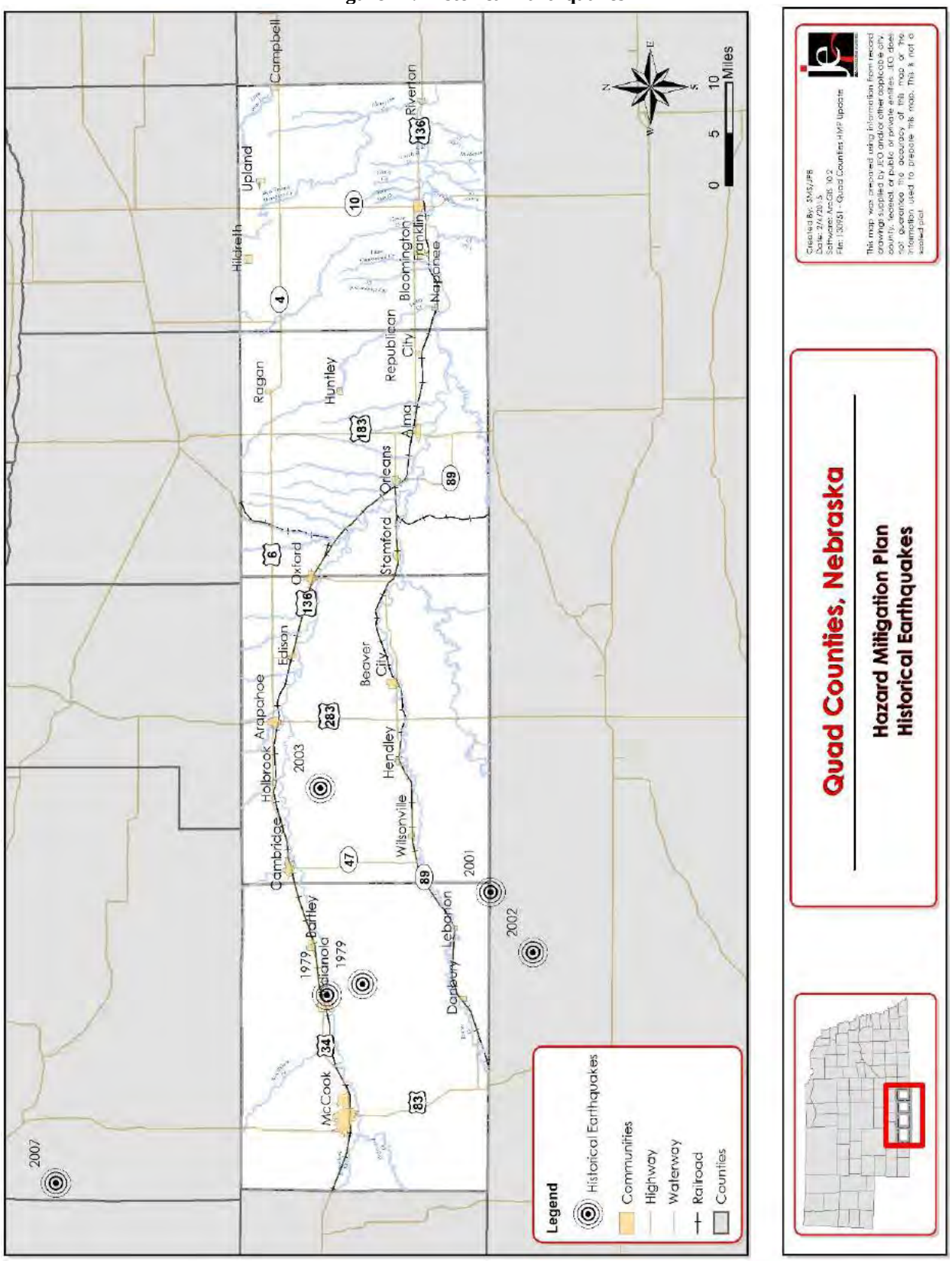
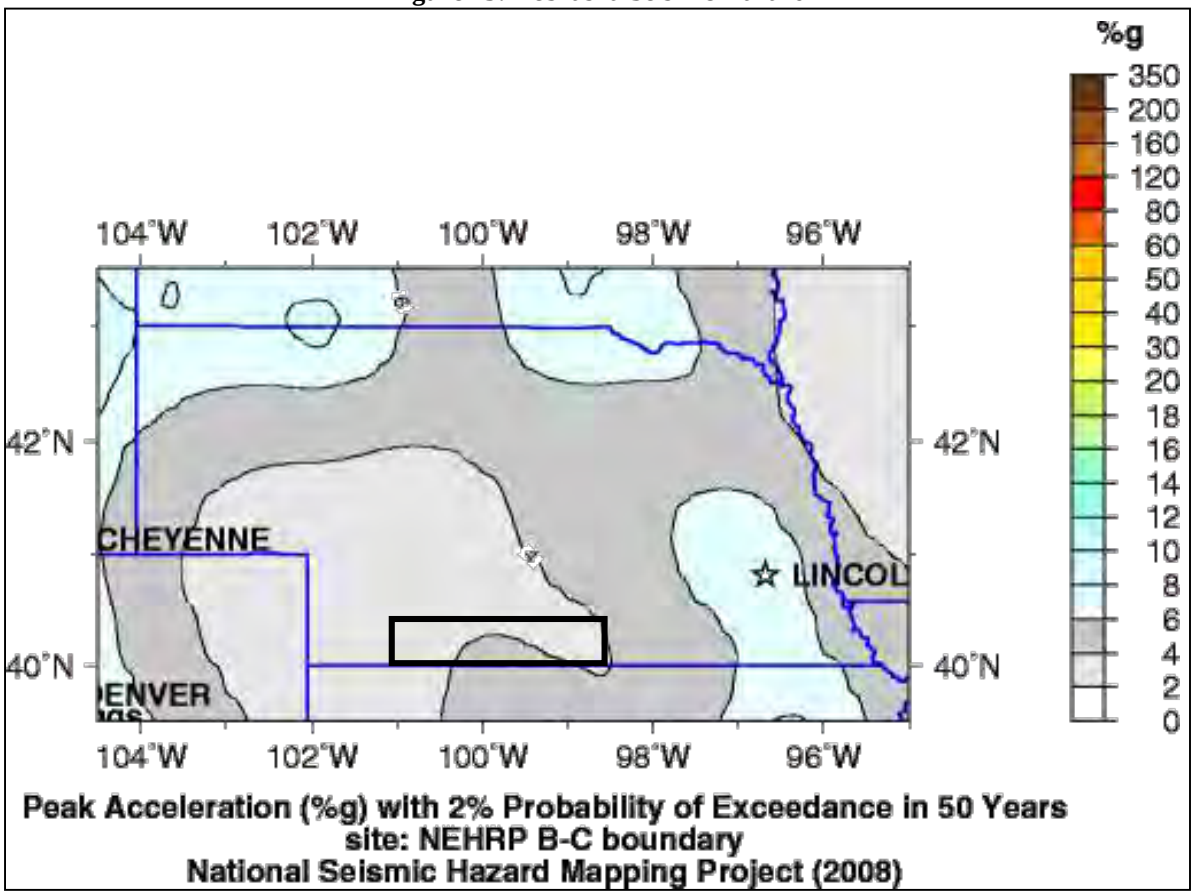


Figure 15: Nebraska Seismic Hazard



Source: United States Geological Survey

Figure 15 displays the seismic hazard map for the State of Nebraska. Colors on this map show the levels of horizontal shaking that have a 2-in-100 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of g (g is the acceleration of a falling object due to gravity). The planning area is outlined in black.

AVERAGE ANNUAL DAMAGES

Due to the lack of sufficient earthquake data, limited resources, low earthquake risk for the area, and limited reports of historical occurrences with recorded damages, it is not feasible to utilize the 'event damage estimate formula' to estimate potential losses for the planning area.

PROBABILITY

Based on the historic record of four earthquakes in forty-two years, there is approximately a 10 percent chance of an earthquake occurring within the planning area annually.

VULNERABILITY ASSESSMENT

Low income individuals are particularly vulnerable to the threat of earthquakes. Often, low income individuals and families live in lower cost homes (older homes, mobile homes) that are less able to withstand disaster. Older homes and mobile homes may not have been constructed using the most advanced building codes or may not have received updates and retrofits that would have increased their stability and ability to withstand seismic events. Damages resulting from the 1994 Northridge earthquake in California were disproportionately focused on low and moderate income rental housing units that were older and thus more vulnerable to seismic damages.

MITIGATION ALTERNATIVES

The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of earthquakes. Some of these strategies, such as the use of warning systems, are already in place in the planning area. Many of these strategies are identified and discussed in greater detail in the FEMA document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards.* Due to the low earthquake risk most of the alternatives are not standard practice in the planning area.

- Increase Earthquake Risk Awareness (i.e. outreach to businesses, schools, and individuals)
- Adopt and enforce seismic building codes
- Incorporate Seismic Safety into all Local Plans (i.e., create a Seismic Safety Committee)
- Conduct inspections of building safety (i.e., identify seismic risk)
- Protect critical facilities and infrastructure (i.e., install shut off valves; bracing equipment; and review all bridge construction plans)
- Implement structural mitigation techniques (i.e. membranes on windows to prevent glass shattering, steel bracing on chimneys; etc.)
- Conduct outreach to building inspectors, engineers and architects.

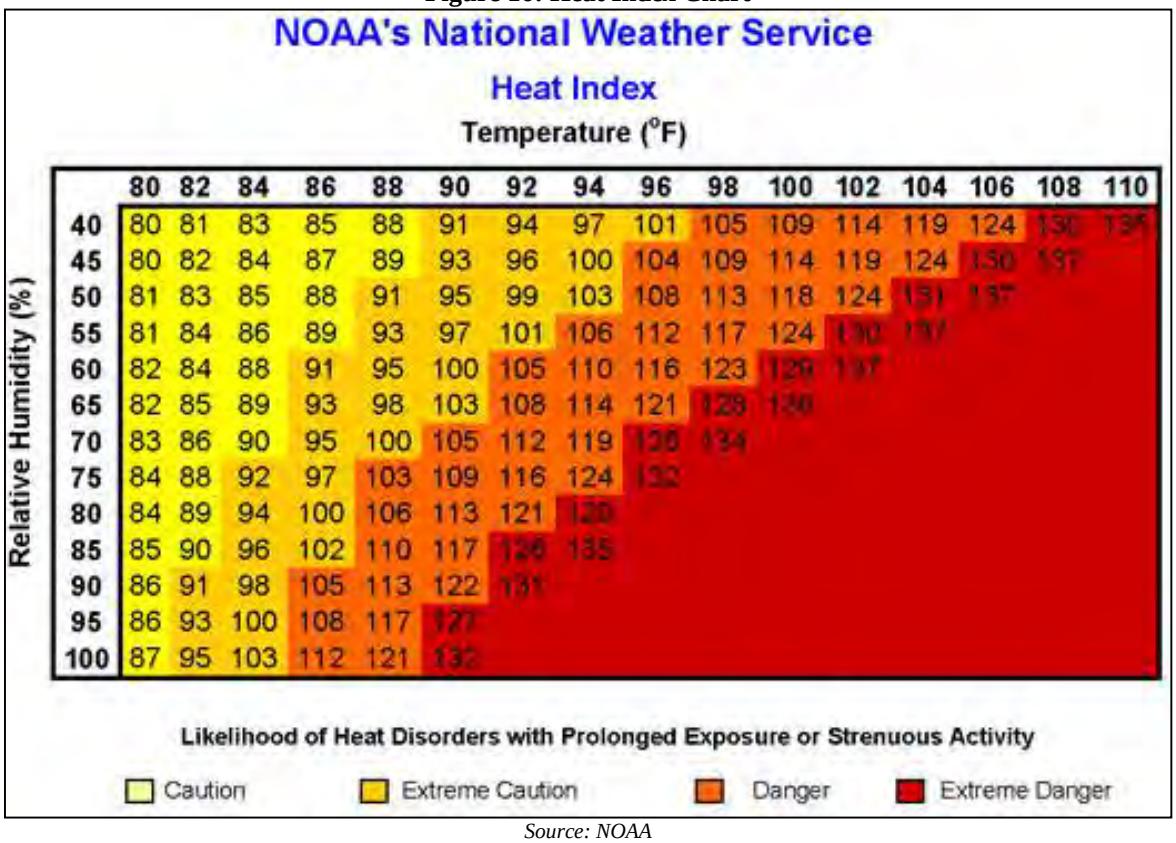
EXTREME HEAT

HAZARD PROFILE

Extreme heat is often associated with periods of drought, but can also be characterized by long periods of high temperatures in combination with high humidity. During these conditions, the human body has difficulty cooling through the normal method of the evaporation of perspiration. Health risks arise when a person is overexposed to heat. Extreme heat can also cause increased strain on the electric grid, which can lead to power failures. For the planning area, the months with the highest temperatures are May, June, July, August, and September. The National Weather Service is responsible for issuing excessive heat outlooks, excessive heat watches, and excessive heat warnings. Excessive heat outlooks are issued when potential exists for an excessive heat event in the next three to seven days. Excessive heat outlooks can be utilized by public utility staffs, emergency managers, and public health officials to plan for extreme heat events. Excessive heat watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. An excessive heat watch should provide local officials and residents in the area enough time to take appropriate actions to mitigate the effects of extreme heat. Finally, excessive heat warnings are issued when an excessive heat event is expected in the next 36 hours. Excessive heat warnings are issued when an extreme heat event is occurring, is imminent, or has a very high probability of occurring.

A key factor in extreme heat situations is the humidity level relative to the temperature. As is indicated in Figure 16, as the relative humidity increases, the temperature needed to cause a dangerous situation decreases. For example, for 100 percent relative humidity dangerous levels of heat begin at 86°F where as a Relative Humidity of 50 percent, requires 94°F. The combination of Relative Humidity and Temperature result in a Heat Index: 100 percent Relative Humidity + 86°F = 112° Heat Index.

Figure 16: Heat Index Chart



Source: NOAA

LOCATION

The entire planning area is likely to experience extreme heat events due to the regional nature of this hazard.

EXTENT

For this planning process and the planning area, extreme heat is defined as temperatures greater than 90°F. It is reasonable that for the month of May the planning area will experience on average three days with temperatures greater than 90°F; for the month of June the planning area will experience 12 days of temperatures greater than 90°F; for the month of July the planning area will experience 21 days of temperatures greater than 90°F; for August the planning area will experience 19 days of temperatures greater than 90°F; and in September the planning area will experience nine days of temperatures greater than 90°F.

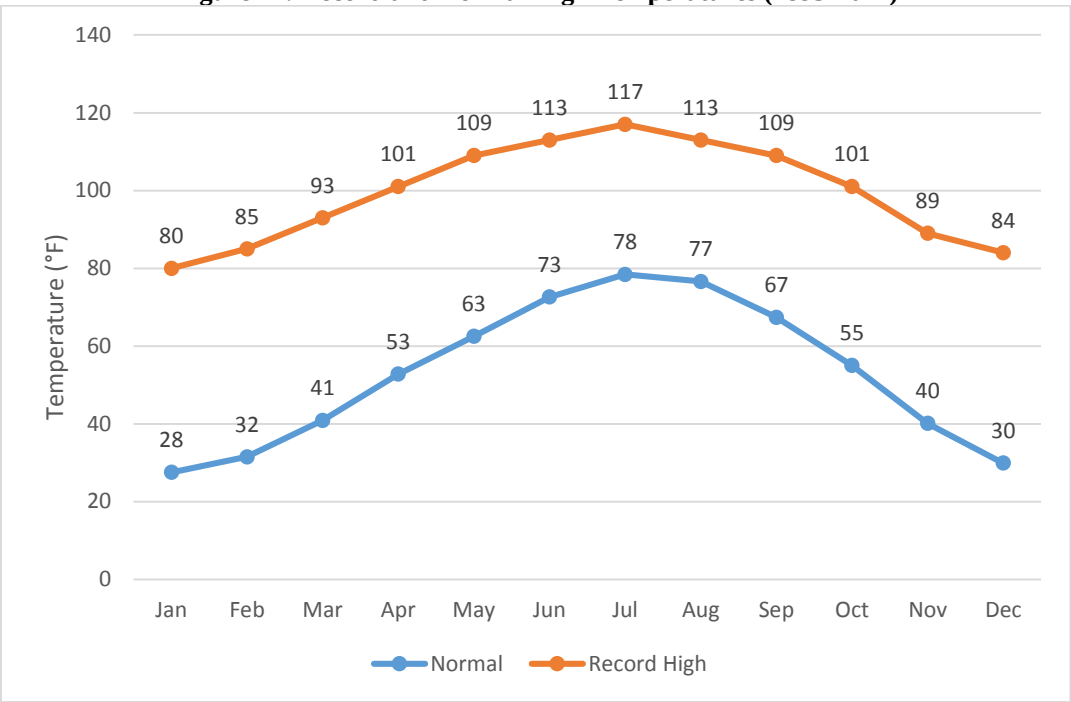
Table 58: Record Highs and Average Days over 90oF for McCook Municipal Airport Station (1893-2012)

Month	Record High	Days with Temperatures Greater than 90°F
January	80°F	0
February	85°F	0
March	93°F	0.1
April	101°F	0.8
May	109°F	3.4
June	113°F	12.4
July	117°F	21.1
August	113°F	19.1
September	109°F	9.2
October	101°F	1.6
November	89°F	0
December	84°F	0

Source: High Plains Regional Climate Center

Extreme heat can occur as early as March and as late as October in the planning area. Figure 17 shows the record and normal high temperatures in the planning area as recorded from 1893-2012.

Figure 17: Record and Normal High Temperatures (1893-2012)



Source: High Plains Regional Climate Center

HISTORICAL OCCURRENCE

While there are no events with death, injuries, or losses reported by the NCDC, the High Plains Regional Climate Center (HPRCC) reports that on average there are 68 days annually where temperatures greater than 90°F occur in the planning area.

AVERAGE ANNUAL DAMAGES

The direct and indirect effects of extreme heat are difficult to quantify. There is no way to place a value on the loss of human life. Potential losses such as power outages could affect businesses, homes, and critical facilities. High demand and intense use of air conditioning can overload the electrical systems and cause damages to infrastructure. According to NCDC, extreme heat causes $4,094,880 per year in crop damages due to heat.

Table 59: Extreme Heat Loss Estimate

Hazard Type	Average Number of Days Per Year >90°F[1]	Total Crop Loss[2]	Average Annual Crop Loss [2]
Extreme Heat	68 days	$61,423,203	$4,094,880

1 Indicates the data is from HPRCC; 2 Indicates data is from USDA RMA (2000 to 2014)

PROBABILITY

Based on the data from the HPRCC, approximately 68 days annually will exceed 90°F. When an extreme heat event occurs, the population, property, and critical facilities and infrastructure are not likely to sustain significant damages. The summer months of June, July, and August are the most likely times to see dangerously high temperatures, which can cause injury or death.

VULNERABILITY ASSESSMENT

The months of June, July, and August are when most extreme heat events occur. These months also have lower amounts of precipitation, thus increasing the possibility for a drought event. Periods of high temperatures can make people vulnerable to heatstroke, heat cramps, heat exhaustion, and pose a threat to human life. Building stock, such as critical facilities, are not at risk; however periods of extreme heat place a significant demand on utilities, such as water and electricity, which can cause a failure in the system. Power loss could occur with the high demand on energy, making an extreme heat event even more dangerous.

The agricultural economy, especially livestock, is highly vulnerable and at great risk during periods of extreme heat. Heat stress in feedlot cattle can cause reduced performance, and in the most severe cases, death of the animals, potentially resulting in millions of dollars in losses to the cattle industry.

All segments of the population are vulnerable to the effects of extreme heat. However, there are population groups with higher levels of vulnerability to extreme heat, which include: the elderly, residents of nursing homes or care facilities, children, those isolated from social interaction, and low-income groups. Elderly residents have a lower tolerance for extreme temperatures and can feel the effects more rapidly. Low-income elderly in urban areas are especially at risk to extreme temperatures. Low-income residents and families may lack resources that mitigate the impacts of extreme heat such as air conditioning. Young children under the age of 5 are highly susceptible to the effects of extreme heat as well. They have a lower body mass to surface ratio making them more vulnerable to heat-related morbidity and mortality. Children also become dehydrated more quickly than adults, making for greater concern. Children are particularly vulnerable due to their physiological coping strategy of compensating, where serious health concerns do not present obviously, and then extremely rapid, severe decompensation, where their body systems fail to perform basic functions.

MITIGATION ALTERNATIVES

The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of extreme heat. Many of these strategies are identified and discussed in greater detail in the FEMA document, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*.

- Identify Existing Community Shelters/Centers
- Assist Vulnerable Populations (i.e., create a database to track those individuals at high risk such as the elderly, low income citizens, and children)
- Reduce Urban Heat Island Effect (i.e., use cool roofing products that reflect sunlight and heat away from buildings)
- Increase Awareness of Extreme Heat Risk and Safety (i.e., educate citizens regarding the dangers of extreme heat and the steps they can take to protect themselves)

FLOODING (RIVERINE AND FLASH)

HAZARD PROFILE

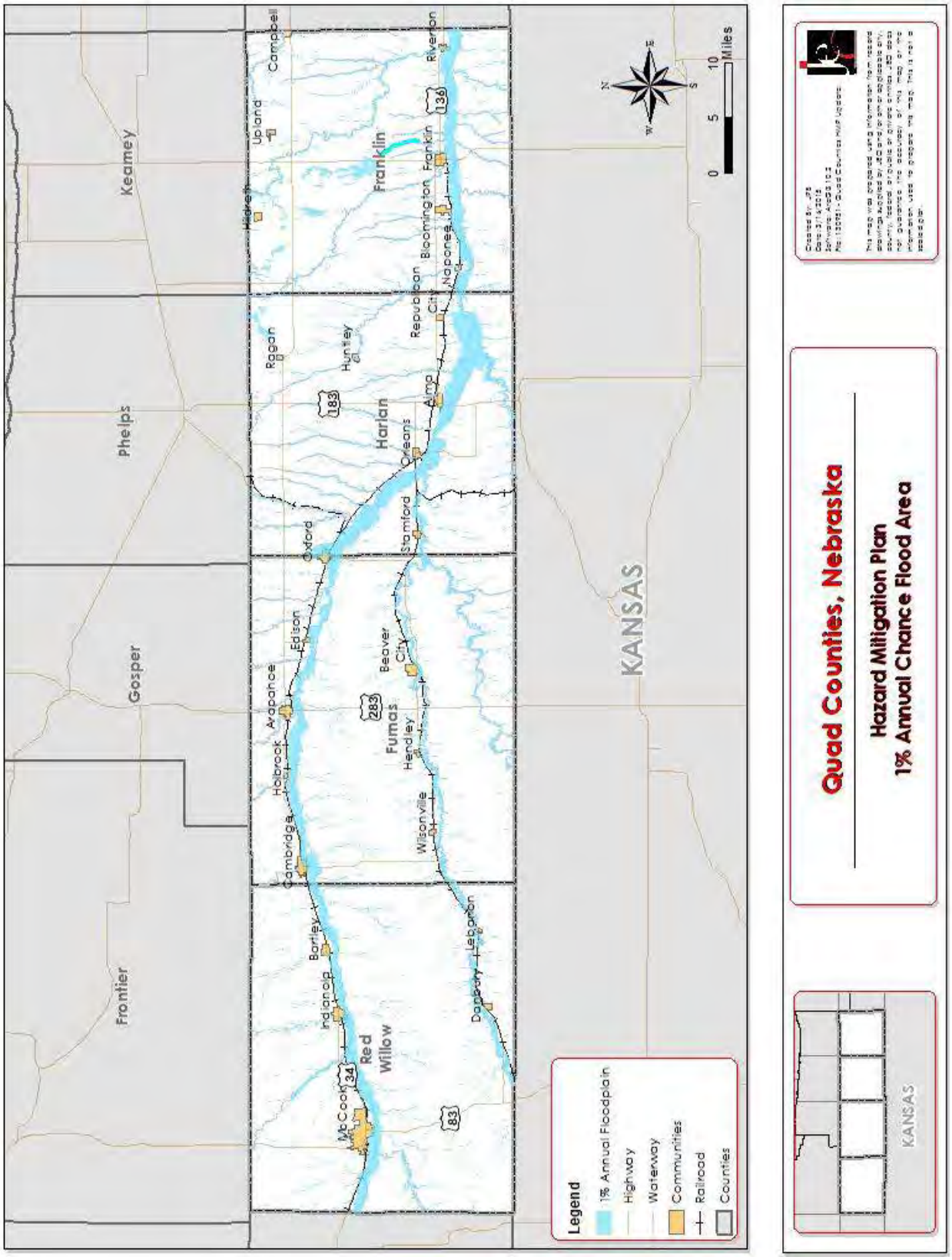
Flood events are the most damaging and costly hazards in the United States, and account for 66 percent of all presidential disaster declarations. Flooding can occur on a local level, sometimes affecting only a few streets, but can also extend throughout an entire district, affecting whole drainage basins and impacting property in multiple states. The principal type of flood most common to Nebraska, due to geographic location and topography, is riverine floods.

Riverine floods, slower in nature, occur when water from sustained rainfall or rapid snow melt overflows a waterway once the volume of water exceeds the capacity of the waterway. Flash floods, faster in nature, result from convective precipitation usually due to intense thunderstorms or a sudden release from an upstream impoundment created behind a dam, landslide, or levee. Flash floods are distinguished from a regular flood by a timescale of less than six hours. Flooding from excessive rainfall in Nebraska usually occurs between late spring and early fall.

Flooding is most commonly caused by excessive rainfall or snowmelt. Occasionally, unexpected drainage obstructions such as landslides, ice, or debris can cause slow flooding upstream of the obstruction. Ice jams can cause flooding when a warm snap breaks up river ice, which flows downstream, and piles up against bridges or other waterway obstructions, causing a temporary dam in the waterway with water backing up behind it. When an ice jam breaks, all of the backed-up water is suddenly released, causing a rush of water downstream which can rapidly exceed the capacity of waterways and cause severe flash flooding. Ice jams are common throughout Nebraska during the transition between winter and spring.

Flash floods are rapid flooding of geomorphic low-lying areas, when the ground becomes saturated with water that has fallen too quickly to be absorbed. They are usually caused by heavy rains associated with a severe thunderstorm. Flash floods can also occur after the collapse of an ice jam, or a man-made structure, such as a dam or levee. Flash floods most often occur in normally dry areas that have recently received precipitation. Flash floods are extremely dangerous because of their sudden nature.

Figure 18: 1% Annual Chance Flood Area for the Planning Area



LOCATION

According to the FEMA Map Service Center website (www.msc.fema.gov), there are communities in the planning area that currently have Flood Insurance Rate Map (FIRM) panels, which are listed in Table 60. In *Section Seven: Participant Sections*, the 1 percent annual chance flood area map is included for each participating jurisdiction, where available, as well as an inventory of structures located in the hazard area.

Table 60: Flood Insurance Rate Map Panels

Location	FIRM Panel	Effective Date
Franklin County	31061C0200C	9/30/2005
Bloomington	31061C0300C	9/30/2005
Campbell	31061C0125C	9/30/2005
Franklin	31061C0325C	9/30/2005
Hildreth	31061C0050C	9/30/2005
Naponee	31061C0275C	9/30/2005
Riverton	31061C0350C	9/30/2005
Upland	31061C0075C	9/30/2005
Furnas County	31065C0225C	3/2/2009
Arapahoe	31065C0075C	3/2/2009
Beaver City	31065C0250C	3/2/2009
Cambridge	31065C0016C	3/2/2009
Edison	31065C0100C	3/2/2009
Holbrook	31065C0050C	3/2/2009
Oxford	31065C0275C	3/2/2009
Wilsonville	31065C0350C	3/2/2009
Harlan County	31083C0200B	2/18/2009
Alma	31083C0330B	2/18/2009
Huntley	31083C0210B	2/18/2009
Orleans	31083C0190B	2/18/2009
Ragan	31083C0100B	2/18/2009
Republican City	31083C0355B	2/18/2009
Stamford	31083C0165B	2/18/2009
Red Willow County	31145C0250C	2/4/2009
Bartley	31145C0275C	2/4/2009
Danbury	31145C0400C	2/4/2009
Indianola	31145C0235D	2/4/2009
Lebanon	31145C0425C	2/4/2009
McCook	31145C0185C	2/4/2009

Source: FEMA

EXTENT

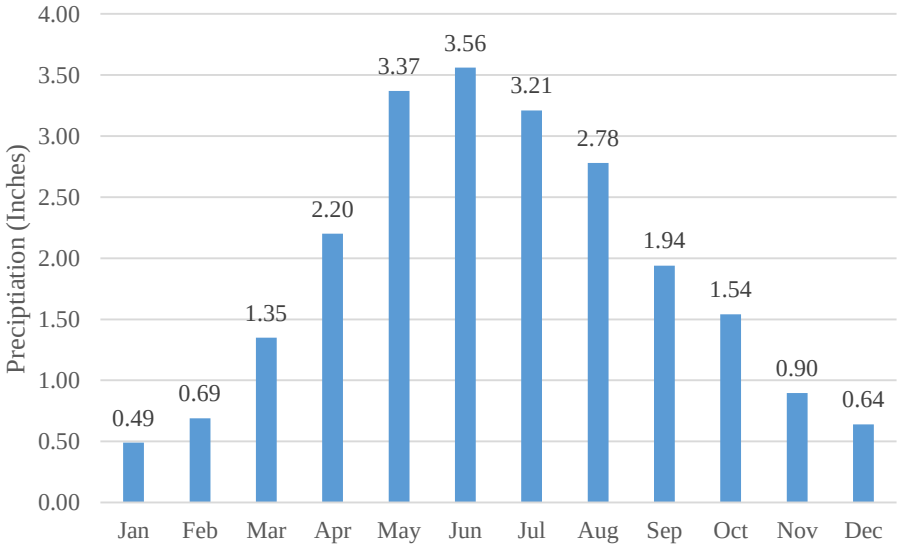
The NWS has three categories to define the severity of a flood once a river reaches flood stage as indicated in Table 61.

Table 61: Flooding Stages

Flood Stage	Description of Flood Impacts
Minor Flooding	Minimal or no property damage, but possible some public threat or inconvenience
Moderate Flooding	Some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary
Major Flooding	Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations

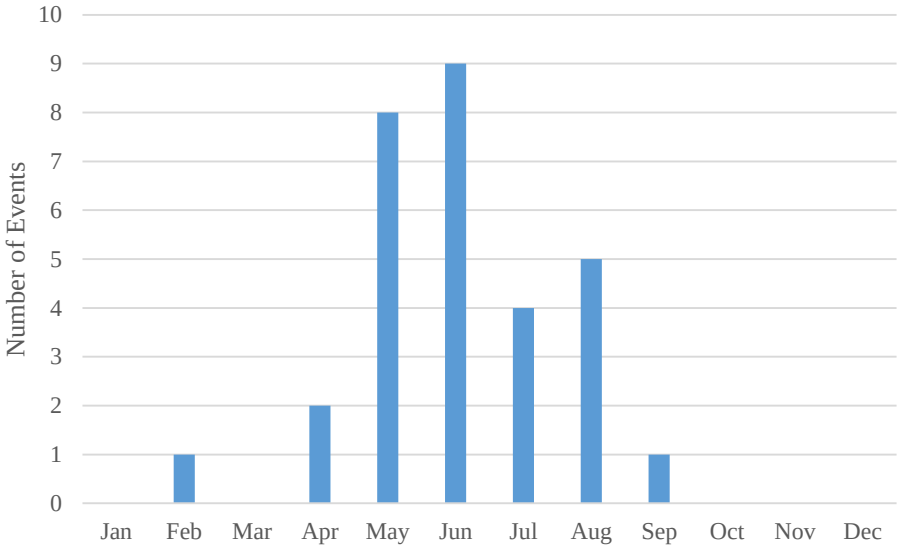
Source: NOAA

Figure 19: Monthly Normal (1893-2012) Precipitation



Source: High Plains Climate Center

Figure 20: Flooding Events (Flash and Riverine)



Source: NCDC

As indicated in Figure 20, the most common months for flooding within the planning area are between May and August. While it is possible that major flood events will occur, the likely extent of flood events within the planning area would be classified as minor or moderate (Table 61).

NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

The NFIP was established in 1968 to reduce flood losses and disaster relief costs by guiding future development away from flood hazard areas where feasible; by requiring flood resistant design and construction practices; and by transferring the costs of flood losses to the residents of floodplains through flood insurance premiums.

In return for availability of federally backed flood insurance, jurisdictions that participate in the NFIP must agree to adopt and enforce floodplain management standards to regulate development in special flood hazard areas as defined by the Federal Emergency Management Agency's flood maps. One of the strengths of the program has been keeping people away from flooding rather than keeping the flooding away from people - through historically expensive flood control projects.

Currently, Nebraska has 11,640 policies in force representing $2 billion worth of coverage. The following tables summarize NFIP participation and active policies within the planning area.

Table 62: NFIP Participants

Jurisdiction	Eligible-Regular Program	Date Current Map	Sanction	Suspension	Rescinded	Participation in NFIP
Franklin County	9/30/2005	9/30/2005	-	-	-	Yes
Bloomington	-	9/30/2005	-	-	-	No
Campbell	3/1/2001	9/30/2005	-	-	-	Yes
Franklin	1/1/1987	9/30/2005	-	-		Yes
Hildreth	-	9/30/2005	-	-	-	No
Naponee	-	9/30/2005	-	-	-	No
Riverton	3/1/2001	9/30/2005	-	-	-	Yes
Upland	-	9/30/2005	-	-	3/31/1977	No
Furnas County	3/20/2009	3/2/2009	-	-	-	Yes
Arapahoe	-	3/2/2009	-	-	3/30/1979	No
Beaver City	8/1/1986	3/2/2009	-	-	-	Yes
Cambridge	3/28/1980	3/2/2009	-	-	-	Yes
Edison	-	-	-	-	-	No
Hendley	-	3/2/2009	-	-	-	No
Holbrook	-	3/2/2009	-	-	-	No
Oxford	-	3/2/2009	-	-	2/2/1977	Yes
Wilsonville	11/7/2001	3/2/2009	-	-	-	Yes
Harlan County	3/29/2010	2/18/2009	-	-	-	Yes
Alma	8/5/2009	2/18/2009	-	-	-	Yes
Huntley	-	2/18/2009	-	-	-	No
Orleans	5/1/1988	2/18/2009	-	-	-	Yes
Ragan	5/1/2009	2/18/2009	-	-		Yes
Republican City	2/6/2012	2/18/2009	-	-		Yes
Stamford	3/8/2013	2/18/2009	-	-	-	Yes
Red Willow County	5/1/1988	11/16/20112/4/2009	-	-	-	Yes
Bartley	8/5/2009	2/4/2009	-	-	-	Yes
Danbury	-	2/4/2009	-	-	-	No
Indianola	11/16/1990	11/16/2011	-	-	-	Yes

Jurisdiction	Eligible-Regular Program	Date Current Map	Sanction	Suspension	Rescinded	Participation in NFIP
Lebanon	-	2/4/2009	-	-	-	No
McCook	5/2/1983	2/4/2009	-	-	-	Yes

Source: NDNR, National Flood Insurance Program

Table 63: NFIP Polices in Force

Jurisdiction	Policies In-force	Total Premium (Dollars)	Total Coverage (Dollars)
Franklin County	3	$1537	$431,400
Bloomington	N/P	N/A	N/A
Campbell	N/P	N/A	N/A
Franklin	N/P	N/A	N/A
Hildreth	N/P	N/A	N/A
Naponee	N/P	N/A	N/A
Riverton	2	$1,210	$116,000
Upland	N/P	N/A	N/A
Furnas County	2	$1,119	$112,000
Arapahoe	N/P	N/A	N/A
Beaver City	N/P	N/A	N/A
Cambridge	3	$1,910	$337,000
Edison	N/P	N/A	N/A
Holbrook	N/P	N/A	N/A
Oxford	2	$661	$230,000
Wilsonville	N/P	N/A	N/A
Harlan County	6	$4,333	$696,500
Alma	1	$429	$280,000
Huntley	N/P	N/A	N/A
Orleans	N/P	N/A	N/A
Ragan	N/P	N/A	N/A
Republican City	N/P	N/A	N/A
Stamford	N/P	N/A	N/A
Red Willow County	9	$5,973	$1,053,7000
Bartley	1	$540	$45,000
Danbury	N/P	N/A	N/A
Indianola	N/P	N/A	N/A
Lebanon	N/P	N/A	N/A
McCook	9	$3,571	$1,968,500
Total for Planning Area	38	$21,283	$14,753,400

N/A: Not Applicable; N/P: Not Participate., *Source: Nebraska Department of Natural Resources, National Flood Insurance Program*

NFIP REPETITIVE LOSS STRUCTURES

NDNR was contacted to determine if any existing buildings, infrastructure, or critical facilities are classified as NFIP Repetitive Loss Structures. According to the NDNR, there are no repetitive loss structures in the planning area.

HISTORICAL OCCURRENCES

The NCDC reports 30 flooding events from 1996 to 2015. Of these events, 19 were flash flooding and 11 were riverine flooding. According to the NCDC, flash flooding resulted in $345,000 in property damages while riverine flooding caused $980,000 in property damage No injuries or deaths were caused by flooding events.

AVERAGE ANNUAL DAMAGES

The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and the number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. It would cause an average of $69,737 in property damage per year and an average of $14,738 in crop losses per year due to flooding events for the planning area.

Table 64: Flood Loss Estimate

Hazard Type	Number of Events[1]	Total Property Loss[1]	Average Annual Property Loss [1]	Total Crop Loss[2]	Average Annual Crop Loss [2]
Flooding	30	$1,325,000	$69,737	$221,069	$14,738

1 Indicates data from NCDC (January 1996 to April 2015) 2 Indicates data from RMA (2000 to 2014)

PROBABILITY

Flooding is likely to occur every year within the planning area with most events resulting in minor flooding. However, moderate flooding is possible where inundation of roads and structures near streams could occur. There were 30 recorded flood events (19 flash floods, 11 riverine floods) reported during a 19 year period in the planning area. Despite this propensity for flooding, as reflected in Table 62, some communities in the planning area do not participate in the NFIP.

VULNERABILITY ASSESSMENT

A 2008 study examining social vulnerability as it relates to flood events found that low-income and minority populations are disproportionately vulnerable to flood events. These groups may lack resources that are needed to mitigate potential flood events as well as resources that are necessary for evacuation and response. In addition, low income residents are more likely to live in areas vulnerable to the threat of flooding, but lack the resources necessary to purchase flood insurance. The study did find that flash floods are more often responsible for injuries and fatalities than prolonged flood events. The elderly, those outdoors during rain events, and those in low-lying areas may be more vulnerable to floods, specifically flash floods. Elderly residents may suffer from a decrease or complete lack of mobility and as a result, be caught in flood-prone areas. Residents in campgrounds or public parks may be more vulnerable to flooding events. These areas exist in natural floodplains and can experience rapid rise in water levels, resulting in injury or death.

MITIGATION ALTERNATIVES

The following list identifies general mitigation strategies that can be used to reduce a community's vulnerability to the threat of flooding. Some of these strategies, such as the use of warning systems, are already in place in the planning area. Many of these strategies are identified and discussed in greater detail in the FEMA document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards.*

- Limit or restrict development in flood-prone areas
- Revise and update floodplain maps
- Manage the Floodplain Beyond Minimum Requirements (i.e. adopting a " no-rise" in base elevation clause for the flood damage prevention ordinance)
- Participate in the NFIP
- Encourage property owners in areas protected by dams and levees to purchase flood insurance
- Remove existing structures from flood-prone areas
- Construct flood control measures
- Evaluate and update municipal storm water systems
- Establish education programs to educate the public about the risks of flooding and ways to protect their families and property
- Preserve natural open spaces in floodplains
- Incorporate permeable surfaces and other "green infrastructure" components into municipal designs
- Establish a "green infrastructure" program
- Elevate or retrofit structures and utilities
- Incorporate flood mitigation programs into comprehensive plans
- Enhanced building codes (i.e. require tie-downs for propane tanks and other gas and chemical storage containers; require water detention swales and retention ponds for new construction)
- Participate in the NFIP's Community Rating System
- Incorporate ice jam prevention techniques into mitigation strategies and projects
- Develop incentives for structural flood proofing
- Develop flood response plans for the community (incorporate information about pet and agricultural animal considerations)
- Consider erosion control and bank stabilization programs for critical facilities
- Retain natural vegetative beds in stormwater channels

GRASS/WILDFIRE

HAZARD PROFILE

Wildfires, also known as brushfires, forest fires, or wildland fires, are any uncontrolled fire that occurs in the countryside or wildland. Wildland areas may include, but are not limited to, grasslands, forests, woodlands, agricultural fields, and other vegetated areas. Wildfires differ from other fires by their extensive size, the speed at which they can spread out from the original source, their ability to change direction unexpectedly, and to jump gaps, such as roads, rivers, and fire breaks. While some wildfires burn in remote forested regions, others can cause extensive destruction of homes and other property located in the wildland-urban interface, the zone of transition between developed areas and undeveloped wilderness.

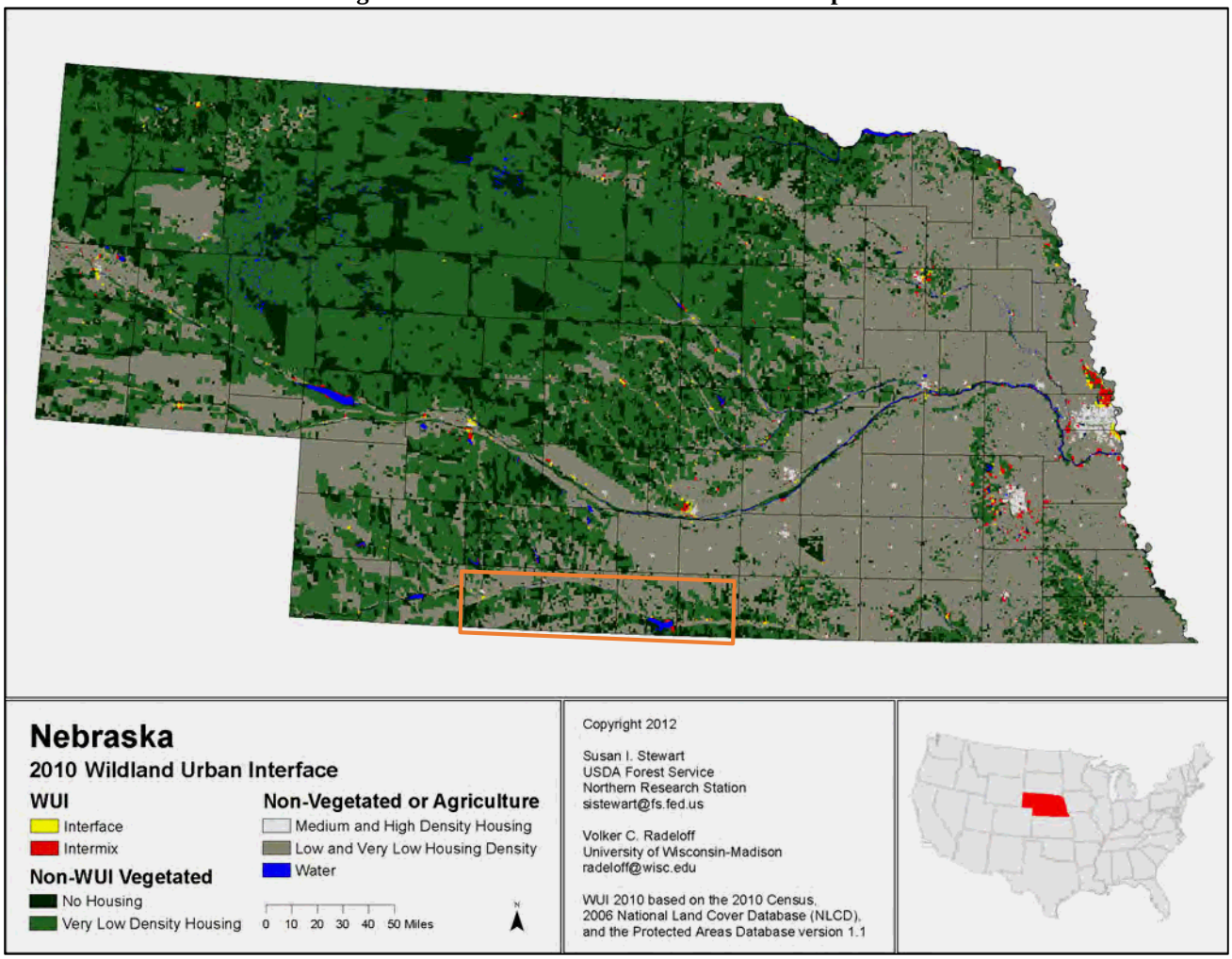
Wildfires are a growing hazard in most regions of the United States, posing a threat to life and property, particularly where native ecosystems meet urban developed areas. Although fire is a natural and often beneficial process, fire suppression can lead to more severe fires due to the buildup of vegetation, which creates more fuel and increases the intensity and devastation of future fires.

> Lightning starts approximately 10,000 **forest fires** each year, yet ninety percent of forest fires are started by humans.
>
> National Park Service

Wildfires are characterized in terms of their physical properties including topography, weather, and fuels. Wildfire behavior is often complex and variably dependent on factors such as fuel type, moisture content in the fuel, humidity, wind speed, topography, geographic location, ambient temperature, the effect of weather on the fire, and the cause of ignition. Fuel is the only physical property humans can control and is the target of most mitigation efforts. The NWS monitors the risk factors including high temperature, high wind speed, fuel moisture (greenness of vegetation), low humidity, and cloud cover in the state on a daily basis.

In recent decades, as the population of the United States has decentralized and residents have moved farther away from the center of villages and cities, the area known as the wildland urban interface (WUI) has developed significantly, in both terms of population and building stock. The WUI is defined as the zone of transition between developed areas and undeveloped wilderness, where structures and other human development meet wildland. The expansion of the WUI increases the likelihood that wildfires will threaten people and homes, making it the focus of the majority of wildfire mitigation efforts. The following map produced by the USDA Forest Service displays the nation's WUI conditions as of 2010. The approximate location of the planning area is indicated by the pink box. A majority of the planning area is located in a Non-WUI designated area (Figure 21), with no or low density housing with a mix of vegetated, non-vegetated, and agricultural land.

Figure 21: 2010 Wildland Urban Interface Map



Source: USDA Forest Service, http://silvis.forest.wisc.edu//maps/wui/2010/download

Based on the Nebraska Forest Service's 'Wildfire by Cause' report, the most common causes of wildfires in the planning area include: equipment, lightning, and debris burning.

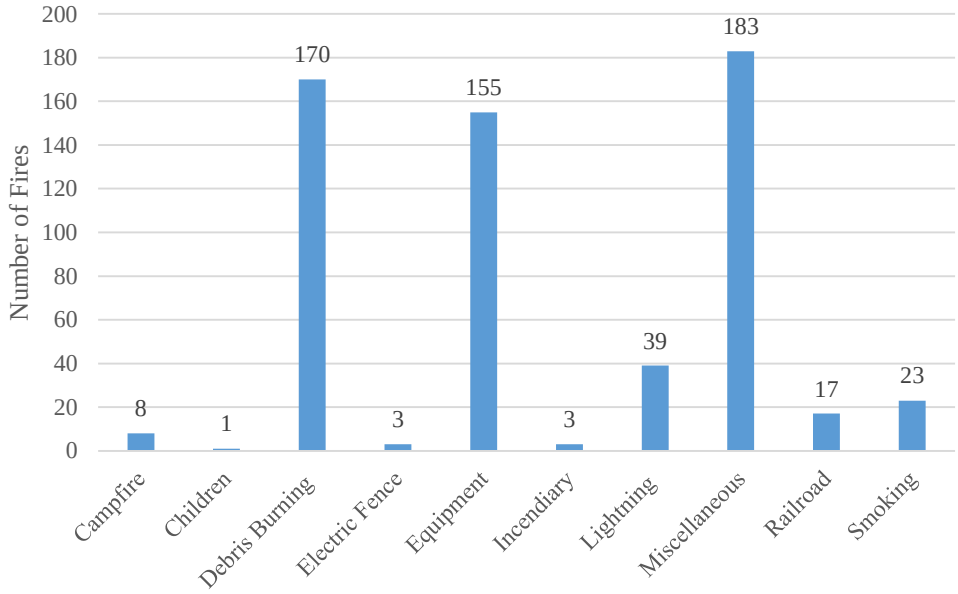
LOCATION

The entire planning area is at risk of wildfire. However, the WUI and agricultural areas are at highest risk of wildfire impacting lives and homes.

EXTENT

There were 602 reported wildfires in the planning area between 2000 and 2014 which burned more than 5,000 acres. In that 15 year span, 10 fires burned 100 acres or more, with the largest wildfire burning more than 400 acres in the Arapahoe area in 2011. Figure 22 illustrates the number of wildfires by cause in the planning area from 2000 to 2014.

Figure 22: Wildfires by Cause for the Planning Area 2000-2014



Source: Nebraska Forest Service

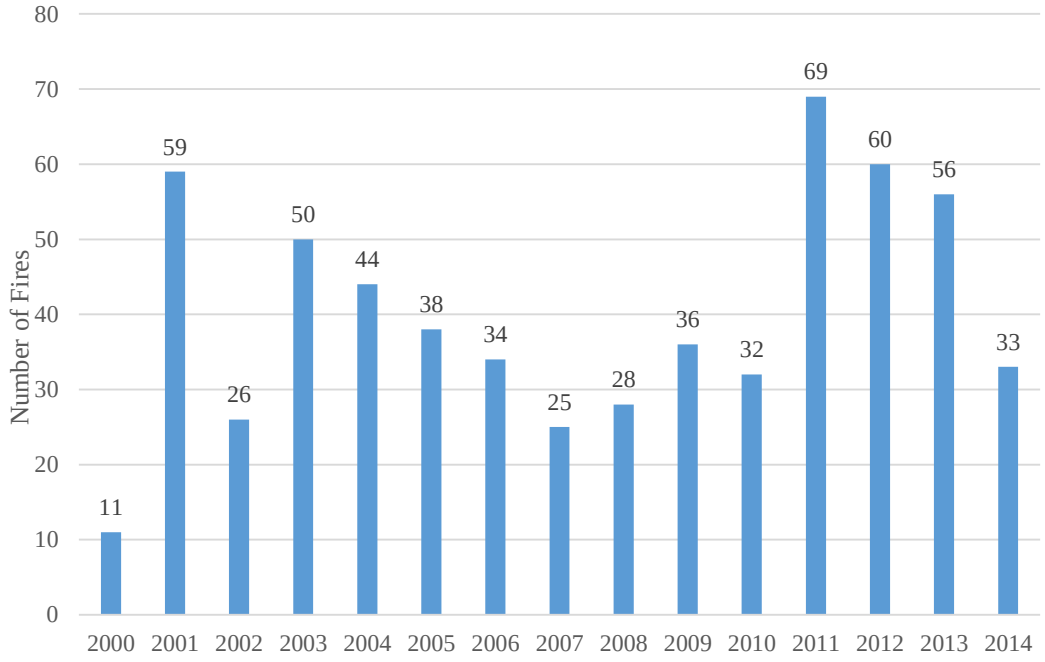
It is most likely that the fire will be started by miscellaneous causes (30%). Debris burning (28%) and equipment (26%) are the second and third leading causes of fires in the planning area. Any fire that does occur in the planning area will most likely be kept to under 100 acres as less than two percent of the fires recorded burned more than 100 acres.

HISTORICAL OCCURRENCES

The entire State of Nebraska is vulnerable to wildfires, but the western portion of the state is more susceptible to this hazard. There have been five presidential declarations of disaster for wildfire in the state since 2006.

In the planning area, there were 513 reported wildfires by 18 different fire departments according to the Nebraska Forest Service from 2000 to 2012. The reported events burned 3,671 acres of range land, 47 acres of forest land, and 1,176 acres of crop land. The reported fire events caused $242,504 in crop damages and $125,330 in property damage according to the Nebraska Forest Service. It should be noted that 2013 and 2014 incidents were excluded from these counts as damage costs were not available.

Figure 23: Number of Wildfires by Year for the Planning Area



Source: Nebraska Forest Service

AVERAGE ANNUAL DAMAGES

The average damage per event estimate was determined based upon U.S. Forest Service wildfires database from 2000 to 2012 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. During the 13 year period, wildfires caused about $18,654 per year in crop damage in the planning area.

Table 65: Wildfire Loss Estimation

Hazard Type	Number of Events[1]	Total Property Loss[1]	Average Annual Property Loss[1]	Total Crop Loss[1]	Average Annual Crop Loss[1]
Grass/Wildfires	513	$125,330	$9,641	$242,504	$18,654

1 Indicates data is from NFS (2000 to 2012)

PROBABILITY

Probability of grass/wildfire occurrence is based on the historic record provided by the Nebraska Forestry Service and reported potential by participating jurisdictions. Small grass/wildfires (less than 100 acres) will likely occur annually within the planning area. According to previous occurrence, large fires (100 acres or greater) have a 66 percent chance of occurring as 10 wildfires burning more than 100 acres were reported between 2000 and 2014.

VULNERABILITY ASSESSMENT

According to FEMA, periods of drought and dry conditions throughout the year greatly increase the potential for wildland fires and contribute to extreme wildfires. During a severe drought, large wildfires are common with windy days and steep slopes, which can cause wildfires to spread rapidly and become out of control in a very short time period.

Wildfires can cause extensive damage, both to property and human life. The damages caused by wildfires extend past the loss of building stock, recreation areas, timber, forage, wildlife habitat, and scenic views.

In addition, secondary effects of wildfires increase due to the exposure of bare ground and loss of vegetative cover. These secondary effects include: erosion, landslides, introduction of invasive species, and changes in water quality.

Wildfire poses a threat to a range of demographic groups. Wildfire could result in major evacuations of residents in impacted and threatened areas. Groups and individuals lacking reliable transportation could be trapped in dangerous locations. Lack of transportation is common among the elderly, low income individuals, and families especially in urban areas. Homes and residents located in the Wildland Urban Interface are also very vulnerable to wildfire and urban fires.

MITIGATION ALTERNATIVES

The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of wildfire. The following mitigation actions were identified as options to help mitigate the impacts of wildfire.

- New municipal wells
- Expand water storage capacity
- Civil service improvements (new fire trucks)
- Map and assess vulnerability to wildfire
- Incorporate wildfire mitigation in comprehensive planning (i.e., identify areas of risk per assessment of vulnerability)
- Reduce risk through land use planning (i.e., implement landscaping ordinances)
- Develop a wildland-urban interface code
- Require or encourage fire-resistant construction (i.e., encourage the use of non-combustible materials)
- Retrofit at-risk structures with ignition-resistant materials (i.e., install wall components that conform to ignition-resistant construction standards)
- Create defensible space around structures and infrastructure
- Conduct maintenance to reduce risk (i.e., perform arson prevention cleanup activities)
- Implement a fuels management program (i.e., Nebraska Forest Service – Forest Fuels Reduction Program)
- Participate in the Firewise program
- Increase wildfire risk awareness (i.e., inform the public about proper evacuation procedures)
- Educate property owners about wildfire mitigation techniques
- Wildland fire fighting training for fire departments

HAIL

HAZARD PROFILE

Hail is usually associated with severe thunderstorms. This association makes hail just as unpredictable as severe thunderstorms. Hail events in thunderstorms differ from many other hazards in that they travel large areas and through multiple jurisdictions within a single region. Additionally, hail events in thunderstorms often occur in a series, with one area having the potential to be hit multiple times in one day.

The moisture from the thunderstorms that are associated with hail events can be beneficial. However, when thunderstorms do produce hail, there is potential for crop losses, property losses due to building and automobile damages, and personal injuries from people not seeking shelter during these events. The potential for damages increases as the size of the hail increases, as some hail stones call fall at 100 mph.

LOCATION

The entire planning area is at risk to hail due to the regional nature of this type of event.

EXTENT

The TORRO scale is used throughout the United Kingdom to classify hailstones and provides some detail related to the potential impacts from hail. Table 66 outlines the TORRO Hailstone Scale.

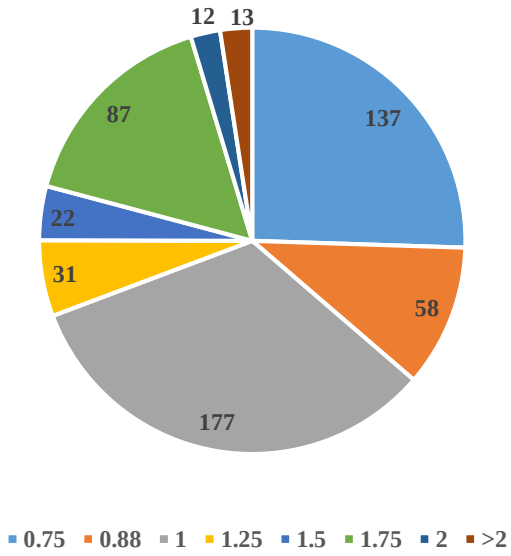
Table 66: TORRO Hail Scale

TORRO Classification / Intensity	Typical Hail Diameter	Typical Damage Impacts
H0: Hard Hail	5 mm; Pea size; 0.2 in	No damage
H1: Potentially Damaging	5 -15 mm (marble); 0.2 – 0.6 in	Slight general damage to plants and crops
H2: Significant	10 -20 mm (grape); 0.4 – 0.8 in.	Significant damage to fruit, crops, and vegetation
H3: Severe	20 -30 mm (Walnut); 0.8 – 1.2 in	Severe damage to fruit and crops, damage to glass and plastic structures
H4: Severe	30 -40 mm (Squash Ball); 1.2 – 1.6 in	Widespread damage to glass, vehicle bodywork damaged
H5: Destructive	40 – 50 mm (Golf ball); 1.6 – 2.0 in.	Wholesale destruction of glass, damage to tiled roofs; significant risk or injury
H6: Destructive	50 – 60 mm (chicken egg); 2.0 – 2.4 in	Grounded aircrafts damaged, brick walls pitted; significant risk of injury
H7: Destructive	60 – 75 mm (Tennis ball); 2.4 – 3.0 in	Severe roof damage; risk of serious injuries
H8: Destructive	75 – 90 mm (Large orange); 3.0 – 3.5 in.	Severe damage to structures, vehicles, airplanes; risk of serious injuries
H9: Super Hail	90 – 100 mm (Grapefruit); 3.5 – 4.0 in	Extensive structural damage; risk of severe or even fatal injuries to persons outdoors
H10: Super Hail	>100 mm (Melon); > 4.0 in	Extensive structural damage; risk or severe or even fatal injuries to persons outdoors

Source: TORRO

From the 542 hail events reported for the planning area, the average hailstone size is 1.17 inches. Events of this magnitude correlate to an H3 classification. It is reasonable to expect H3 classified events to occur more than one time per year in the planning area. In addition it is reasonable, based on the number of occurrence, to expect larger hailstones to occur in the planning area annually. For this area it is realistic to expect an H6 event to occur approximately every year in the planning area. Figure 24 shows hail events based on the size of the hail.

Figure 24: Hail Events by Size in Inches



Source: NCDC, 1996--2015

HISTORICAL OCCURRENCES

The NCDC reports events as they occur in each community. A single hail event can affect multiple communities and counties at a time; the NCDC reports these large scale, multi-county events as separate events. The result is a single hail event covering a large portion of the planning area could be reported by the NCDC as several events. The NCDC reports a total of 542 hail events in the planning area between 1996 and 2015. These events were responsible for $7,151,000 in property damages and $55,340,800 in crop damages. These events resulted in three injuries and no fatalities.

AVERAGE ANNUAL DAMAGES

The average damage per event estimate was based upon NCDC Storm Events Database since 1996 and number of historical occurrences as described above. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. Hail events would cause an average of $376,368 per year in property damage, and an average of $3,689,387 per year in crop damage for the planning area.

Table 67: Hail Loss Estimate

Hazard Type	Number of Events[1]	Total Property Loss[1]	Average Annual Property Loss[1]	Total Crop Loss[2]	Average Annual Crop Loss [2]
Hail Events	542	$7,151,000	$376,368	$55,340,800	$3,689,387

1 Indicates the data is from NCDC (January 1996 to April 2015); 2 Indicates data is from USDA RMA (2000 to 2014)

PROBABILITY

Based on historic records and reported events, severe thunderstorms with hail are likely to occur on an annual basis within the planning area. The NCDC reported 542 hail events between 1996 and 2015, or on average of 29 times per year.

VULNERABILITY ASSESSMENT

Hail occurs on an irregular basis, and can equally affect the entire planning area. Severe thunderstorms can produce heavy rain, flooding, damaging hail, lightning, and high winds during and after the event. All

building stock and infrastructure including critical facilities, vehicles, power lines, trees, and utilities are at risk of being damaged or affected by severe thunderstorms. According to climate data, May and June have the greatest number of hail events. This coincides with severe thunderstorms and increased tornado activity during these months.

Hail is one component of severe thunderstorms that can seriously impact residents of mobile homes. Hail events occur frequently within the state. Nebraska had more hail events than any other state in 2014. Hail can damage vehicles, roofs, and landscaping, as well as cause injury and occasionally death.

Vulnerable populations related to hail events include the elderly, those living in mobile homes, and those caught outside during storm events. During hail events, it is not uncommon for residents/towns to lose power for a temporary or prolonged period of time. These power outages may prove deadly for elderly citizens that are reliant upon machines to remain alive. The elderly are generally less mobile than many other members or the community, making them more vulnerable to a wide range of threats.

MITIGATION ALTERNATIVES

The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of hail. Many of these strategies are identified and discussed in greater detail in the FEMA document, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*

- Continue to participate, or become a participant, in Tree City USA; establish a tree maintenance ordinance
- Establish a tree board to assist in the development of a tree management program
- Establish redundancies for necessary municipal services (i.e. water, gas, electric, transportation)
- Bury power and service lines
- Establish community severe weather warning protocols
- Incorporate text messaging into severe weather messaging programs
- Incorporate cable TV interruption warning systems
- Purchase and issue weather radios to critical facilities and vulnerable populations
- Establish mutual aid agreements with neighboring communities and privately owned businesses
- Establish public education programs to increase awareness of the dangers posed by hail events and ways the public can mitigate the potential impacts
- Incentive programs to encourage the use of hail resistant roofing materials for new and existing structures
- Develop business continuity plans for critical community services (public and private)
- Establish data recovery program and backup program for municipal employees

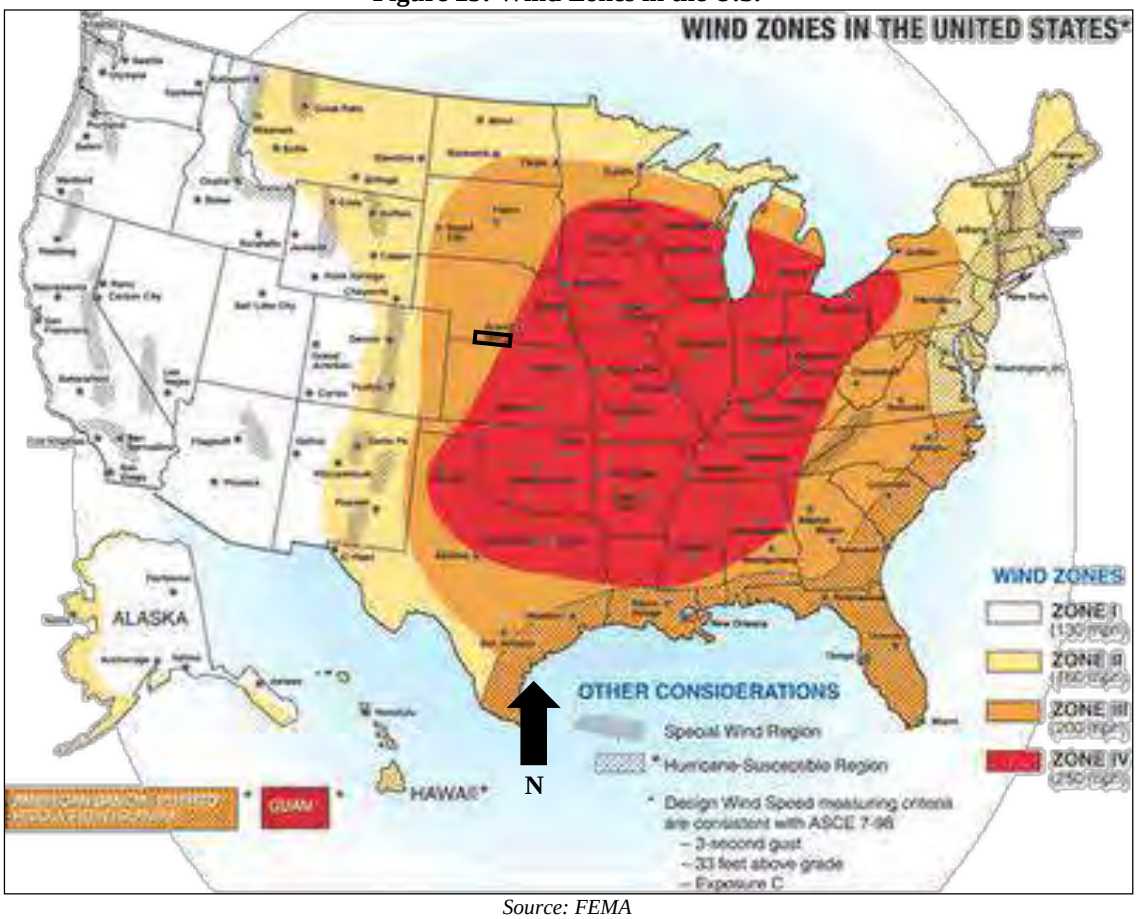
HIGH WINDS (WINDSTORMS)

HAZARD PROFILE

High winds typically accompany severe thunderstorms and severe winter storms. High winds can cause significant property and crop damage, downed power lines, loss of electricity, obstruction to traffic flow, and significant damage to trees and center-pivot irrigation systems. All building stock and above ground infrastructure, including critical facilities, are at risk of being damaged or affected by high winds. High wind speeds and flying debris can pose a significant threat to human life.

Figure 25 shows the wind zones in the United States. The wind zones are based on the maximum wind speeds that can occur from a tornado or hurricane event. The planning area is located in zone II which has maximum winds of 200 mph equivalent to an EF4 tornado.

Figure 25: Wind Zones in the U.S.



Source: FEMA

LOCATION

High winds commonly occur throughout the planning area. Developed areas are at a greater risk of damages than the rural, less densely populated portions of the planning area.

EXTENT

The NWS defines high winds as sustained wind speeds of 40 mph or greater lasting for one hour or longer, or winds of 58 mph or greater for any duration. The NWS issues High Wind Advisories when there are sustained winds of 25 to 39 miles per hour and/or gusts to 57 mph. The Beaufort Wind Scale can be used

to classify wind strength. Table 68 outlines the scale, providing wind speed ranking, range of wind speeds per ranking, and a brief description of conditions for each ranking.

Table 68: Beaufort Wind Ranking

Beaufort Wind Force Ranking	Range of Wind Speeds	Conditions
0	<1 mph	Smoke rises vertically
1	1 – 3 mph	Direction shown by smoke but not wind vanes
2	4 – 7 mph	Wind felt on face; leaves rustle; wind vanes move
3	8 – 12 mph	Leaves and small twigs in constant motion
4	13 – 18 mph	Raises dust and loose paper; small branches move
5	19 – 24 mph	Small trees in leaf begin to move
6	25 – 31 mph	Large branches in motion; umbrellas used with difficulty
7	32 – 38 mph	Whole trees in motion; inconvenience felt when walking against the wind
8	39 – 46 mph	Breaks twigs off tree; generally impedes progress
9	47 – 54 mph	Slight structural damage; chimneypots and slates removed
10	55 – 63 mph	Trees uprooted; considerable structural damages; improperly or mobiles homes with no anchors turned over
11	64 – 72 mph	Widespread damages; very rarely experienced
12 – 17	72 - >200 mph	Hurricane; devastation

Source: Storm Prediction Center

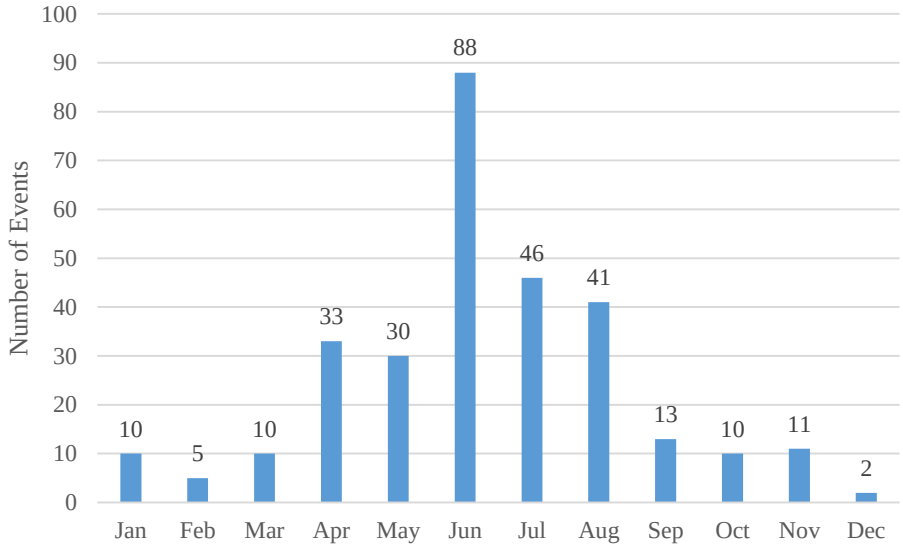
Using the NCDC reported events the most common high wind event is a level 9/10. The reported high wind events produced an average event with 55 mph winds. It is likely that this level of event will occur annually if not more frequently.

HISTORICAL OCCURRENCES

Due to the regional scale of high winds, the NCDC reports events as they occur in each county. While a single event can affect two or more counties at a time, the NCDC reports them as separate events.

There were 299 storm events that occurred between January 1996 and April 2015. One death and two injuries were reported as the result of high winds. Moreover, these recorded events caused a total of $11,697,140 in property damages. Crop damages total $21,102,991 as a result of a high wind events in the planning area. These events from NCDC and reported by each community are listed in each participant section in *Section Seven: Participant Sections*.

Figure 26: High Wind Events by Month



Source: NCDC

AVERAGE ANNUAL DAMAGES

The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. It is estimated that high wind events can cause an average of $615,639 per year in property damage, and an average of $1,406,866 per year in crop damage for the planning area.

Table 69: High Wind Loss Estimate

Hazard Type	Number of Events[1]	Total Property Loss[1]	Average Annual Property Loss [1]	Total Crop Loss[2]	Average Annual Crop Loss [2]
High Winds	299	$11,697,140	$615,639	$21,102,991	$1,406,866

1 Indicates the data is from NCDC (January 1996 to April 2015); 2 Indicates data is from USDA RMA (2000 to 2014)

PROBABILITY

Based on historical records and reported events, it is likely that high winds will occur within the planning area annually. For the 19 years examined, there were 299 reported high wind events reported.

VULNERABILITY ASSESSMENT

High winds occur with irregularity, and can equally affect the entire planning area. All building stock and above ground infrastructure, including critical facilities, are at risk of being damaged or affected by high winds. High winds can cause structure loss, downed power lines, loss of electricity, obstruction to traffic flow, and significant damage to trees and center-pivot irrigation systems. A catastrophic event could lead to major economic loss for the jurisdiction. High wind speeds and flying debris can pose a significant threat to human life.

High winds can impact a wide range of people and properties. People living in mobile homes are particularly susceptible to the effects of tornados. Mobile homes that are not anchored or are not anchored properly can be blown over by winds as fast as 60 to 70 mph. Other factors that may increase vulnerability to the threat posed by high winds include age, poverty levels, and home rentals.

MITIGATION ALTERNATIVES

The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of high winds. Some of these strategies may already be in progress within the participating jurisdictions, please see *Section 7: Participant Section* to find details on the status of these items for a specific jurisdiction. Many of these strategies are identified and discussed in greater detail in the FEMA document, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards.*

- Bury overhead power lines
- Establish redundancies for necessary municipal services (i.e. water, gas, electric, transportation)
- Continue to participate, or become a participant, in Tree City USA; establish a tree maintenance ordinance
- Establish a Tree Board to assist in the development of a tree management program
- Encourage the construction of safe rooms
- Enhance building codes to incorporate wind –resistant building techniques
- Establish data recovery program and backup program for municipal employees
- Require tornado safe rooms in newly constructed municipal buildings
- Work with trailer and mobile home parks to develop tornado safe rooms
- Ensure schools are equipped with sufficient safe space for their maximum student capacity

LEVEE FAILURE

HAZARD PROFILE

According to FEMA on their website:

> "The United States has thousands of miles of levee systems. These manmade structures are most commonly earthen embankments designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water to provide some level of protection from flooding. Some levee systems date back as far as 150 years. Some levee systems were built for agricultural purposes. Those levee systems designed to protect urban areas have typically been built to higher standards. Levee systems are designed to provide a specific level of flood protection. No levee system provides full protection from all flooding events to the people and structures located behind it. Thus, some level of flood risk exists in these levee-impacted areas."

Levee failure can occur several ways. A breach of a levee is when part of the levee breaks away, leaving a large opening for floodwaters to flow through. A levee breach can be gradual by surface or subsurface erosion, or it can be sudden. A sudden breach of a levee often occurs when there are soil pores in the levee that allow water to flow through causing an upward pressure greater than the downward pressure from the weight of the soil of the levee. This under seepage can then resurface on the backside of the levee and can quickly erode a hole to cause a breach. Sometimes the levee actually sinks into a liquefied subsurface below.

Another way a levee failure can often occur is when the levee overtops the crest of the levee. This happens when the flood waters simply exceed the lowest crest elevation of the levee. An overtopping can lead to significant erosion of the backside of the levee and can result to a breach and thus a levee failure.

LOCATION

There are three levees that are located within the Quad Counties. There is one levee in Furnas County, and two levees in Red Willow County. The levees protect the City of Cambridge, the Village of Bartley, and the City of Indianola. Of these levees, only the levee in Indianola is FEMA certified and shown to provide protection from the 1 percent annual flood risk as available FIRM. The levee in Bartley was built by the USACE and does appear on the National Levee Database. Only two of the levees in the planning area (Bartley, Indianola) are federal levees and are inspected by the USACE. The levee in Indianola was rated as Minimally Acceptable in July 2014. The levee in Bartley has not been inspected.

EXTENT

The USACE, who is responsible for federal levee oversight and inspection of levees, has three ratings for levee inspections.

Table 70: USACE Levee Rating Categories

Ratings	Description
Acceptable	All inspection items are rated as Acceptable
Minimally Acceptable	One or more inspection items are rated as Minimally Acceptable or one or more items are rated as Unacceptable and an engineering determination concludes that the Unacceptable inspection items would not prevent the segment/system from performing as intended during the next flood event.
Unacceptable	One or more items are rated as Unacceptable and would prevent the segment/system from performing as intended, or a serious deficiency noted in past inspections has not been corrected within the established timeframe, not to exceed two years.

Source: USACE

The USACE is also responsible for determining levee safety. There are five classifications for levee safety.

Table 71: Levee Safety Classes

Class	Urgency
I	Urgent and Compelling
II	Urgent
III	High Priority
IV	Priority
V	Normal

Source: USACE

If one of the levees were to fail, the extent would be inundation of parcels located within the inundation area. See Table 72for the number of parcels located in inundation areas.

HISTORICAL OCCURRENCES

There have been no reports of levee failure within the planning area.

POTENTIAL LOSSES

To calculate potential losses for levee failure, it was estimated that all structures within the inundation area would sustain 20 percent building damage at a flood depth of two feet, similar to a 100-year flood event. The evaluation is based on the average for one to two story buildings with basements. This information is from the Flood Building Loss Estimation Table provided by the FEMA Benefit-Cost Analysis Full Data Module. The table below summarizes the potential building damages for the structural inventory located within the approximate levee breach areas. Data related to the Cambridge levee inundation area was unavailable.

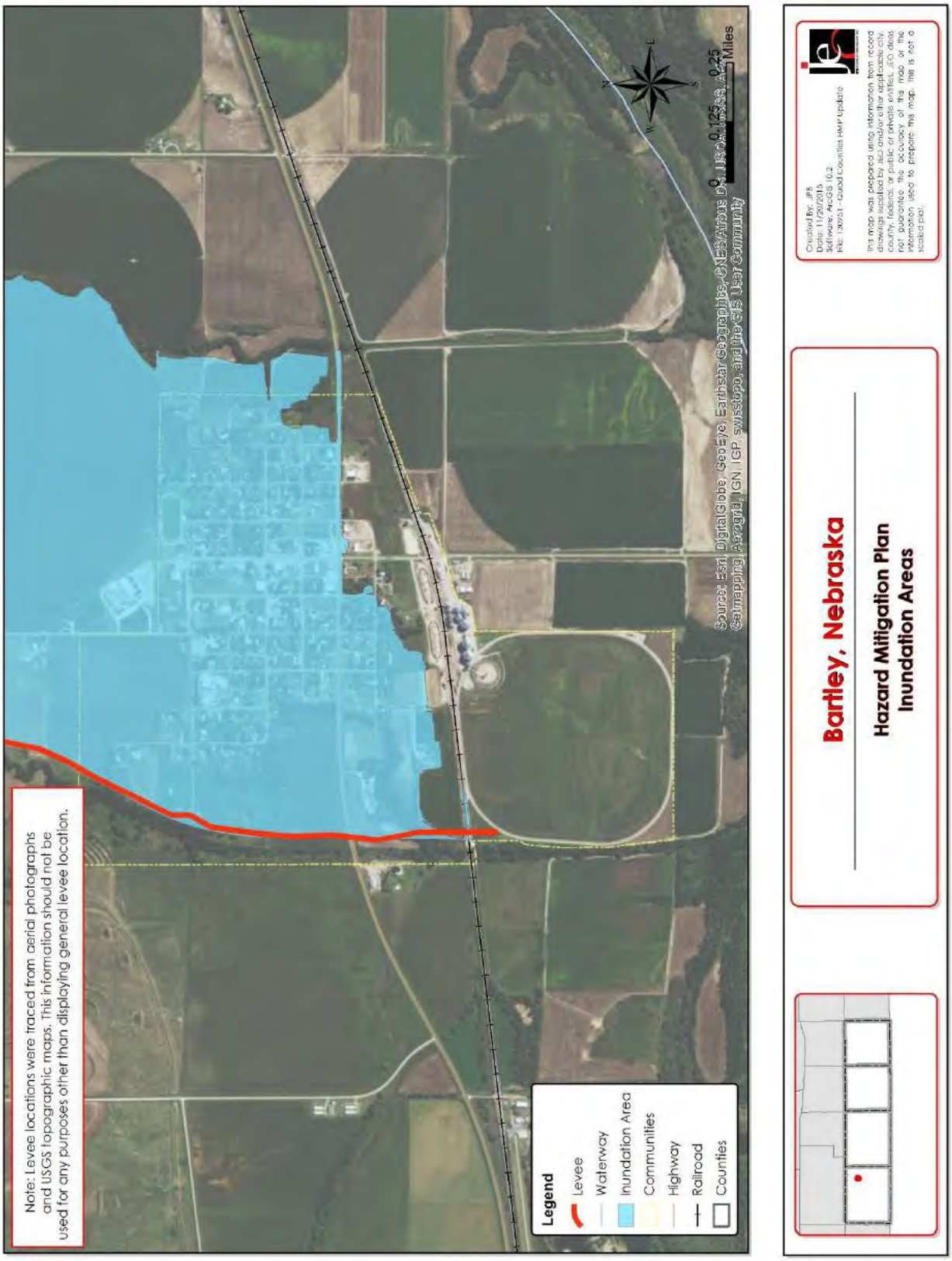
Table 72: Potential Losses in Levee Inundation Area

	Number of Parcels in Inundation Area	Value of Improvements in Inundation Area	Estimated Losses
Bartley	255	$6,758,568	$1,351,713
Cambridge	Unavailable	Unavailable	Unavailable
Indianola	297	$10,056,994	$2,011,398

Sources: Red Willow County Assessor, USACE

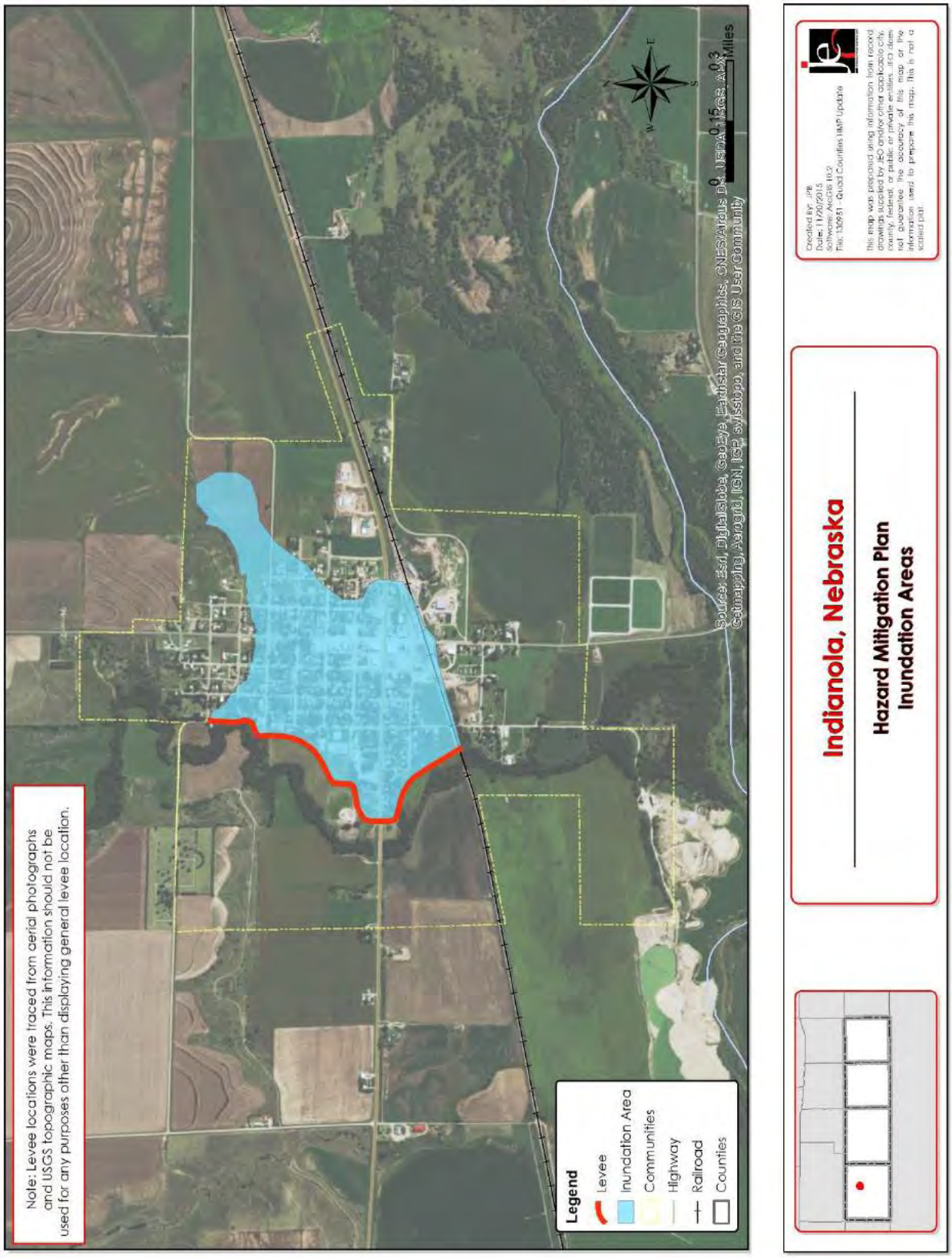
The following figures show the inundation areas in Bartley and Indianola if these levees were to breech. The inundation area map for Cambridge was unavailable. Inundation areas were taken from the USACE National Levee Database.

Figure 27: Bartley Levee Inundation Area



Source: USACE National Levee Database

Figure 28: Indianola Levee Inundation Area



Source: USACE National Levee Database

PROBABILITY

Levee failure has a low probability of occurring in the future. With zero reported incidents in the past, it is unlikely that levee failure will occur. For the purpose of this plan, the probability of levee failure will be stated as one percent annually. The plan recognizes that while there have not been occurrences in the past, that is not necessarily indicative of future occurrences.

VULNERABILITY ASSESSMENT

Residents located within the inundation areas in Bartley, Cambridge, and Indianola are vulnerable to levee failure. The elderly, low income residents, children and others with limited mobility have an increased vulnerability to levee failure.

MITIGATION ALTERNATIVES

There are many options that can be done to mitigate the impacts of a levee failure.

- Develop an evacuation plan
- Land-use regulations preventing development in area protected by existing levees
- Encourage structures protected by levees to purchase flood insurance
- Education on the potential impacts of a levee failure
- Develop Emergency Preparedness Plan
- Develop Risk Awareness Communication Plan
- Conduct emergency preparedness exercises

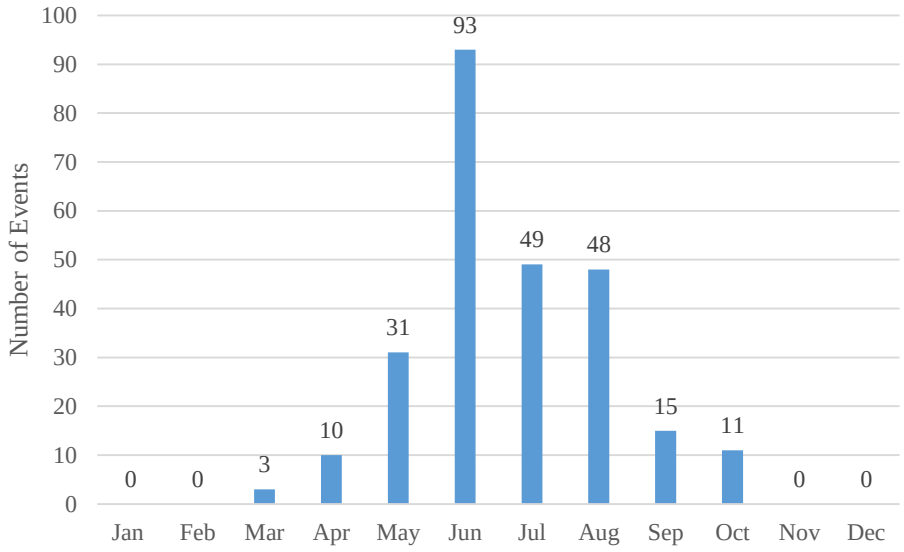
SEVERE THUNDERSTORMS (THUNDERSTORM WIND, HEAVY RAIN, AND LIGHTNING)

HAZARD PROFILE

Severe thunderstorms are common and unpredictable annual events throughout the central and southern United States. Thunderstorms differ from many other hazards in that they are generally large in magnitude, have a long duration, and travel across large areas and through multiple jurisdictions within a single region. Additionally, thunderstorms often occur in a series, with one area having the potential to be hit multiple times in one day.

Severe thunderstorms in the planning area usually occur in the evening, during the spring and summer months. These often massive storms can include heavy rain, hail, lightning, high wind, and can produce tornados with little or no advanced warning. Furthermore, heavy rains can cause flooding, lightning can cause wildfires, and high winds can down trees, cause power outages, and destroy property with their sheer force.

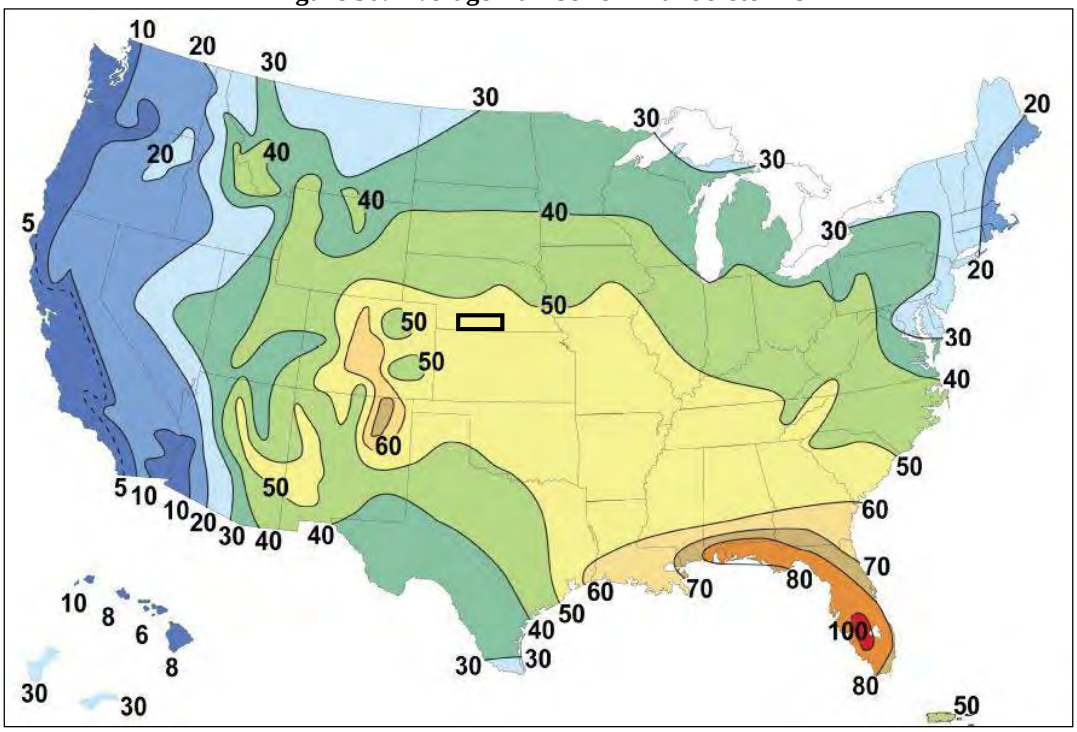
Figure 29: Severe Thunderstorms by Month



Source: NCDC, 1996-2015

Economically, thunderstorms are generally beneficial in that they provide moisture necessary to support Nebraska's largest industry, agriculture. The majority of thunderstorms do not cause damage, but when they escalate to the point of becoming severe, the potential for damages drastically increase. The potential damages include crop losses from wind and hail, property losses due to building and automobile damages from hail, wind, or flash flooding, and death or injury to humans and animals from lightning, drowning, or getting struck by falling or flying debris. Figure 29 displays the average number of days with thunderstorms across the country each year, with Nebraska experiencing between 45 to 55 days from north to south across the state. The planning area experiences an average of 50 thunderstorms over the course of one year.

Figure 30: Average Number of Thunderstorms



Source: NWS

Thunderstorms can develop in fewer than 30 minutes, and can grow to an elevation of eight miles into the atmosphere. Lightning, by definition, is present in all thunderstorms and can be harmful to humans and animals, cause fires to buildings and agricultural lands, and cause electrical outages in municipal electrical systems. Lightning can strike up to 10 miles from the portion of the storm depositing precipitation. There are three types of lightning: intra-cloud, inter-cloud, and cloud to ground. Intra and inter-cloud lightning are more common, however, society is potentially impacted when lightning comes in contact with the ground. Lightning generally occurs when warm air is mixed with colder air, resulting in atmospheric disturbances necessary for polarizing the atmosphere. Between 2006 and 2013, an average of 33 people were killed each year by lightning in the United States. In Nebraska, one fatality was attributed to lightning between 2004 and 2013.

LOCATION

The entire planning area is at risk of severe thunderstorms due to the regional nature of this hazard.

EXTENT

A major component of severe thunderstorms is rainfall accumulations. For the planning area, it is reasonable to expect spring (March, April and May) and summer (June, July and August) to have the highest rainfall totals. Using data provided by the HPRCC, Table 73 shows the average number of days with precipitation for the spring and summer months.

Table 73: Average Number of Days with Precipitation

Amount of precipitation	Spring	Summer
Trace	20 days	23 days
0.1 in.	14 days	16 days
0.5 in.	5 days	6 days
1 in.	2days	3 days

Source: High Plains Regional Climate Center

HISTORICAL OCCURRENCES

The NCDC reports events as they occur in each community. A single severe thunderstorm event can affect multiple communities and counties at a time; the NCDC reports these large scale, multi-county events as separate events. The result is a single thunderstorm event covering the entire region could be reported by the NCDC as several events. The NCDC reported a total of 260 thunderstorm (wind) and lightning events in the planning area from January 1996 to April 2015. These events were responsible for $11,770,900 in total property damages. There were no deaths from these storms but a total of six injuries occurred.

AVERAGE ANNUAL DAMAGES

The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. Severe thunderstorms would cause an average of $619,521 per year in property damages.

Table 74: Severe Thunderstorms Loss Estimate

Hazard Type	Number of Events	Total Property Loss	Average Annual Property Loss	Total Crop Loss	Average Annual Crop Loss
Severe Thunderstorms	260	$11,770,900	$619,521	N/A	N/A

Data is from NCDC (January 1996 to April 2015)

PROBABILITY

Based on historical records and reported events, several severe thunderstorms are likely to occur on an annual basis. The NCDC reported 260 severe thunderstorms between 1996 and 2015; this results in 100 percent chance annually for thunderstorms.

VULNERABILITY ASSESSMENT

Severe thunderstorms can produce heavy rain, flooding, damaging hail, lightning, and high winds during and after the event. All building stock and infrastructure including critical facilities, vehicles, power lines, trees, and utilities are at risk of being damaged or affected by severe thunderstorms. According to climate data, May and June have the greatest amounts of rainfall. This coincides with severe thunderstorms and increased tornado activity during these months.

Severe thunderstorms can cause property damage or loss, downed power lines, loss of electricity, obstruction to traffic flow, significant damage to trees, and pose a threat to human life. The electrical infrastructure is highly vulnerable to damages from lightning strikes and downed tree branches. Roadways are vulnerable to wash outs and surface damages from flash floods. Building stock and personal property are vulnerable to damages from large hail stones. Severe thunderstorms can also cause significant damage to crops, levees, and dams throughout the rural areas of the planning area.

Vulnerable populations related to severe thunderstorms include the elderly, those living in mobile homes, and those caught outside during storm events. During severe thunderstorms, it is not uncommon for residents/towns to lose power for a temporary or prolonged period of time. These power outages may prove deadly for elderly citizens that are reliant upon machines to remain alive. The elderly are generally less mobile than many other members or the community, making them more vulnerable to a wide range of threats. Mobile homes that are not anchored or are improperly anchored are also at high risk during thunderstorms because they can be turned over by a wind of 60 to 70 mph. Severe thunderstorms are defined by winds in excess of 58 mph.

Lightning is commonly considered the most dangerous and most frequently encountered weather hazard. Annually, there is an average of 62 fatalities from lightning in the United States. The most vulnerable groups related to lightning strikes are people located outside during storm events. Vulnerable areas to consider include public parks, campgrounds, swimming pools, and schools with playgrounds.

MITIGATION ALTERNATIVES

The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of severe thunderstorms. Some of these strategies, such as the use of warning systems, are already in place in the planning area. Many of these strategies are identified and discussed in greater detail in the FEMA document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*. As communities vary in their risk and vulnerability to the hazard, community-related mitigation strategies can be found in *Section Seven: Participant Sections*.

- Bury overhead power lines
- Establish redundancies for necessary municipal services (i.e. water, gas, electric, transportation)
- Continue to participate, or become a participant, in Tree City USA; establish a tree maintenance ordinance
- Establish a Tree Board to assist in the development of a tree management program
- Encourage the construction of safe rooms
- Establish community severe weather warning protocols
- Incorporate text messaging into severe weather messaging programs
- Incorporate cable TV interruption warning systems
- Purchase and issue weather radios to critical facilities and vulnerable populations
- Establish mutual aid agreements with neighboring communities and privately owned businesses
- Establish public education programs to increase awareness of the dangers posed by severe thunderstorms and ways the public can mitigate the potential impacts
- Establish data recovery program and backup program for municipal employees
- Install and maintain surge protection for critical facilities
- Incentive programs to encourage the use of hail resistant roofing materials for new and existing structures
- Develop business continuity plans for critical community services (public and private)

SEVERE WINTER STORMS (SEVERE WINTER, ICE STORMS, AND EXTREME COLD)

HAZARD PROFILE

Severe winter storms are an annual occurrence in Nebraska. Winter storms can bring extreme cold, high winds, freezing rain, and heavy or drifting snow, creating blizzards. Blizzards are particularly dangerous due to drifting snow and the potential for rapidly occurring whiteout conditions which greatly inhibits vehicular traffic. Generally, winter storms occur between the months of November and March, but may occur as early as October and as late as April. Heavy snow is usually the most defining element of a winter storm. Large snow events can cripple an entire jurisdiction by hindering transportation, knocking down tree limbs and utility lines, and causing structural damage to buildings.

Extreme Cold

Along with snow and ice storm events, extreme cold can be dangerous to the well-being of people and animals. What constitutes extreme cold varies from region to region, but is generally accepted as temperatures that are significantly lower than the average low temperature. For the planning area, the coldest months of the year are January, February, March, November and December. The average low temperatures for these months are all below freezing (average low for the five months 19.8°F). The average high temperatures for the months of January, February, and December are near 34°F. Record lows for the region range from -34°F in December, -26°F in January and -35°F in February.

Freezing Rain

Along with snow events, winter storms also have the potential to deposit significant amounts of ice. Ice buildup on tree limbs and power lines can cause them to collapse. This is most likely to occur when ice falls in the form of rain that freezes upon contact, especially in the presence of wind. Freezing rain is the name given to rain that falls when surface temperatures are below freezing. Unlike a mixture of rain and snow, ice pellets or hail, freezing rail is made entirely of liquid droplets. Freezing rain can also lead to many problems on roads, as it makes them slick, causing automobile accidents, and making vehicle travel difficult.

Blizzards

Blizzards are particularly dangerous due to drifting snow and the potential for rapidly occurring whiteout conditions which greatly inhibits vehicular traffic. Heavy snow is usually the most defining element of a winter storm. Large snow events can cripple an entire jurisdiction by hindering transportation, knocking down tree limbs and utility lines, and causing structural damage to buildings.

LOCATION

The entire planning area is at risk of severe winter storms.

EXTENT

The Sperry-Piltz Ice Accumulation Index (SPIA) was developed by the NWS to predict the accumulation of ice and resulting damages. The SPIA looks at total precipitation, wind, and temperatures to predict the intensity of ice storms. Figure 32 shows the SPIA index.

Figure 31: SPIA Index

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised-October, 2011	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	> 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

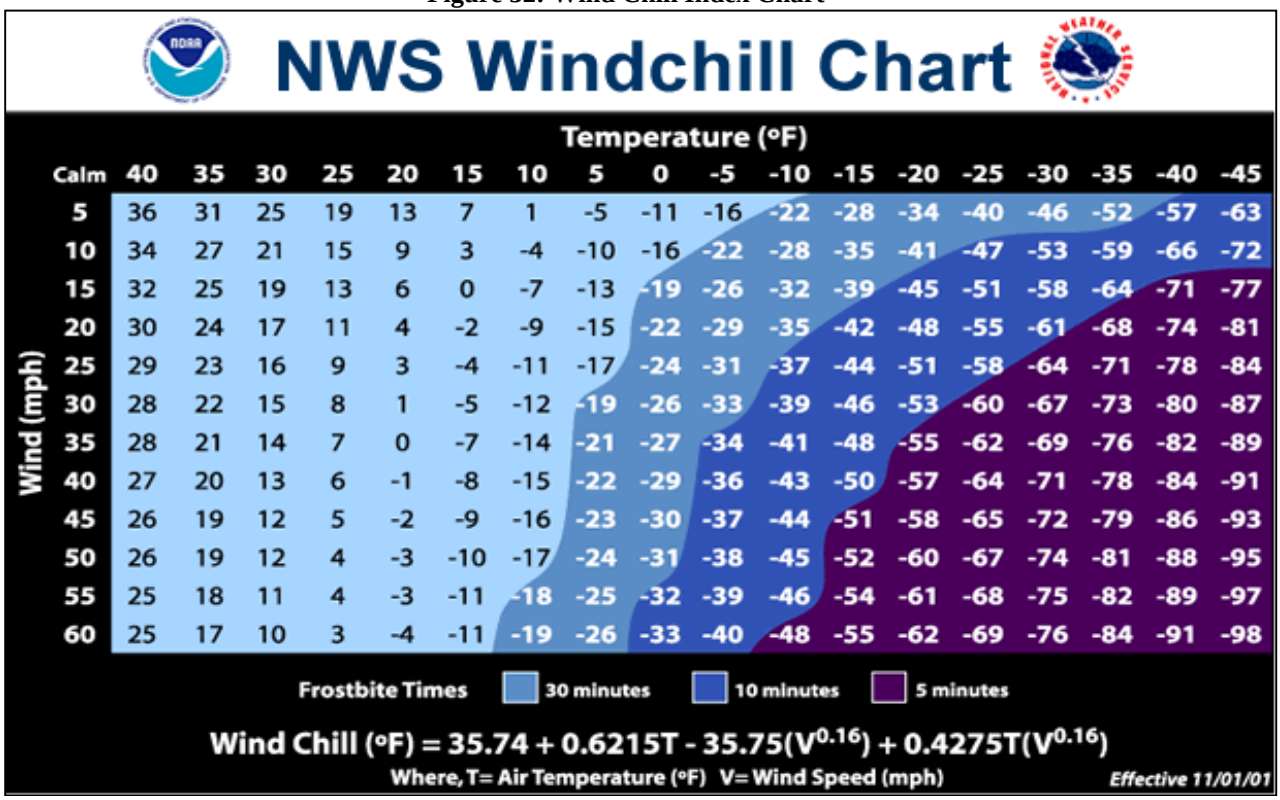
(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

Source: http://www.spia-index.com/index.php

Reviews of historical severe winter storms across the planning area show that there is a range of events that can occur. Typical ice events correlate with Level 2 occurrences according to the SPIA Index. Ice accumulations range from a quarter of an inch to three quarters of an inch. The most common accumulation was one quarter of an inch to half an inch occurring in both ice events.

The Wind Chill Index was developed by the NWS to determine the decrease in air temperature felt by the body on exposed skin due to wind. The wind chill is always lower than the air temperature and can hasten the effects of hypothermia or frost bite as temperatures decrease. Figure 32 shows the wind chill index used by the NWS.

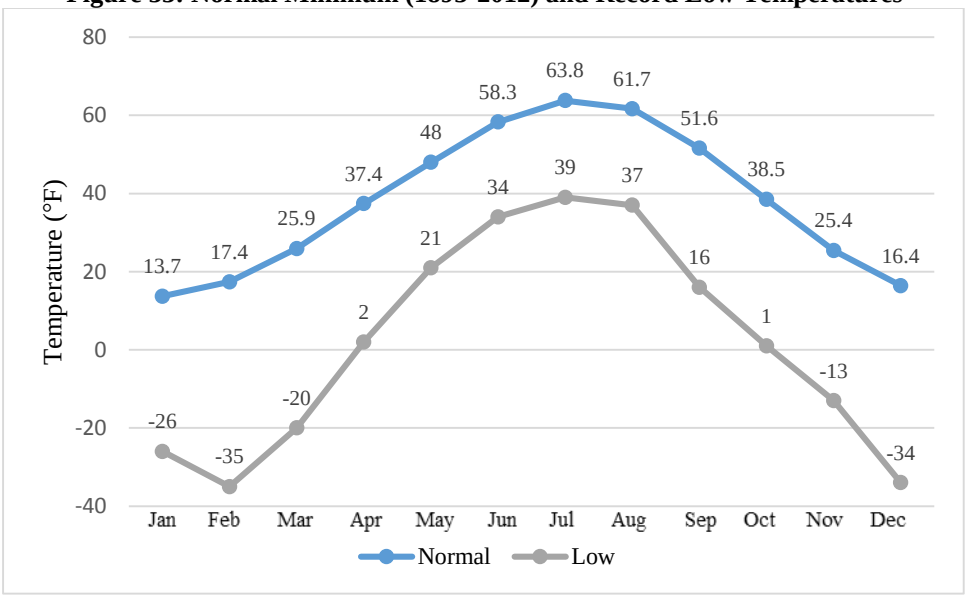
Figure 32: Wind Chill Index Chart



Source: NWS

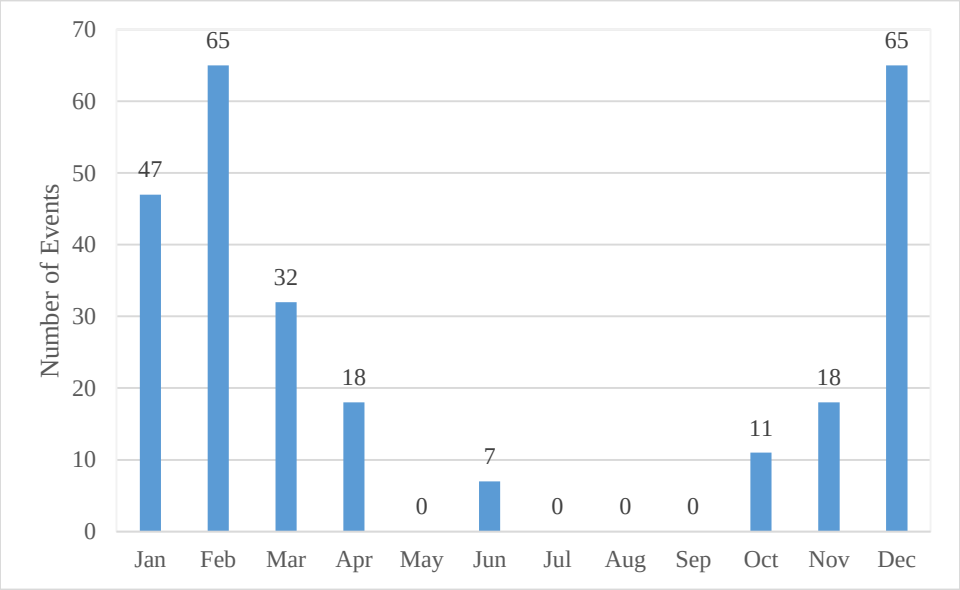
The coldest months of the year are January, February, March, November, and December and normal lows for these months are generally around 20 degrees as shown in Figure 33.

Figure 33: Normal Minimum (1893-2012) and Record Low Temperatures



Source: High Plains Regional Climate Center

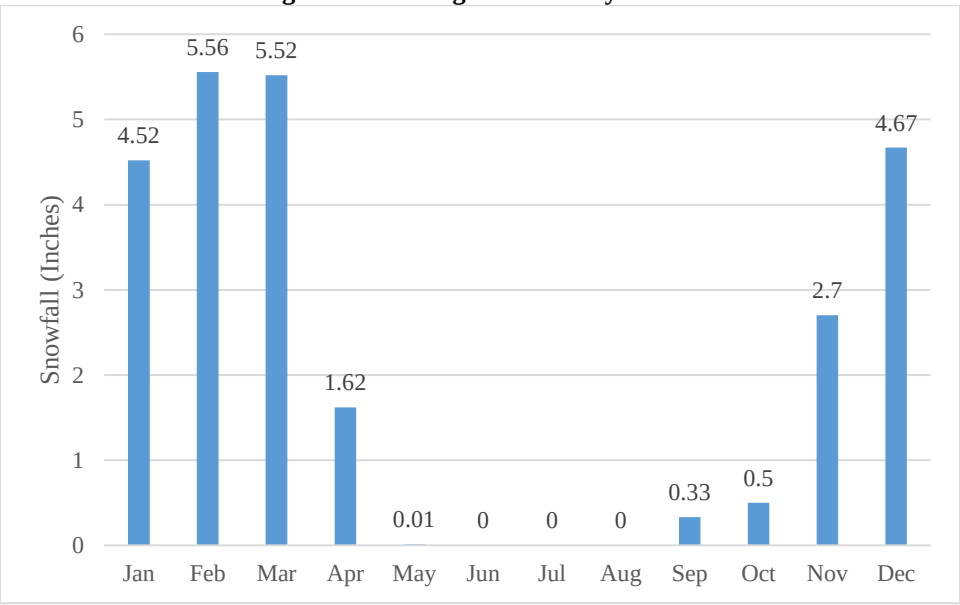
Figure 34: Number of Winter Storms by Month



Source: NCDC

Historic snow events report accumulation between two inches and 9 inches during a twelve hour period. Average monthly snowfall for the planning area is shown in Figure 35, which shows the snowiest months are between December and March. This data is from the North Platte Airport weather station between 1893 and 2012. A common snow event (likely to occur annually) will result in accumulation totals between four and eight inches. Often these snow events are accompanied by high winds. It is reasonable to expect wind speeds of 25 to 40 mph with gusts reaching 60 mph or higher. Strong winds and low temperatures can combine to produce extreme wind chills of 20°F to 40°F below zero.

Figure 35: Average Snowfall by Month



Source: High Plains Regional Climate Center

HISTORICAL OCCURRENCES

Due to the regional scale of severe winter storms, the NCDC reports events as they occur in each county. According to the NCDC, there were 263 winter storm events for the planning area from January 1996 to April 2015. These recorded events caused a total $6,330,000 in property damages and $7,783,392 in crop damages.

AVERAGE ANNUAL DAMAGES

The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. Severe winter storms have caused an average of $331,158 per year in property damage, and an average of $518,893 per year in crop damage for the planning area.

Table 75: Severe Winter Storm Loss Estimate

Hazard Type	Number of Events[1]	Total Property Loss[1]	Average Annual Property Loss [1]	Total Crop Loss[2]	Average Annual Crop Loss [2]
Severe Winter Storms	263	$6,330,000	$333,158	$7,783,392	$518,893

1 Indicates the data is from NCDC (January 1996 to April 2015); 2 Indicates data is from USDA RMA (2000 to 2014)

PROBABILITY

Based on historical records, it is likely that severe winter storms will occur annually within the planning area.

VULNERABILITY ASSESSMENT

Power outages, which occur on an almost annual basis with severe winter storms in Nebraska, in combination with cold temperatures and below zero wind-chill, can pose a significant threat to human life. Highly vulnerable populations include residents of nursing homes, young children, the elderly, and those living in less than adequate environments. Critical facilities and infrastructure including emergency response and recovery operations, warning and communication systems, wells and water treatment, and many other services vital for returning the jurisdiction's functions to normal, are at risk during severe winter storm events due to potential power outages and other damages.

Severe winter storms occur on a regional scale, and can equally affect the entire planning area. All building stock and infrastructure, including critical facilities, are at risk of being damaged or affected by a severe winter storm.

The collection of snow and ice on power lines and electrical equipment can cause equipment damage, downed power lines, and a loss of electricity. Snow and ice accumulations on transportation routes can lead to obstruction of traffic flow and hinder emergency response. Severe winter storms can also cause significant damage to trees, with branches downing electrical lines, blocking roadways, or causing building and property damage.

Severe winter storms regularly result in damages to power lines and telephone lines, as well as other infrastructure related to threat communication (i.e. radio and television antennas). This potential for decreased message dissemination combined with potential power outages results in higher levels of vulnerability for a number of groups within the community including: the elderly, individuals and families living below the poverty line, those isolated from social interactions, groups with limited mobility, and residents that are new to the area/region. Elderly citizens are at higher risk of being isolated during severe winter storms as a result of decreased mobility, as well as a diminished ability to remove accumulations of snow and ice from vehicles and driveways. A 2011 study conducted by the Center for Injury Research and

Policy found that on average there are 11,500 injuries and 100 deaths annually related to snow removal. People, especially males over the age of 55, are 4.25 times more likely to experience cardiac distress symptoms during snow removal.

Individuals and families below the poverty line and those isolated from social interactions may lack resources or access to resources that could mitigate the impacts of severe winter storms, such as sufficient food supplies or alternative heating sources during prolonged power outages. Severe winter storms often result in closed or impassable roadways. This increases the vulnerability among segments of the population that already have decreased mobility, making it important that they have a social network that can check on them and ensure that they have access to heat and food. Finally, people who are new to the area may not know what to expect from a severe winter storm and what actions are appropriate in preparing for the event. Threat communication is imperative for informing and educating this portion of the population.

MITIGATION ALTERNATIVES

The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of severe winter storms. Some of these strategies may already be in progress within the participating jurisdictions, refer to *Section 7: Participant Section* to find details on the status of these items for a specific jurisdiction. Many of these strategies are identified and discussed in greater detail in the FEMA document, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*.

- Incorporate text messaging into severe weather messaging programs
- Incorporate cable TV interruption warning systems
- Establish road closure policies and procedures necessary to protect the public
- Continue to participate, or become a participant, in Tree City USA; establish a tree maintenance ordinance
- Establish a Tree Board to assist in the development of a tree management program
- Establish redundancies for necessary municipal services (i.e. water, gas, electric, transportation)
- Develop a database of vulnerable populations
- Establish public education programs to increase awareness of the dangers posed by severe winter storms and ways the public can mitigation the potential impacts
- Work with community groups serving "vulnerable populations" such as Meals on Wheels programs to help monitor vulnerable groups
- Develop continuity plans for critical community services (public and private)
- Improve buildings codes to eliminate flat roofs in areas that expect heavy snow loads
- Retrofit buildings and infrastructure to withstand snow loads
- Increase weather monitoring procedures

TERRORISM

According to the FBI, there is no single, universally accepted definition of terrorism. Terrorism is defined in the Code of Federal Regulations as "the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof in furtherance of a political or social objectives" (28 C.F.R. Section 0.85).

The FBI further describes terrorism as either domestic or international, depending on the origin, base, and objectives of the terrorist organization. The FBI uses the following definitions for domestic and international terrorism:

- Domestic terrorism is the unlawful use, or threatened use, of force or violence by a group or individual based and operating entirely within the United States or Puerto Rico without foreign direction committed against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof in furtherance of political or social objectives.

- International terrorism involves violent acts or acts dangerous to human life that are a violation of the criminal laws of the United States or any state, or that would be a criminal violation if committed within the jurisdiction of the United States or any state. These acts appear to be intended to intimidate or coerce a civilian population, influence the policy of a government by intimidation or coercion, or affect the conduct of a government by assassination or kidnapping. International terrorist acts occur outside the United States or transcend national boundaries in terms of the means by which they are accomplished, the persons they appear intended to coerce or intimidate, or the locale in which their perpetrators operate or seek asylum.

There are different types of terrorism depending on the target of attack, which are:

- Political Terrorism
- Bio-Terrorism
- Cyber-Terrorism
- Eco-Terrorism
- Nuclear-Terrorism
- Narco-Terrorism

Terrorist activities are also classified based on motivation behind the event such as ideology (i.e. religious fundamentalism, national separatist movements, and social revolutionary movements). Terrorism can also be random with no ties to ideological reasoning.

The FBI also provides clear definitions of terrorist incident and terrorism prevention:

- A terrorist *incident* is a violent act or an act dangerous to human life, in violation of the criminal laws of the United States, or of any state, to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.

- Terrorism *prevention* is a documented instance in which a violent act by a known or suspected terrorist group or individual with the means and a proven propensity for violence is successfully interdicted through investigative activity.

Primarily, threat assessment, mitigation and response to terrorism are federal and state directives, and work mostly with local law enforcement. The Office of Infrastructure Protection within the Federal Department of Homeland Security is a component within the National Programs and Protection Directorate.

The Office of Infrastructure Protection leads the coordinated national program to reduce and mitigate risk within 18 national critical infrastructure and key resources (CIKR) from acts of terrorism and natural disasters and to strengthen sectors' ability to respond and quickly recover from an attack or other emergency. This is done through the National Infrastructure Protection Plan (NIPP).

Under the NIPP, a Sector-Specific Agency (SSA) is the federal agency assigned to lead a collaborative process for infrastructure protection for each of the 18 sectors. The NIPP's comprehensive framework allows the Office of Infrastructure Protection to provide the cross-sector coordination and collaboration needed to set national priorities, goals, and requirements for effective allocation of resources. More importantly, the NIPP framework integrates a broad range of public and private CIKR protection activities.

The Sector-Specific Agencies provide guidance about the NIPP framework to state, tribal, territorial and local homeland security agencies and personnel. They coordinate NIPP implementation within the sector, which involves developing and sustaining partnerships and information-sharing processes, as well as assisting with contingency planning and incident management.

The Office of Infrastructure Protection has Sector-Specific Agency responsibility for six of the 18 CIKR sectors. Those six are:

- Chemical
- Commercial Facilities
- Critical Manufacturing
- Dams
- Emergency Services
- Nuclear Reactors, Materials and Waste

Sector-Specific Agency responsibility for the other 12 CIKR sectors is held by other Department of Homeland Security components and other federal agencies. Those 12 are:

- Agriculture and Food – Department of Agriculture; Food and Drug Administration
- Banking and Finance – Department of the Treasury
- Communications – Department of Homeland Security
- Defense Industrial Base – Department of Defense
- Energy – Department of Energy
- Government Facilities – Department of Homeland Security
- Information Technology – Department of Homeland Security
- National Monuments and Icons – Department of the Interior
- Postal and Shipping – Transportation Security Administration
- Healthcare and Public Health – Department of Health and Human Services
- Transportation Systems – Transportation Security Administration; U.S. Coast Guard
- Water – Environmental Protection Agency

The NIPP requires that each Sector-Specific Agency prepare a Sector-Specific Plan, review it annually, and update it as appropriate.

The Department of Homeland Security and its affiliated agencies are responsible for disseminating any information regarding terrorist activities in the country. The system in place is the National Terrorism Advisory System (NTAS). NTAS replaced the Homeland Security Advisory System (HSAS) which was

the color coded system put in place after the September 11th attacks by Presidential Directive 5 and 8 in March of 2002. NTAS replaced HSAS in 2011.

NTAS is based on a system of analyzing threat levels and providing either an imminent threat alert or an elevated threat alert.

An *Imminent Threat Alert* warns of a credible, specific and impending terrorist threat against the United States.

An *Elevated Threat Alert* warns of a credible terrorist threat against the United States.

The Department of Homeland Security, in conjunction with other federal agencies, will decide whether a threat alert should be issued should credible information be available.

Each alert provides a statement summarizing the potential threat and what, if anything should be done to ensure public safety.

The NTAS Alerts will be based on the nature of the threat: in some cases, alerts will be sent directly to law enforcement or affected areas of the private sector, while in others, alerts will be issued more broadly to the American people through both official and media channels.

An individual threat alert is issued for a specific time period and then automatically expires. It may be extended if new information becomes available or the threat evolves. The ***sunset provision*** contains a specific date when the alert expires, as there will not be a constant NTAS Alert or blanket warning that there is an overarching threat. If threat information changes for an alert, the Secretary of Homeland Security may announce an updated NTAS Alert. All changes, including the announcement that cancels an NTAS Alert, will be distributed the same way as the original alert.

LOCATION
Terrorist activity within the planning area is possible throughout the region.

EXTENT
Impacts from terrorism can range from very isolated occurrences of property damage with limited injuries to large scale events with catastrophic impacts to lives and property.

HISTORICAL OCCURRENCES
There is no record of terrorist events within the planning area.

AVERAGE ANNUAL DAMAGES
Due to lack of data and historic impacts, average losses will not be calculated for this hazard.

PROBABILITY
There have been no reports of terrorism reported within the planning area. This plan recognizes that while there have not been incidents of terrorism reported in the past, that does not prevent future occurrences. Probability of future occurrence related to this threat is stated at one percent.

VULNERABILITY ASSESSMENT
The unpredictable nature of terrorism is such that impacts can range from very isolated occurrences of property damage with limited injuries to large scale events with catastrophic impacts to lives and property. Infrastructure that are vulnerable includes: tampering with water supply, agricultural attacks (plant and animal diseases), and cyber security attacks.

MITIGATION ALTERNATIVES

Potential mitigation alternatives for terrorism include:

- Training and exercises
- Education and outreach
- Vehicular barrier and other building protection measures
- General awareness raising programs such as "See Something, Say Something."

TORNADOS

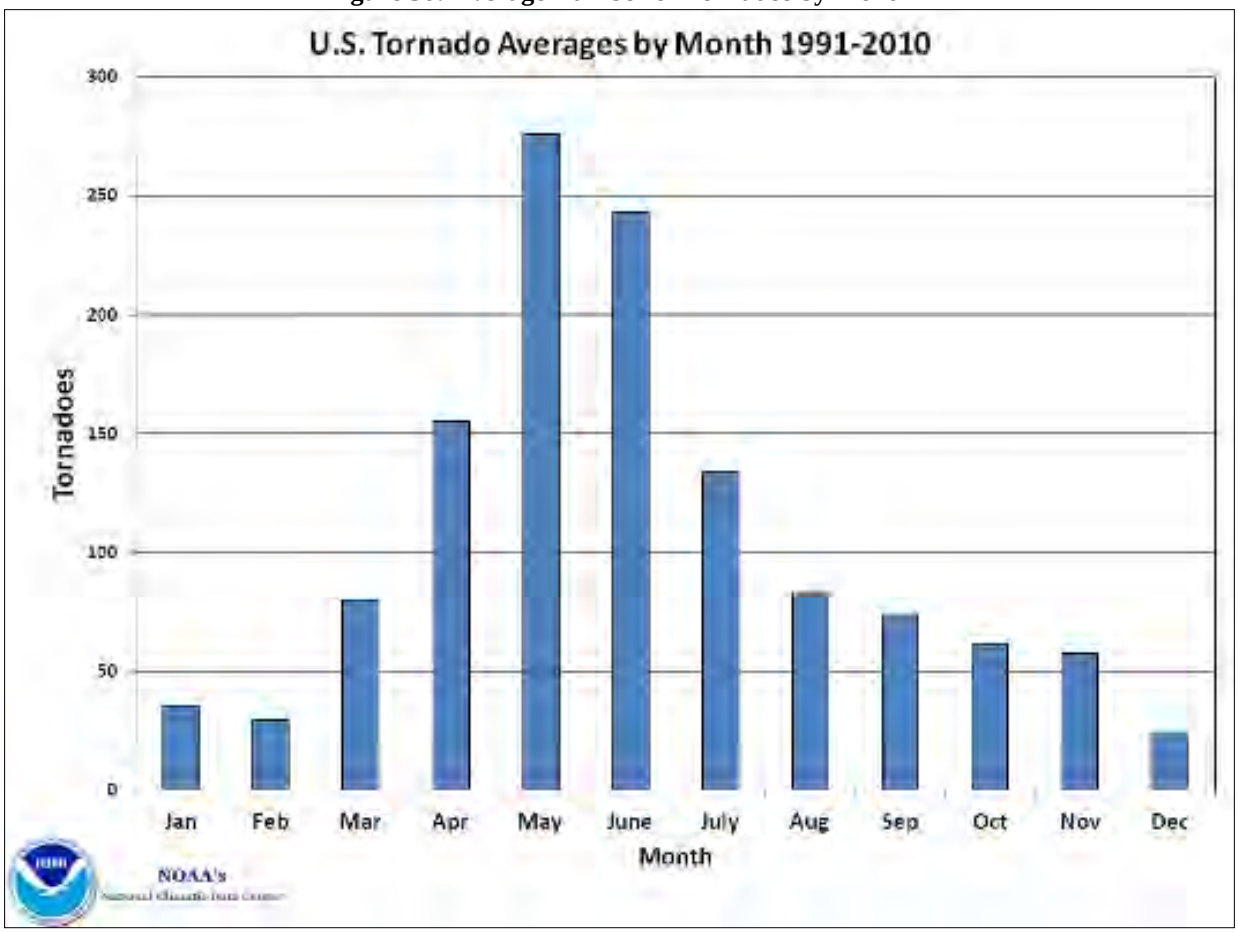
HAZARD PROFILE

A tornado is typically associated with a supercell thunderstorm. In order for rotations to be classified as tornados, three characteristics must be met:

- There must be a microscale rotating area of wind, ranging in size from a few feet to a few miles wide;
- The rotating wind, or vortex, must be attached to a convective cloud base and must be in contact with the ground; and,
- The spinning vortex of air must have caused enough damage to be classified by the Fujita Scale as a tornado.

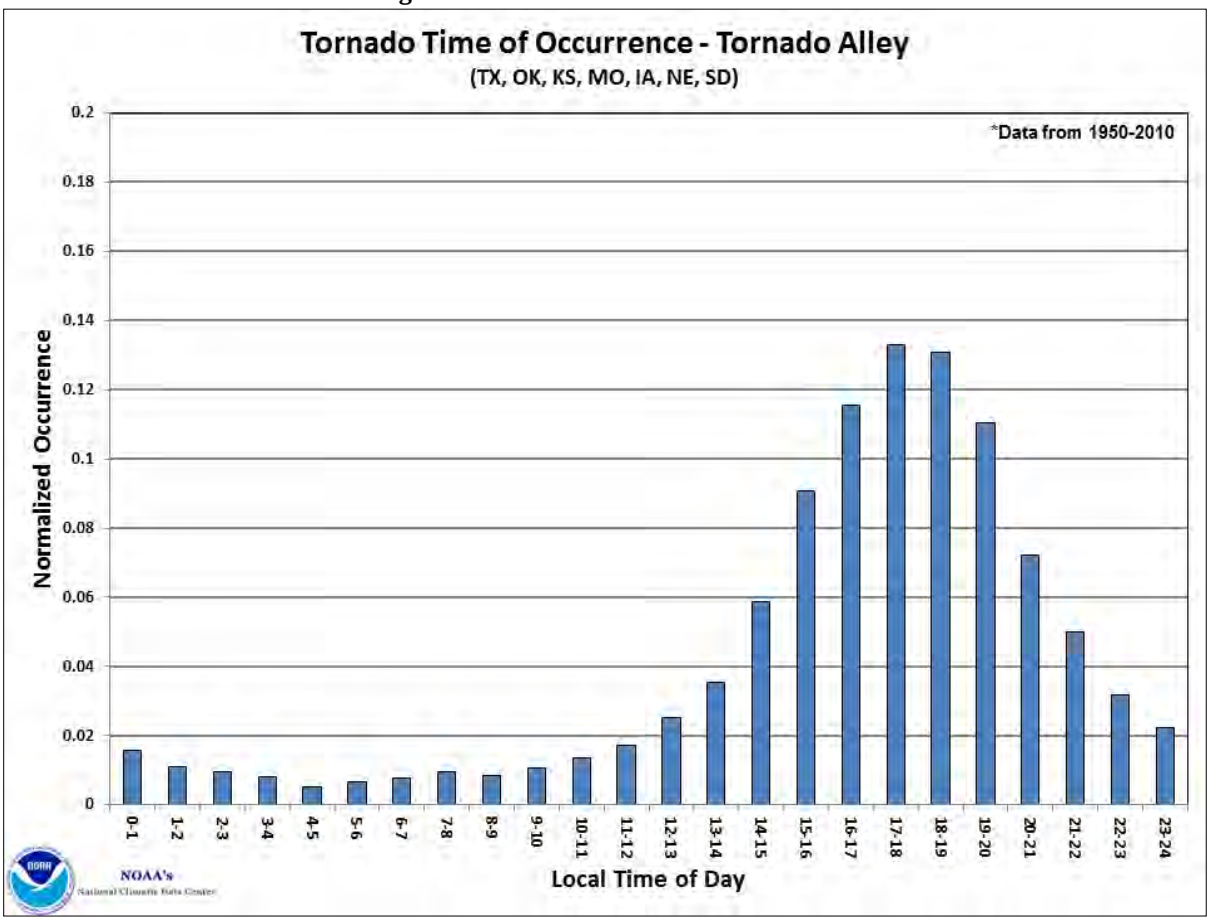
Once tornados are formed, they can be extremely violent and destructive. They have been recorded all over the world, but are most prevalent in the American Midwest and South, in an area known as "Tornado Alley." Approximately 1,000 tornados are reported annually in the contiguous United States (NOAA 2012). Tornados can travel distances over 100 miles and reach over 11 miles above ground. Tornados usually stay on the ground no more than 20 minutes. Nationally, the tornado season typically occurs between March and April. On average, 80 percent of tornados occur between noon and midnight. In Nebraska 77 percent of all tornados occur in the months of May, June, and July.

Figure 36: Average Number of Tornados by Month



Source: NCDC

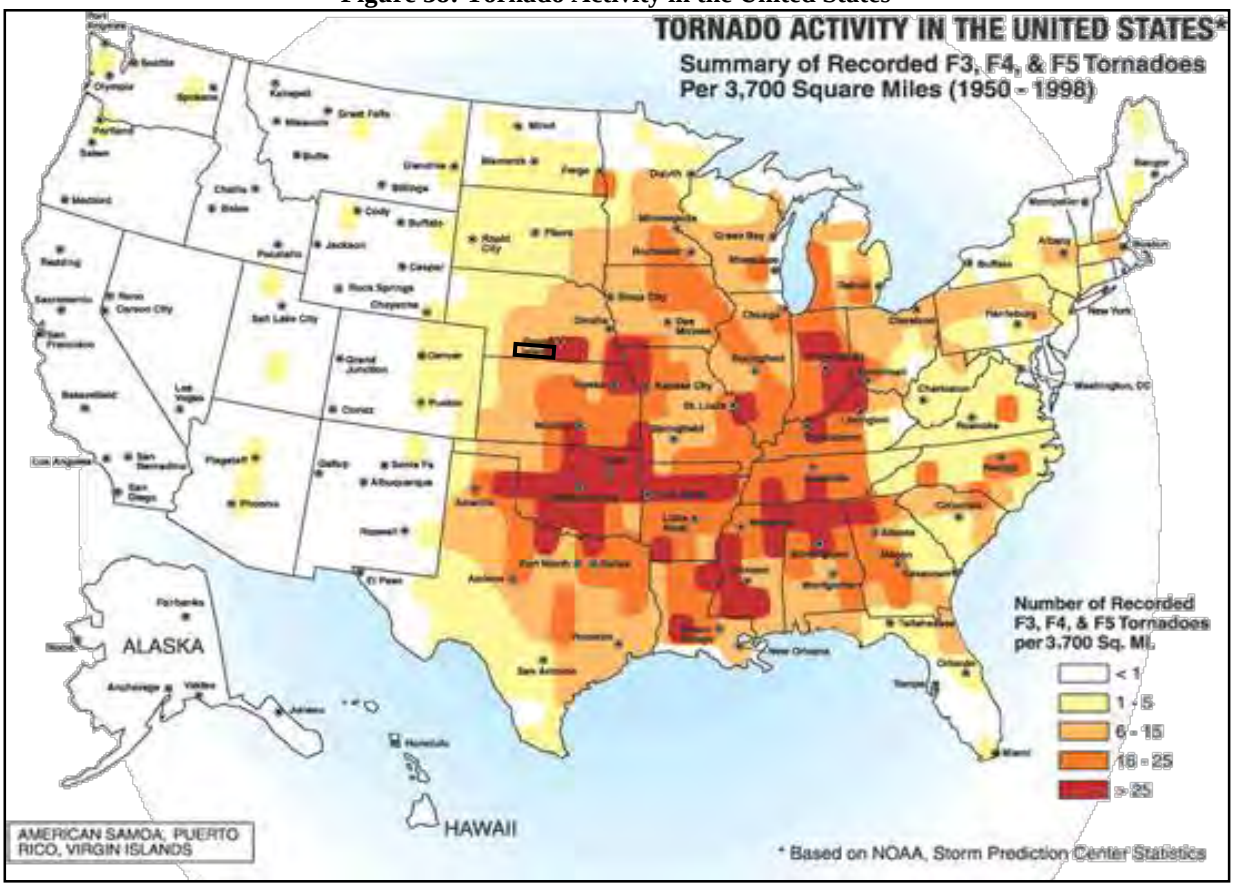
Figure 37: Tornado Time of Occurrence



Source: NCDC

Nebraska is ranked fifth in the nation for tornado frequency with an annual average of 45 tornados between 1953 and 2004 (NOAA 2011). The annual average number of tornados for Nebraska from 1991 to 2011 has increased slightly to 57 (NOAA 2013). Figure 36 shows the tornado activity in the United States as a summary of recorded F3, F4, and F5 tornados per 3,700 square miles form 1950-1998.

Figure 38: Tornado Activity in the United States



Source: Storm Prediction Center

LOCATION

Tornados have occurred in all of the counties participating in this plan. In the planning area, Red Willow County has had the highest number of tornados reported since 1996, with 16.

EXTENT

After a tornado, an official rating category is determined which provides a common benchmark that allows comparisons to be made between different tornadoes. The magnitudes of a tornado are measured by the Enhanced Fujita Scale. The Enhanced Fujita Scale does not measure tornadoes by their size or width, but rather the amount of damage caused to human-built structures and trees. The Enhanced Fujita Scale replaced the Fujita Scale in 2007. The enhanced scale classifies EF0-EF5 damage as determined by engineers and meteorologists across 28 different types of damage indicators, including different types of building and tree damage. In order to establish a rating, engineers and meteorologists examine the damage, analyze the ground-swirl patterns, review damage imagery, collect media reports, and sometimes utilize photogrammetry and videogrammetry. Based on the most severe damage to any well-built frame house, or any comparable damage as determined by an engineer, an EF-Scale number is assigned to the tornado. Table 76 and Table 77 summarize the Enhanced Fujita Scale and damage indicators. According to a recent report from the National Institute of Science and Technology on the Joplin Tornado, tornados rated EF3 or lower account for around 96 percent of all tornado damages.

Table 76: Enhanced Fujita Scale

Storm Category	3 Second Gust (mph)	Damage Level	Damage Description
EF0	65-85 mph	Gale	Some damages to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	86-110 mph	Weak	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages might be destroyed.
EF2	111-135 mph	Strong	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	136-165 mph	Severe	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	166-200 mph	Devastating	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	200+ mph	Incredible	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.
EF No rating	--	Inconceivable	Should a tornado with the maximum wind speed in excess of F5 occur, the extent and types of damage may not be conceived. A number of missiles such as iceboxes, water heaters, storage tanks, automobiles, etc. will create serious secondary damage on structures.

Source: NOAA; FEMA

Table 77: Enhanced Fujita Scale Damage Indicator

Number	Damage Indicator
1	Small barns, farm outbuildings
2	One- or two-family residences
3	Single-wide mobile home (MHSW)
4	Double-wide mobile home
5	Apt, condo, townhouse (3 stories or less)
6	Motel
7	Masonry apt. or motel
8	Small retail bldg. (fast food)
9	Small professional (doctor office, branch bank)
10	Strip mall
11	Large shopping mall
12	Large, isolated ("big box") retail bldg.
13	Automobile showroom
14	Automotive service building
15	School - 1-story elementary (interior or exterior halls)
16	School - jr. or sr. high school
17	Low-rise (1-4 story) bldg.
18	Mid-rise (5-20 story) bldg.
19	High-rise (over 20 stories)
20	Institutional bldg. (hospital, govt. or university)
21	Metal building system

Number	Damage Indicator
22	Service station canopy
23	Warehouse (tilt-up walls or heavy timber)
24	Transmission line tower
25	Free-standing tower
26	Free standing pole (light, flag, luminary)
27	Tree - hardwood
28	Tree - softwood

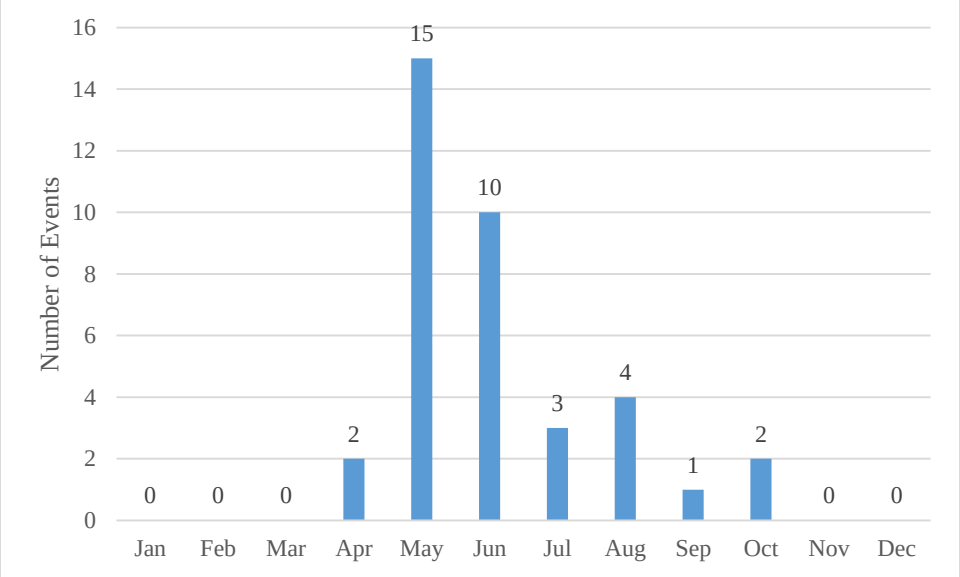
Source: NOAA; FEMA

Based on the historic record it is most likely that tornados that do occur within the planning area will be of EF0 strength. Of the 37 reported events: seven were F/EF1 tornados, one event was an F/EF2 tornados, 29 were F/EF 0.

HISTORICAL OCCURRENCES

The NCDC cites 37 tornado events ranging from a magnitude of F/EF0 to F/EF2. These events were responsible for $2,124,500 in property damage and $27,388 in crop damage. No deaths or injuries were reported. The jurisdiction specific events from NCDC and reported by each community were listed in each participant section in *Section Seven: Participant Sections*. The following table shows the months when tornados are most common.

Figure 39: Tornados by Month in the Planning Area



Source: NCDC

AVERAGE ANNUAL DAMAGES

The average damage per event estimate was determined based upon NCDC Storm Events Database since 1996 and number of historical occurrences. This does not include losses from displacement, functional downtime, economic loss, injury, or loss of life. It would cause an average of $111,816 per year in property damage due to tornados, with annual crop damage coming in at $1,826.

Table 78: Tornado Loss Estimate

Hazard Type	Number of Events[1]	Total Property Loss[1]	Average Annual Property Loss [1]	Total Crop Loss[2]	Average Annual Crop Loss [2]
Tornados	37	$2,124,500	$111,816	$27,388	$1,826

1 Indicates the data is from NCDC (January 1996 to April 2015); 2 Indicates data is from USDA RMA (2000 to 2014)

PROBABILITY

Based on historical records, it is likely that tornados will occur within the planning area annually with the most probable magnitude being an EF0. For the 19 years examined, there were 37 reported tornados, and a majority of these tornados were rated an EF0 or EF1.

VULNERABILITY ASSESSMENT

Tornados can impact a wide range of people and properties. People living in mobile homes are specifically susceptible to the effects of tornados. Other factors that may increase vulnerability to the threat posed by tornados include age, poverty levels, and home rentals.

The most common injuries from tornados are from flying or falling debris. The second most common injuries come from being picked up or blown by the tornado. Other injuries that occur include being hit by objects, building collapsing, or broken glass. The most common injuries are soft tissue injuries and fractures.

Lower income populations often live in housing that is the most vulnerable. The homes that are available to this group are not always up to code and it is hard for the residents to make improvements because of the income bracket they are in.

Mobile homes that are not anchored or are not anchored properly can be blown over by winds at speeds of 60 to 70 mph. A 2007 study conducted by Dr. W. Ashley at Northern Illinois University found that between 1985 and 2005, 44 percent of all tornado related fatalities occurred in mobile homes. Tornado related deaths in mobile homes have increased over the timeframe investigated from 37 percent of all fatalities from 1986 to 1990 to nearly 57 percent of all fatalities from 2001 to 2005.

The timing of tornados also impacts the vulnerability of people living in mobile homes. The 2007 study found that while only 25.8 percent of tornados occur between sunset and sunrise they account for 42.5 percent of tornado fatalities. This is a result of a number of factors including: decreased ability to identify tornados in the dark, decreased ability to communicate tornado threats due to a high rate of people sleeping during the night, and a higher number of people in the housing units (i.e. mobile home) during the nighttime.

The 2007 study found that middle age (those over 40 years of age) and the elderly are more vulnerable to tornados. This may be a result of decreased mobility, higher rate of auditory complications, or lack of resources needed to mitigate potential tornado related impacts.

Tornados occur with irregularity, and can equally affect the entire planning area. All building stock and above ground infrastructure, including critical facilities, are at risk of being damaged or affected by tornados. Tornados can cause structure loss, downed power lines, loss of electricity, obstruction to traffic flow, and significant damage to trees and center-pivot irrigation systems.

MITIGATION ALTERNATIVES

The following bullet points identify some general mitigation strategies that can be used to reduce a community's vulnerability to the threat of tornados. Some of these strategies may already be in progress

within the participating jurisdictions, please see *Section 7: Participant Section* to find details on the status of these items for a specific jurisdiction. Many of these strategies are identified and discussed in greater detail in the FEMA document, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards.*

- Bury power and service lines
- Establish redundancies for necessary municipal services (i.e. water, gas, electric, transportation)
- Continue to participate, or become a participant, in Tree City USA; establish a tree maintenance ordinance
- Establish a Tree Board to assist in the development of a tree management program
- Encourage the construction of safe rooms
- Ensure outdoor warning sirens are functional and located adequately to warn the public of potential tornadic events
- Incorporate text messaging into severe weather messaging programs
- Incorporate cable TV interruption warning systems
- Establish mutual aid agreements with neighboring communities and privately owned businesses
- Establish public education programs to increase awareness of the dangers posed by severe tornados and strong winds and ways the public can mitigate potential impacts
- Enhance building codes to incorporate wind –resistant building techniques
- Establish data recovery program and backup program for municipal employees
- Require tornado safe rooms in newly constructed municipal buildings
- Work with trailer and mobile home parks to develop tornado safe rooms
- Ensure schools are equipped with sufficient safe space for their maximum student capacity
- Develop business continuity plans for critical community services (public and private)
- Develop maps of vulnerable populations and safe rooms located near those groups

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Section Five: Mitigation Strategy

INTRODUCTION

The primary focus of the mitigation strategy is to establish goals and objectives, and identify action items to reduce the effects of hazards on existing infrastructure and property in a cost effective and technically feasible manner. The development of goals and objectives was completed through the 'hazard identification' public meetings.

After each hazard was identified, goals and objectives were established. The intent of each goal and set of objectives was to develop strategies to account for the risks associated with the hazards, and identify ways to reduce or eliminate those risks. Each goal and set of objectives is preceded by 'mitigation alternatives' or actions items.

A preliminary list of goals and objectives was provided to the Planning Team and participants at the 'hazard identification' public meetings. Each participant was asked to review all of the goals and objectives and comment on how to improve or change them to meet the needs of their jurisdiction. Information from this review was used to finalize the goals and objectives.

SUMMARY OF CHANGES

The development of the mitigation strategy for this plan update includes the addition of several mitigation actions, revisions to the mitigation alternative selection process, and the incorporation of mitigation actions for the additional hazards addressed in the update.

GOALS AND OBJECTIVES

Below is the final list of goals and objectives as determined by the participating jurisdictions and the Planning Team. These goals and objectives provide specific direction to guide participants in reducing future hazard related losses. The goals and objectives were numbered to assist in the development and organization of mitigation alternatives 'action items', as discussed in *Section Seven: Participant Sections*.

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] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

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.

Requirement §201.6(c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Goal 1: Protect the Health and Safety of Residents

Objective 1.1: *Reduce or prevent damage to property or prevent loss of life or serious injury (overall intent of the plan).*

Goal 2: Reduce Future Losses from Hazard Events

Objective 2.1: *Provide protection for existing structures, future development, critical facilities, services, utilities, and trees to the greatest extent possible.*

Objective 2.2: *Develop hazard specific plans, conduct studies or assessments, and retrofit jurisdiction to mitigate for hazards and minimize their impact.*

Objective 2.3: *Minimize and control the impact of hazard events through enacting or updating ordinances, permits, laws, or regulations.*

Goal 3: Increase Public Awareness and Educate on the Vulnerability to Hazards

Objective 3.1: *Develop and provide information to residents and businesses about the types of hazards they are exposed to, what the effects may be, where they occur, and what they can do to be better prepared.*

Goal 4: Improve Emergency Management Capabilities

Objective 4.1*: Develop or improve Emergency Response Plan and procedures and abilities.*

Objective 4.2: *Develop or improve Evacuation Plan and procedures.*

Objective 4.3: *Improve warning systems and ability to communicate to residents and businesses during and following a disaster or emergency.*

Goal 5: Pursue Multi-Objective Opportunities (whenever possible)

Objective 5.1: *When possible, use existing resources, agencies, and programs to implement the projects.*

Objective 5.2: *When possible implement projects that achieve several goals.*

Goal 6: Enhance Overall Resilience and Promote Sustainability

Objective 6.1: *Incorporate hazard mitigation and adaptation into updating other local planning endeavors (e.g., comprehensive plans, zoning ordinances, subdivisions regulations, etc.)*

MITIGATION ALTERNATIVES (ACTION ITEMS)

After the establishment of each participant's goals and objectives, mitigation alternatives were prioritized. The alternatives considered included: the mitigation actions in the previous plan; additional mitigation actions discussed during the planning process; actions identified in FEMA's *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*, projects identified in other local planning mechanisms (comprehensive plans, 1 & 6 year plans, etc) and recommendations from JEO for additional mitigation actions. In addition, JEO provided each participant a preliminary list of mitigation alternatives to be used as a starting point. The prioritized list of alternatives helped participants determine which actions will best assist their respective jurisdiction in alleviating damages in the event of a disaster. The listed priority does not mandate which actions will be implemented first, but will serve as a guide in determining the order at which each action should be implemented.

These projects are the core of a hazard mitigation plan. The group was instructed that each alternative must be directly related to the goals and objectives. Alternatives must be specific activities that are concise and can be implemented individually. Each goal, objective, and corresponding 'action item' is arranged by a numbering system.

Mitigation alternatives were evaluated based on referencing the community's risk assessment and capability assessment. Communities were encouraged to choose mitigation actions that were realistic and relevant to the concerns identified.

A final list of alternatives was established including information on the associated hazard mitigated, description of the action, responsible party, priority, cost estimate, potential funding sources, and timeline. This information was established through input from participants and the consultant.

It is important to note that not all of the mitigation actions identified may ultimately be included in the community's plan due to limited capabilities, prohibitive costs, low benefit/cost ratio, or other concerns. Even though there are cost estimates, priority scores, and responsible agencies identified, planning participants have not necessarily committed to undertaking any of the activities. This information will serve as a guide for the participants to assist in hazard mitigation for the future. Additionally, some jurisdictions may identify additional mitigation actions not identified in this plan.

PARTICIPANT MITIGATION ALTERNATIVES

The following are specific actions listed by participants of the Quad Counties Hazard Mitigation Plan intended to be utilized in the implementation of mitigation alternatives. Each action is described in more detail in Section Seven: Participant Sections and include the following components:

- Description – general summary of the action item.
- Analysis – brief summary of what the action item will accomplish.
- Goal/Objective – which goal and objective the action item falls under.
- Hazard(s) Addressed – which hazard the mitigation action aims to address.
- Estimated Cost – approximate cost of implementing mitigation action.
- Potential funding – a list of any potential funding mechanisms used to fund the action.
- Timeline – a general timeline as established by planning participants and the Planning Team.
- Priority –a general description of the importance and workability in which an action may be implemented (high/medium/low). Priority may vary between each community, mostly dependent on funding capabilities and the size of the local tax base.
- Lead agency – listing of agencies which may lead the implementation of the action item.
- Action since 2010 – brief summary of the status and progress of the mitigation action since the previous plan update

Implementation of the actions will vary between individual plan participants based upon the availability of existing information, funding opportunities and limitations, and administrative capabilities of smaller communities. The information listed in Table 79 is a compilation of the mitigation alternatives organized by the goal and objective to be met. Establishment of a cost-benefit analysis is out of the scope of this plan and could potentially be completed prior to submittal of a project grant application or as part of a 5-year update. Ongoing and highly ranked mitigation alternatives for each participating jurisdiction can be found in *Section Seven: Participant Section.*

MITIGATION ALTERNATIVE PROJECT MATRIX

During public meetings, each participant was asked to update mitigation projects from the previous Hazard Mitigation Plan. The participants were also asked to list new projects based on FEMA's best practices

manual which would lead to action items to reduce the effects of natural hazards. Communities were also strongly encouraged to develop highly specific projects based on completed risk assessments that were relevant to their communities. Participants also indicated if there were projects they did not want. Actions selected varied from community to community dependent upon the significance of each hazard present. The following table is a summary of the selected mitigation actions throughout the planning area.

Table 79: Mitigation Alternative Project Matrix

Goal/ Objective	Action Item #	Action Item	Summary	Hazards Addressed
Goal 1 Objective 1.1	1.1.1	**Hazard Tree Removal**	Identify and remove hazardous limbs and/or trees.	Severe Thunderstorms, Hail, High Winds, Tornadoes, Severe Winter Storms
	1.1.2	**Designated Snow Routes**	Develop designated snow routes.	Severe Winter Storms
	1.1.3	**Cooling Station Database**	Work with the public to maintain a list of sites available for public use during extreme heat events. These sites should be available 24 hours per day, or be made available after normal business hours.	Extreme Heat
	1.1.4	**Stabilize/Anchor Fertilizer, Fuel and Propane Tanks**	Anchor fuel tanks to prevent movement. If left unanchored, tanks could present major threat to property and safety in a tornado or high wind event.	Tornados, High Winds
	1.1.5	**Facility Monitoring**	Install security cameras in/around critical facilities and key infrastructure.	Terrorism
Goal 2 Objective 2.1	2.1.1	**Backup Generators**	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities and shelters.	Tornados, High Winds, Severe Winter Storms, Severe Thunderstorms
	2.1.2	**Safe Rooms**	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.	Tornados, High Winds, Severe Thunderstorms
	2.1.3	**Flood Prone Property Acquisition**	Voluntary acquisition and demolition of properties prone to flooding will reduce the general threat of flooding for communities. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.	Flooding, Dam Failure, Levee Failure
	2.1.4	**Stream Bank Stabilization/Grade Control Structure/ Channel Improvement**	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock riprap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.	Flooding
	2.1.5	**Stormwater System and Drainage Improvements**	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.	Severe Thunderstorms, Flooding
	2.1.6	**Power, Service, Electrical, and Water Distribution Lines**	Work with Public Power District and utilities departments to identify vulnerable transmission and distribution lines and plan to bury lines underground or retrofit existing structures to be less vulnerable to	Tornados, High Winds, Severe Winter Storms,

Goal/ Objective	Action Item #	Action Item	Summary	Hazards Addressed
			storm events. Electrical utilities shall be required to use underground construction methods where possible for future installation of power lines.	Severe Thunderstorms
	2.1.7	**New Well**	Provide a safe backup water supply for the community; replace existing wells affected by drought, increase of demand in water, and additional water for fire protection.	All Hazards
	2.1.8	**Sewer Project**	Install new gravity flow sewer lagoon with no pumps.	All Hazards
	2.1.9	**Impact Resistant Roof Coverings**	Use roofing materials that are resistant to hail impacts for new buildings. Retrofit existing buildings with hail resistant roofing.	Hail
	2.1.10	**Updating Sewer Plant**	Design and construct a sewer treatment plant for the appropriate communities.	Flooding
	2.1.11	**Incorporate Native Species into Municipal Landscapes**	Work to incorporate native species of plants into municipal landscapes when updates/improvements are implemented.	Drought
	2.1.12	**Back up Municipal Records**	Develop protocol for backup of critical municipal records.	All Hazards
	2.1.13	**Updating Sewer Plant**	Design and construct a sewer treatment plant	Flooding
Goal 2 Objective 2.2	**2.2.1**	**Drainage Study/Storm Water Master Plan**	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.	Flooding, Severe Thunderstorms
	2.2.2	**Develop a Drought Management Plan**	Work with relevant stakeholders to develop a drought management plan. The drought management plan would identify water monitoring protocols, outline drought responses, identify opportunities to reduce water consumption, and establish the jurisdictional management procedures.	Drought
	2.2.3	**Assess Vulnerability to Drought Risk**	The jurisdiction will review relevant plans and municipal systems to identify factors which may increase drought impacts or gaps in planning and service delivery. This may include but is not limited to: assessing water distribution system(s), reviewing well levels and identifying alternative water sources (if needed), examining water intensive consumers, review of water pricing structures, considering the need for municipal water meters, and other locally appropriate actions.	Drought
	2.2.4	**Monitor Drought Conditions**	Establish specific drought monitoring protocols. These protocols will serve as triggers for implementing drought response actions.	Drought
	2.2.5	**Source Water Contingency Plan**	Evaluate and locate new sources of groundwater to ensure adequate supplies to support the existing community and any additional growth which may occur.	Drought
	2.2.6	**Remove Flow Restrictions**	Conduct a preliminary drainage assessment and/or design bridge improvements to reduce and/or alleviate flooding. Bridges typically serve as flow restrictions along streams and rivers. Cleanout and reshaping channel segments at bridge crossings can increase conveyance, reducing the potential for	Flooding

Goal/ Objective	Action Item #	Action Item	Summary	Hazards Addressed
			flooding. Replacing modifying bridges and other flow restrictions may be necessary to eliminate flooding threats and damages.	
	2.2.7	**Develop an Agricultural Disease Response Action Plan**	Coordinate with farmers, USDA, UNL, and other local actors to develop a plan of action to contain or respond to disease outbreaks.	Agricultural Disease
	2.2.8	**Mortality Management Plan**	Develop procedures and plan for emergency disposal of diseased animals which prevents the spread of disease.	Agricultural Disease
	2.2.9	**Groundwater/Irrigation/Water Conservation Management Plan and Practices**	Develop and implement a plan/best management practices to conserve water use and reduce total use (high water use to low water use) and consumption of groundwater resources by citizens and irrigators of agricultural land during elongated periods of drought. Identify water saving irrigation projects or improvements such as sprinklers of soil moisture monitoring. Potential restrictions on water could include limitation on lawn watering, car washing, farm irrigation restrictions, or water conservation practices such as changes in irrigation management, education on no-till agriculture and use of xeriscaping in communities.	Drought
Goal 2 Objective 2.3	**2.3.1**	**Maintain Good Standing in the NFIP**	Enable property owners to purchase insurance protection against flood losses by maintaining in good standing in the NFIP.	Flooding
	2.3.2	**Participate in the NFIP**	Participate in the NFIP to allow residents to purchase flood insurance.	Flooding
	2.3.3	**Floodplain Management**	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.	Flooding
	2.3.4	**Floodplain Regulation Enforcements and Updates**	Continue to enforce local floodplain regulations for structures located in the 1% annual chance flood are. Strict enforcement of the type of development and elevations of structures should be considered through issuance of building permits by any Nebraskan city. Continue education of building inspectors or Certified Floodplain Managers.	Flooding
Goal 3 Objective 3.1	**3.1.1**	**Public Awareness / Education**	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.	All Hazards
	3.1.2	**Fire Prevention Program: Planning and Training**	Participate in the Nebraska Forest Service Wildland Fire Protection Program which provides services in wildfire suppression training, equipment, pre-suppression planning, wildfire preventions, and aerial fire suppression.	Grass/Wildfire
	3.1.3	**Develop and Distribute Drought Educational Materials**	Work to develop and distribute educational materials related to drought and drought impacts. Topics addressed may include, but are not limited to: xeriscaping, low-flow fixtures, smart irrigation systems, water collection devices/rain barrels, permeable surfaces, rain gardens, etc.	Drought

Goal/ Objective	Action Item #	Action Item	Summary	Hazards Addressed
	3.1.4	**Shelter in Place**	Provide shelter in place training to facilities housing vulnerable populations (nursing homes, childcare facilities, schools, etc.).	All Hazards
Goal 4 Objective 4.1	**4.1.1**	**Comprehensive Disaster/Emergency Response/Rescue Plan**	Establish or update Comprehensive Village Disaster and Emergency Response/Rescue Plan.	Tornados, High Winds, Severe Winter Storms, Severe Thunderstorms
	4.1.2	**Civil Service Improvements**	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's water tanks/trucks, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles and identifying and training additional personnel for emergency response.	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms, Wildfires
	4.1.3	**Establish Formal Drought Response Protocols**	Establish a response protocol for times of drought. This may include, but is not limited to: lawn watering restrictions, requirements for water intensive businesses (i.e. car washes, golf courses, etc.) responses for local facilities (swimming pools, public fountains, etc.).	Drought
	4.1.4	**Emergency Communications**	Establish an action plan to improve communication between agencies to better assist residents and businesses during and following emergencies. Establish inner-operable communications.	All Hazards
	4.1.5	**Emergency Operations**	Identify and establish an Emergency Operations Center.	All Hazards
	4.1.6	**Emergency Exercise: Hazardous Spill**	Utilize exercise to prepare for potential explosions or hazardous spills. Ensure that nearby businesses and residents have appropriate plans in place.	Chemical Spills
	4.1.7	**Emergency Exercise: Agricultural Disease Outbreak**	Conduct an outbreak exercise with producers, emergency managers, veterinarians, extension agents, etc. to identify areas for improvement and become familiar with procedures.	Agricultural Disease
Goal 4 Objective 4.3	**4.3.1**	**Warning Systems**	Implement Code Red for the county or counties.	All Hazards
	4.3.2	**Weather Radios**	Conduct an inventory of weather radios at schools and other critical facilities. Provide weather radios in critical facilities.	All Hazards
	4.3.3	**Alert/Warning Sirens**	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or upgraded. Install new sirens and remote activation where lacking.	All Hazards
Goal 5 Objective 5.2	**5.2.1**	**Tree City USA**	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.	High Winds, Severe Winter Storms, Severe Thunderstorms, Tornados
	5.2.2	**Infrastructure Assessment Study**	Conduct an assessment of bridges in the county and assess other potential areas of concern.	All Hazards

Goal/ Objective	Action Item #	Action Item	Summary	Hazards Addressed
Goal 6 Objective 6.1	**6.1.1**	**Update Comprehensive Plan**	Update Comprehensive Plan. Integrate plan with Hazard Mitigation Plan components.	All Hazards

COMPLETED MITIGATION EFFORTS

Previously completed mitigation actions identified by the communities can be found in their specific participant section in *Section Seven*.

Section Six: Plan Implementation and Maintenance

SUMMARY OF CHANGES

Section Six is consistent with what was outlined in the previous mitigation plan. It should be noted that the Planning Team and participating jurisdiction have designed a tool to meet the annual review requirement for this planning process.

MONITORING, EVALUATING, AND UPDATING THE PLAN

Participants of the Hazard Mitigation Plan will be responsible for annually monitoring, evaluating, and updating of the plan. Hazard mitigation projects will be prioritized by each participant's governing body with support and suggestions from the public, as well as property and business owners. Unless otherwise specified by each participant's governing body, the governing body will be responsible for implementation of the recommended projects. The responsible party for the various implementation actions will report on the status of all projects and include which implementation processes worked well, any difficulties they encountered, how coordination efforts are proceeding, and which strategies could be revised.

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.

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.

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.

To assist with monitoring of the plan, as each recommended project is completed, a detailed timeline of how that project was completed will be written and attached to the plan in a format selected by the governing body. Information that should be included will address project timelines, agencies involved, area(s) benefited, total funding (if complete), etc. At the discretion of each governing body, a local task force may be used to review the original draft of the mitigation plan and to recommend changes.

Reviewing and updating of this plan will occur at least every five years. At the discretion of each governing body, updates may be incorporated more frequently, especially in the event of a major hazard. The governing body shall start meeting to discuss mitigation updates at least six months prior to the deadline for completing the plan review. The persons overseeing the evaluation process will review the goals and objectives of the previous plan and evaluate them to determine whether they are still pertinent and timely. Among other questions, they may want to consider the following:

- Do the goals and objectives address current and expected conditions?
- If any of the recommended projects have been completed, did they have the desired impact on the goal for which they were identified? If not, what was the reason it was not successful (lack of funds/resources, lack of political/popular support, underestimation of the amount of time needed, etc.)?
- Have the nature, magnitude, and/or type of risks changed?
- Are there implementation problems?
- Are current resources appropriate to implement the plan?
- Were the outcomes as expected?
- Did the plan partners participate as originally planned?
- Are there other agencies which should be included in the revision process?

Worksheets in *Appendix D* may also be used to assist with plan updates.

In addition, the governing body will be responsible for ensuring that the Hazard Mitigation Plan goals and objectives are incorporated into applicable revisions of each participant's comprehensive plan and any new planning projects undertaken by the participant. The Hazard Mitigation Plan should also take into account any changes in the comprehensive plans, and incorporate the information accordingly in its next update.

CONTINUED PUBLIC INVOLVEMENT

To ensure continued plan support and input from the public as well as property and business owners, public involvement should remain a top priority for each participant. Notices for public meetings involving discussion of, or action on mitigation updates should be published and posted in the following locations a minimum of two weeks in advance:

- Public spaces around City/Village
- City/Village hall
- Websites
- Local newspapers
- Regionally-distributed newspaper

UNFORESEEN OPPORTUNITIES

If any significant new, innovative mitigation strategies arise and could impact the planning area or elements of this plan and which are determined to be of importance, a plan amendment may be proposed and considered separate from the annual review and other proposed plan amendments. Counties in the planning area should compile a list of proposed amendments received annually and prepare a report providing applicable information for each proposal, and recommend action based on the proposed amendments.

INCORPORATION INTO EXISTING PLANNING MECHANISMS

The Planning Team utilized a variety of plan integration tools to help communities determine how their existing planning mechanisms were related to the Hazard Mitigation Plan. Utilizing FEMA's *Integrating the Local Natural Hazard Mitigation Plan into a Community's Comprehensive Plan* Guidance, as well as FEMA's *2014 Plan Integration Guide,* each community engaged in a plan integration discussion. Each community referenced all relevant existing planning mechanisms and provided information on how these did or did not address hazards and vulnerability. Recommendations for improving this integration were discussed at the public meetings. Many communities have not incorporated hazard mitigation into other relevant planning mechanisms.

For communities that lack additional planning mechanisms, the Hazard Mitigation Plan should be used as a guide for future activity and development in the community. Each community which had a comprehensive plan was encouraged to incorporate elements of the Hazard Mitigation Plan within it. This would ensure that hazard mitigation was incorporated into future development decisions. In order to determine which components of the comprehensive plan overlap with the Hazard Mitigation Plan, communities can use the modified Nebraska Safe Growth Audit. However, care must be taken so that this mitigation components is reviewed and updated every five years, as the evaluation and updating of the comprehensive plan is typically done every ten years.

Section Seven: Participant Sections

PURPOSE OF PARTICIPANT SECTIONS

Participant sections contain information specific to jurisdictions which have participated in the Quad Counties planning effort. Information from individual communities was collected at public and one-on-one meetings and used to establish the plan. Participant sections include: history and development, location and geography, transportation, demographics, critical facilities, future development trends, risk assessment, capability assessment, and mitigation actions. In addition, maps specific only to each jurisdiction are included such as: critical facilities as identified by the jurisdiction, 1 percent annual floodplain boundaries, and land use maps.

The risk assessment information, as provided by individual participants, in *Section Four: Risk Assessment* and *Section Seven: Participant Sections* varies in large part to the extent of the geographical area and the jurisdictions designated representatives (who were responsible for completing meeting worksheets) identification of hazards, and occurrence and risk of each hazard type. For example, a jurisdiction located near a river may list flooding as highly likely in probability and severe in extent of damage, where a jurisdiction located on a hill may list flooding as unlikely in probability and limited in extent of damage. The overall risk assessment for the identified hazard types represents the presence and vulnerability to each hazard type area throughout the entire planning area. Only certain hazards are examined in depth for each participant section. The discussion of certain hazards selected for each participant section were prioritized by the local planning team based on the identification of hazards of greatest concern, hazard history, and the jurisdiction's capabilities. The hazards not examined in depth can be referred to in *Section Four: Risk Assessment.*

Franklin County

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

Franklin County participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Franklin County's participation was extensive; a representative from Franklin County attended every public meeting, met individually with members from the planning team, completed all hazard identification and project identification worksheets, engaged the general public in the planning process, and assisted in interdepartmental coordination and data analysis.

For Franklin County, the top concerns that were identified through this planning process include drought, flooding, high winds, severe thunder storms, severe winter storms and tornados.

The following people were involved in the development of Franklin County's Participant Section:

Table FRC 1: Franklin County Plan Contributors

Name	Title	Department / Organization
Jerry Archer	Franklin County Sheriff	Franklin County
David Pedersen	Franklin County Supervisor	Franklin County
Michael Ingram	Franklin County Highway Superintendent	Franklin County

This section contains important information about Franklin County relevant to hazard mitigation, including the following elements:

- Location/Geography
- Transportation
- Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
    - Business Profile
- Governance
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern/Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

County Profile

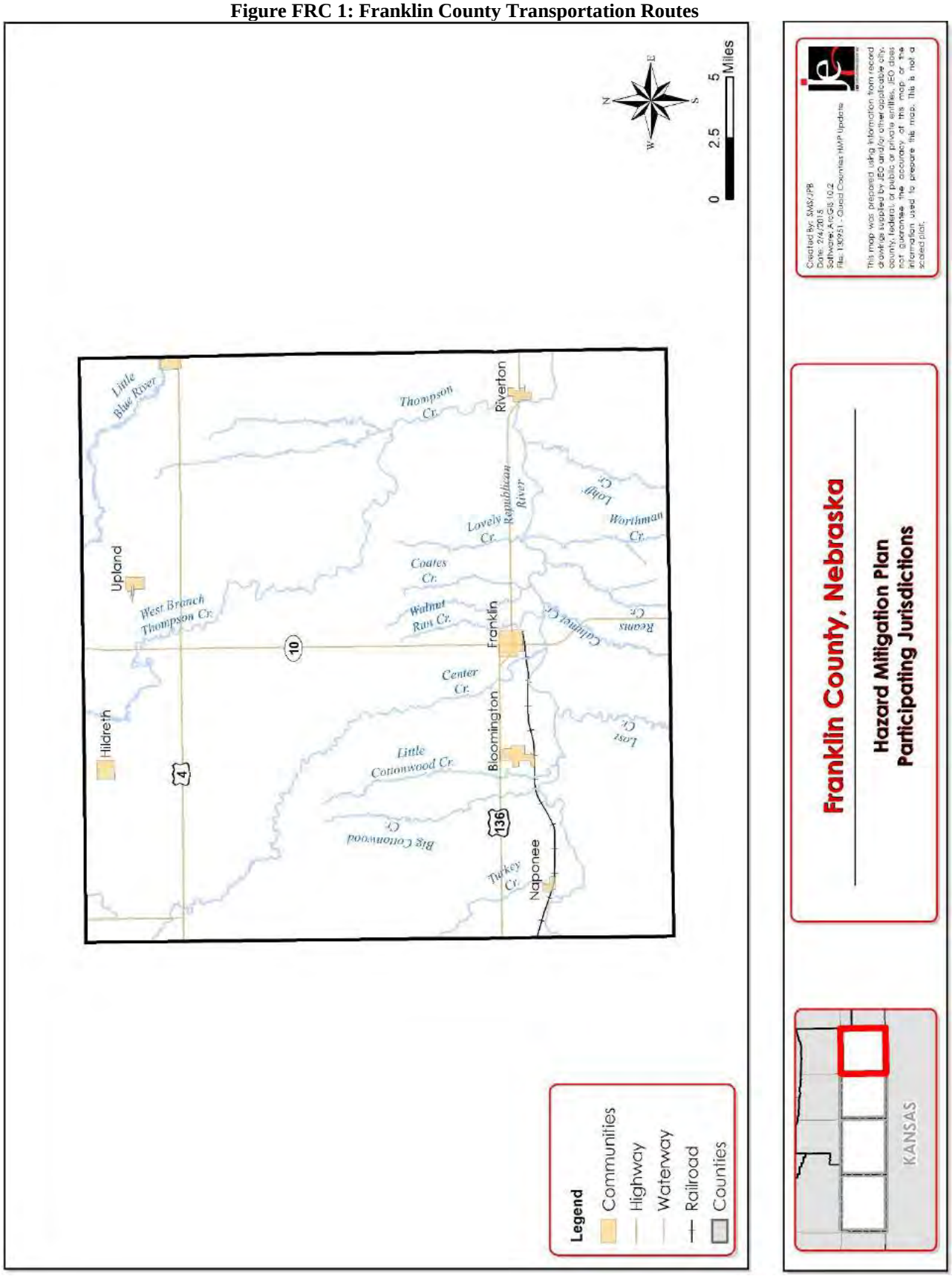
Location/Geography

Franklin County is one of the 93 counties in the State of Nebraska. It is located in the southcentral region of the state. Franklin County is adjacent to Webster, Kearney, and Harlan counties in Nebraska, and Smith and Phillips counties in Kansas. The communities in Franklin County include Bloomington, Campbell, Franklin, Hildreth, Naponee, Riverton, and Upland. The City of Franklin is the county seat. Franklin County covers an area of 576 square miles and has an average elevation of 2,028 feet above sea level. Franklin County is comprised of two different topographic regions: the dissected plains, and plains. Most of the county is in the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. The northern part of the county lies in the plains. These flat lying lands above the valley are made from materials of sandstone or stream-deposited silt, clay sand, and gravel overlain by wind-deposited silt. The Republican River traverses the southern portion of the county.

Transportation

Figure FRC 1 shows the major transportation routes for the county. There are three main highways in the county: US Highway 136, NE Highway 4, and NE Highway 10. According to the Nebraska Department of Roads, the average daily traffic count for US Highway 136 is 525 vehicles with 65 heavy trucks at the east border of the county, and 675 vehicles with 75 of those being heavy trucks at the western border of the county. The traffic count for NE Highway 4 is 840 vehicles with 85 of those being heavy trucks at the eastern border and 505 vehicles with 55 of those being heavy trucks at the western border of the county. The traffic count for NE Highway 10 is 1,520 vehicles with 180 of those being heavy trucks at the northern border of the county and 515 vehicles with 60 of those being heavy trucks.

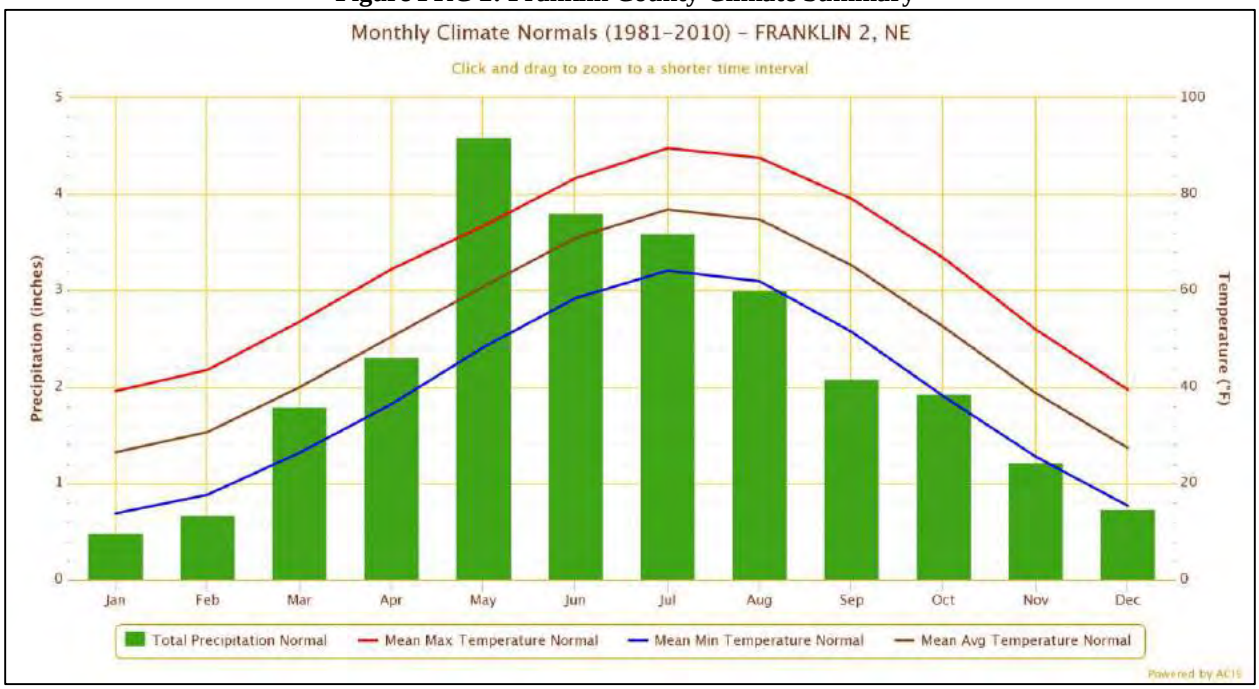
Figure FRC 1: Franklin County Transportation Routes



Climate

Weather data for Franklin County is taken in Franklin (253035), a representative location for the rest of the county. The average annual high temperature for Franklin County is 65.8ºF and the average annual low is 38.4ºF. The warmest month is July with an average high of 91.8ºF. The record high for the county of 116ºF occurred in July 1936. The coldest month is January with an average low of 12.5ºF. The record low for the county of 39ºF below zero occurred in February 1899. The average precipitation for the county is 23.38 inches. The wettest month is June with the average precipitation of 3.84 inches. The average snowfall for the county is 20.4 inches with March receiving an average of 5 inches. Figure FRC 2 **Figure FRC 2** provides a summary of the climate normals for Franklin County.

Figure FRC 2: Franklin County Climate Summary

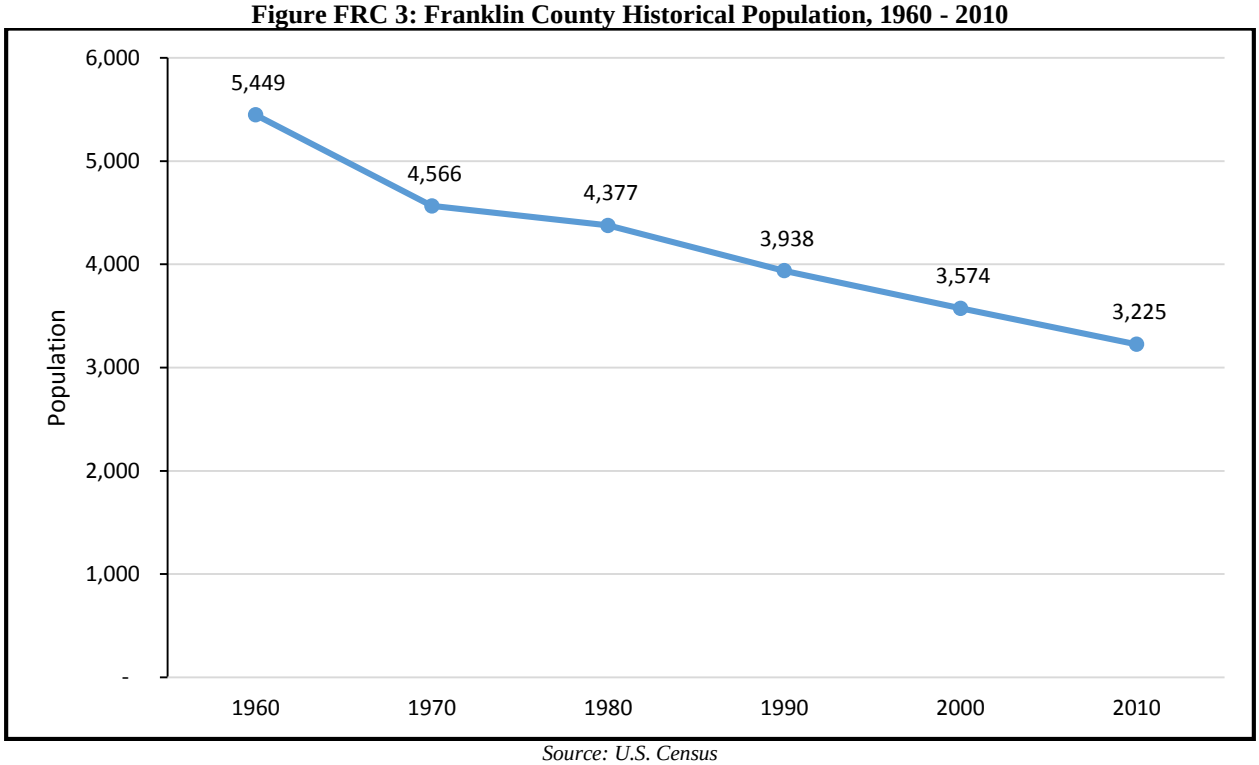


Source: SCACIS

Demographics

Figure FRC 3 shows the population from 1960 to 2010. The population of Franklin County has been declining since 1960. From 2000 to 2010, the county lost about 10 percent of its population. This is notable for hazard mitigation because communities with declining population may have a higher level of unoccupied housing that is not being maintained. Furthermore, areas with declining population will be less prone to pursuing residential/commercial development in their areas, which may reduce the number of structures vulnerable to hazards in the future. Decreasing populations can also represent decreasing tax revenue for the county, which could make implementation of mitigation actions more fiscally challenging.

Figure FRC 3: Franklin County Historical Population, 1960 - 2010



Source: U.S. Census

Table FRC 2 shows the population for the county compared to each community in the county from 2000 to 2010. The county saw population decrease by about 10 percent since 2000. The Village of Riverton lost over 35 percent of its population. The villages of Naponee and Riverton lost about 20 percent of their populations. The Village of Bloomington and the unincorporated area of the county lost about 15 percent of their populations. The Village of Campbell lost around 10 percent of its population. Declining populations often result in higher rates of empty or vacant properties, declining or poorly maintained infrastructure, and reduced response and recovery capabilities.

Table FRC 2: Population Trend

Jurisdiction	2000 Population	2010 Population	% Change	2020 Projected Population
Franklin County (Total)	3,574	3,225	-9.8%	2,909
Franklin County (Unincorporated)	1,211	1,032	-14.8%	879
Bloomington	124	103	-16.9%	86
Campbell	387	347	-10.3%	311
Franklin	1,026	1,000	-2.5%	975
Hildreth	370	378	2.2%	386
Naponee	132	106	-19.7%	85
Riverton	145	89	-38.6%	34
Upland	179	143	-20.1%	114

Source: U.S. Census Bureau – 2000, 2010

Table FRC 3 illustrates the age distribution and median age for Franklin County in comparison to the state, the villages of Bloomington, Campbell, Hildreth, Naponee, Riverton, and Upland, and the city of Franklin. Five communities have a higher percentage of the population over the age of 64 than that of the county.

Two communities and the state have a lower percentage of the population over the age of 64 than that of the County. Four communities have a higher median age than that of the county. One community has a median age that is equal to the county, while two communities and the state have a lower median age than the county.

Table FRC 3: Franklin County Age Distribution

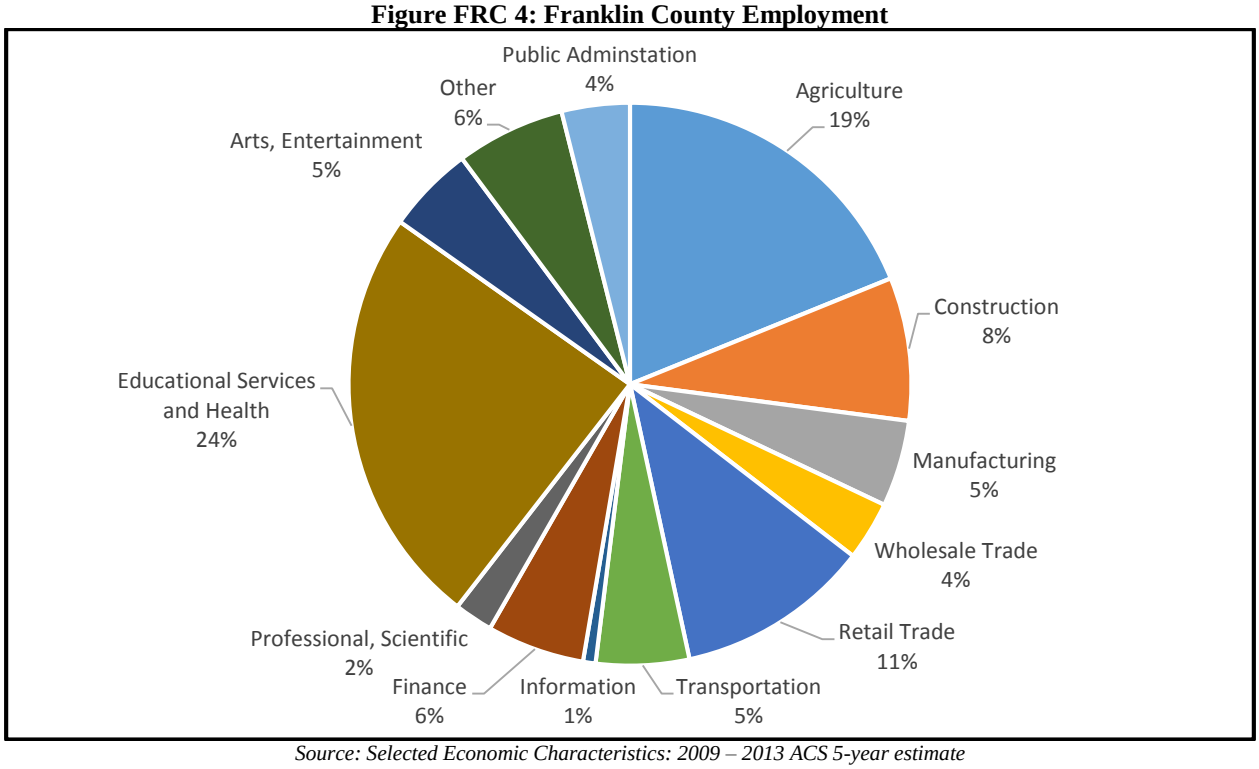
Age	Nebraska	Franklin County	Bloomington	Campbell	Franklin	Hildreth	Naponee	Riverton	Upland
<5	7.2%	5.6%	6.8%	6.1%	6.3%	5.3%	4.7%	3.4%	5.6%
5-64	79.2%	70.6%	68%	65.9%	66.2%	74%	37.6%	69.6%	83.2%
>64	13.6%	23.8%	25.2%	28%	27.5%	20.7%	32.9%	27%	11.2%
Median	36.2	48.4	51.5	49.3	48.5	46.4	52.0	51.8	42.5

Source: U.S. Census Bureau, 2010

Employment

Figure FRC 4 shows the employment by industry for Franklin County. Franklin County had 75 businesses with 461 paid employees according to the 2012 U.S. Economic Census.

Figure FRC 4: Franklin County Employment



Source: Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate

The educational services and health sector employs about 24 percent of the population. This is due to the Franklin County Memorial Hospital and three medical clinics that are located in the county. There is one school district located in the county managing two schools.

Agriculture

The agricultural and forestry industry accounts for 19 percent of employment in the county, ranking it second of all industries. The agricultural and forestry industry is an integral part of the economy and local communities. For example, other industries, such as transportation, are connected to the agricultural industry as some of their transports include crops, feed, and animals for farmers. Franklin County's 338 farms (Table FRC 4) covers 287,684 acres of land, which accounts for 78 percent of the surface land in the

county. Crops and livestock are the visible parts of the agricultural economy, but many related businesses contribute as well by producing, processing and marketing farm and food products. These businesses generate income, employment and economic activity throughout the region.

Table FRC 4: Agricultural Inventory

Agricultural Assets	Inventory
Number of Farms	338
Land in Farms	287,684 acres
Estimated market values of land & buildings (per farm)	$2,527,118
Crop Lands	166,249 acres
Cattle Inventory	23,306 head

Source: USDA Census of Agriculture, 2012

Housing and Economics

The median household income, per capita income, home value and rent for the county as a whole are compared with the villages of Bloomington, Campbell, Hildreth, Naponee, Riverton, Upland and the city of Franklin in Table FRC 5. The median household income for the county is $60,168 with a median home value of $56,200. The median household income is over $8,500 more than that of the state and the median home value is over $71,800 less than that of the state.

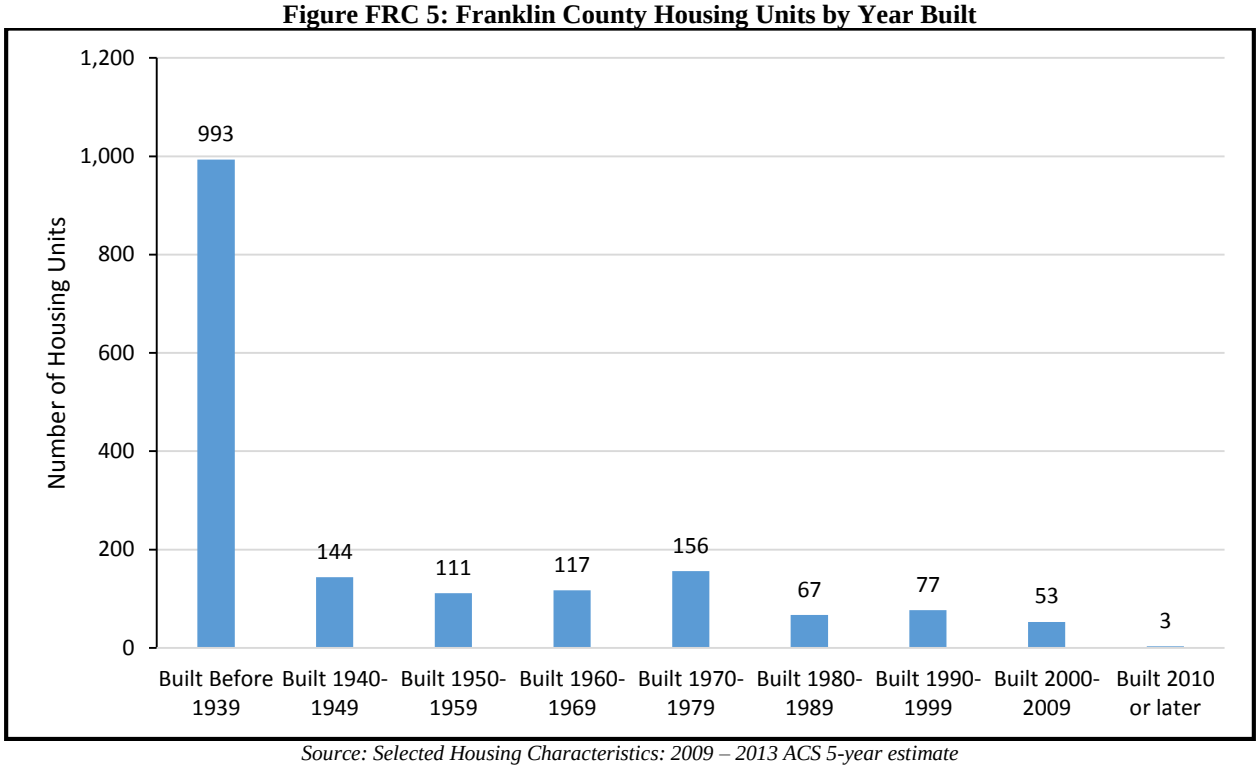
Table FRC 5: Franklin County Housing Value and Income

	Nebraska	Franklin County	Bloomington	Campbell	Franklin	Hildreth	Naponee	Riverton	Upland
Median Household Income[1]	$51,672	$60,168	$52,500	$30,208	$38,611	$53,125	$38,750	$28,333	$52,500
Per Capita Income[1]	$26,899	$26,095	$18,915	$17,892	$19,567	$24,955	$26756	$16516	$44,375
Median Home Value[2]	$128,000	$56,200	$24,400	$35,300	$44,800	$68,000	$38,300	$10,000	$43,000
Median Rent[2]	$706	$543	-	$742	$482	$435	$413	-	$690

1: Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2: Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Table FRC **6**), Franklin County has 1,721 housing units with 81.2 percent of those units occupied. Five communities, Campbell, Hildreth Naponee, Riverton, and Upland, have vacancy rates that are over 15 percent. These vacant buildings are more susceptible to damage from high winds, severe thunderstorms, and tornados. Although there are no mobile home parks located in unincorporated areas of the county, 3.5 percent of the county's homes are classified as mobile homes. Over 69 percent of the county's homes were built prior to 1960 (Figure FRC 5). Mobile homes and the aging housing stock are susceptible to high winds, severe thunderstorms and tornados. Residents living near or in these types of structures will be vulnerable to severe weather hazards. Over 96 percent of the county's homes were built prior to the first FIRM for the county in 2005. Houses built prior to this year may not be constructed above the base flood elevation. There are 312 parcel improvements located in the 1% annual flood risk area in the County.

Figure FRC 5: Franklin County Housing Units by Year Built



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table FRC 6: Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Franklin County (Total)	1,398	81.2%	323	18.8%		1,149	82.2%	249	17.8%
Franklin County (Unincorporated)	393	81.2%	91	18.8%		315	80.2%	78	19.8%
Bloomington	58	90.6%	6	9.4%		35	60.3%	23	39.7%
Campbell	123	69.9%	53	30.1%		101	82.1%	22	7.9%
Franklin	454	86.8%	69	13.2%		376	82.8%	78	17.2%
Hildreth	199	84.7%	36	15.3%		175	87.9%	24	12.1%
Naponee	51	56%	40	44%		40	78.4%	11	21.6%
Riverton	60	84.5%	11	15.5%		52	86.7%	8	13.3%
Upland	60	77.9%	17	22.1%		55	91.7%	5	8.3%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in the following table.

Table FRC 7: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
1,641	$77,074,876	$46,968	312	$18,481,340

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

For Franklin County, only critical facilities unidentified in other jurisdictions' participant sections are identified in Table FRC 8. All other critical facilities are located within incorporated communities' participant section in the county.

Table FRC 8: Critical Facilities

Critical Facility Number	Critical Facility
1	Franklin County Court House

Dams

There are 45 dams in Franklin County. None of these dams have been identified as high hazard dams.

Table FRC 9: Dams in Franklin County

	Number of Dams	Minimal	Low	Significant	High
Franklin County	45	16	24	0	0
Planning Area	175	33	125	3	2

Source: NDNR

Table FRC 10 shows the high hazard dams that could affect jurisdictions within Franklin County.

Table FRC 10: High Hazard Dam That Could Affect Franklin County

NIDID	Name	County	Downstream Jurisdiction
NE01066	Harlan County Dam	Harlan	Naponee

Source: NDNR

Chemical Storage Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of eight chemical storage sites in Franklin County, and four of these sites house materials categorized as hazardous. Table FRC 11 lists facilities that house hazardous materials only.

Table FRC 11: Chemical Storage Fixed Sites

Facility	Address	Hazardous Material
Aurora Co-op Elevator Company	127 Main St, Upland	Anhydrous Ammonia
Cooperative Producers	509 S Railway, Hildreth	Anhydrous Ammonia
Cooperative Producers	807 Broad St, Campbell	Anhydrous Ammonia
CPI Feed Chemicals Bulk	1204 15th Ave, Franklin	Anhydrous Ammonia

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there are four historic sites located in Franklin County. There is one site in the 1% annual floodplain.

Table FRC 12: National Historic Registry

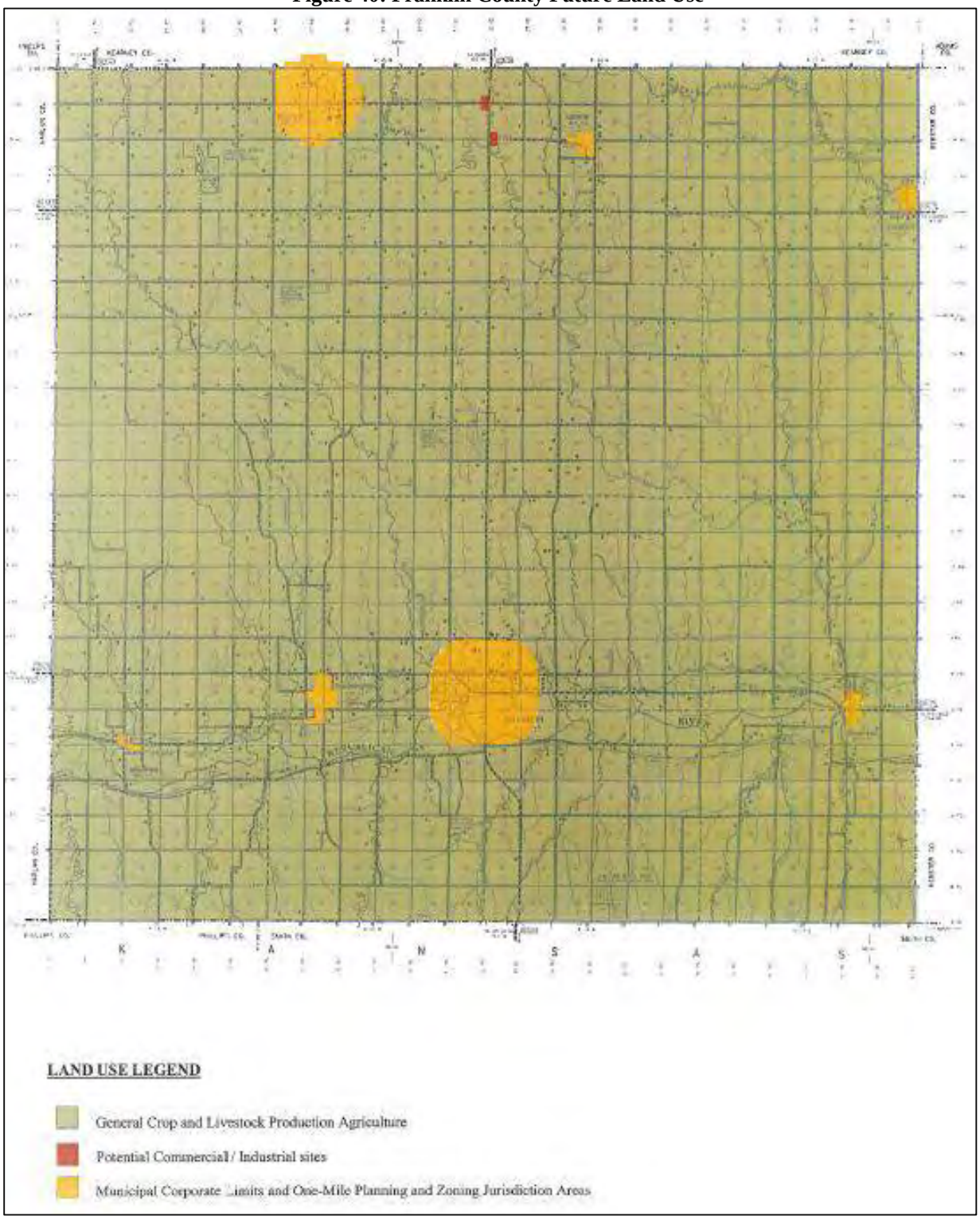
Site Name	Date Listed	Classification	In Floodplain?
Lost Creek Archeological Site	5/26/1983	Site	No
Republican River Bridge	6/29/1992	Structure	Yes
Franklin County Courthouse	7/5/1990	Building	No
First Congregational Church	9/14/1982	Building	No

Source: Nebraska State Historical Society

Future Development Trends

Franklin County does not expect any future development in the next five years within the unincorporated areas of the county. Any new structures in the unincorporated areas of the county will most likely be associated with agricultural operations. It will be important that residential areas be protected from site specific hazards such as flood prone areas. Refer to the participant sections of the communities for their own future development trends. Below is the future land use map from the Franklin County Comprehensive Plan.

Figure 40: Franklin County Future Land Use



Source: Franklin County Comprehensive Plan

Risk Assessment

Hazard Identification

Table FRC 13 is a risk assessment identified specifically for the county. Refer to *Section Four: Community Based Risk Assessment* for an explanation of this methodology.

Table FRC 13: Franklin County Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	2014 HIRA	Specific Concerns Identified
Agricultural Animal Disease	No	Medium	None
Agricultural Plant Disease	No	Medium	None
Chemical Spills (Fixed Site)	No	Medium	None
Chemical Spills (Transportation)	No	Medium	None
Dam Failure	No	Medium	None
Drought*	Yes	High	Economic impacts
Earthquake	No	Medium	None
Extreme Heat	Yes	N/A	None
Flooding*	Yes	Medium	Damages to property and crops
Grass/Wildfire	Yes	Medium	None
Hail	Yes	N/A	None
High Winds	Yes	Medium	None
Levee Failure	No	Medium	None
Severe Thunderstorm*	Yes	High	Property damage and power outages
Severe Winter Storm*	Yes	High	Property damage and power outages
Terrorism	No	Medium	None
Tornado*	Yes	High	Significant property damages and loss of life possible

** Identified as a top concern by the local planning team*

The top five hazards in Franklin County are drought, flooding, high winds, severe thunderstorms, severe winter storms and tornados. These five hazards of greatest concern for the community are discussed in detail.

Historical Occurrence

The events recorded by NCDC are broken down by two types: county-based and zone-based events. The county-based records are events that affect the jurisdictions within the county. The zone-based records are those affecting the zone that include the county as part of the affected zone. Please refer to specific villages or cities within the county for the previous county-based severe weather events retrieved from NCDC. For zone-based events, there are 113 recorded events from 1996 to 2014. Of those 113 events, 12 resulted in damages. Table FRC 14 provides a summary of the events that resulted in damage.

Table FRC 14: Franklin County NCDC Severe Weather Events

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
7/4/2000	Flood	-	0	0	$500,000
11/24/2001	High Wind	-	0	0	$2,080
3/2/2002	Winter Storm	-	0	0	$5,000
3/28/2003	High Wind	40 kts./ 46 mph	1	0	$10,000
2/5/2004	Winter Storm	-	0	0	$5,000

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
4/18/2004	High Wind	52 kts./ 60 mph	0	0	$5,000
11/27/2005	Blizzard	-	0	0	$250,000
3/21/2006	Winter Storm	-	0	0	$50,000
11/26/2006	Winter Weather	-	0	0	$5,000
12/29/2006	Ice Storm	-	0	0	$3,000,000
12/1/2007	Ice Storm	-	0	0	$20,000
12/11/2007	Winter Storm	-	0	0	$100,000

Source: NCDC

Since NCDC data provides limited information on crop losses, additional crop loss information from 2000-2014 was gathered from the Risk Management Agency (RMA) located within the United States Department of Agriculture (USDA). RMA information is only available at the county level, therefore additional data is not provided for the individual jurisdictions. The RMA data shows greater impacts to crops than all of the NCDC data shows. This discrepancy occurs because total crop losses for every event may not be reported to NCDC like they are to RMA. In Table FRC 15, the total crop loss is provided for each hazard type, along with the number of events or records over the 15 year period. Annual crop loss was calculated by dividing the total crop loss by the number of years (15).

Table FRC 15: Franklin County RMA Loss Data

Hazard Type	Number of Records	Total Crop Loss	Annual Crop Loss
Extreme Cold	68	$539,599	$38,543
Drought	124	$22,873,191	$1,633,799
Flooding	5	$8,490	$606
Hail Events	97	$5,302,269	$378,734
Heat	60	$5,879,964	$419,997
Severe Thunderstorms	0	$0	$0
Tornados	0	$0	$0
High Wind	74	$1,656,060	$118,290
Plant Disease	8	$62,588	$4,471

Source: USDA, RMA Cause of Loss 2000-2014
** Amounts rounded to the nearest dollar*

Dam Failure

Although dam failure was not identified as a top concern by the Franklin County planning team, the county could be affected by this hazard. According to the Franklin County LEOP, approximately 12 percent of the county's population could be affected by dam failure. If the Harlan County Dam were to fail, it would affect the Republican River as far as Milford Lake in Kansas. The area affected would be slightly greater than the 100 year floodplain. Dam failure would have the greatest effect on Naponee and Riverton, which would approach 100 percent inundation.

Drought

The NDMC reported that Franklin County experienced 148 months of D2 drought. The longest drought of at least D2 began in July of 1955 and lasted until July of 1965. The County also experienced a D3 drought in 2012.

The county does not have a drought monitoring board or a drought plan.

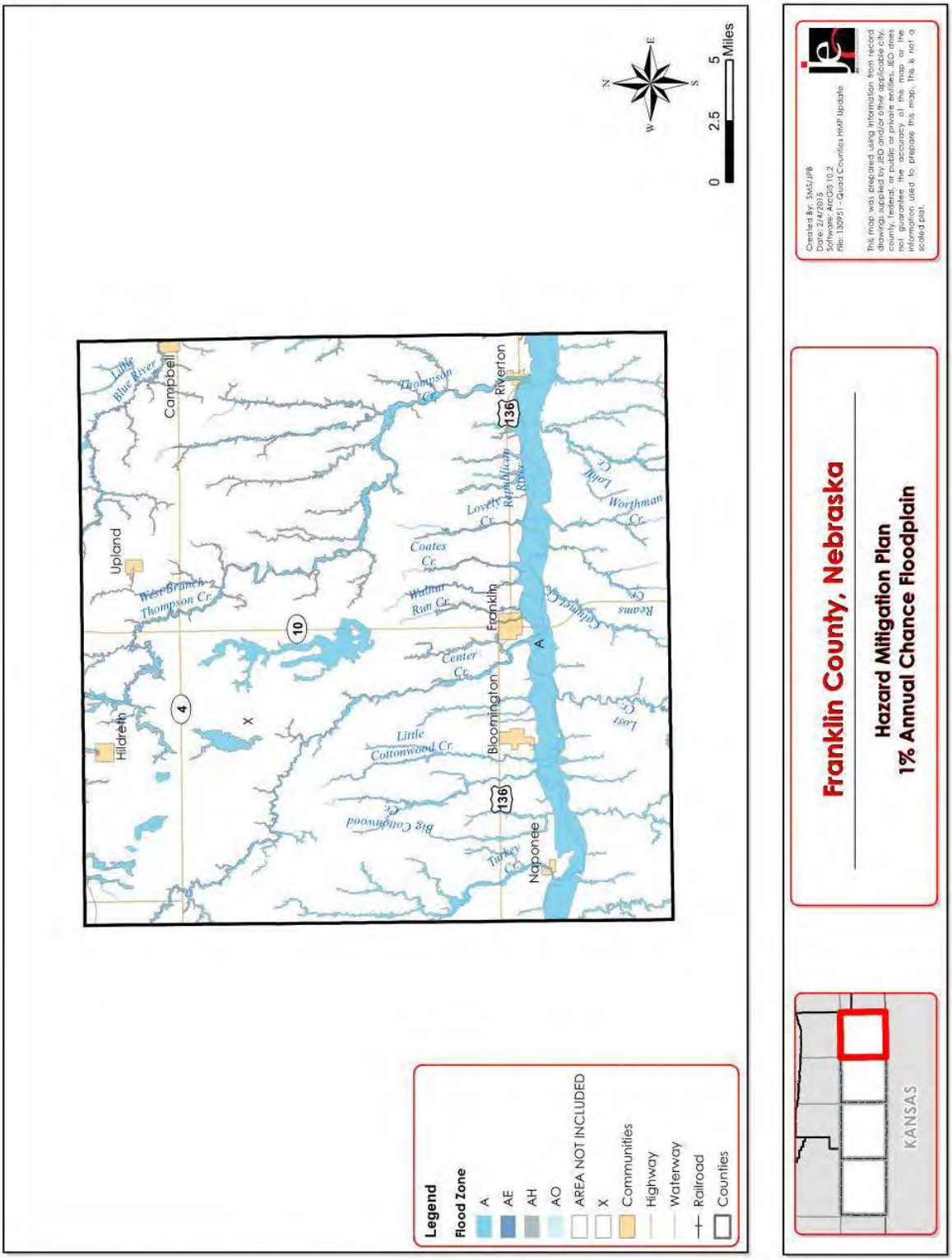
Flooding

Franklin County does participate in the NFIP, with two policies in effect worth $423,000 as of February 28, 2015. The initial FIRM for Franklin County was developed in September of 2005.

Figure FRC **6** shows the 1% annual floodplain for Franklin County. Franklin County has 312 parcels within the floodplain, worth $18,481,340. There are no repetitive loss properties in the county.

The NCDC reported seven flooding events in the county between January 1996 and December 2014 that resulted in $735,000 in property damage. RMA reported $8,490 in crop damage.

Figure FRC 6: Franklin County 1% Annual Chance Floodplain



Severe Thunderstorms
The NCDC reported 46 severe thunderstorms (wind, rain, and lightning) and 97 hail events between January 1996 and December 2014 that resulted in $4,616,000 in property damage. RMA reported $5,302,269.

Severe Winter Storms
NCDC reported 73 severe winter storms for Franklin County that resulted in $3,435,000 in property damage. RMA reported $539,599 in crop damage.

Franklin County has designated snow routes. County crew installs snow fence in vulnerable areas.

Tornados
NCDC reported eight tornados and two funnel clouds in Franklin County that resulted in $210,000 in property damage. Seven of the eight tornados were rated an F/EF 0 and one tornado was rated an F/EF 1.

Capability Assessment
Thus far, the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as a capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism for understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Unincorporated County Governance
The jurisdiction of Franklin County includes all unincorporated areas within the County boundaries. The Franklin County government structure is a seven member Board of Supervisors. The Franklin County government includes the following departments and offices:

- Assessor's Office
- Sheriff's Office
- County Attorney
- County Treasurer
- County Clerk
- Election Commissioner
- Register of Deeds
- Health and Human Services
- District Court Clerk
- Highway Superintendent
- Veterans Services
- Weed Superintendent

Table FRC 16: Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes
	Ongoing public education or information program (e.g., responsible water use, fire	No

Survey Components/Subcomponents		Comments
	safety, household preparedness, environmental education)	
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in Table FRC 16 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings from this analysis.

Franklin County has a Local Emergency Operations Plan, which was last updated in 2012. This plan discusses a number of hazards that can affect the county. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

Franklin County has the administrative staff and technical and fiscal capabilities to implement some mitigation projects without assistance. Larger projects such as drainage improvements may require that the county look to partner with the LRNRD, and other regional and state agencies. Through this update process, the planning team reviewed previously identified mitigation projects and added new projects as well.

Mitigation Strategy

Completed Mitigation Projects

Description	Warning Systems
Analysis	Implement Code Red for the County.
Goal/Objective	Goal 4/ Objective 4.3
Hazard(s) Addressed	All Hazards
Timeline	Completed
Lead Agency	Board of Supervisors, County Sheriff/Emergency Manager
Action since 2010 plan	Code Red in Place beginning June 1, 2015

New/Ongoing Mitigation Projects

Description	Backup Power Generators
Analysis	Provide a safe back-up supply of power for critical facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$15,000 to 30,000 per generator
Potential Funding	HMGP, PDM, County Funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Board of Supervisors, County Sheriff/Emergency Manager

Description	Backup Power Generators
Action since 2010 plan	This project has not been started

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, CDBG, FHA Mortgage Insured Financing
Timeline	2 – 5 years
Priority	High
Lead Agency	Board of Supervisors, County Sheriff/Emergency Manager
Action since 2010 plan	This project has not been started

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	Existing Staff
Potential Funding	General Funds
Timeline	Ongoing
Priority	Medium
Lead Agency	Board of Supervisors, County Sheriff/Emergency Manager, Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	Public Awareness / Education
Analysis	Activities such as outreach projects, distribution of maps, and environmental education increase public awareness of natural hazards and ways to protect people and property from these hazards. This information is relevant to public and private property owners, renters, businesses, and local officials. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	HMGP, PDM, General Funds
Timeline	2 – 5 years
Priority	Low
Lead Agency	County Sheriff/Emergency Manager
Action since 2010 plan	This project has not been started

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	HMGP, PDM, General Funds
Timeline	2 – 5 years
Priority	High
Lead Agency	County Sheriff Emergency Manager
Action since 2010 plan	This project has not been started

Description	Update Comprehensive Plan
Analysis	Update Comprehensive Plan. Integrate plan with Hazard Mitigation Plan components.
Goal/Objective	Goal 6/Objective 6.1
Hazard(s) Addressed	All hazards

Description	Update Comprehensive Plan
Estimated Cost	$10,000
Potential Funding	HMGP, PDM, General Funds
Timeline	1 Year
Priority	High
Lead Agency	Zoning Administrator
Action since 2010 plan	This project has not been started

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Village of Bloomington

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Bloomington participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Bloomington attended every public meeting; met with members of the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Bloomington, the top concerns that were identified through this planning process include: hail, high winds, severe thunderstorms, severe winter storms, and tornados.

The following people were involved in the development of Bloomington's Participant Section:

Table BMN 1: Village of Bloomington Plan Contributors

Name	Title	Department / Organization
Linda Carpenter	Clerk/Treasurer	Village of Bloomington
Jerry Archer	Franklin County Sheriff	Franklin County

This section contains important information about the Village of Bloomington relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern/Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

Location/Geography

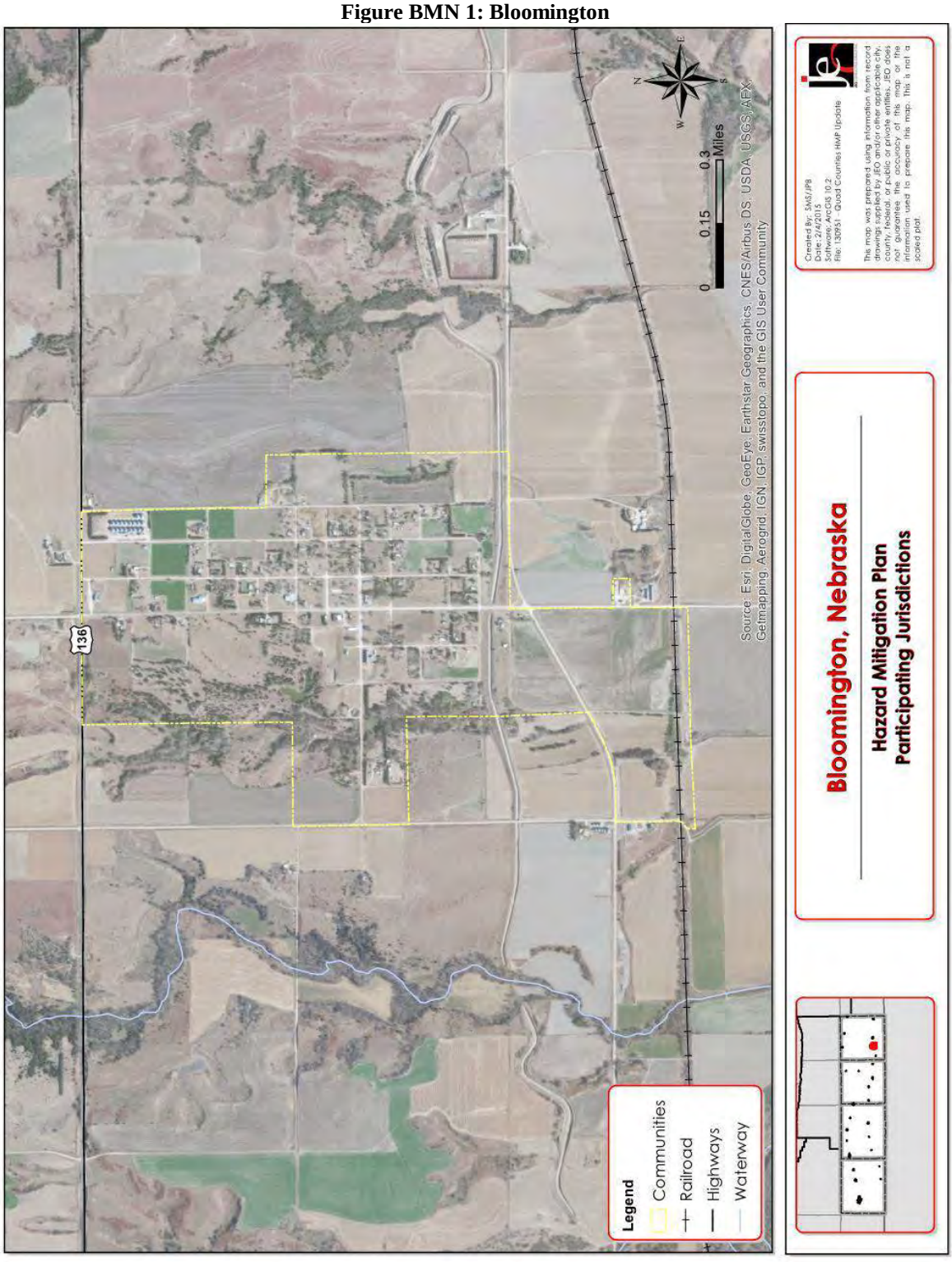
Bloomington is a village located in southwest portion of Franklin County. The Village of Bloomington covers an area of 512 acres and has an elevation of 1,946 feet above sea level. Bloomington is 41 miles south of Kearney. The topographic region of Bloomington lies in the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. The Harlan County Reservoir is just 10 miles west of the village.

Transportation

Figure BMN 1 shows the major transportation routes for the village. There is one major highway in the village, US HWY 136. According to the Nebraska Department of Roads, the average daily traffic count for US HWY 136 is 1,210 vehicles with 130 of those being heavy trucks passing to the east of the village and

870 vehicles with 105 of those being heavy trucks passing to the west of the village. There is one railway that goes through the village and it passes through extreme southern portion of the village.

Figure BMN 1: Bloomington



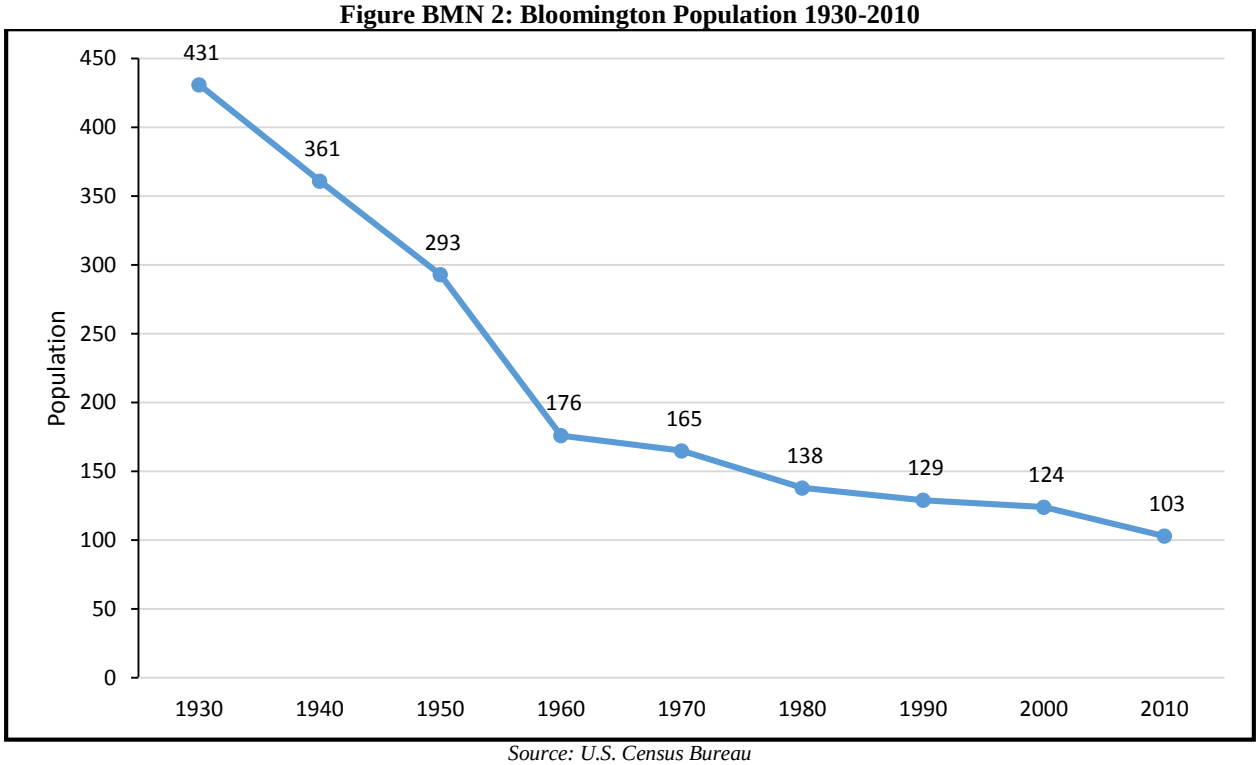
Climate

Please refer to the *Franklin County Section* for a climate summary for the village.

Demographics

Figure BMN 2 displays the population for Bloomington from 1930 to 2010. Bloomington has been experiencing population decline since 1930. From 2000 to 2010 the village lost approximately 17 percent of its population. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure BMN 2: Bloomington Population 1930-2010



Source: U.S. Census Bureau

Table BMN 2 illustrates the age distribution and median age for Franklin County in comparison to the Village of Bloomington. The village has a higher percentage of population over the age of 64 than that of the county by about one percent. The village also has a higher median age by about 3 years.

Table BMN 2: Bloomington Population Distribution

Age	Franklin County	Bloomington
<5	5.6%	6.8%
5-64	70.6%	68%
>64	23.8%	25.2%
Median	48.4	51.5

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Bloomington in Table BMN 3. The median home value for the village is $31,800 less than that of the county, and the median rent for the village is not given. The population has decreased in the last decade as noted in the demographic section, the lower cost of living compared with the rest of the county may be due to the aging housing stock. If these structures are not cared for as they age, they may continue to increase the vulnerabilities to hazards.

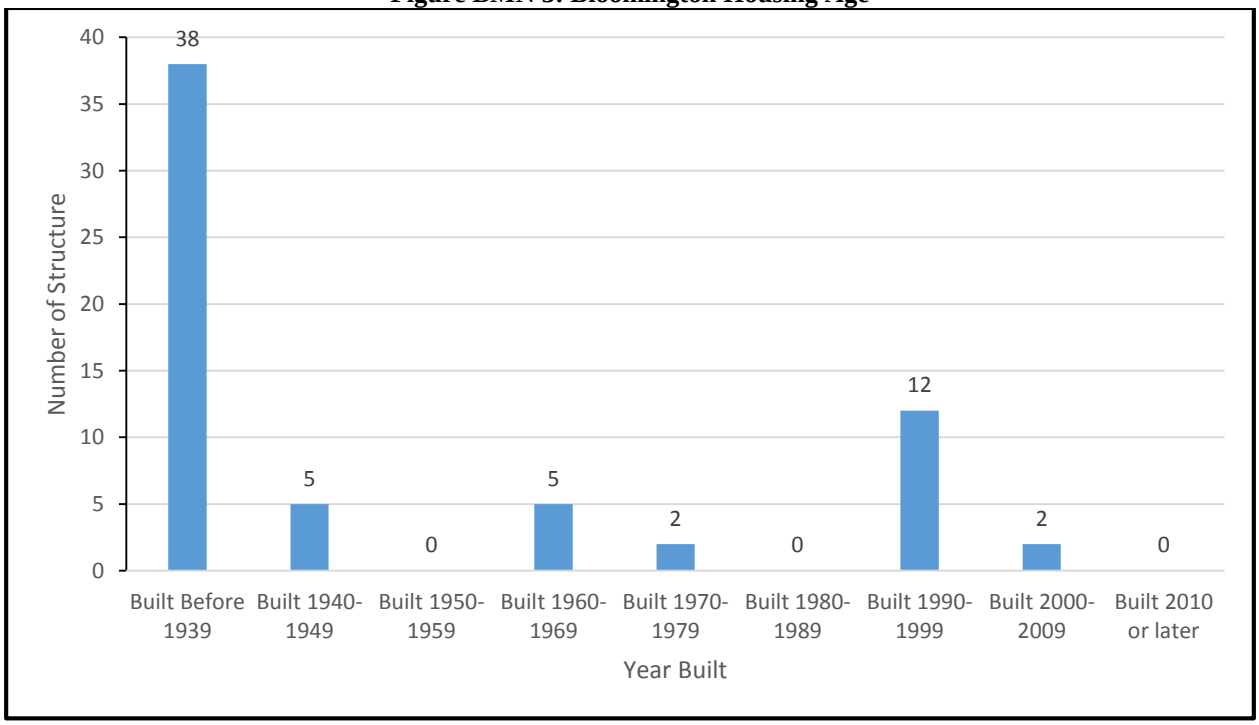
Table BMN 3: Bloomington Housing Value and Income

	Franklin County	Bloomington
Median Household Income[1]	$60,168	$52,500
Per Capita Income[1]	$26,095	$18,915
Median Home Value[2]	$56,200	$24,400
Median Rent[2]	$543	-

1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the 2010 Census data (
Figure BMN **3**) the village has 64 housing units with 91 percent of those units occupied (Table BMN 4). There is one mobile home located in the village. 75 percent of the village's housing was built before 1960. The aging housing stock in the village will be especially vulnerable to high winds, severe thunderstorms, and tornados.

Figure BMN 3: Bloomington Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table BMN 4: Bloomington Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Franklin County	1,398	81.2%	323	18.8%		1,149	82.2%	249	17.8%
Bloomington	58	90.6%	6	9.4%		35	60.3%	23	39.7%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Bloomington are educational services and health care (46.8 percent), retail trade (17.7 percent), and manufacturing (14.3 percent). The major employers for the Village of Bloomington were not identified.

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table BMN 5.

Table BMN 5: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
87	$1,897,335	$21,808	1	$66,755

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Bloomington planning team as a part of the plan update. Table BMN 6 and

Figure **BMN 4** is a summary of the type and location of critical facilities for the jurisdiction.

Table BMN 6: Bloomington Critical Facility List

Critical Facility Number	Critical Facility
1	Well and Water Tower
2	Community Center

Figure BMN 4: Bloomington Critical Facilities Map

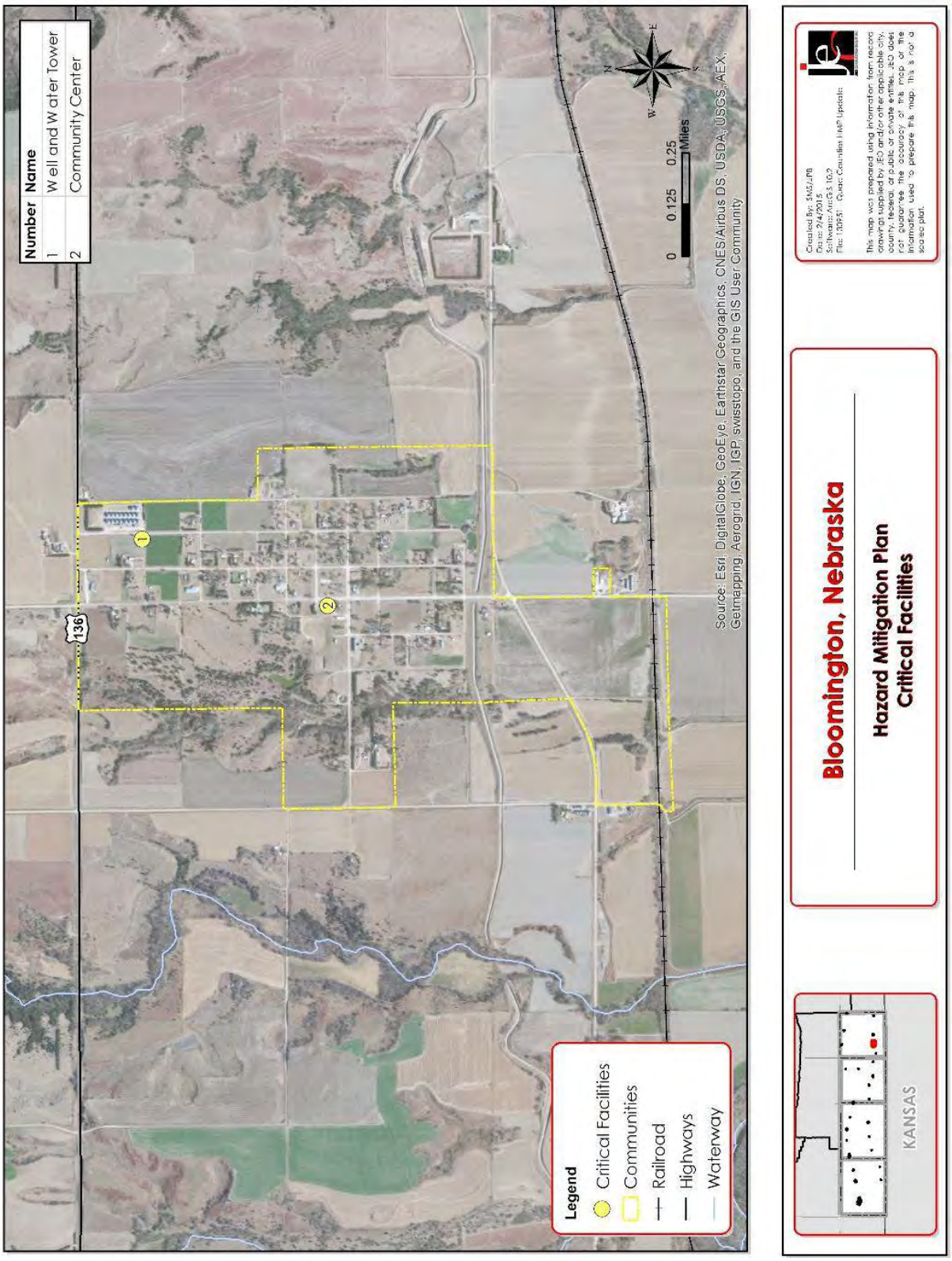


Figure BMN 5: Bloomington 1% Annual Chance Floodplain

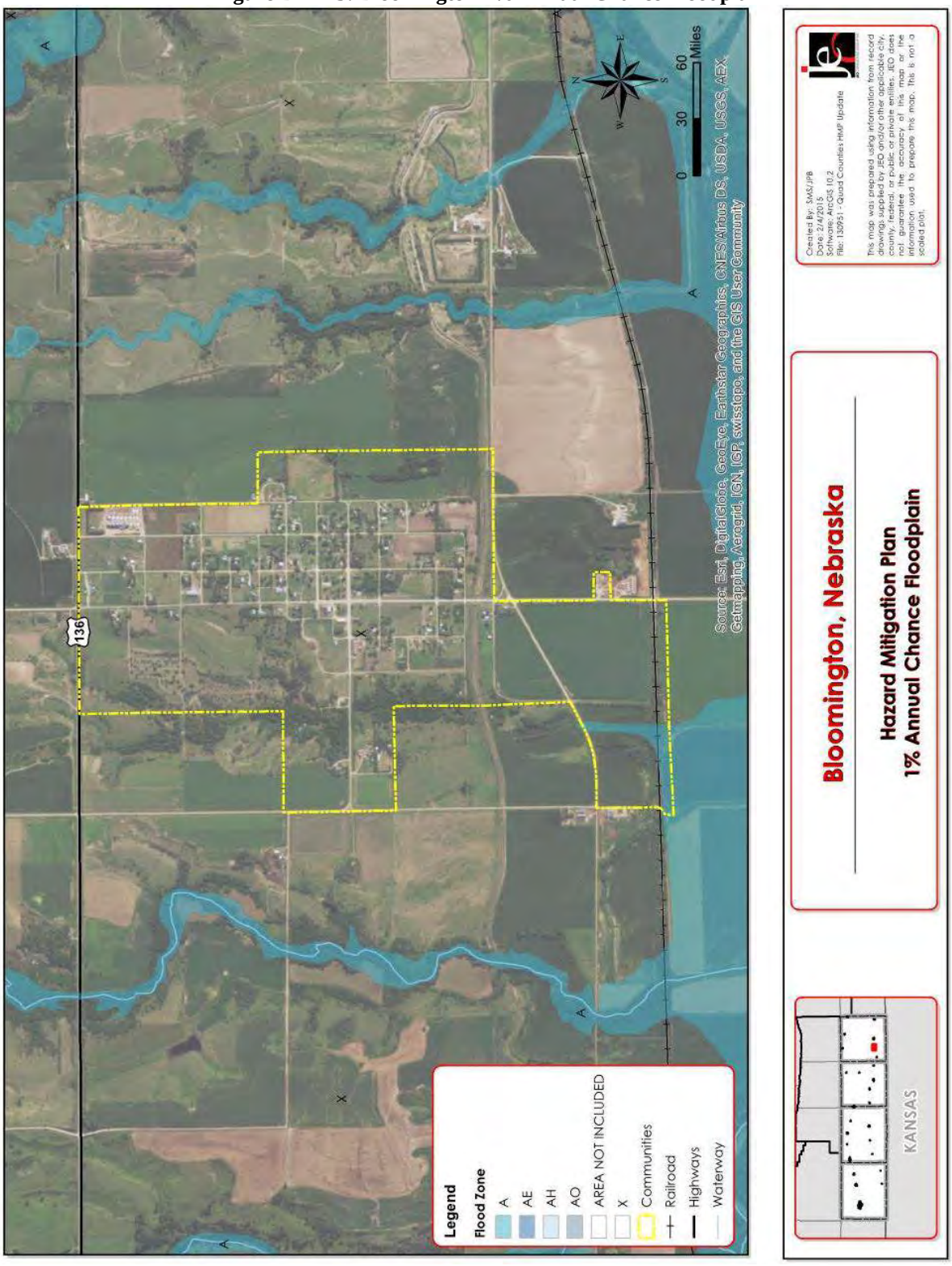


Figure BMN 5 shows the 1% annual floodplain for the Village of Bloomington. The village has one parcel improvement worth $66,755 in the floodplain. There are no critical facilities within the floodplain. There are no repetitive loss properties in the village. The initial FIRM for Bloomington was developed in March of 2005. Bloomington does not participate in the NFIP due to the lack of structures within the floodplain. Bloomington will continue to evaluate participation in the NFIP as flooding concerns and floodplain maps change.

Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are no chemical storage sites in the Village of Bloomington.

Historic Sites

According to the National Register of Historic Places for Nebraska, there is one historic sites located near the Village of Bloomington. The site is not located within the 1% annual floodplain.

Table BMN 7: National Historic Registry

Site Name	Date Listed	In Floodplain?
Lost Creek Archeological Site	5/26/1983	No

Source: Nebraska State Historical Society

Future Development Trends

There is no residential or commercial development planned in the Village of Bloomington in the next five years. Any future development will be discouraged from areas with an increased risk to hazards.

Risk Assessment

Hazard Identification

Table BMN 8 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table BMN 8: Bloomington Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical (Transportation)	No	None
Dam Failure	No	Minor inundation around the edge of town
Drought	Yes	None
Earthquake	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfire	Yes	None
Hail*	Yes	Property damages
High Winds*	Yes	Damages to property and utilities
Levee Failure	No	None
Severe Thunderstorm*	Yes	Damages to property and utilities

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Severe Winter Storm*	Yes	Damages to property and utilities, power outages
Terrorism	No	None
Tornado*	Yes	Significant damages and potential loss of life

** Identified as a top concern by the local planning team*

The top five hazards in Bloomington are hail, high winds, severe thunderstorms, severe winter storms, and tornados. These five hazards that raise the greatest concern for the community are discussed in detail.

Historical Occurrence

The NCDC reported eight severe weather events (all of them hail) from 1996 to 2014 in the Village of Bloomington. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table BMN 9 provides a summary of these events.

Table BMN 9: Bloomington Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/12/1996	Hail	0.75 in.	0	0	$0
5/14/1996	Hail	0.75 in	0	0	$0
5/22/1999	Hail	0.75 in.	0	0	$0
9/10/2003	Hail	1.75 in.	0	0	$25,000
6/12/2004	Hail	0.75 in	0	0	$0
5/27/2012	Hail	0.75 in	0	0	$0
9/6/2012	Hail	1.25 in.	0	0	$5,000
4/23/2014	Hail	1.25 in.	0	0	$10,000

Source: NCDC

Dam Failure

Dam failure was not identified by the local planning team as a top concern. However, dam failure can affect the village. According to the Franklin County LEOP, if the Harlan County Dam were to fail, the predicted time of maximum flood elevation in Bloomington is 180 minutes. The resulting flooding would be located in the 100 year floodplain.

Hail

NCDC data reported eight hail events in Bloomington since 1996 that have resulted in a total of $40,000 in property damages. The largest of these hail events resulted in hailstones of 1.75 inches.

High Winds

High winds have the potential to cause damages to property and utilities. The local planning team indicated that one recent significant high wind event occurred during a thunderstorm on Father's Day in 2014.

Severe Thunderstorms

Severe thunderstorms occur several times annually in Bloomington. One recent significant event occurred on Father's Day in 2014. The thunderstorm caused significant damages throughout the village.

Severe Winter Storms

Severe winter storms occur annually in Bloomington and the rest of the planning area. Severe winter storms have the potential to cause power outages, creating dangerous conditions for residents.

Tornados
Although there has not been a previous occurrence of a tornado in Bloomington, it has occurred in the county. Tornados are a concern due to the potential for significant damages and deaths.

Capability Assessment

Thus far, the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as a capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism for understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance
The Village of Bloomington is governed by a five member village board, led by a chairperson. The village also has the following offices and/or departments that may aid in implementing hazard mitigation projects.

- Clerk/Treasurer
- Fire Department
- Water Plant Operator

Table BMN 10: Bloomington Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No

Survey Components/Subcomponents		Comments
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	Yes
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	No
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the
Table BMN were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Bloomington has an annex to the Franklin County Local Emergency Operations Plan, which was last updated in 2012. This plan discusses a number of hazards that can affect the county. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The Village of Bloomington has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from partnerships with the county and LRNRD, and will need to explore outside funding assistance for project implementation. Through this update process, the local planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Projects

Description	**Backup Generators**
Analysis	Provide a portable or stationary source of backup power to critical facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$20,000 to $50,000 per generator
Funding	Municipal funds, Grants
Timeline	N/A
Priority	High
Lead Agency	Village Board
Status	Completed. Purchased portable generator for village shop in 2014.

Description	**Stream Bank Stabilization/Grade Control Structure/ Channel Improvement**
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$50,000
Funding	Municipal Funds, Grants
Timeline	N/A
Priority	High
Lead Agency	Village Board, Maintenance
Status	Project was completed in the spring of 2015 on the Republican River.

Ongoing/New Mitigation Projects

Description	**Safe Rooms**
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.

Description	Safe Rooms
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Village funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Maintenance, Chairman of Board
Action since 2010 plan	Not yet started, Community Center identified as needing a safe room.

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Village funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Maintenance
Action since 2010 plan	Not yet started

Description	Drainage Study/Storm Water Master Plan
Analysis	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$10,000 to $100,000+
Potential Funding	HMGP, PDM, Village funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Maintenance
Action since 2010 plan	Not yet started

Description	Public Awareness / Education
Analysis	Activities such as outreach projects, distribution of maps, and environmental education increase public awareness of natural hazards and ways to protect people and property from these hazards. This information is relevant to public and private property owners, renters, businesses, and local officials. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	Village funds
Timeline	1 Year
Priority	High
Lead Agency	Emergency Manager, Clerk
Action since 2010 plan	Not yet started

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio

Description	Weather Radios
Potential Funding	HMGP, PDM, Municipal funds
Timeline	1 year
Priority	High
Lead Agency	Emergency Manager, Village Board
Action since 2010 plan	Not yet started

Removed Mitigation Projects

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer needed by the local planning team due to the lack of flooding concerns. This action will be reevaluated as flood risks and concerns change.

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Village of Campbell

Quad Counties Multi-Jurisdictional Hazard Mitigation Plan

2016

Overview

The Village of Campbell participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Campbell attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Campbell, the top concerns that were identified through this planning process include drought, hail, high winds, severe thunderstorms, and tornados.

The following local representatives were involved in the development of Campbell's Participant Section:

Table CBL 1: Village of Campbell Plan Contributors

Name	Title	Department / Organization
Ron Pankoke	Utilities Superintendent/ Fire Chief	Village of Campbell
Jerry Archer	Franklin County Sheriff	Franklin County

This section contains important information about the Village of Campbell relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern/Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

Location/Geography

Campbell is a village located on the northeast border of Franklin County. The Village of Campbell covers an area of 256 acres and has an elevation of 2,011 feet above sea level. Campbell is approximately 33 miles southeast of Kearney. The topographic region of Campbell lies in the plains. These flat-lying land above the valley are made from materials of sandstone or stream-deposited silt, clay sand and gravel overlain by wind-deposited silt.

Transportation

Figure CBL 1 shows the major transportation routes for the village. There is one major highway through the village NE HWY 4. According to the Nebraska Department of Roads, the average daily traffic count for Campbell is 840 vehicles with 85 of those being heavy trucks passing to the east of the village and 605 vehicles with 65 of those being heavy trucks passing to the west of the village.

Figure CBL 1: Campbell

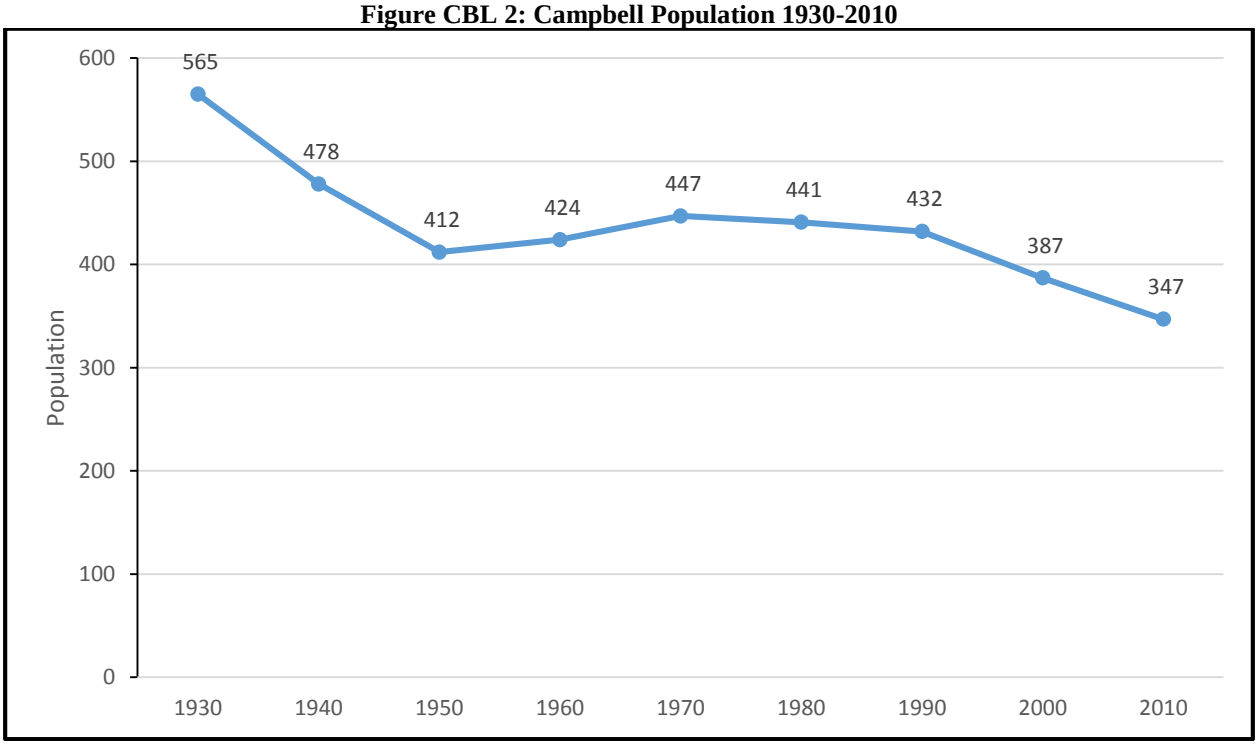
Climate

All the climate data for the county has been taken from a station located two miles outside of Franklin (253035). Please refer to the *Franklin County Section* for a climate summary for the village.

Demographics

Figure CBL 2 displays the population for Campbell from 1930 to 2010. The population for Campbell has declined since 1930. From 2000 to 2010 the village lost approximately 10 percent of its population. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure CBL 2: Campbell Population 1930-2010



Source: U.S. Census Bureau, 2010

Table CBL 2 illustrates the Age distribution and median age for Franklin County in comparison to the Village of Campbell. The village has a higher percentage of population over the age of 64 than that of the county by about 4 percent. The village has a median age that is about one year older than that of the county.

Table CBL 2: Campbell Age Distribution

Age	Franklin	Campbell
<5	5.6%	6.1%
5-64	70.6%	65.9%
>64	23.8%	28.0%
Median	48.4	49.3

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are comparted with the Village of Campbell in Table CBL 3 . The median home value for the village is $20,900 less than that of the county. The median rent for the village is about $200 higher than that of the county. The population has decreased in the last decade as noted in the demographic section, the lower cost of living compared with the rest of the county may be due to the aging housing stock. If these structures are not cared for as they age they may continue to increase the vulnerabilities to hazards.

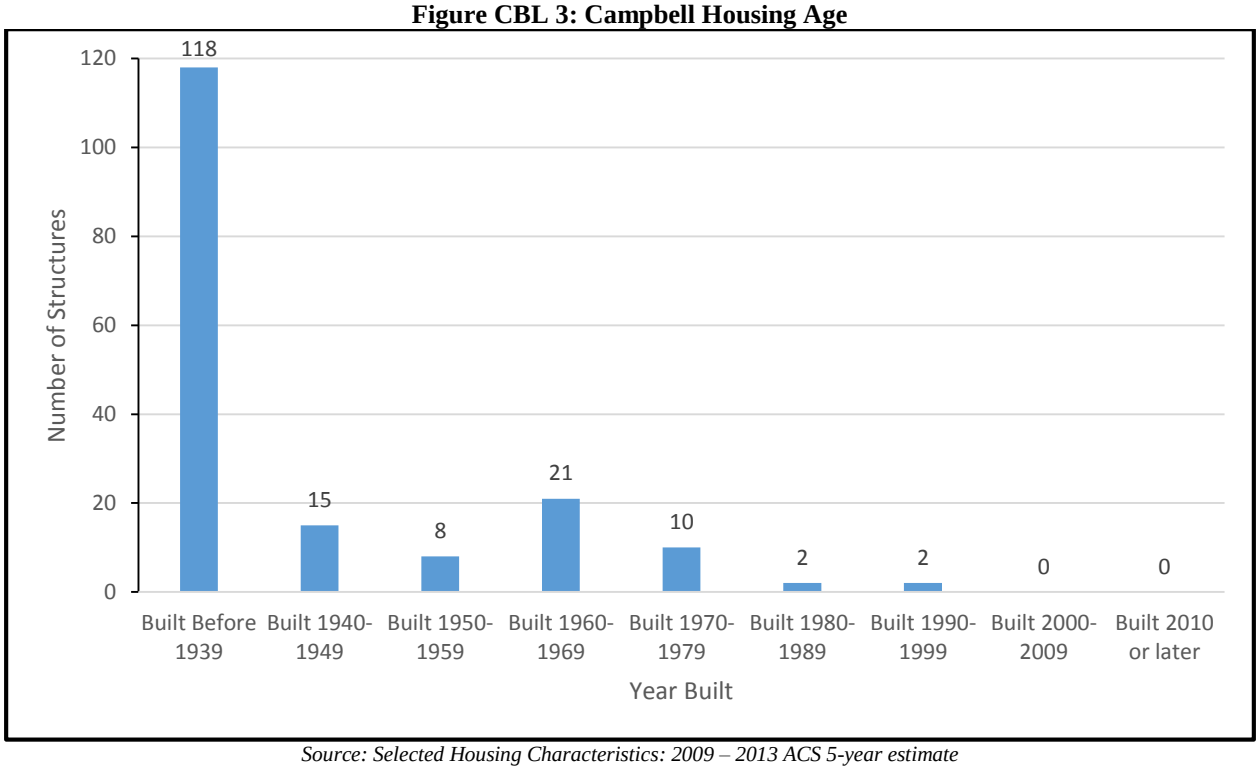
Table CBL 3: Campbell Housing Value and Income

	Franklin County	Campbell
Median Household Income[1]	$60,168	$30,208
Per Capita Income[1]	$26,095	$17,892
Median Home Value[2]	$56,200	$35,300
Median Rent[2]	$543	$742

1Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the 2010 Census data (Figure CBL 3) the village has 176 housing units with 70 percent of those units occupied (Table CBL 4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. The local planning team indicated that blighted properties are an issue throughout the village. These blighted properties result in a decreased value for the surrounding properties. There are no mobile homes in the village. Eighty percent of the village's housing was built before 1960. The aging housing structure will be vulnerable to high winds, severe thunderstorms, and tornados.

Figure CBL 3: Campbell Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table CBL 4: Campbell Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Franklin County	1,398	81.2%	323	18.8%		1,149	82.2%	249	17.8%
Campbell	123	69.9%	53	30.1%		101	82.1%	22	17.9%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Campbell are educational services and health care (25.3%), retail trade (17.6 %), and agriculture and forestry (14.3%).

The major employers for the Village of Campbell include Cooperative Producers Inc., Hall's Oil Inc., South Central State Bank. A large percentage of residents also commute to other communities such as Hastings, Kearney, Franklin, Blue Hill, Minden, and Red Cloud.

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table CBL 5.

Table CBL 5: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
171	$5,689,061	$33,269	1	$83,405

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Campbell planning team as a part of the plan update. Table CBL 6 provides a summary of the type and location of critical facilities for the jurisdiction. The village does not have any critical facilities in the 1% annual floodplain.

Table CBL 6: Critical Facility List

Critical Facility Number	Critical Facility	Address
1	North City Well	900 blk Deming
2	Sewer Lift Station	E N Railway
3	Power Plant	172 W S Railway
4	Village Offices and Community Hall	721 Broad St
5	Post Office	724 Broad St
6	Fire Department	712 Broad St
7	Catholic Church	518 Stewart
8	West City Well	349 Deming
9	Lutheran Church	378 Stewart
10	Presbyterian Church	442 Broad St
11	Water Tower and Park City Well	400 blk Taylor
12	Nursing Home	148 Broad St
13	Doctor Office and 911 Center	148 Taylor St
14	Legion Hall	631 Broad St

Figure CBL 4: Critical Facilities Map

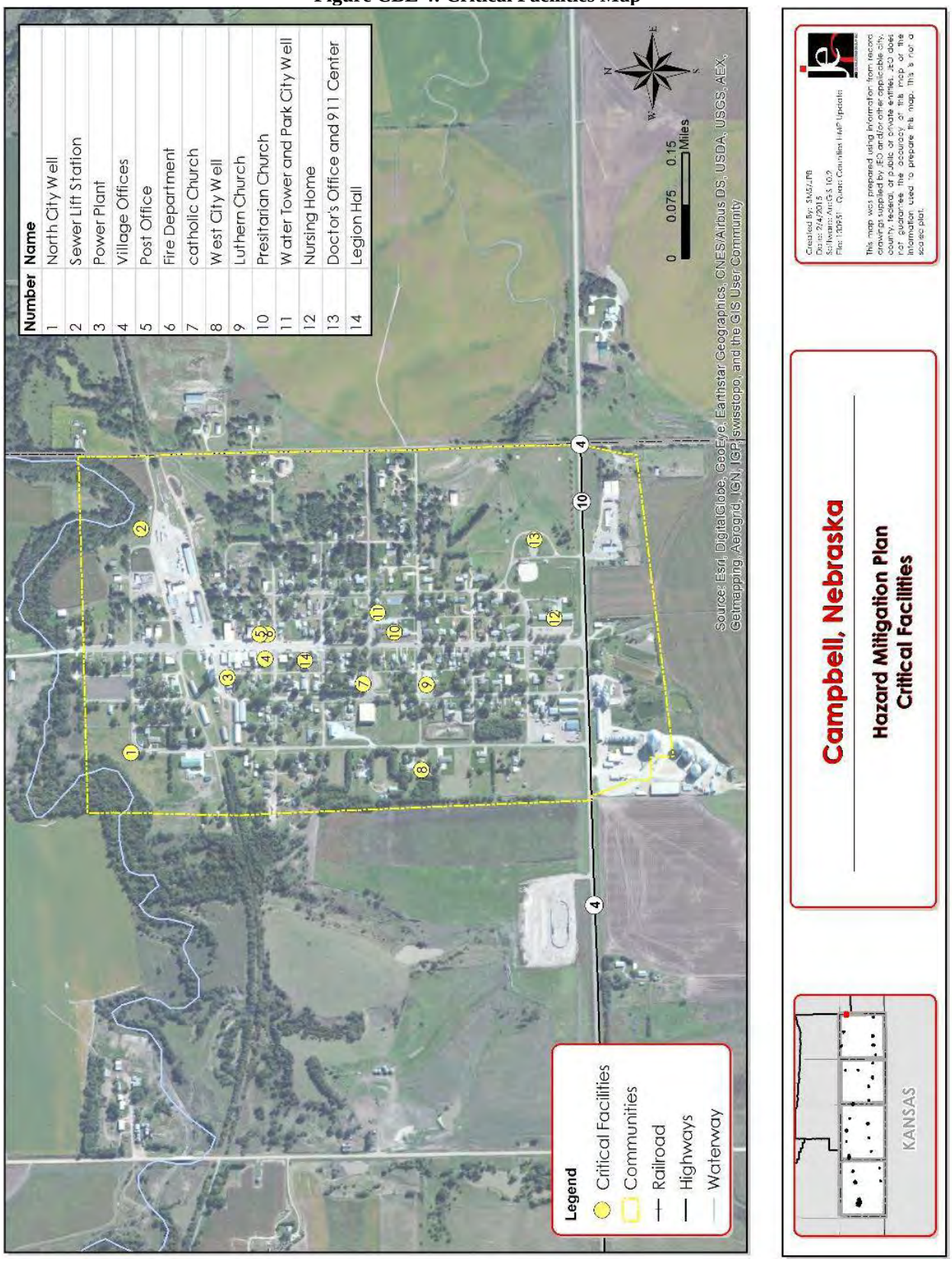
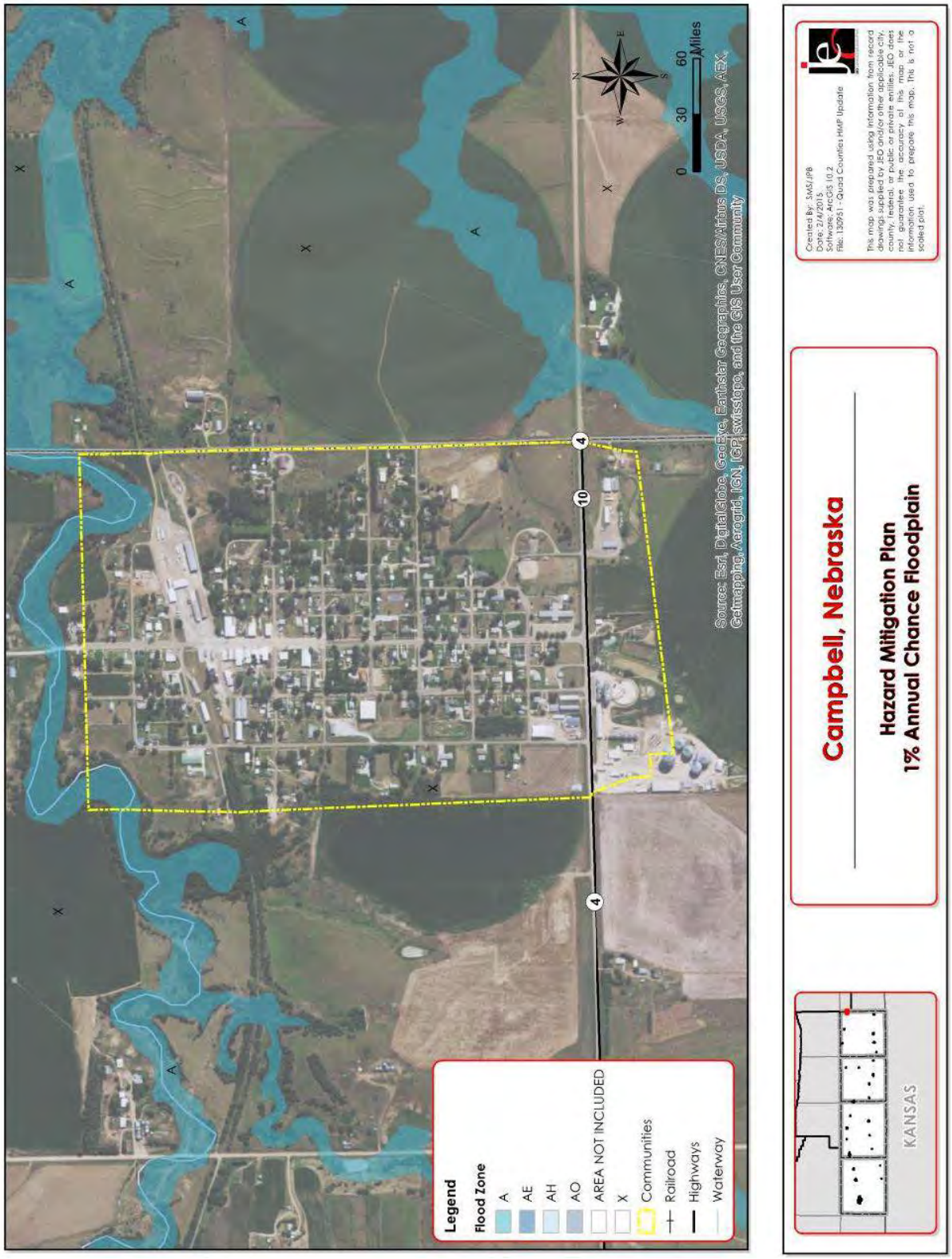


Figure CBL **5** shows the 1% annual floodplain for the Village of Campbell. The village has one parcel located in the floodplain worth $83,405. There are no critical facilities in the floodplain. There are no repetitive loss properties in the village. The initial FIRM for the village was developed in March of 2001. Campbell does participate in the NFIP, but there were no policies in effect as of February 28, 2015.

Figure CBL 5: Campbell 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of three chemical storage sites in the Village of Campbell, and one of these house materials that are categorized as hazardous. Table CBL 7 lists facilities that house hazardous materials only.

Table CBL 7: Chemical Storage Fixed Sites

Facility	Address	Hazardous Material
Cooperative Producers Inc.	907 Broad St., Campbell	Anhydrous Ammonia

Source: Nebraska Department of Environmental Quality

Historic Site

According to the National Register of Historic Places for Nebraska, there are no historic sites located in the Village of Campbell.

Future Development Trends

According to the census data, Campbell's population is declining. The local planning team indicated that a lack of jobs is a leading factor in the population decline. In the last five years, one house has been destroyed. There are plans for several more housing demolitions. There are no more residential or commercial developments planned in the next five years.

Risk Assessment

Hazard Identification

Table CBL 8 is a risk assessment identified specifically for the county. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table CBL 8: Campbell Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought*	Yes	Stress to municipal water supply
Earthquake	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfire	Yes	None
Hail*	Yes	Damage to structures and property
High Winds*	Yes	Damage to structures, utilities, and trees
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damage, power outages
Severe Winter Storm	Yes	None
Terrorism	No	None
Tornado*	Yes	Significant property damages, loss of life

** Identified as a top concern by the local planning team*

The top hazards in Campbell are drought, severe thunderstorms, hail, high winds, and tornados. These hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 13 severe weather events from 1996 to 2014 in the Village of Campbell. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table CBL 9 provides a summary of events that caused damage to the village.

Table CBL 9: Campbell Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
9/18/1996	Lightning	-	0	0	$15,000
11/5/2000	Hail	1.75 in.	0	0	$5,000
5/26/2002	Hail	1 in.	0	0	$20,000
6/12/2002	Hail	1.75 in.	0	0	$50,000
5/22/2004	Tornado	F0	0	0	$10,000
6/20/2006	Thunderstorm Winds	52 kts./60 mph	0	0	$5,000
6/4/2008	Hail	1.75 in.	0	0	$20,000
5/27/2012	Hail	1.75 in.	0	0	$25,000

Source: NCDC

Drought

According to the local planning team, the water supply is not sufficient for municipal needs and an alternative water source is needed. The town is attempting to find a location suitable to place a well. Nitrate contaminants have restricted potential locations for the new well. Campbell has a drought ordinance, and has implemented water conservation measures during periods of drought.

Hail

There are regular hailstorms that occur in Campbell. NCDC data recorded five hail events that have caused a total of $120,000 in property damage. Municipal facilities are insured for hail events. Powerlines and poles are also insured for hail damages.

High Winds

The local planning team identified there have been storms in Campbell that have had 100 mph winds. Municipal records have data backup systems. The county offers Code Red alerts. Campbell installed a new warning siren in 2005. Educational outreach activities are done in the community regarding high winds. Campbell does have Mutual Aid Agreements with neighboring communities in the event of a disaster.

Severe Thunderstorms

There are regular severe thunderstorms in Campbell. Municipal records are protected with surge protectors on electronic devices. In the event of a power outage, Campbell has a generator that can provide electricity to the entire town. None of the power lines within the town have been buried. The local planning team identified that there are hazardous trees that need to be removed. Weather radios are located in critical facilities.

Tornados

There was a F0 tornado in 2004 that resulted in $10,000 in property damages. Most residents have basements to take shelter in the event of a tornado. Residents that do not have basements can go to the gymnasium, community hall, or fire hall for shelter. Municipal records have data backup systems. The county offers Code Red alerts. Campbell installed a new warning siren in 2005. Educational outreach

activities are done in the community including an annual local meeting. Campbell does have Mutual Aid Agreements with neighboring communities in the event of a disaster. The fire department would check on vulnerable populations following a tornadic event.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

A community's governance indicates the number of boards or offices that may be available to help implement hazard mitigation actions. The Village of Campbell is governed by a five member village board led by a Chairperson. The Village of Campbell also has a number of offices or departments that may be involved in implementing hazard mitigation projects.

- Clerk
- Utility Superintendent
- Volunteer Fire Department
- Street Superintendent

Table CBL 10: Campbell Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	Yes
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes

Survey Components/Subcomponents		Comments
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While

this planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table CBL 10 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Campbell has an annex to the Franklin County Local Emergency Operations Plan, which was last updated in 2012. This plan discusses a number of hazards that can affect the county. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The Village of Campbell has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from strong partnerships with the county and LRNRD, and will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Projects

Description	**Backup Generators**
Analysis	Provide a safe back-up power supply for critical facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$1,500,000
Potential Funding	Village Funds
Timeline	Completed
Priority	High
Lead Agency	Village Board, Fire Department
Action since 2010 plan	Campbell has a backup generator with the capabilities to power the entire village. The generator was installed in 1984.

Description	**Weather Radios**
Analysis	Conduct an inventory of weather radios at schools and other critical facilities.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	N/A
Timeline	Completed
Priority	High
Lead Agency	Fire Department, County Emergency Manager
Action since 2010 plan	Facilities in need of weather radios have purchased them, including fire department.

Ongoing/New Mitigation Projects

Description	**Maintain Good Standing in the NFIP**
Analysis	Maintain good standing in the NFIP. Enable property owners to purchase insurance protection against flood losses.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	Existing Staff
Potential Funding	Village Funds
Timeline	Ongoing
Priority	Medium
Lead Agency	Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Severe winter storms, severe thunderstorms, tornados, high winds
Estimated Cost	$2,000
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Village Board, Village Utilities
Action since 2010 plan	Not yet started

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1, Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	HMGP, PDM, Village Funds
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Board, Fire Department
Action since 2010 plan	Fire department and the Village regularly produce educational materials/raise awareness

Removed Mitigation Projects

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Reason for Removal	Determined to be no longer needed.

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer needed. Lack of flooding concerns.

Description	Stream bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer needed. Lack of flooding concerns.

Description	Drainage Study/Storm Water Master Plan
Analysis	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to

Description	Drainage Study/Storm Water Master Plan
	perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.
Hazard(s) Addressed	Flooding
Reason for removal	Determined to be no longer needed. Lack of flooding concerns.

Description	Floodplain Regulation Enforcements and Updates
Analysis	Continue to enforce local floodplain regulations for structures located in the 1% annual floodplain. Strict enforcement of the type of development and elevations of structures should be considered through issuance of building permits by any Nebraska city. Continue education of building inspectors or Certified Floodplain Managers.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer needed. This action is incorporated into the 'maintain good standing in NFIP' mitigation action.

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer needed. This action is incorporated into the 'maintain good standing in NFIP' mitigation action.

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City of Franklin

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The City of Franklin participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Franklin attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Franklin, the top concerns that were identified through this planning process include chemical spills during transportation, hail, severe thunderstorms, severe winter storms, and tornados.

The following people were involved in the development of Franklin's Participant Section:

Table FRN 1: City of Franklin Plan Contributors

Name	Title	Department / Organization
Ed Brickman	Franklin Police Chief	City of Franklin
Jerry Archer	Franklin County Sheriff	Franklin County

This section contains important information about the City of Franklin relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern/Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

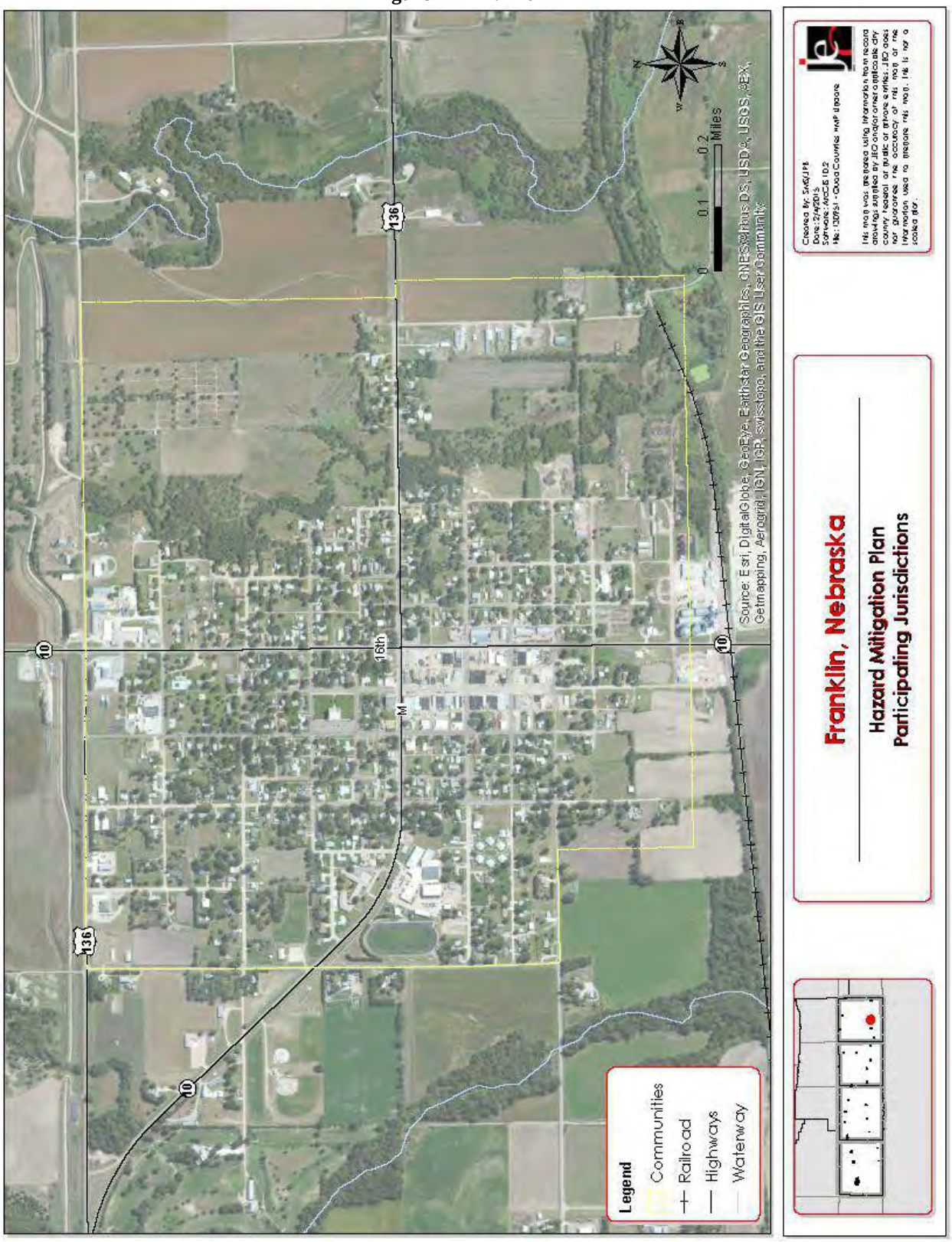
Community Profile

Location/Geography

Franklin is a city located in the south-central portion of Franklin County. The City of Franklin covers an area of 640 acres and has an elevation of 1,864 feet above sea level. Franklin is approximately 43 miles southeast of Kearney. The topographic region of Bloomington lies in the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. There are two water ways near the city. Coon Creek is located to the east of the city and Center Creek is located to the west. Both of these creeks drain into the Republican River.

Figure FRN **1** shows the land use and major transportation routes for the city. There are two major highways in the city: US HWY 136 and NE HWY 10. According to the Nebraska Department of Roads' average daily traffic counts, US HWY 136 has an average of 740 vehicles with 80 of those being heavy trucks passing to the east of the city and 1,310 vehicles with 140 of those being heavy trucks passing to the west of the city. NE HWY 10 has an average traffic count of 1,670 vehicles with 205 of those being heavy trucks passing to the north of the city and 765 vehicles with 70 of those being heavy trucks passing to the south of the city. There is one railway south of the city. Chemicals are normally transported along the highways through the city. There are six critical facilities that are located along the highways and vulnerable to any chemical spill from one of the vehicles carrying the chemicals.

Figure FRN 1: Franklin



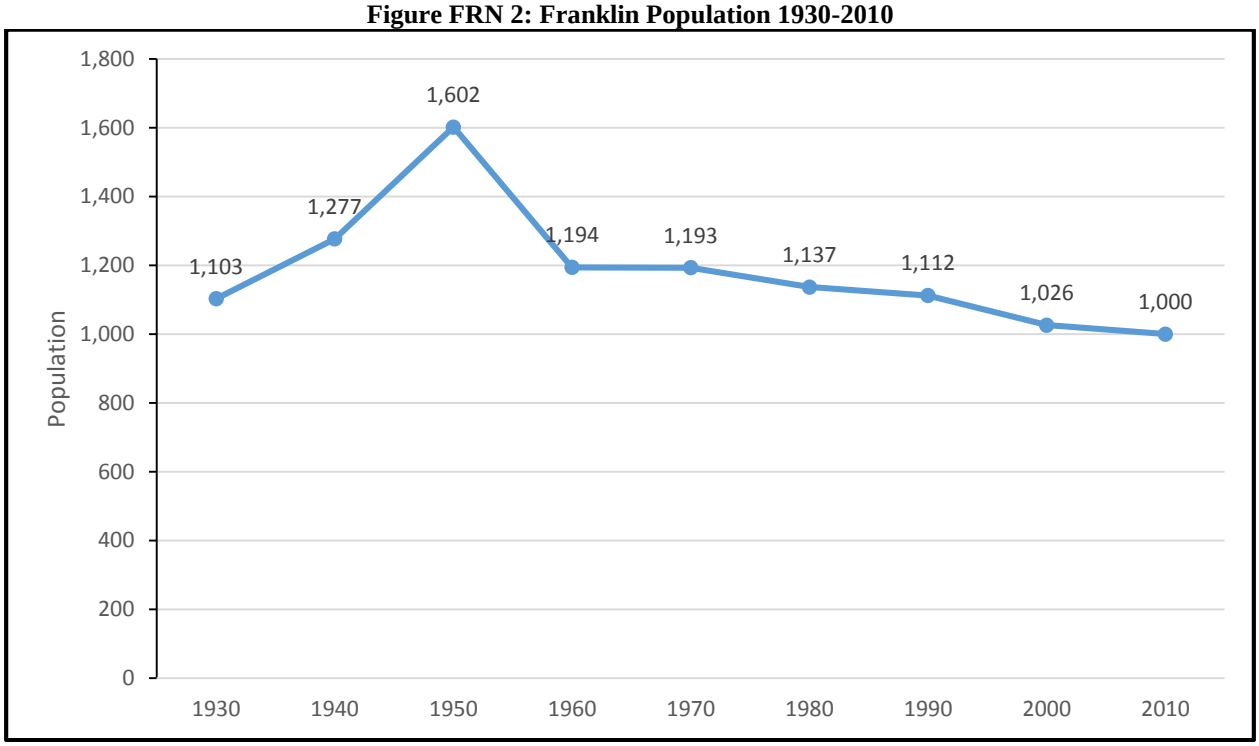
Climate

All the climate data for the county has been taken from a station located two miles outside of the city (253035). Please refer to the *Franklin County Section* for a climate summary for the city.

Demographics

Figure FRN 2 displays the population for Franklin from 1930 to 2010. The population of Franklin peaked in 1950 and has been declining slowly since then. A decrease in population results in a decrease in tax revenue for the city, which can make it more difficult to fiscally implement mitigation projects.

Figure FRN 2: Franklin Population 1930-2010



Source: U.S. Census

Table FRN 2 illustrates the age distribution and median age for Franklin County in comparison to the City of Franklin. The city has a higher percentage of population over the age of 64 than that of the county by about 10 percent. The city and the county have a median age that is about the same.

Table FRN 2: Franklin Population Distribution

Age	Franklin County	Franklin
<5	5.6%	6.3%
5-64	70.6%	59.3%
>64	23.8%	34.4%
Median	48.4	48.5

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the City of Franklin in Table FRN 3. The median home value for the city is $11,400 less than that of the county. The median rent value for the city is $61 less than that of the county. The population has decreased (though not as significantly as in the rest of the county) in the last decade as noted in the demographic section, the lower cost of living compared with the rest of the county may be due to the aging

housing stock. If these structures are not cared for as they age, they may continue to increase the vulnerabilities to hazards.

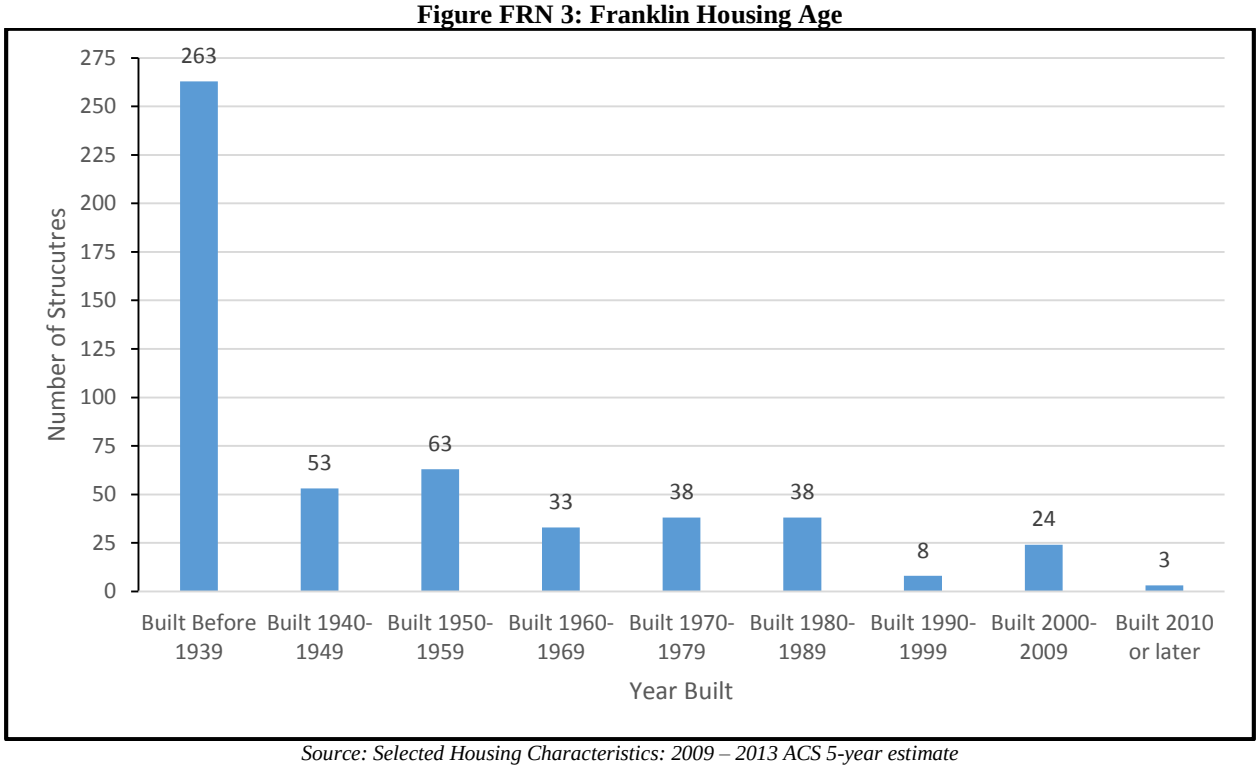
Table FRN 3: Franklin Housing Value and Income

	Franklin County	Franklin
Median Household Income[1]	$60,168	$38,611
Per Capita Income[1]	$26,095	$19,567
Median Home Value[2]	$56,200	$44,800
Median Rent[2]	$543	$482

1Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the 2010 Census data (Figure FRN 3), the city has 523 housing units with 87 percent of those units occupied (Table FRN 4). 2.9 percent of the city's homes are classified as mobile homes. 72 percent of the city's housing was built before 1960. Although there are mobile homes in the community, they are not located in a single identified mobile home park in the city, but are spread throughout the city. The city does have a problem with blighted properties, and have identified 10 properties that are classified as blighted. Residents living within the mobile homes, blighted properties or aging housing structures will be especially vulnerable to high winds, severe thunderstorms, and tornados. Over 86 percent of the city's housing was built before the first FIRM for the city in 1987. Houses built prior to this year may not be constructed above the base flood elevation. There are 20 parcel improvements that are located in the floodplain.

Figure FRN 3: Franklin Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table FRN 4: Franklin Total Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Franklin County	1,398	81.2%	323	18.8%		1,149	82.2%	249	17.8%
Franklin	454	86.8%	69	13.2%		376	82.8%	78	17.2%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the City of Franklin are educational services and health care (25.4%), transportation, warehousing, and utilities (11.6 %), and retail trade (11.2%).

The major employers for the City of Franklin include Franklin Public Schools, Franklin Memorial Hospital and Pool Medical Clinic, and C.P.I. Co-op.

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table FRN 5.

Table FRN 5: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
480	$18,142,190	$37,796	20	$1,348,375

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Franklin planning team as a part of the plan update. Table FRN 6 and

Figure FRN **4** provide a summary of the type and location of critical facilities for the jurisdictions. Four of the facilities have a backup generator and three facilities have an areas that can be used for shelters during storms, but they are not built to the FEMA 361 requirements.

Table FRN 6: Franklin Critical Facility List

Critical Facility Number	Critical Facility
1	Franklin Memorial Hospital
2	Pool Memorial Clinic
3	Water Tower
4	Public Library
5	County Courthouse
6	Public School
7	Nursing Home
8	Catholic Church
9	Gymnasium (No longer a city entity)
10	Southern Public Power
11	Lutheran Church
12	Methodist Church
13	Congregational United Church
14	City Hall/ Police Station
15	City Power Plant
16	Fire Department
17	Senior Center
18	Evangelical Free Church
19	FSA/SCS Office
20	Golden Age Village
21	C.P. I. Co-op
22	Cross Gate Church

Figure FRN 4: Franklin Critical Facility Map

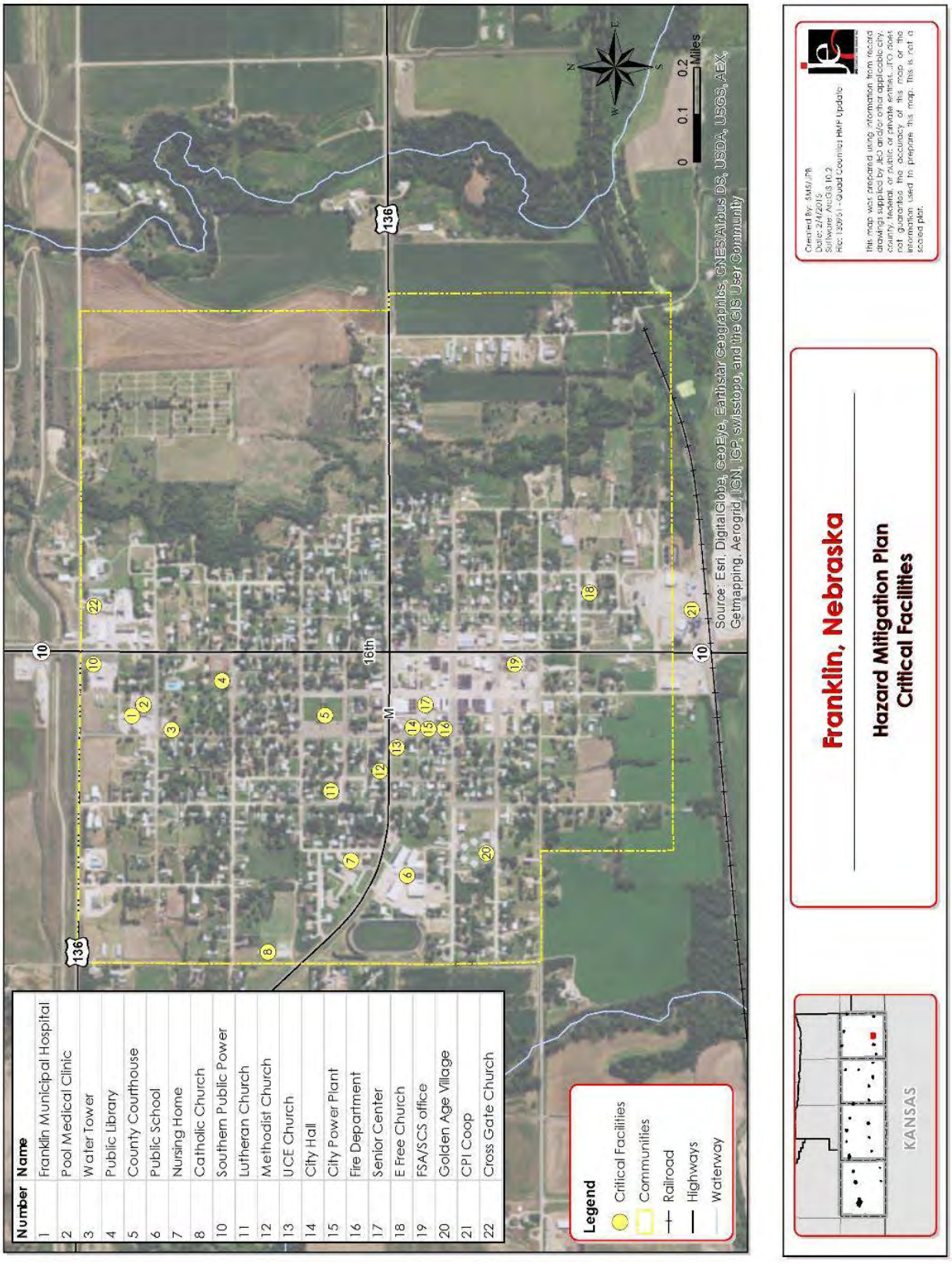
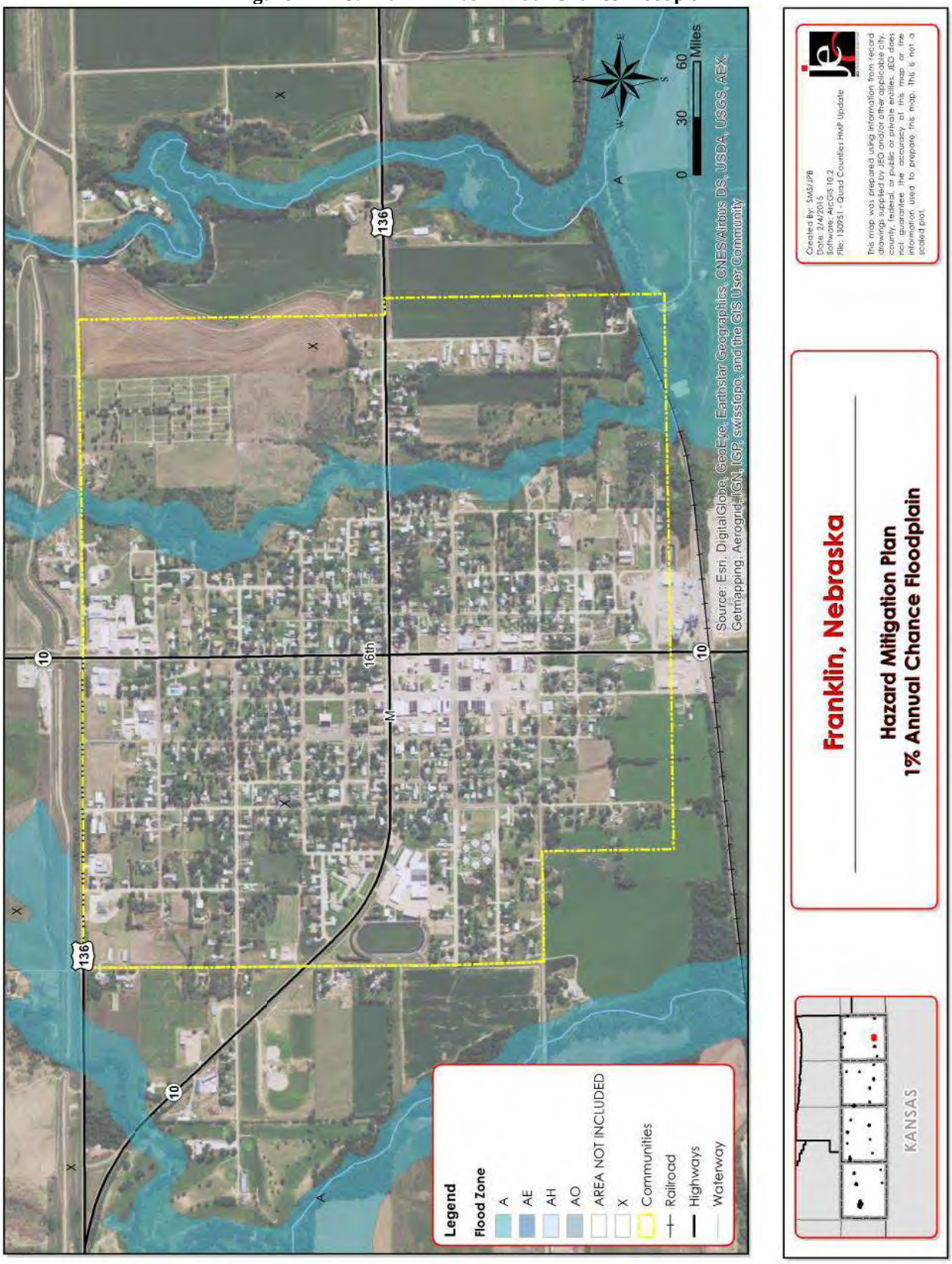


Figure FRN 5 shows the 1% annual floodplain for the City of Franklin. The city has 20 parcels worth $1,348,375 in the floodplain. There are no critical facilities in the floodplain. There are no repetitive loss properties in the city. The initial FIRM for Franklin was developed in January of 1987. Franklin does participate in the NFIP, but there are no policies in effect as of February 28, 2015.

Figure FRN 5: Franklin 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of three chemical storage sites in the City of Franklin, including one that houses materials that are categorized as hazardous. There are two critical facilities located near chemical storage sites: the Evangelical Free Church and the FSA SCS Office. If a spill were to occur at one of these facilities, the Rural Fire Department, Franklin Police Department, and Franklin County Sheriff would all respond to the incident. Table FRN 7 lists facilities that house hazardous materials only.

Table FRN 7: Chemical Storage Fixed Site

Facility	Address	Hazardous Material
CPI Feed Chemicals Bulk	1204 15th Ave, Franklin	Anhydrous Ammonia

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there are three historic sites located in the City of Franklin. Three of the historic sites are located within the 1% annual floodplain.

Table FRN 8: National Historic Registry

Site Name	Date Listed	Classification	In Floodplain?
Dupee Music Hall	9/26/1985	Building	No
Franklin County Courthouse	7/5/1990	Building	No
Lincoln Hotel	7/6/1987	Building	Yes

Source: Nebraska State Historical Society

Future Development Trends

Since the 2010 plan, there have been two new businesses in the city: an insurance agency and an antique shop. With the declining population, there are no new businesses or housing developments planned. Some of the reasons for the population decline include a poor job market and poor economic growth within the city. There has also been an increase in low income families in the city as well.

Risk Assessment

Hazard Identification

Table FRN 9 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table FRN 9: Franklin Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)*	No	Injuries or loss of life possible, property damage
Chemical Spills (Transportation)	No	None
Dam Failure	No	Flooding in the South area of town
Drought	Yes	None
Earthquake	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfire	Yes	None

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Hail*	Yes	Damage to structures and property
High Winds	Yes	None
Levee Failure	No	N/A
Severe Thunderstorm*	Yes	Injuries or loss of life possible, property damage
Severe Winter Storm*	Yes	Injuries or loss of life possible, power outages
Terrorism	No	None
Tornado*	Yes	Injuries or loss of life possible, property damage

** Identified as a top concern by the local planning team*

The top hazards in Franklin are severe thunderstorms, severe winter storms, tornados, and chemical spills during transportation. These hazards that raise the greatest concern for the community are discussed in detail.

Historical Occurrence

The NCDC reported 48 severe weather events from 1996 to 2014 in the City of Franklin. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table FRN 10 is a summary of events that caused damage to the city.

Table FRN 10: Franklin Historical Occurrence

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
7/6/1996	Hail	1 in.	0	0	$5,000
6/4/1999	Thunderstorm Wind	62 kts. /71 mph	0	0	$75,000
8/17/1999	Thunderstorm Wind	61 kts./ 70 mph	0	0	$50,000
5/201999	Thunderstorm Wind	63 kts. / 72 mph	0	0	$50,000
6/27/1999	Thunderstorm Wind	56 kts./64 mph	0	0	$20,000
3/7/2000	Thunderstorm Wind	52 kts./60 mph	0	0	$5,000
7/4/2000	Thunderstorm Wind	53 kts/61 mph	0	0	$10,000
5/26/2002	Hail	1.25 in.	0	0	$45,000
5/26/2002	Hail	4 in.	0	0	$700,000
6/12/2004	Hail	1.25 in.	0	0	$10,000
3/30/2006	Hail	1.5 in.	0	0	$30,000
7/16/2006	Thunderstorm Wind	52 kts./60 mph	0	0	$10,000
5/4/2007	Hail	1 in.	0	0	$10,000
6/22/2007	Hail	1 in.	0	0	$5,000
8/20/2007	Thunderstorm Wind	52 kts./60 mph	0	0	$100,000
9/6/2007	Hail	1.25 in.	0	0	$50,000
5/30/2011	Thunderstorm Wind	61 kts./ 70 mph	0	0	$150,000
7/13/2011	Thunderstorm Wind	56 kts/64 mph	0	0	$75,000
5/27/2012	Hail	2 in.	0	0	$75,000

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
9/6/2012	Hail	1.75 in.	0	0	$25,000
4/23/2014	Hail	1.75 in.	0	0	$25,000
8/9/2014	Heavy Rain	6 in.	0	0	$15,000

Source: NCDC

Chemical Spills (Fixed Site)

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of three chemical storage sites in the City of Franklin. One of these facilities houses anhydrous ammonia. There have been no spills reported by the city from any of these facilities.

There are two critical facilities located near chemical storage sites: the Evangelical Free Church and the FSA SCS Office. Residents that live and work near the chemical storage sites are educated about the threat and the appropriate responses to take if a spill were to occur. If a spill were to occur at one of these facilities the Rural Fire Department, Franklin Police Department, and Franklin County Sheriff would all respond to the incident.

Hail

NCDC reported 31 hail events within the City of Franklin between January 1996 and December 2014. These events resulted in $980,000 in property damages. Residents are given information on hail resistant building material. Municipal facilities are insured for hail damage.

Severe Thunderstorms

NCDC reported 16 severe thunderstorms (wind, rain and lightning) between January 1996 and December 2014 that resulted in $560,000 in property damage. The city has not had any significant events occur in the past two years. There are surge protectors on electronic devices with critical city records and four critical facilities have backup generators in place.

Severe Winter Storms

NCDC reported 73 severe winter storms throughout the county between January 1996 and December 2014 that resulted in $3,435,000 in property damages. The city has not had any significant events happen in the past two years.

The city currently is responsible for removing snow from the streets. The city's snow removal resources are sufficient at this time. There are two designated snow routes in the city 14th Ave which runs north-south through the city, and M St which runs east-west through the city.

Tornados

NCDC did not have any tornados reported in Franklin but did identify one funnel cloud over the city in May 2004. There were no reported damages. The city also reported damages from a June 2014 tornado and high wind event that affected the city. The city library and city shop have experienced damage from tornados in the past. The Storm Prediction Center reported an F1 tornado that hit Franklin in 1993.

The city has taken steps to reduce their vulnerability to tornados. The city has a mutual aid agreement with Franklin County and offers alerts through Code Red. While the city does not have any community safe rooms, there are three critical facilities that would be able to adequately shelter the residents.

Capability Assessment

Thus far, the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as a capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism for understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

The City of Franklin is governed by a Mayor and a four member City Council. The city also has the following departments and boards:

- City Attorney
- City Clerk/ Treasurer
- Electric
- Library
- Parks and Cemetery
- Police
- Streets
- Waste Reduction/Sanitation
- Water/Sewer

Table FRN 11: Franklin Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	Yes
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No

Survey Components/Subcomponents		Comments
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	Yes, Consultant
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	Yes
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	Yes
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table FRN 11 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide.* The following paragraph presents a summary of the findings of this analysis.

Franklin has an annex to the Franklin County Local Emergency Operations Plan, which was last updated in 2012. This plan discusses a number of hazards that can affect the county. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The City of Franklin has the administrative staff and technical and fiscal capabilities to implement some mitigation projects without assistance. Larger projects such as drainage improvements may require that the city partner with the Franklin County Emergency Management, Franklin County, LRNRD, or other regional and state agencies. Through this update process, the planning team reviewed previously identified mitigation projects and added new projects as well.

Mitigation Strategy

Completed Mitigation Projects

Description	Backup Power Generators
Analysis	Provide a backup power supply for critical facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Timeline	Completed
Lead Agency	Electric Department
Action since 2010 plan	Installed generators at city power facilities, the city hospital and clinic, and the nursing home.

Description	Warning Systems
Analysis	Implement Code Red for the city.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All Hazards
Timeline	Completed
Lead Agency	City Council, City Police, County Sheriff/ Emergency Manager
Action since 2010 plan	Code Red in Place beginning June 1, 2015

Ongoing/New Mitigation Projects

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, City Taxes, City Funds
Timeline	2 – 5 years
Priority	High
Lead Agency	Police Department, City Utilities
Action since 2010 plan	City hall is in need of a safe room but a site for the community has not been selected

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 - $100,000+
Potential Funding	HMGP, PDM, CDBG
Timeline	1 year
Priority	Medium
Lead Agency	City Council, State Roads

Description	Stormwater System and Drainage Improvements
Action since 2010 plan	Nebraska Department of Roads is currently working on a drainage project in the city

Description	Drainage Study/Stormwater Master Plan
Analysis	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 - $100,000+
Potential Funding	HMGP, PDM, CDBG
Timeline	1 year
Priority	Medium
Lead Agency	City Council, State Roads
Action since 2010 plan	Nebraska Department of Roads is currently working on a drainage study in the city

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP. Enable property owners to purchase insurance protection against flood losses.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	Existing Staff
Potential Funding	City general funds
Timeline	Ongoing
Priority	Medium
Lead Agency	City Council, Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation. Become a Tree City USA in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Estimated Cost	$1,000+
Potential Funding	City general funds
Timeline	Ongoing
Priority	Low
Lead Agency	City Gardens Department
Action since 2010 plan	City has a tree care ordinance, but has not met the other requirements

Description	Public Awareness / Education
Analysis	Activities such as outreach projects, distribution of maps, and environmental education increase public awareness of natural hazards and ways to protect people and property from these hazards. This information is relevant to public and private property owners, renters, businesses, and local officials. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	City general funds
Timeline	2 – 5 years
Priority	Medium

Description	Public Awareness / Education
Lead Agency	City Council/Police
Action since 2010 plan	Will need to gather additional information and work to develop program in the future. Currently provide information on hail resistant building materials, and information to residents on how to respond to a chemical spill.

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	HMGP, PDM, City general funds
Timeline	2 – 5 years
Priority	High
Lead Agency	City Police, County Sheriff/ Emergency Manager
Action since 2010 plan	Part of updating Radio System. Facilities in need include Police Department, School, and Rural Fire Department

Removed Mitigation Projects

Description	Stabilize/Anchor Fertilizer, Fuel and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement. If left unanchored tanks could present major threat to property and safety in a tornado or high wind event.
Hazard(s) Addressed	Tornados and High Winds
Reason for Removal	No fuel tanks present at this time

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	No streams flow through the city

Description	Flood Prone Property Acquisition
Analysis	Voluntary acquisition and demolition of properties prone to flooding will reduce the general threat of flooding for communities. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.
Hazard(s) Addressed	Flooding
Reason for Removal	No repetitive loss properties in the city

Description	Floodplain Regulation Enforcements and Updates
Analysis	Continue to enforce local floodplain regulations for structures located in the 1% annual floodplain. Strict enforcement of the type of development and elevations of structures should be considered through issuance of building permits by any Nebraska city. Continue education of building inspectors or Certified Floodplain Managers.
Hazard(s) Addressed	Flooding
Reason for Removal	Floodplain Regulations are up to date. This action is incorporated into the 'maintain good standing with NFIP' mitigation action.

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of floodplain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Hazard(s) Addressed	Flooding
Reason for Removal	Floodplain regulations and maps are up to date. This action is incorporated into the 'maintain good standing with NFIP' mitigation action.

Description	Emergency Communications
Analysis	Establish an action plan to improve communication between agencies to better assist residents and businesses during and following emergencies. Establish inner-operable communications.
Hazard(s) Addressed	All Hazards
Reason for Removal	This action is will be led by the county

Village of Hildreth

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Hildreth participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Hildreth attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Hildreth, the top concerns that were identified through this planning process include extreme heat, flooding, grass/wildfire, hail, and severe thunderstorms.

The following people were involved in the development of Hidreth's Participant Section:

Table HLD 1: Village of Hildreth Plan Contributors

Name	Title	Department / Organization
Dale Casper	Utility Superintendent and Police Chief	Village of Hildreth

This section contains important information about the Village of Hildreth relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

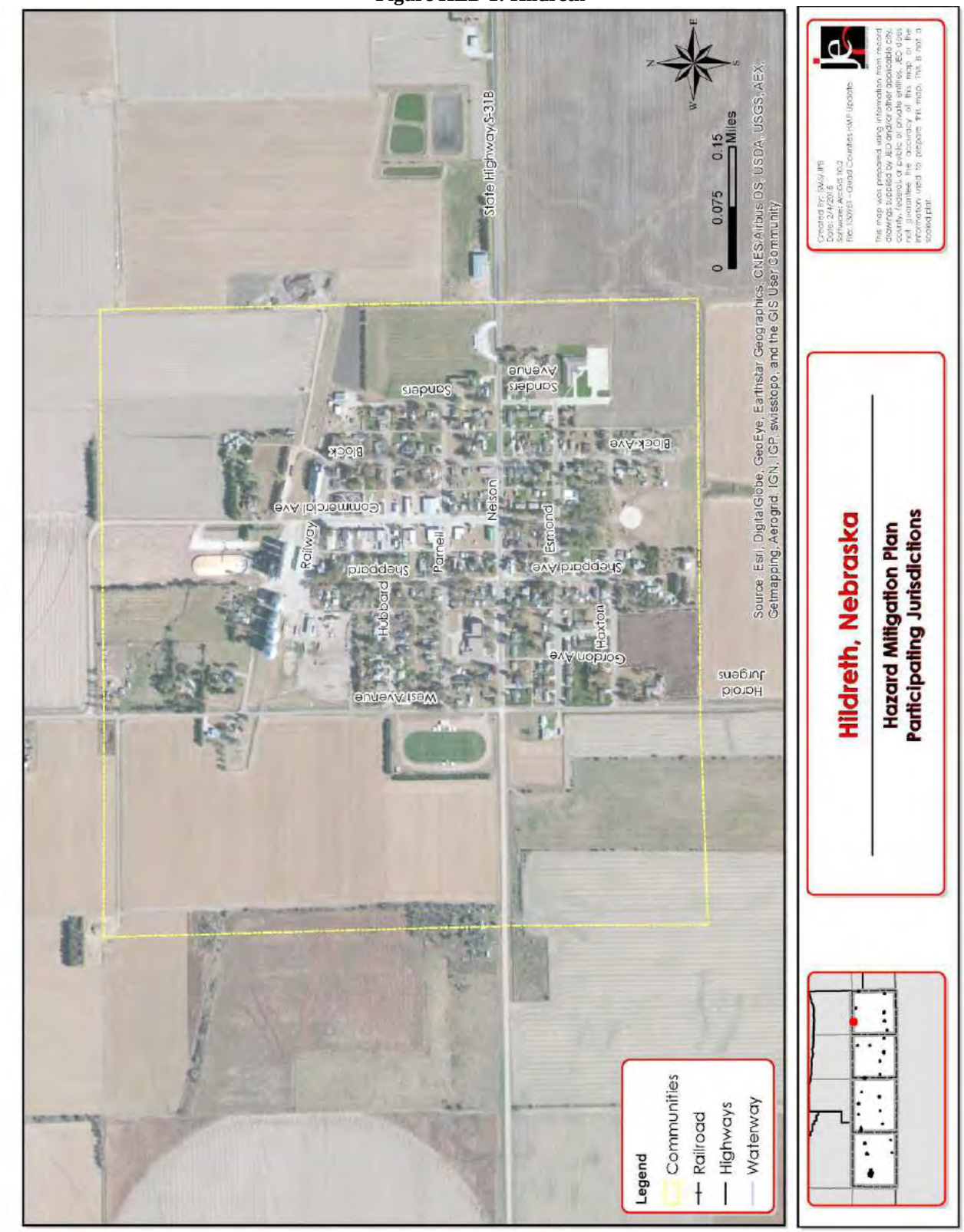
Location/Geography

Hildreth is a village located in the northwest portion of Franklin County. The Village of Hildreth covers an area of 384 acres and has an elevation of 2,175 feet above sea level. Hildreth is approximately 25 miles south of Kearney. The topographic region Hildreth lies in is that of the plains. These flat-lying land above the valley are made from materials of sandstone or stream-deposited silt, clay sand and gravel overlain by wind-deposited silt.

Transportation

Figure HLD **1** shows the major transportation routes for the village. There is one major highway in the village, Nebraska Highway 31B. According to the Nebraska Department of Roads the average daily traffic county for Nebraska Highway 31B is 455 vehicles with 30 of those being heavy trucks.

Figure HLD 1: Hildreth



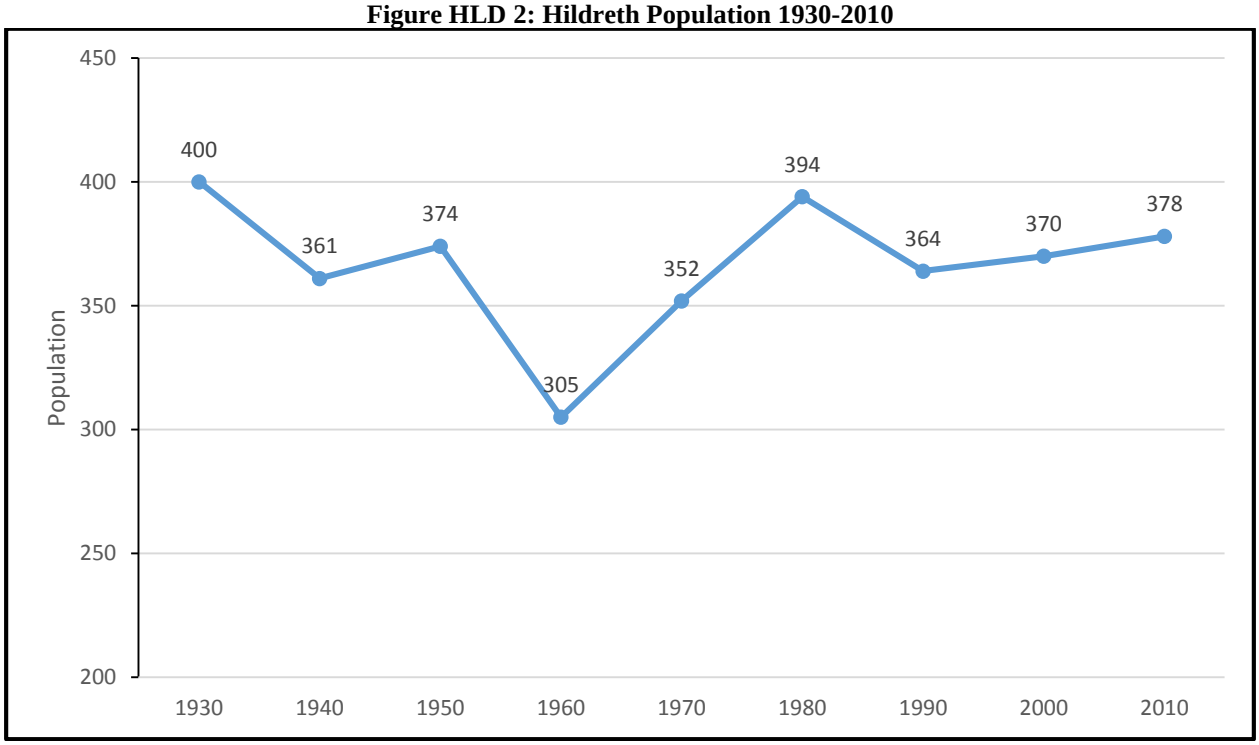
Climate

All the climate data for the county has been taken from a station located two miles outside of Franklin (253035). Please refer to the *Franklin County Section* for a climate summary for the village.

Demographics

Figure HLD 2 displays the population for Hildreth from 1930 to 2010. The population for Hildreth has been fluctuating since 1930. A fluctuating population goes through periods of growth and decline. When there is a decrease in population it results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects. When there is a growing population that results in more tax revenue for the community to implement hazard mitigation projects.

Figure HLD 2: Hildreth Population 1930-2010



Source: U.S. Census

Table HLD 2 illustrates the age distribution for Franklin County in comparison to the Village of Hildreth. The village has a lower percentage of population over the age of 64 than that of the county by about 3 percent. The village also has a younger median age than that of the county by two years.

Table HLD 2: Hildreth Population Distribution

Age	Franklin County	Hildreth
<5	5.6%	5.3%
5-64	70.6%	74%
>64	23.8%	20.7%
Median	48.4	46.4

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Hildreth in Table HLD 3. The median housing value for the village is $11,800 higher than that of the county average, while the median rent is about the same for the village and county.

The median income for the village is $7,000 less than that of the county. The lower income and higher cost of living combined with the aging housing stock could lead to a future decline in population.

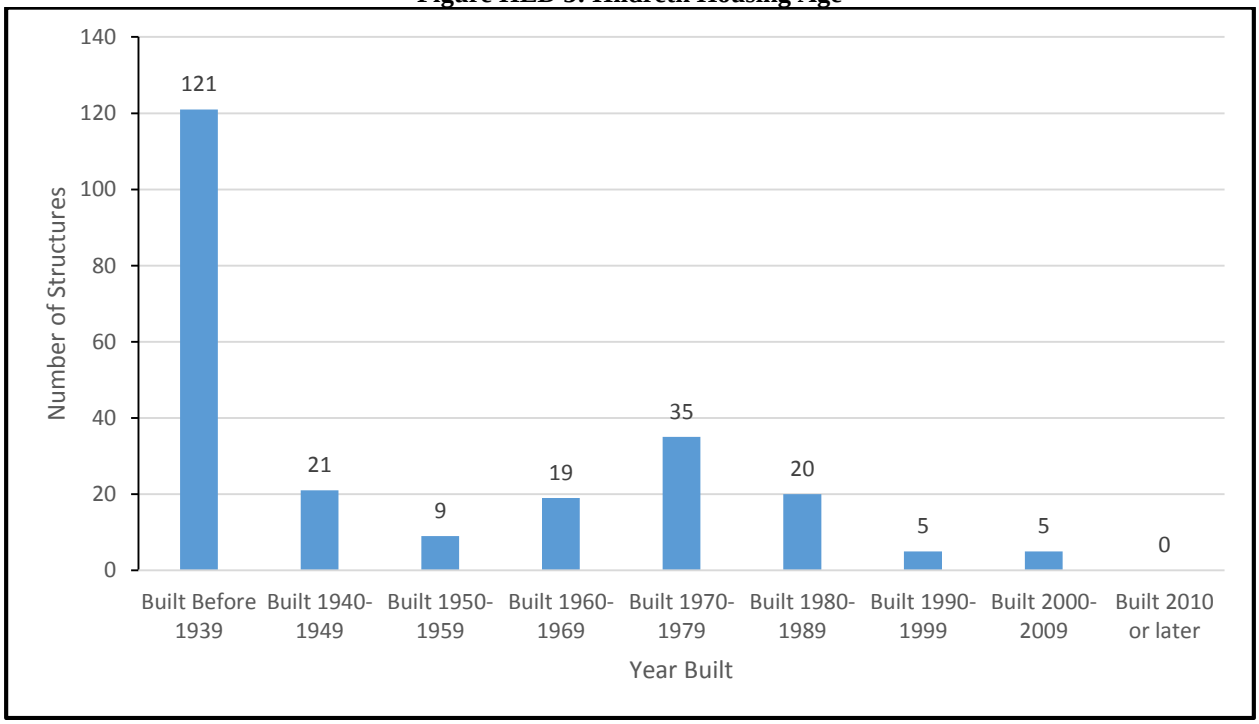
Table HLD 3: Hildreth Housing Value and Income

	Franklin County	Hildreth
Median Household Income[1]	$60,168	$53,125
Per Capita Income[1]	$26,095	$24,955
Median Home Value[2]	$56,200	$68,000
Median Rent[2]	$543	$544

1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the 2010 Census data (Figure HLD 3) the village has 235 housing units with 85 percent of those units occupied (Table HLD 4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. Approximately 64 percent of the village's housing stock was built before 1960. Residents living within these types of structures can be more vulnerable to high winds, severe thunderstorms, and tornados. Over 97 percent of the village's housing was built before the first FIRM for the village in 2005. Houses built prior to this year may not be constructed above the base flood elevation. There are four parcel improvements within the 1% annual floodplain.

Figure HLD 3: Hildreth Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table HLD 4: Hildreth Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Franklin County	1,398	81.2%	323	18.8%		1,149	82.2%	249	17.8%
Hildreth	199	84.7%	36	15.3%		175	87.9%	24	12.1%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Hildreth are educational services and health care (25.2%), retail trade (17.3%), and Manufacturing (10.2%).

The major employers for the Village of Hildreth include the Co-op and Wilcox-Hildreth Public School. A large percentage of residents also commute to Kearney, Minden, and Holdrege.

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table HLD 5.

Table HLD 5: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
185	$10,758,205	$58,152	4	$192,850

Source: Nebraska Department of Revenue, Property Assessment Division

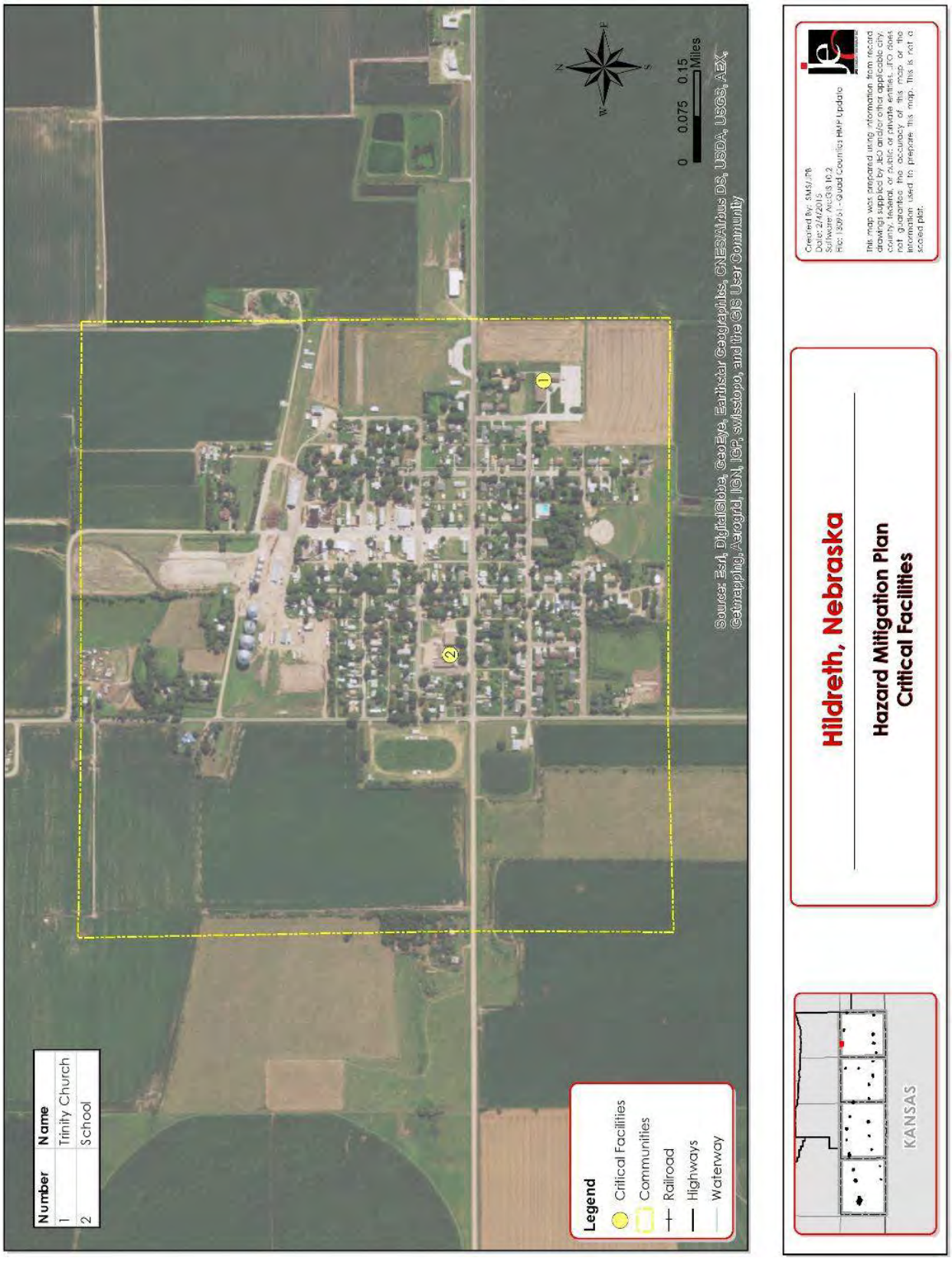
Critical Infrastructure/Key Resources

The Village of Hildreth did not identify any critical facilities in the 2010 plan. However, the Hildreth planning team identified the following critical facilities as a part of this plan update.

Table HLD 6: Hildreth Critical Facilities

Critical Facility Number	Critical Facility
1	Trinity Church
2	School

Figure 41: Hildreth Critical Facilities



Chemical Storage Fixed Site

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there is one chemical storage site in the Village of Hildreth. This site, shown in the following table, does house materials that are categorized as hazardous. In the event of a spill the Hildreth Fire Department would respond.

Table HLD 7: Chemical Storage Fixed Site

Facility	Address	Hazardous Material
Cooperative Producers Inc.	509 S Railway, Hildreth	Anhydrous Ammonia

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sites located in the Village of Hildreth.

Future Development Trends

According to the local planning team, there has not been any new housing or businesses in the past five years. There are not any new residential or commercial developments planned in the next five years. According to census data, Hildreth's population is growing. The local planning team indicated that factors contributing to this growth include that Hildreth is a small, clean town with good housing.

Risk Assessment

Hazard Identification

Table HLD 8 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table HLD 8: Hildreth Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat*	Yes	Lack of cooling centers, power outages
Flooding*	Yes	Minor property damages
Grass/Wildfire*	Yes	Damage to property and crops
Hail*	Yes	Property damage
High Winds	Yes	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Damage to property and utilities, power outages
Severe Winter Storm	Yes	None
Terrorism	No	None
Tornado	Yes	None

** Identified as a top concern by the local planning team*

The top five hazards in Hildreth are extreme heat, flooding, grass/wildfire, hail, and severe thunderstorms. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 14 severe weather events from 1996 to 2014 in the Village of Hildreth. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table HLD 9 provides a summary of events that caused damage to the village.

Table HLD 9: Hildreth Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
5/22/1996	Hail	1.75 in.	0	0	$0
5/22/1996	Hail	0.88 in.	0	0	$0
7/7/1996	Thunderstorm Wind	60 kts./ 70 mph	0	0	$0
7/22/1996	Thunderstorm Wind	55 kts./ 63 mph	0	0	$25,000
5/21/1998	Thunderstorm Wind	52 kts./60 mph	0	0	$0
5/14/1999	Hail	1.25 in.	0	0	$4,000
6/19/2000	Hail	1 in.	0	0	$75,000
5/18/2004	Flash Flood	-	0	0	$15,000
5/15/2009	Hail	1.75 in.	0	0	$20,000
6/15/2009	Hail	1 in.	0	0	$75,000
7/22/2009	Thunderstorm Wind	52 kts./ 60 mph	0	0	$0
6/14/2012	Hail	1.5 in.	0	0	$25,000

Source: NCDC

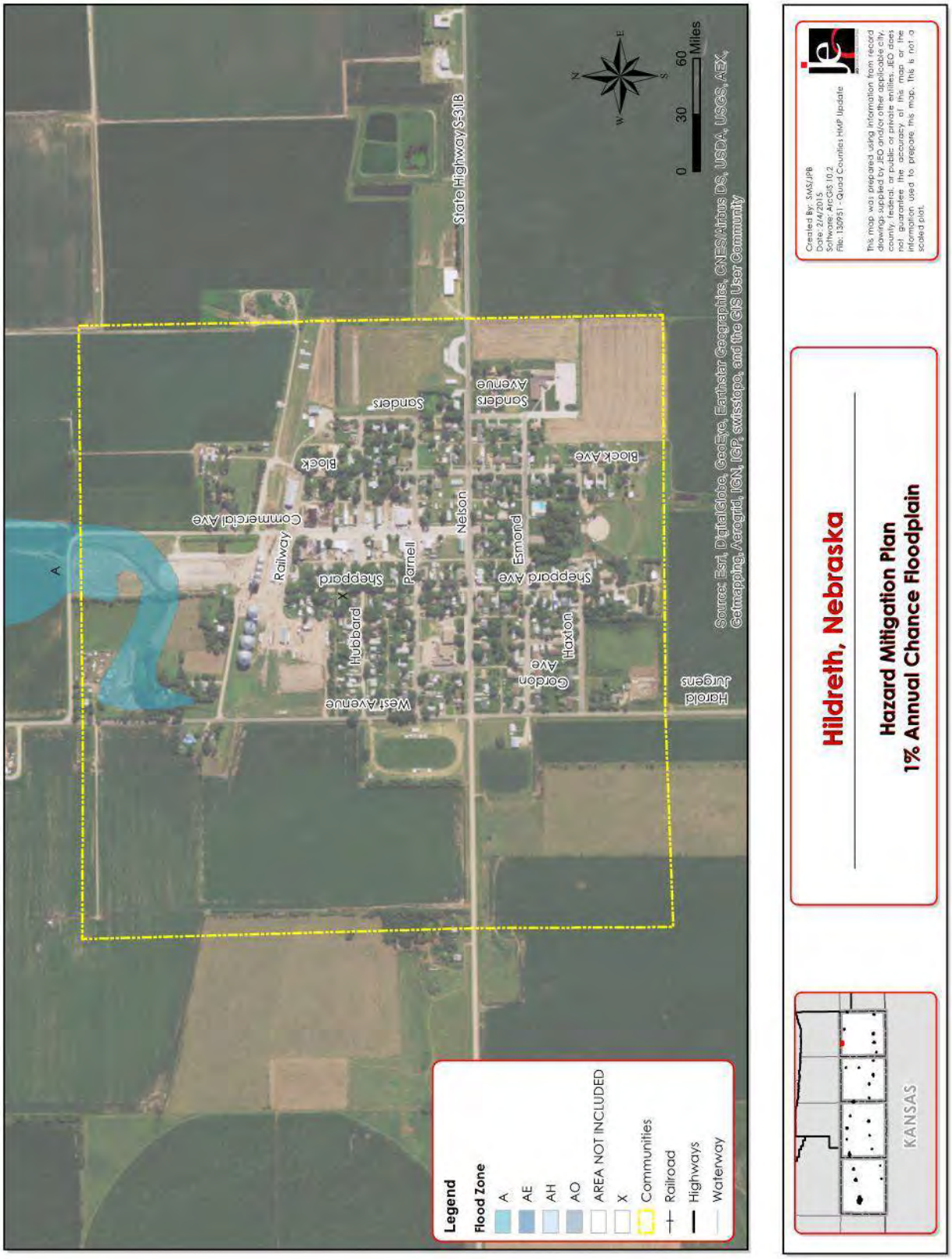
Extreme Heat

Extreme heat occurs several time per year in Hildreth. The community does not have any cooling centers available. Extreme heat events put a strain on the electrical system. There are local concerns regarding the power supply and power outages during extreme heat events. In an extreme heat event, the Fire Department, Lion's Club, and Friends of the Library would be available to assist vulnerable populations.

Flooding

Figure HLD 4 show the 1% annual floodplain for the Village of Hildreth. The village has four parcels in the floodplain, worth $192,850. There are no repetitive loss properties in the village. The initial FIRM for the village was developed in September of 2005. Hildreth does not participate in the NFIP. However, the local planning team identified participating in the NFIP as a mitigation action. There are no areas around the community that have poor stormwater drainage.

Figure HLD 4: Hildreth 1% Annual Chance Floodplain



Grass/Wildfire
Wildfires occur frequently in the area near Hildreth. According to the local planning team, the Hildreth Fire Department responded to ten wildfires in 2014. The Nebraska Forest Service recorded five wildfires that burned a total of 21.5 acres in 2013 and 2014. The local planning team indicated that the Fire Department is in need of a tanker and a pumper. The local water supply is sufficient for firefighting. The Fire Department has a fire education program to inform residents about fire safety. The Hildreth Fire Department has mutual aid agreements with neighboring fire departments.

Hail
NCDC reported seven hail events since 1996 that have caused $199,000 in property damages. The largest of the hailstones in these events were measured at 1.75 inches. However, the local planning team identified that there have been no damages to critical facilities resulting from hail. Municipal facilities are insured for hail.

Severe Thunderstorms
NCDC reported four thunderstorm wind events that resulted in $20,000 in property damages. However, severe thunderstorms occur several times a year in Hildreth. Approximately a third of Hildreth's power lines are buried. New development is required to bury power lines. The local planning team identified 248 Commercial Avenue as a location for safe room. Necessary capacity of 200 people is identified.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance
The Village of Hildreth is governed by a five member village board and chairman. The Village of Hildreth government includes the following departments and offices:

- Village Clerk
- Librarian
- Utility Superintendent/ Police Chief

Table HLD 10: Hildreth Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	Yes
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	No
	Building Codes	Yes
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	No
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire	No

Survey Components/Subcomponents		Comments
	safety, household preparedness, environmental education)	
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table HLD10 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraphs present a summary of the findings of this analysis.

Hildreth has an annex to the Franklin County Local Emergency Operations Plan. This plan was last updated in 2012 and provides clear assignment of responsibility during an emergency. The Village of Hildreth staff, and the Fire Department are familiar with the Franklin County Local Emergency Operations Plan.

The Village of Hildreth zoning ordinance discourages development in hazardous areas such as wetlands, floodways, and floodplains. Hildreth's building code has requirements for structures to be elevated or flood proofed. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The Village of Hildreth has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from existing relationships with the county and LRNRD, and will need to explore outside funding assistance for project implementation. Through this update process, the local planning team reviewed previously identified mitigation projects.

Mitigation Strategy

New/Ongoing Mitigation Projects

Description	Backup Generators
Analysis	Provide a source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Winter Storms, Severe Thunderstorms, Flooding
Estimated Cost	$20,000 to $50,000 per generator
Potential Funding	HMGP, PDM, Village Funds, Private entities
Timeline	2-5 Years
Priority	High
Lead Agency	Emergency Manager, Police Chief
Action since 2010 plan	Waiting for funds, identified city wells and lift station as needing generators.

Description	Hazardous Tree Removal
Analysis	Identify and remove hazardous trees and limbs.
Goal/Objective	Goal 1/Objective 1.1

Description	Hazardous Tree Removal
Hazard(s) Addressed	Tornados, High Winds, Severe Winter Storms, Severe Thunderstorms
Estimated Cost	$20,000
Potential Funding	Village Funds, Private entities
Timeline	1 Year
Priority	High
Lead Agency	Village Superintendent
Action since 2010 plan	Identifying matching funds.

Description	Power, Service, Electrical, and Water Distribution Lines
Analysis	Work with Public Power District and utilities department to identify vulnerable transmission and distribution lines and plan to bury lines underground or retrofit existing structures to be less vulnerable to storm events. Electrical utilities shall be required to use underground construction methods where possible for future installation of power lines.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Winter Storms, Severe Thunderstorms
Estimated Cost	$50,000 to $70,000 per mile (electrical)
Potential Funding	Village Funds, Private entities
Timeline	1 Year
Priority	High
Lead Agency	Village Superintendent
Action since 2010 plan	Identifying matching funds.

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/ Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	Village Funds, Private entities
Timeline	2-5 Years
Priority	High
Lead Agency	Emergency Manager, Village Superintendent
Action since 2010	Identified the location and necessary capacity for safe room.

Description	Participate in the NFIP
Analysis	Participate in the NFIP to allow residents to purchase flood insurance.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Low
Lead Agency	Village Board
Action since 2010	Not yet started

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Estimated Cost	$1,000+
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Low

Description	Tree City USA
Lead Agency	Village Board
Action since 2010	Not yet started

Description	Public Awareness/Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. Also, educate citizens on water conservation methods, evacuation plans, etc. In addition, purchasing equipment such as overhead projectors and laptops.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All
Estimated Cost	$500+
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Village Board, Emergency Manager
Action since 2010	Not yet started

Description	Warning Systems
Analysis	Improve city cable TV interrupt warning system and implement telephone interrupts system such as Reverse 911
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All
Estimated Cost	$5000+
Potential Funding	Village Funds
Timeline	1 Year
Priority	High
Lead Agency	Village Board, Emergency Manager
Action since 2010	Not yet started

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All
Estimated Cost	$50 per radio
Potential Funding	Village Funds
Timeline	1 Year
Priority	High
Status	Identified facilities in need of weather radios
Lead Agency	Fire Department

Description	New Well
Analysis	Dig new well to ensure water safety and supply.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All
Estimated Cost	$500,000
Potential Funding	Village Funds, Grants
Timeline	2-5 Years
Priority	Medium
Lead Agency	Water Department, Village Board
Action since 2010	Not yet started, this is a new action

Description	Sewer Project
Analysis	Install new gravity flow sewer lagoon with no pumps.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All

Description	Sewer Project
Estimated Cost	$800
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Water Department, Village Board
Action since 2010	Not yet started, this is a new action

Village of Naponee

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Naponee participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Naponee attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Naponee, the top concerns that were identified through this planning process include chemical spills during transportation, extreme heat, sever winter storms, and tornados. The following people were involved in the development of Naponee's Participant Section:

Table NAP 1: Village of Naponee Plan Contributors

Name	Title	Department / Organization
Richard Blake	Board Chairperson	Village of Naponee
Jerry Archer	Franklin County Sheriff	Franklin County

This section contains important information about the Village of Naponee relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern/Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

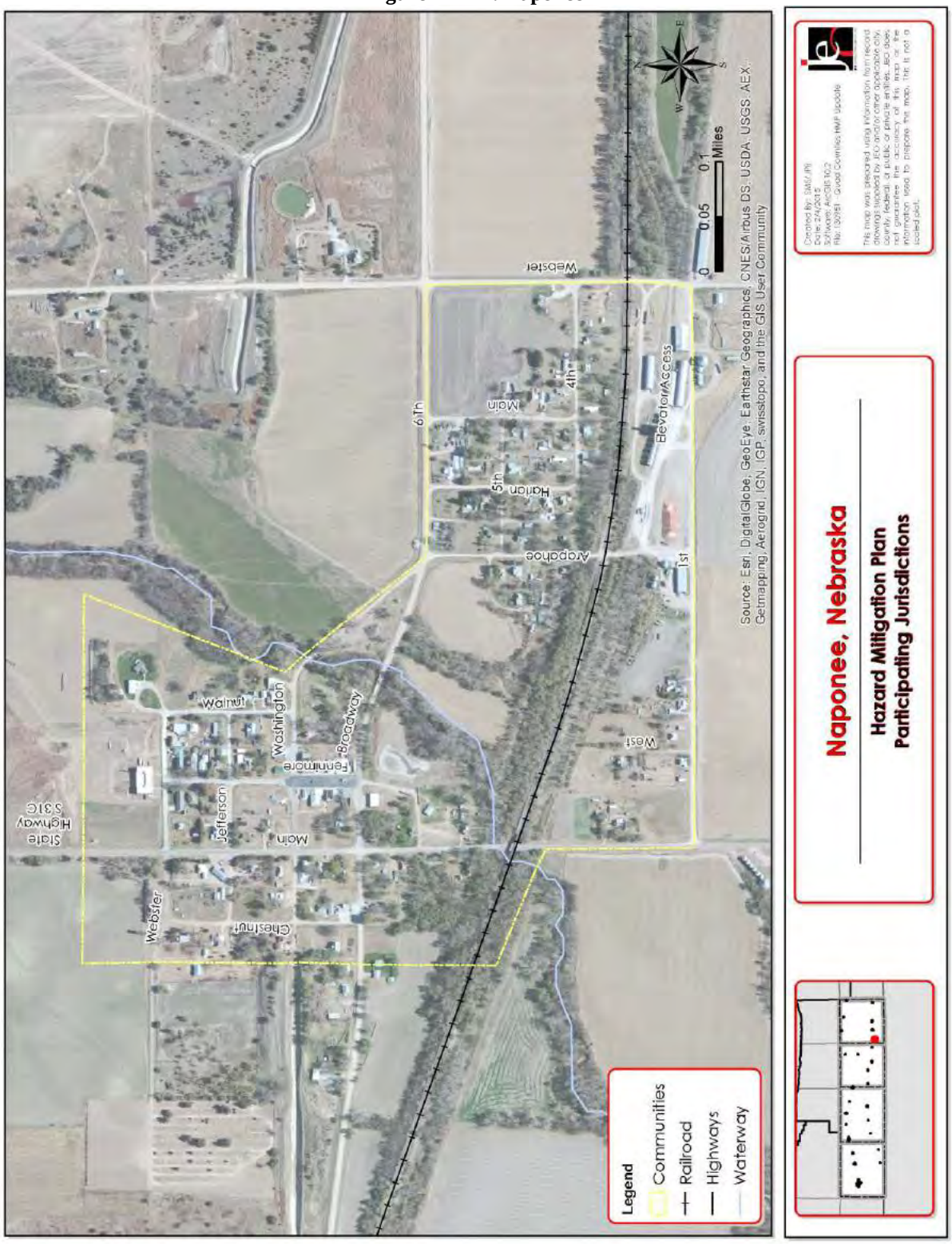
Location/Geography

Naponee is a village located in the southwest corner of Franklin County. The Village of Naponee covers an area of 128 acres and has an elevation of 1,919 Feet above sea level. Naponee is approximately 45 miles south of Kearney. The topographic region Naponee lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. The Harlan County Reservoir is just five miles west of the village. There is one water way that runs through the city. Turkey Creek enters the east side of the villages and flows through to the southwest.

Transportation

Figure NAP 1 shows the major transportation routes for the village. There is one highway in the village NE HWY 31C. According to the Nebraska Department of Roads the average daily traffic count for NE HWY 31C is 300 vehicles with 25 of those being heavy trucks. There is one railway across the southern portion of the village, but has been closed.

Figure NAP 1: Naponee



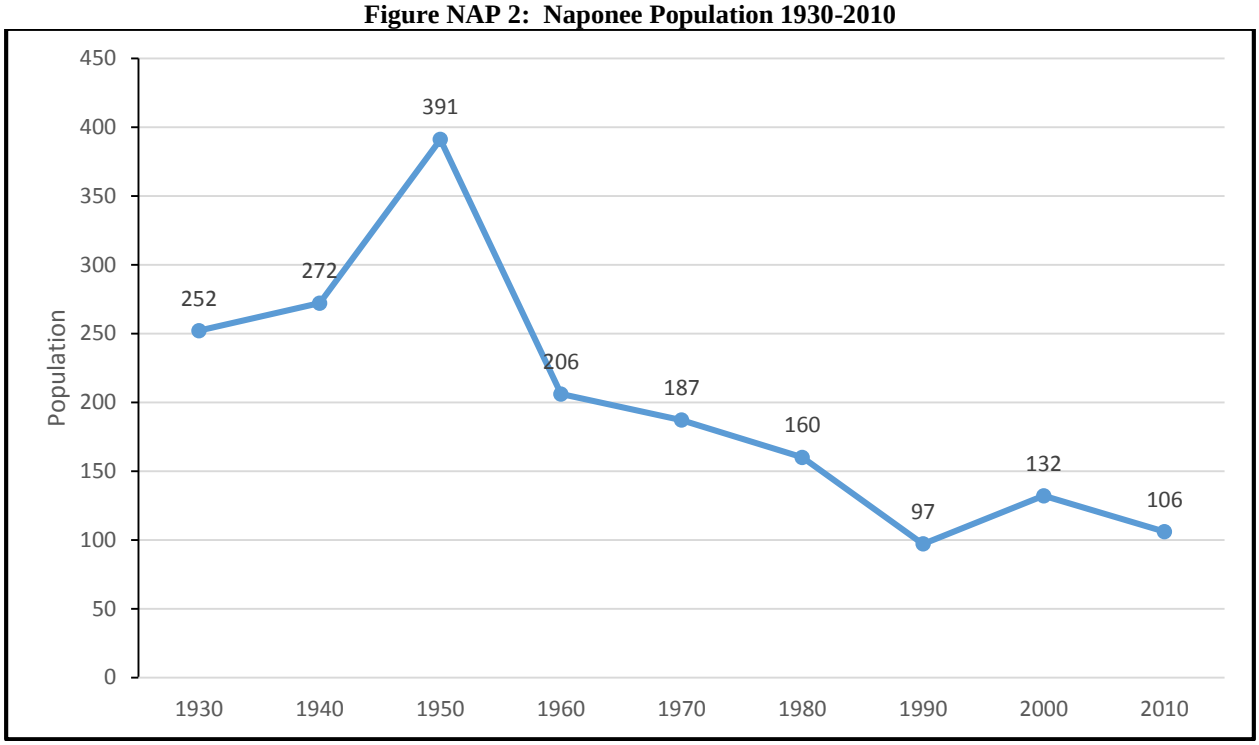
Climate

All the climate data for the county has been taken from a station located two miles outside of Franklin (253035). Please refer to the *Franklin County Participant Section* for a climate summary for the village.

Demographics**Figure NAP 2**

Figure NAP 2 displays the Population for Naponee from 1930 to 2010. The population of Naponee peaked in 1950. From 2000 to 2010 the village lost approximately a 20 percent of its population. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure NAP 2: Naponee Population 1930-2010



Source: US Census

Table NAP 2 illustrates the age distribution and median age for Franklin County in comparison to the Village of Naponee. The village has a higher population over the age of 64 than that of the county by about 10 percent. The village also has a higher median age than that of the county by about four years.

Table NAP 2: Naponee Age Distribution

Age	Franklin County	Naponee
<5	5.6%	4.7%
5-64	70.6%	62.4%
>64	23.8%	32.9%
Median	48.4	52.0

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Naponee in Table NAP 3. The median home value for the village is $17,900 less than that of the county, and the median rent value is $130 less than that of the county. The population has decreased in the last decade as noted in the demographic section, the lower cost of living compared

with the rest of the county may be due to the aging housing stock. As these structures age if they are not cared for they may continue to increase the vulnerabilities to hazards.

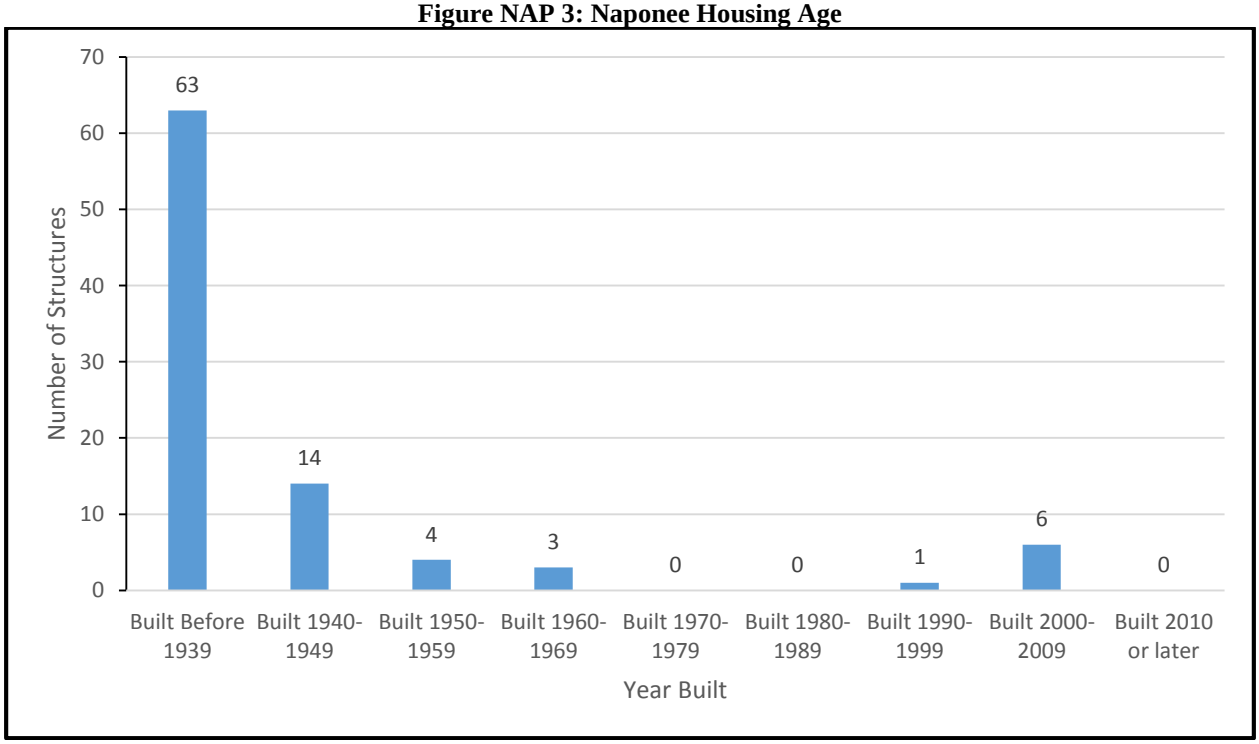
Table NAP 3: Naponee Housing Value and Income

	Franklin County	Naponee
Median Household Income[1]	$60,168	$38,750
Per Capita Income[1]	$26,095	$26,756
Median Home Value[2]	$56,200	$38,300
Median Rent[2]	$543	$413

1Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the 2010 Census data (Figure NAP 3), the village has 91 housing units with 56 percent of those units occupied (Table NAP 4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. There are four mobile homes located in the village and 89 percent of the village's housing stock was built before 1960. Although there are mobile homes in the community, they are not located in a single identified mobile home park in the village, but are spread throughout the village. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados. Over 93 percent of the village's housing was built before the first FIRM for the village in 2005. Houses built prior to this year may not be constructed above the base flood elevation.

Figure NAP 3: Naponee Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table NAP 4: Naponee Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Franklin County	1,398	81.2%	323	18.8%		1,149	82.2%	249	17.8%
Naponee	51	56%	40	44%		40	78.4%	11	21.6%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Naponee are arts, entertainment and recreation (26.8%); finance and insurance, and real estate (14.6 %); and manufacturing (12.2%).

The major employers for the Village of Naponee include CPI Cooperative Producers Inc. A large percentage of residents also commute to Holdrege, Kearney, and Alma for work.

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table NAP 5.

Table NAP 5: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
82	$1,775,310	$21,650	3	$43,605

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Naponee planning team as a part of the plan update. Table NAP ***6*** and Figure NAP 4 provide a summary of the type and location of critical facilities for the jurisdiction. The village does not have any critical facilities in the 1% annual floodplain.

Table NAP 6: Critical Facilities List

Critical Facility Number	Critical Facility
1	Water Well
2	Water Well
3	Fire Department
4	Post Office
5	Village Office
6	Water Tower
7	Wesleyan Church
8	Old School House
9	Lift Station

Figure NAP 4: Naponee Critical Facilities Map

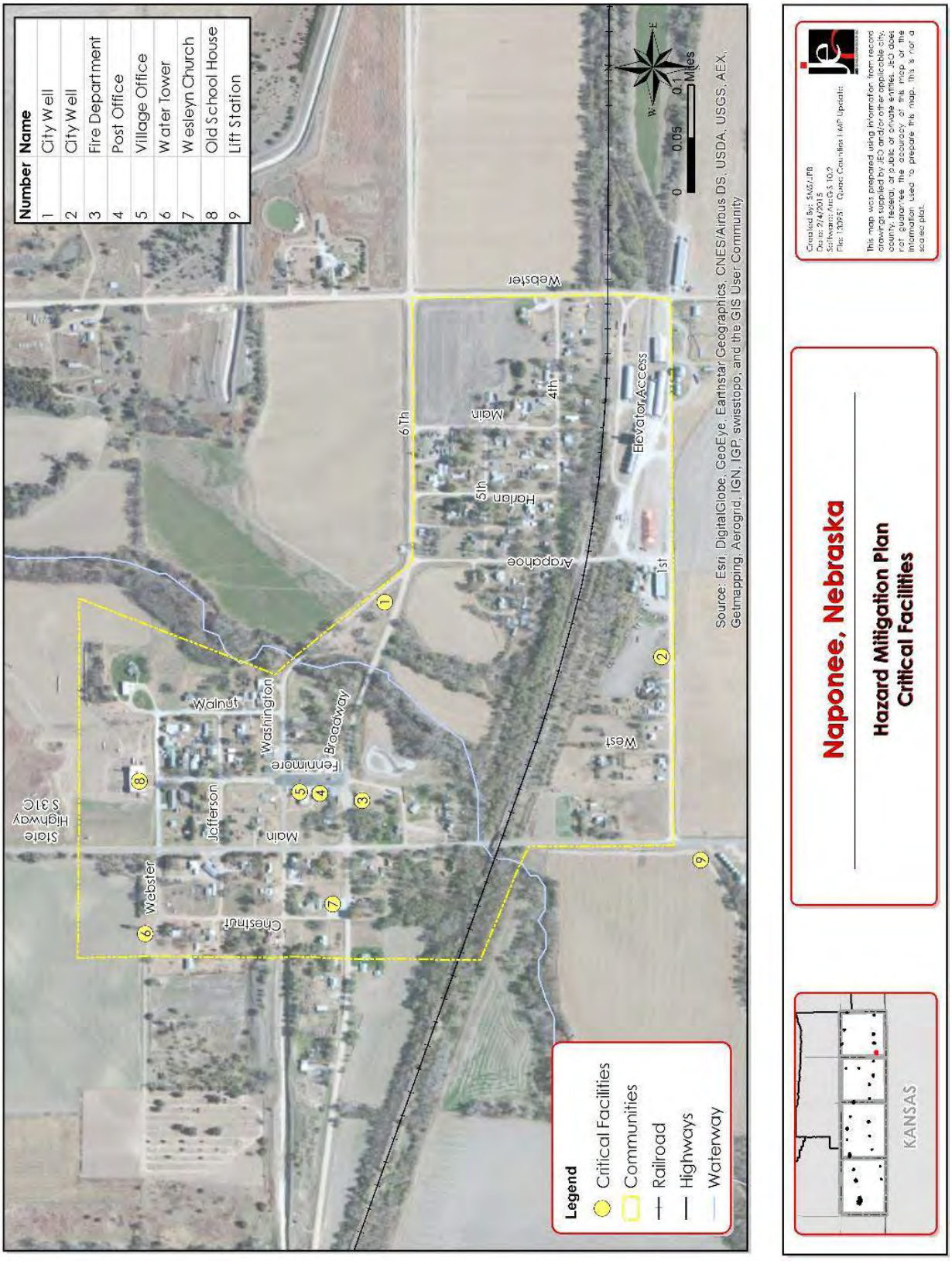
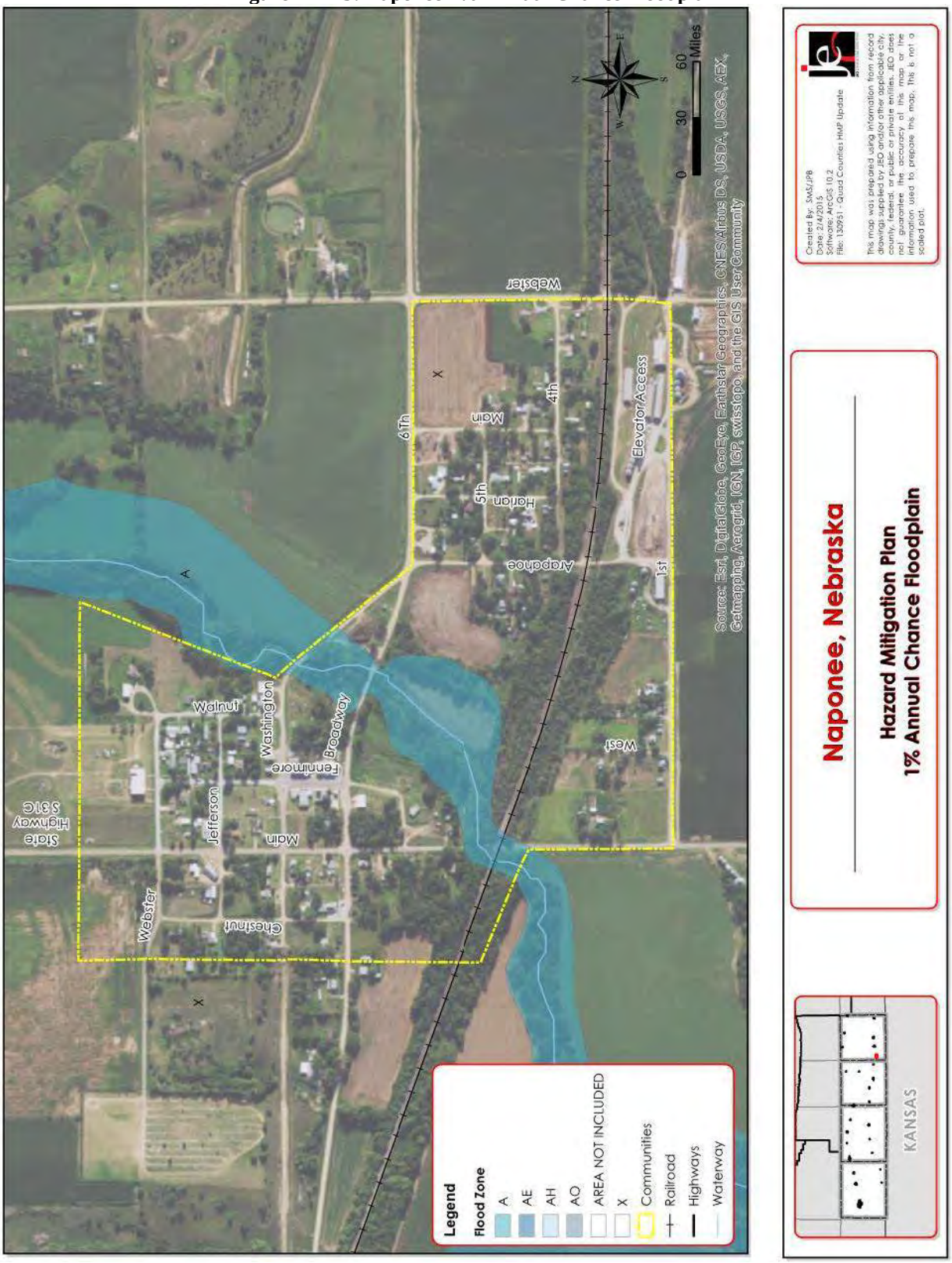


Figure NAP 5 shows the 1% annual floodplain for the Village of Naponee. There are three parcels worth $43,605 in the floodplain. There are no critical facilities in the floodplain. There are no repetitive loss properties in the village. The initial FIRM for Naponee was developed in September of 2005. Naponee does not participate in the NFIP due to the lack of local support. The village will continue to reevaluate participation in the NFIP as flooding risk and local support increases.

Figure NAP 5: Naponee 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are no chemical storage sites in the Village of Naponee. In the event of a chemical spill, the Naponee Fire Department would be the local response.

Historic Sites

According to the National Register of Historic Places for Nebraska, there is one historic site located in the Village of Naponee. The historic site is not located within the 1% annual floodplain.

Table NAP 7: National Historic Registry

Site Name	Date Listed	Classification	In Floodplain?
First Congregational Church	9/14/1982	Building	No

Source: Nebraska State Historical Society

Future Development Trends

In the past five years, two houses were demolished. According to the census data, Naponee's population is declining. According to the local planning team, factors such as lack of employment opportunities and an aging population are contributing to this decline. There are no housing or commercial developments planned in the next five years.

Risk Assessment

Hazard Identification

Table NAP 8 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table NAP 8: Naponee Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)*	No	Injuries, lack of resources to clean-up spill
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat*	Yes	Injuries to vulnerable population
Flooding	Yes	None
Grass/Wildfire	Yes	None
Hail*	Yes	Property damage
High Winds	Yes	None
Levee Failure	No	None
Severe Thunderstorm	Yes	None
Severe Winter Storm*	Yes	Damage to utilities, transportation difficulties
Terrorism	No	None
Tornado*	Yes	Significant property damage, loss of life

** Identified as a top concern by the local planning team*

The top five hazards of greatest concern to Naponee are chemical spills during transportation, extreme heat, hail, severe winter storms, and tornados. These five hazards are discussed in detail below.

Historical Occurrence

The NCDC reported 18 severe weather events from 1996 to 2014 in the Village of Naponee. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table NAP 9 provides a summary of events that caused damage to the village.

Table NAP 9: Naponee Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
7/7/1996	Tornado	F0	0	0	$0
5/20/1999	Thunderstorm Wind	60 kts/ 70 mph	0	0	$50,000
6/15/2002	Hail	0.75 in.	0	0	$0
5/4/2007	Hail	1.25 in.	0	0	$20,000
5/23/2008	Flash Flood	-	0	0	$50,000
5/29/2008	Flash Flood	-	0	0	$20,000
5/3/2012	Hail	1.5 in	0	0	$25,000

Source: NCDC

Chemical Spills (Transportation)

There has not been a chemical spill due to transportation within Naponee. However, if a spill were to occur the local response would not have the necessary resources to clean up hazardous materials. Residents along NE HWY 31C have a greater risk of being affected by chemical spills due to transportation.

Extreme Heat

Naponee experiences extreme heat every year during the summer. The village does not have any cooling centers identified for community members. In the event of extreme heat, the fire department would be available to assist vulnerable populations.

Flooding

Although flooding was not identified as a concern to the local planning team, the hazard is addressed because there are three structures within the floodplain. There have been two reported flash flooding events in Naponee since 1996. These floods caused $70,000 in damages. There are no repetitive flood loss properties in Naponee. The Village of Naponee is not a member of the NFIP.

Hail

The local planning team selected hail as a significant concern because of the frequency of occurrence and the damages resulting from the hazard. Hail events have caused $45,000 in property damages since 2007. Damages from many hail events have gone unreported despite causing damage to windows, siding, and property. Municipal facilities are insured for hail damage.

Severe Winter Storms

Although there has not been structural damages to critical facilities from severe winter storms, the hazard remains a significant concern for the village. Severe winter weather regularly occurs in Naponee and the rest of the planning area. Snow removal resources have been deemed sufficient for local events.

Tornados

According to the NCDC, there have been two reported tornados within Naponee since 1996. These storms briefly touched down near Naponee and did not cause any damages. Tornados have the potential to cause significant damages and loss of life. The community does not have a safe room. The local planning team indicated that there is no place for community members seeking safe shelter during a tornadic event. There is no data backup systems for municipal records.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

A community's governance indicates the number of boards or offices that may be available to help implement hazard mitigation actions. The Village of Naponee has a number of offices or departments that may be involved in implementing hazard mitigation projects. The village is governed by a five member village board, led by a chairperson. In addition, the village has the following staff that can help implement mitigation actions:

- Clerk
- Volunteer Fire Department
- Street Superintendent
- Sewer and Water Commissioner
- Parks and Recreation

Table NAP 10: Naponee Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	No
	Natural Resources Protection Plan	No

Survey Components/Subcomponents		Comments
	Open Space Preservation plan	No
	Floodplain Management Plan	Yes
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	Yes
	Building Codes	Yes – State codes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	No
	Gas/Electric Service Fees	Yes
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in
Table NAP **10** were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

The Village of Naponee has an annex to the Franklin County Local Emergency Operations Plan. This plan was last updated in 2012. This plan provides clear assignment of responsibility during an emergency. Village staff and the Fire Department are familiar with the Franklin County Local Emergency Operations Plan. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The Village of Naponee has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from strong partnerships, such as with the county and the Lower Republican NRD, and will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Actions

Description	**Backup Power Generators**
Analysis	Provide a safe backup water supply for the community; replace existing wells affected by drought, increase of demand in water, and additional water for fire protection.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Funding	Village funds
Timeline	Completed
Lead Agency	Utilities
Action since 2010 plan	Installed generators at critical facilities

New/Ongoing Mitigation Actions

Description	**Participate in the NFIP**
Analysis	Participate in the NFIP. Enable property owners to purchase insurance protection against flood losses
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Low
Lead Agency	Village Board, Floodplain Administrator
Action since 2010 plan	Not yet started

Description	**Tree City USA**
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree

Description	Tree City USA
	identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Estimated Cost	$1,000+
Potential Funding	Village funds
Timeline	5+ Years
Priority	Low
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Village Board, Fire Department
Action since 2010 plan	Not yet started

Description	Warning Systems
Analysis	Improve city cable TV interrupt warning system and implement telephone interrupts system as Reverse 911.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Village Board, Fire Department
Action since 2010 plan	Not yet started

Description	Impact Resistant Roof Coverings
Analysis	Use roofing materials that are resistant to hail impacts for new buildings. Retrofit existing buildings with hail resistant roofing.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Hail
Estimated Cost	Unknown
Timeline	5+ years
Priority	Low
Lead Agency	Village Board
Action since 2010 plan	Identified village office as needing hail resistant roof.

Description	Cooling Station Database
Analysis	Work with the public to maintain a list of sites available for public use during extreme heat events. These sites should be available 24 hours per day, or be made available after normal business hours.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Extreme Heat
Estimated Cost	Unknown
Timeline	2-5 Years

Description	Cooling Station Database
Priority	Medium
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Removed Mitigation Actions

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Reason for Removal	Determined no longer needed

Description	Stabilize/Anchor Fertilizer, Fuel, and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement. If left unanchored, tanks could present a major threat to property and safety in a tornado or high wind event.
Hazard(s) Addressed	Tornados, High Winds
Reason for Removal	Determined no longer needed

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer needed

Description	Stream Bank Stabilization/Grad Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	No bank degradation identified

Description	Drainage Study/Stormwater Master Plan
Analysis	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer needed. Lack of localized flooding.

Description	Flood Prone Property Acquisition
Analysis	Voluntary acquisition and demolition of properties prone to flooding will reduce the general threat of flooding for communities. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.
Hazard(s) Addressed	Flooding
Reason for Removal	No repetitive loss properties in the village

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Hazard(s) Addressed	All hazards
Reason for Removal	Determined to be no longer needed

Village of Upland

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Upland participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Upland attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Upland, the hazards of top concern that were identified through this planning process include chemical spills (fixed site), high winds, severe thunderstorms, severe winter storms, and tornados.

The following people were heavily involved in the development of Upland's Participant Section:

Table UPD 1: Village of Upland Plan Contributors

Name	Title	Department / Organization
Dave Trine	Board Member	Village of Upland
Jeremy Johnson	Board Member	Village of Upland
Jerry Archer	Franklin County Sheriff	Franklin County

This section contains important information about the Village of Upland relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

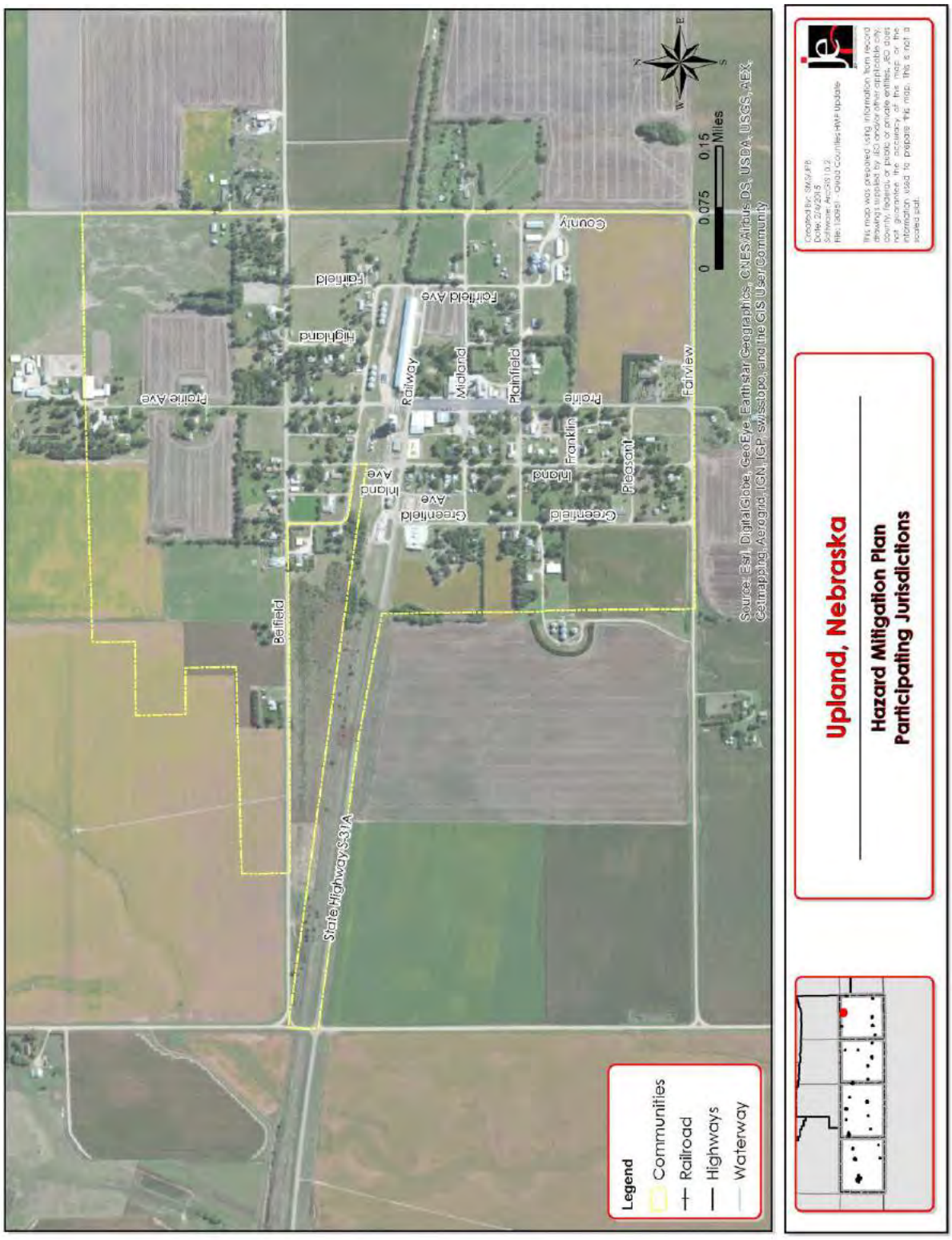
Location/Geography

Upland is a village located in the northcentral portion of Franklin County. The Village of Upland covers an area of 256 acres and has an elevation of 2,162 feet above sea level. Upland is 28 miles southeast of Kearney. There are no major water ways near the village.

Transportation

Figure **UPD 1** shows the major transportation routes for the village. There is one highway in the village NE HWY 31A. According to the Nebraska Department of Roads the average daily traffic count for NE HWY 31A is 360 vehicles with 35 of those being heavy trucks.

Figure UPD 1: Upland



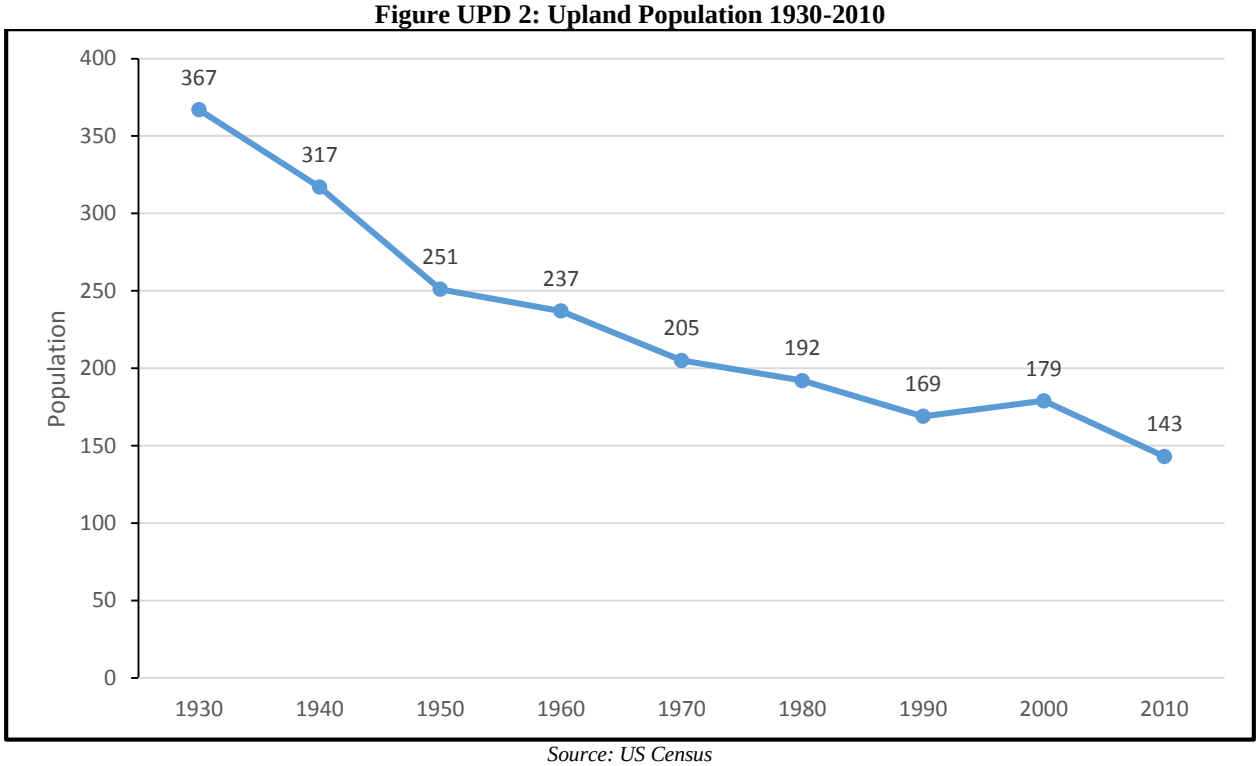
Climate

All the climate data for the county has been taken from a station located two miles outside of Franklin (253035). Please refer to the *Franklin County Section* for a climate summary for the village.

Demographic

Figure UPD 2 displays the population for Upland from 1930 to 2010. The population for Upland has been declining since 1930. From 2000 to 2010 the village lost approximately 20 percent of its population.

Figure UPD 2: Upland Population 1930-2010



Source: US Census

Table UPD 2 illustrates the age distribution and median age for Franklin County in comparison to the Village of Upland. The village has a lower percentage of population over the age of 64 than that of the county by about 13 percent. The village also has a lower median age than that of the county by about five years.

Table UPD 2: Upland Age Distribution

Age	Franklin County	Upland
<5	5.6%	5.6%
5-64	70.6%	83.2%
>64	23.8%	11.2%
Median	48.4	42.5

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Upland in Table UPD 3. The median home value for the village is $13,200 less than that of the county. The median rent value for the village was not reported. The population has decreased in the last decade as noted in the demographic section, the lower cost of living compared with the rest of the county may be due to the aging housing stock. As these structures age if they are not cared for they may continue to increase the vulnerabilities to hazards.

Table UPD 3: Upland Housing Value and Income

	Franklin County	Upland

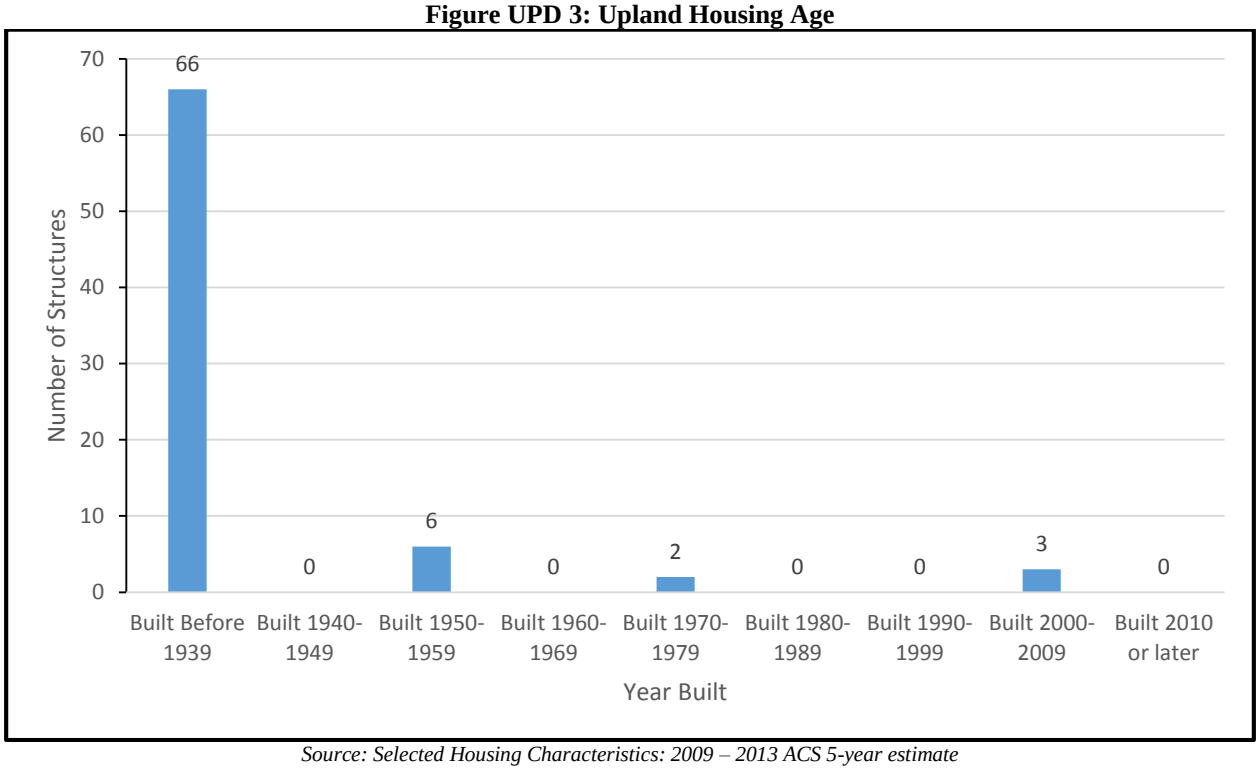
Median Household Income[1]	$60,168	$52,500
Per Capita Income[1]	$26,095	$21,215
Median Home Value[2]	$56,200	$43,000
Median Rent[2]	$543	-

1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the 2010 Census data (Figure UPD 3) the village has 77 housing units with percent of those units occupied (

Table **UPD** 4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. There are three units in the village classified as mobile homes and 86 percent of the village's housing stock was built before 1960. Although there are mobile homes in the community, they are not located in a single identified mobile home park in the village, but are spread throughout the village. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados.

Figure UPD 3: Upland Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table UPD 4: Upland Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Franklin County	1,398	81.2%	323	18.8%		1,149	82.2%	249	17.8%
Upland	60	77.9%	17	22.1%		55	91.7%	5	8.3%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Upland are educational services and health care (19%), agriculture and forestry (13.1 %), and wholesale trade (11.9%).

The major employers for the Village of Upland include Aurora Coop. A large percentage of residents also commute to Minden and Kearney for employment.

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table UPD 5.

Table UPD 5: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
76	$2,181,370	$28,702	0	$0

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Upland planning team as a part of the plan update. Table UPD 6 and

Figure UPD **4** provide a summary of the type and location of critical facilities for the jurisdiction.

Table UPD 6: Critical Facilities List

Critical Facility Number	Critical Facility
1	Legion Hall
2	Post Office
3	Methodist Church
4	Fire Hall

Figure UPD 4: Upland Critical Facilities Map

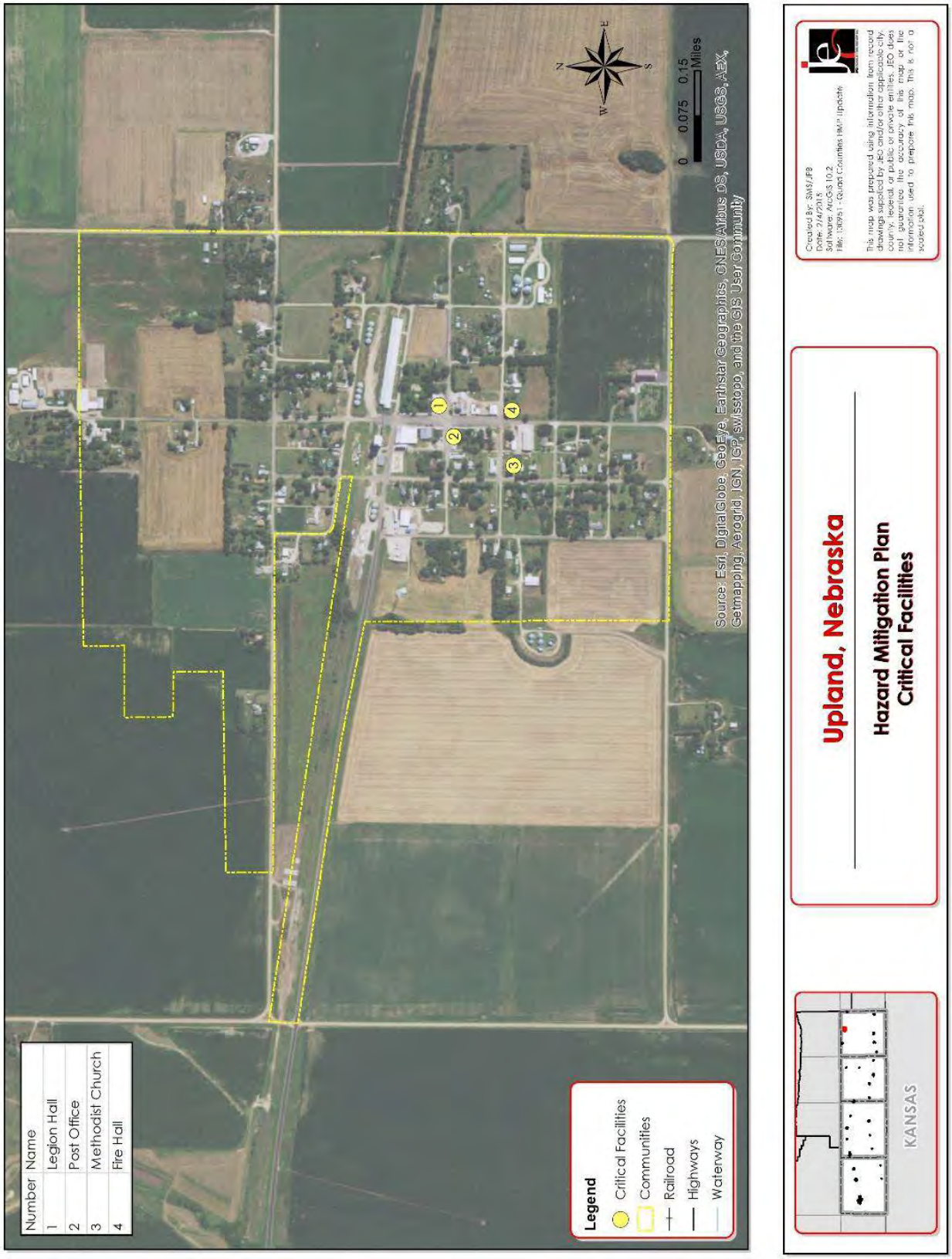
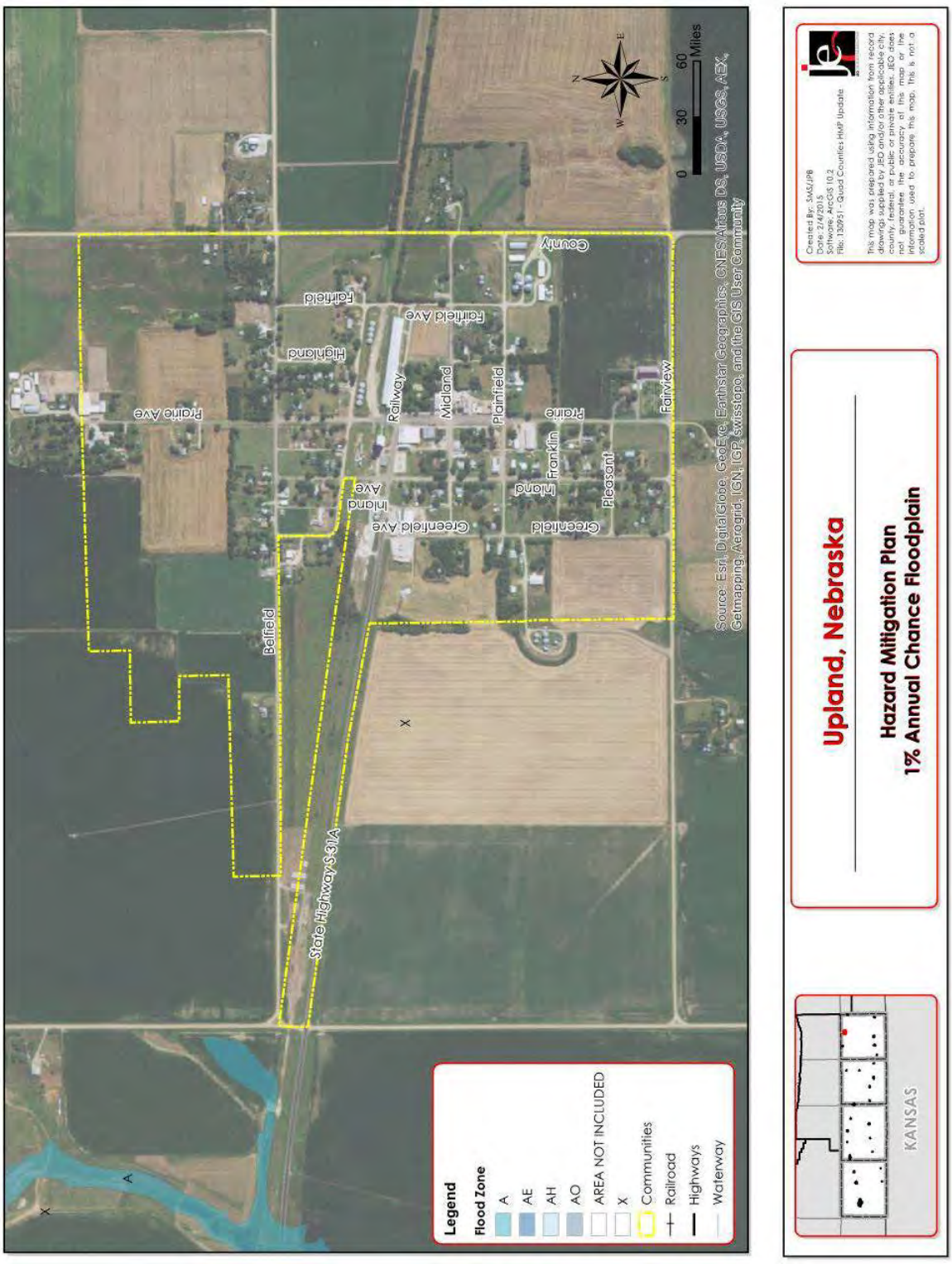


Figure UPD 5 shows the 1% annual floodplain for the Village of Upland. The village has no parcels or critical facilities within the floodplain. There are no repetitive loss properties in the village. The initial FIRM for Upland was developed in September of 2005. Upland does not participate in the NFIP due to the lack of parcels and structures within the floodplain. Upland will reevaluate participation if conditions change.

Figure UPD 5: Upland 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there is one chemical storage site in the Village of Upland, and this site does house materials that are categorized as hazardous. Table UPD 7 lists facilities that house hazardous materials only.

According to the local planning team, there are vulnerable populations located to the north and south of the site. Residents near the site are not educated about the threat and appropriate response. The local response resources include Upland Volunteer Fire Department, and Campbell and Hildreth Ambulance.

Table UPD 7: Chemical Storage Fixed Site

Facility	Address	Hazardous Material
Aurora Co-op Elevator Company	127 Main St., Upland	Anhydrous Ammonia

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sites located in the Village of Upland.

Future Development Trends

There is no residential or commercial development planned in the next five years. According to the local planning team, the lack of employment opportunities is a factor in the population decline. Any future development will be discouraged from hazard prone areas.

Risk Assessment

Hazard Identification

Table UPD 8 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table UPD 8: Upland Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	Economic impacts
Agricultural Plant Disease	Yes	Economic impacts
Chemical Spills (Fixed Sites)*	No	Location of vulnerable populations near fixed site
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought	Yes	None
Grass/Wildfire	Yes	None
High Winds*	Yes	Lack of shelter for residents, property damages, power outages
Flooding	No	None
Extreme Heat	Yes	None
Hail	Yes	None
Earthquake	No	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damages, power outages
Severe Winter Storm*	Yes	Power outages
Terrorism	No	None

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Tornados*	Yes	Lack of shelter for residents, potential for significant damages and loss of life

** Identified as a top concern by the local planning team*

The top five hazards in Upland are chemical spills (fixed site), high winds, severe thunderstorms, severe winter storms, and tornados. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 17 severe weather events from 1996 to 2014 in the Village of Upland. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table UPD **9**9 provides a summary of events that caused damage to the village.

Table UPD 9: Upland Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/26/1999	Hail	1 in.	0	0	$5,000
5/15/2009	Hail	1 in.	0	0	$10,000
5/27/2012	Thunderstorm Wind	61 kts./ 70 mph	0	0	$50,000
6/14/2014	Thunderstorm Wind	70 kts./ 81 mph	0	0	$1,500,000

Source: NCDC

Chemical Spills (Fixed Site)

The Aurora Co-op Elevator Company is the sole chemical fixed site within Upland. This site houses anhydrous ammonia. In the event of a spill, the Upland Fire Department, and the Campbell and Hildreth Ambulance would be the first response. The local planning team is most concerned about the vulnerable populations located north and south of the site.

High Winds

Upland has experienced high winds during severe thunderstorm events. High winds have the potential to damage trees and blow over power lines. If there is an approaching storm with high winds, dispatch offers text alerts to members of the Fire Department.

Severe Thunderstorms

According to the NCDC, there have been five thunderstorm wind events in Upland from 1996 to 2014. These events caused a reported $1,550,000 in property damages. The local planning team indicated that severe thunderstorms occur annually within Upland. The Fire Hall has two backup generators located within it. One of these generators is for the hall and the other is for the municipal water supply. It is estimated that less than one percent of power lines within Upland have been buried.

Severe Winter Storms

Severe winter weather occurs annually within Upland and the rest of the planning area. Upland has experienced a number of winter storms that have led to power outages, including a recent ice storm. Upland has not had structural damages to critical facilities from severe winter storms. Streets are cleared by village staff, and snow removal resources are sufficient for most storms.

Tornados
According to the NCDC, there have been three tornados that have touched down near Upland from 1996 to 2014. Luckily, these tornados touched down outside of town and did not lead to any reported damages. Upland does not have a safe room available for residents. Residents seeking shelter during a tornado would reach out to neighbors. In the event of a disaster, the Fire Department has a Mutual Aid Agreement with neighboring communities.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance
The Village of Upland is governed by a five member village board, led by a chairperson. In addition to the village board, the village has the following positions that may assist in implementing mitigation projects.

- Clerk
- Treasurer
- Utility Superintendent
- Engineer (contract)

Table UPD 10: Upland Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	Yes
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No

Survey Components/Subcomponents		Comments
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	No
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	Yes, Contract
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use,

transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in
Table UPD 10 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Upland does not have many planning mechanisms in which to incorporate hazard mitigation principles. Plans that Upland does have, such as the Capital Improvements Plan, incorporate hazard mitigation principles and reduce risk. Upland has an annex to the Franklin County Local Emergency Operations Plan, which was last updated in 2012. This plan discusses a number of hazards that can affect the county. The plan also provides a clear assignment of responsibility during an emergency. Regulations such as the subdivision regulations will continue to discourage future development near hazardous areas. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary
Upland has limited fiscal and administrative capabilities to implement hazard mitigation projects. Larger projects may require the village to partner with the county, LRNRD, and other regional and state agencies. Through this update process, the planning team reviewed previously identified mitigation projects and added new projects to pursue.

Mitigation Strategy

Completed Mitigation Projects

Description	**Warning Systems**
Analysis	Implement Code Red for the county
Goal/Objective	Goal 4/ Objective 4.3
Hazard(s) Addressed	All Hazards
Funding	County Funds
Timeline	Completed
Lead Agency	Board of Supervisors, County Sheriff/Emergency Manager
Action since 2010 plan	Code Red in place in the county beginning in June 1, 2015.

Description	**Alert/Warning Sirens**
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or the placement of new sirens.
Goal/Objective	Goal 4/ Objective 4.3
Hazard(s) Addressed	All Hazards
Funding	County Funds, Grants
Timeline	Completed
Lead Agency	Board of Supervisors, County Sheriff/Emergency Manager
Action since 2010 plan	Installed warning siren

New/Ongoing Mitigation Projects

Description	**Backup Power Generators**
Analysis	Provide a safe back-up power supply for critical facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$15,000 to 30,000 per generator
Potential Funding	HMGP, PDM, County Funds, Village Funds
Timeline	5+ years
Priority	Medium
Lead Agency	Village Board, County Sheriff/Emergency Manager
Action since 2010 plan	This project has not been started.

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, CDBG, FHA Mortgage Insured Financing, Village Funds
Timeline	5+ years
Priority	Low
Lead Agency	Village Board, Fire Department
Action since 2010 plan	Identified auditorium as location for safe room. Identified needed capacity as 150-200 people.

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs.
Goal/Objective	Goal 2 /Objective 2.3
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Estimated Cost	$1,000+
Potential Funding	Village Funds, local community development grant
Timeline	5+ years
Priority	Low
Lead Agency	Village Board
Action since 2010 plan	Upland has a tree board and tree care ordinance.

Description	Public Awareness/Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. Also educate citizens on water conservation methods, evacuation plans, etc. In addition, purchasing equipment such as overhead projectors and laptops.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$15,000 to 30,000 per generator
Potential Funding	HMGP, PDM, County Funds, Village Funds
Timeline	5+ years
Priority	Low
Lead Agency	Village Board, Fire Department
Action since 2010 plan	This project has not been started.

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's, water tanks/trucks, snow removal equipment, etc. This would also include developing backup systems for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Wildfires
Estimated Cost	$5,000 to $400,000 per vehicle, depends on the equipment needed
Potential Funding	HMGP, PDM, County Funds, Municipal Funds, local cost-share grants
Timeline	5+ years
Priority	Medium
Lead Agency	Village Board, County Sheriff/Emergency Manager, Fire Department
Action since 2010 plan	Tax levy was increased for fire department during last election.

Description	Emergency Communications
Analysis	Establish an action plan to improve communication between agencies to better assist residents and businesses during and following emergencies. Establish inner-operable communications.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$10,000+
Potential Funding	HMGP, PDM, County Funds, Municipal Funds
Timeline	5+ years
Priority	Medium
Lead Agency	Village Board, County Sheriff/Emergency Manager
Action since 2010 plan	This project has not been started

Removed Mitigation Projects

Description	Stormwater System and Drainage Improvements
Analysis	Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer needed.

Description	Stream Bank Stabilization/Grade Control Structure/ Channel
Analysis	Bank degradation is occurring along many rivers and creeks in the planning area. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer needed. No stream in or around Upland.

Description	Participate in the NFIP
Analysis	Enable property owners to purchase insurance protection against flood losses.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer needed by the Village. Village does not have any areas within the floodplain.

Furnas County

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

Furnas County participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Furnas County's participation was extensive; a representative from Furnas County attended every public meeting, met individually with members from the planning team, completed all hazard identification and project identification worksheets, engaged the general public in the planning process, and assisted in interdepartmental coordination and data analysis.

For Furnas County, the top concerns that were identified through this planning process include flooding, severe thunderstorms, severe winter storms, and tornados.

The following people were involved in the development of Furnas County's Participant Section:

Table FSC 1: Furnas County Plan Contributors

Name	Title	Department / Organization
Roger Powell	Furnas County Emergency Manager	Furnas County

This section contains important information about Furnas County relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
    - Business Profile
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

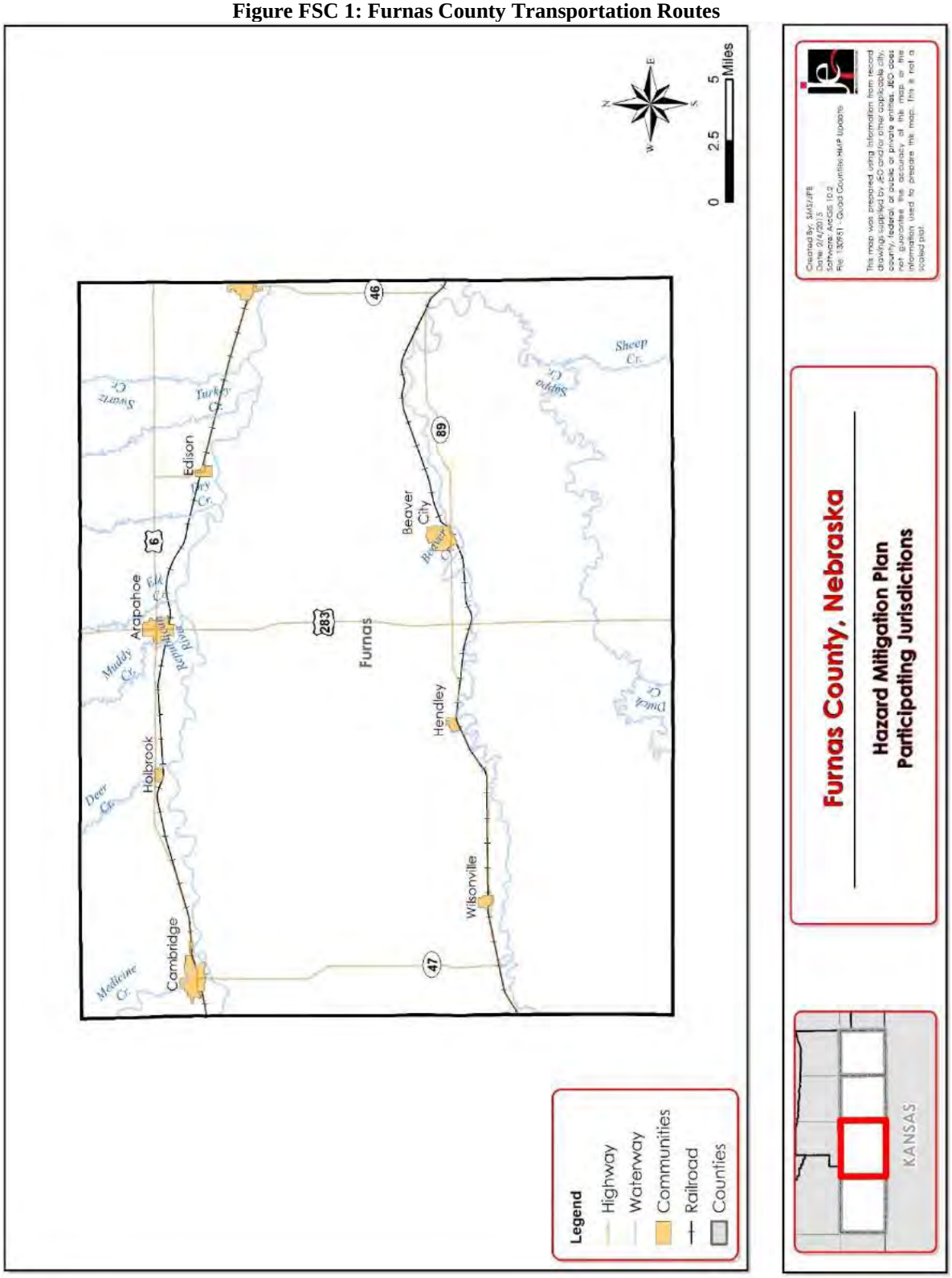
County Profile

Location/Geography

Furnas County is located on the southwest border of Nebraska; adjacent to its borders are Harlan, Red Willow, Frontier, and Gosper counties in Nebraska, ad Norton and Decatur counties in Kansas. Furnas County is approximately 2,028 feet above sea level and covers 721 square miles. Furnas County is in the topographic region of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. The Republican River traverses the northern portion of the county.

Figure **FSC 1** shows the major transportation routes through the county. There are three major highways in the county: US Highway 6, US Highway 283, and NE Highway 89. According to the Nebraska Department of Roads average daily traffic count US Highway 6 has 2,050 vehicles with 365 of those being heavy trucks enter at the eastern border of the county and 3,050 vehicles with 390 of those being heavy trucks at the western border of the county. US Highway 283 has a traffic count of 1,415 vehicles with 250 of those being heavy trucks at the northern border of the county and 675 vehicles with 150 of those being heavy trucks at the southern border of the county. NE Highway 89 has a traffic count of 435 vehicles with 60 of those being heavy trucks at the eastern border of the county and 255 with 35 of those being heavy trucks at the western edge of the county.

Figure FSC 1: Furnas County Transportation Routes

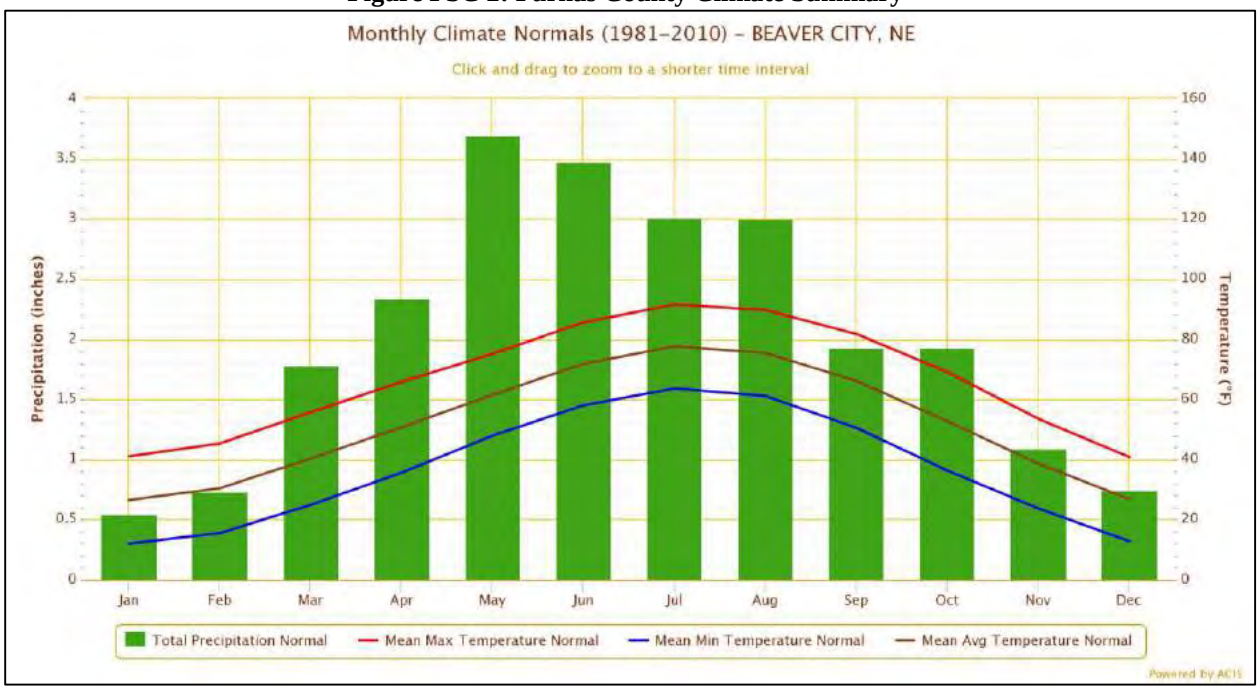


Climate

Weather data for Furnas County is taken in Beaver City (250640), a representative location for the rest of the county. The normal high temperature for the month of July is 93.4ºF, and the normal low temperature for the month of January is 13.5ºF. The record high for the county of 117ºF was set in July 1934, and the record low for the county of 35ºF below zero was set in February of 1899. On average Furnas County receives 23.84 inches of rain and 25.5 inches of snow.

Figure FSC **2** provides a summary of the climate normals for the county.

Figure FSC 2: Furnas County Climate Summary

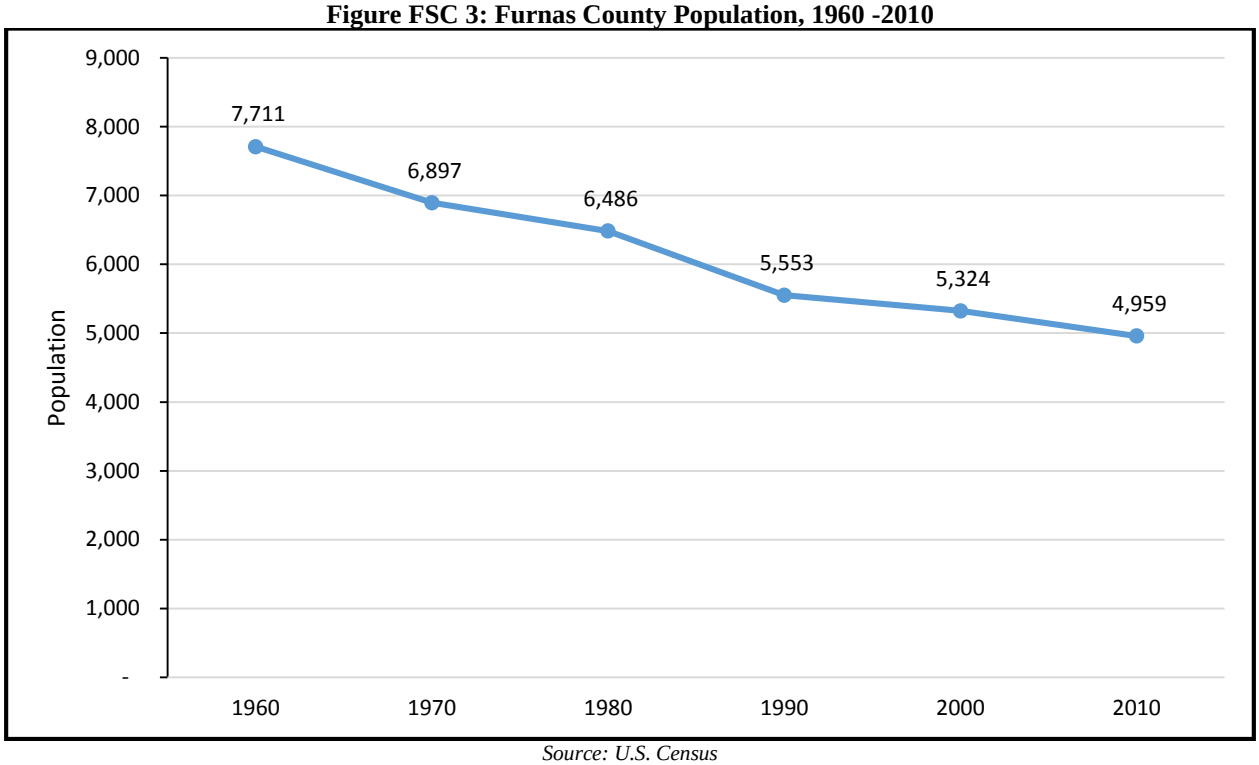


Source: SCACIS

Demographics

Figure FSC 3 show the population for Furnas County from 1960 to 2010. The population for Furnas County has been declining since 1960. This is notable for hazard mitigation because communities with declining population may have a higher level of unoccupied housing that is not being maintained. Furthermore, areas with declining population will be less prone to pursuing residential/commercial development in their areas, which may reduce the number of structures vulnerable to hazards in the future. Decreasing populations can also represent decreasing tax revenue for the county which could make implementation of mitigation actions more fiscally challenging.

Figure FSC 3: Furnas County Population, 1960 -2010



Source: U.S. Census

Table FSC 2 shows the population for the county compared to each community in the county from 2000 to 2010. The county saw population decrease by seven percent since 2000. The Village of Wilsonville lost over 20 percent of its population. The villages of Edison and Oxford both lost over 10 percent of their population. The Unincorporated portion of Furnas County lost 15 percent of its population. As communities experience population decline, they become more vulnerable to the impacts from hazards. Declining populations often result in higher rates of empty or vacant properties, declining or poorly maintained infrastructure, and reduced response and recovery capabilities.

Table FSC 2: Furnas County Population Trend

Jurisdiction	2000 Population	2010 Population	% Change	2020 Projected Population
Furnas County (Total)	5,324	4,959	-7%	4,612
Furnas County (Unincorporated)	1,241	1,049	-15.5%	886
Arapahoe	1,028	1,026	-0.2%	1,024
Beaver City	641	609	-5%	579
Cambridge	1,041	1,063	2.1%	1,085
Edison	154	133	-13.6%	115
Holbrook	225	207	-8%	190
Oxford	876	779	-11.1%	693
Wilsonville	118	93	-21.2%	73

Source: United States Census Bureau – 2000, 2010

Table FSC 3 illustrates the age distribution and median age for Furnas County in comparison to the state, the villages of Edison, Holbrook, Oxford, and Wilsonville, and to the cities of Arapahoe, Beaver City, and Cambridge. There are four communities with a higher percentage of population over the age of 64 than the county. Three communities and the state that have a lower percentage of population over the age of 64.

There is only one community with a higher median age than the county. Two communities have a median age within one year of the county's median age. Four communities and the state have a lower median age than the county.

Table FSC 3: Furnas County Age Distribution

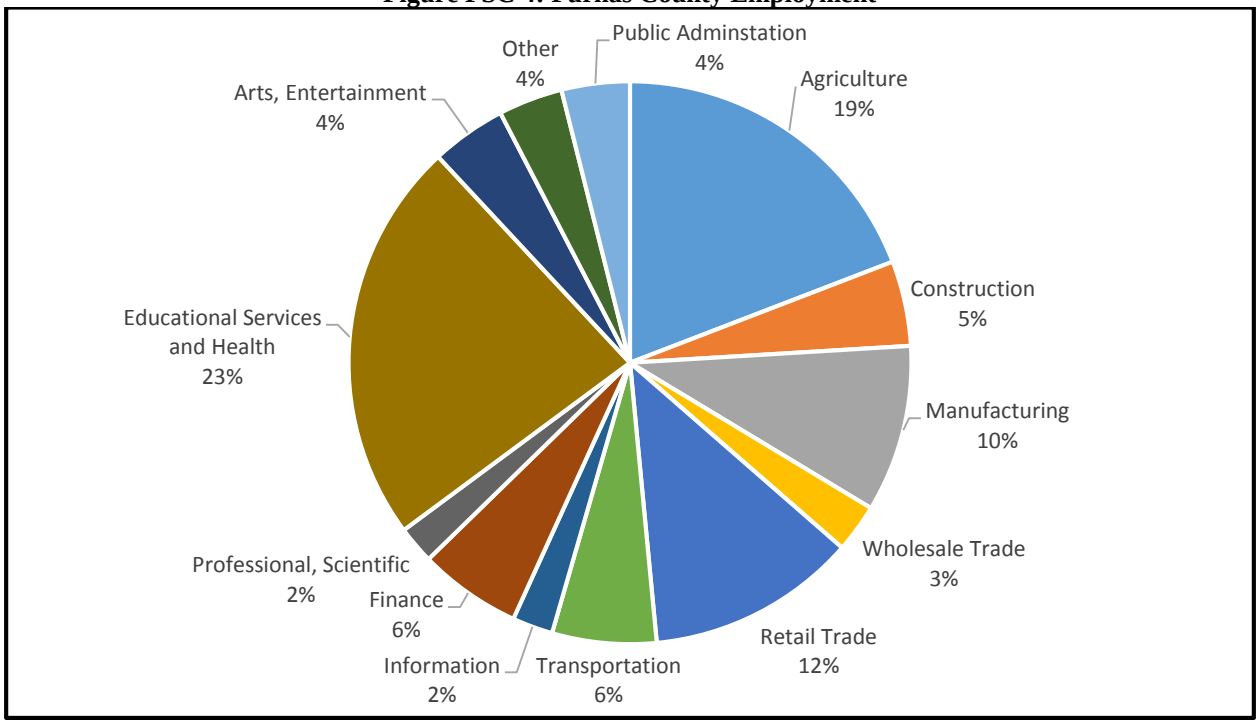
Jurisdiction	< 5 years of age	5 – 64 years of age	> 64 Years of Age	Median Age
Nebraska	7.2%	79.2%	13.6%	36.2
Furnas County	5.2%	71.7%	22.7%	47.4
Arapahoe	6.7%	69.7%	23.6%	46.3
Beaver City	6.9%	67.2%	25.9%	47.1
Cambridge	5.4%	68.3%	26.3%	47.6
Edison	4.5%	78.9%	16.6%	45.4
Holbrook	6.8%	74.9%	18.3%	43.8
Oxford	4.9%	75.3%	19.8%	46.2
Wilsonville	2.2%	74%	23.8%	51.4

Source: United States Census Bureau – 2010

Employment

Figure FSC 4 shows the employment by industry for Furnas County. Furnas County had 183 businesses with 1,327 paid employees according to the 2012 U.S. Economic Census.

Figure FSC 4: Furnas County Employment



Source: Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate

The top sector for employment in the county is educational services and health employing about 23 percent of the population. This is in part due to the Tri-Valley Health system having a hospital in Cambridge, a clinic in Arapahoe and Cambridge, and three options for senior living. There are also three school districts in the county (Arapahoe Public Schools, Cambridge Public Schools, and Southern Valley Schools). Agriculture is the second highest sector for employment with about 19 percent of the population.

Agriculture

The agricultural and forestry industry accounts for 19 percent of employment in the county, ranking it second of all industries, it is an integral part of the economy and local communities. For example, other industries such as transportation are related to the agricultural industry as some of their transports include crops, feed, and animals for farmers. Furnas County's 389 farms (Table FSC 4) covers 435,711 acres of land, which accounts for 95 percent of the surface land in the county. Crops and livestock are the visible parts of the agricultural economy, but many related businesses contribute as well by producing, processing and marketing farm and food products. These businesses generate income, employment and economic activity throughout the region.

Table FSC 4: Agricultural Inventory

Agricultural Assets	Inventory
Number of Farms	389
Land in Farms	435,711 acres
Estimated market values of land & buildings (per farm)	$2,622,413
Crop Lands	282,694 acres
Cattle Inventory	34,501 head

Source: USDA Census of Agriculture, 2012

Housing and Economics

The median household income, per capita income, home value and rent for the county as a whole are compared with the villages of Edison, Holbrook, Oxford, and Wilsonville and the cities of Arapahoe, Beaver City, and Cambridge in

Table FSC ***5***. The median household income for the county is $39,603 with a median home value of $56,400. The median household income is about $12,100 less than that of the state and the median home value is $71,600 less than that of the state. The lower cost of living compared to that of the state may be due to a lower quality of building materials used in construction of homes in the county.

Table FSC 5: Furnas County Housing Value and Income

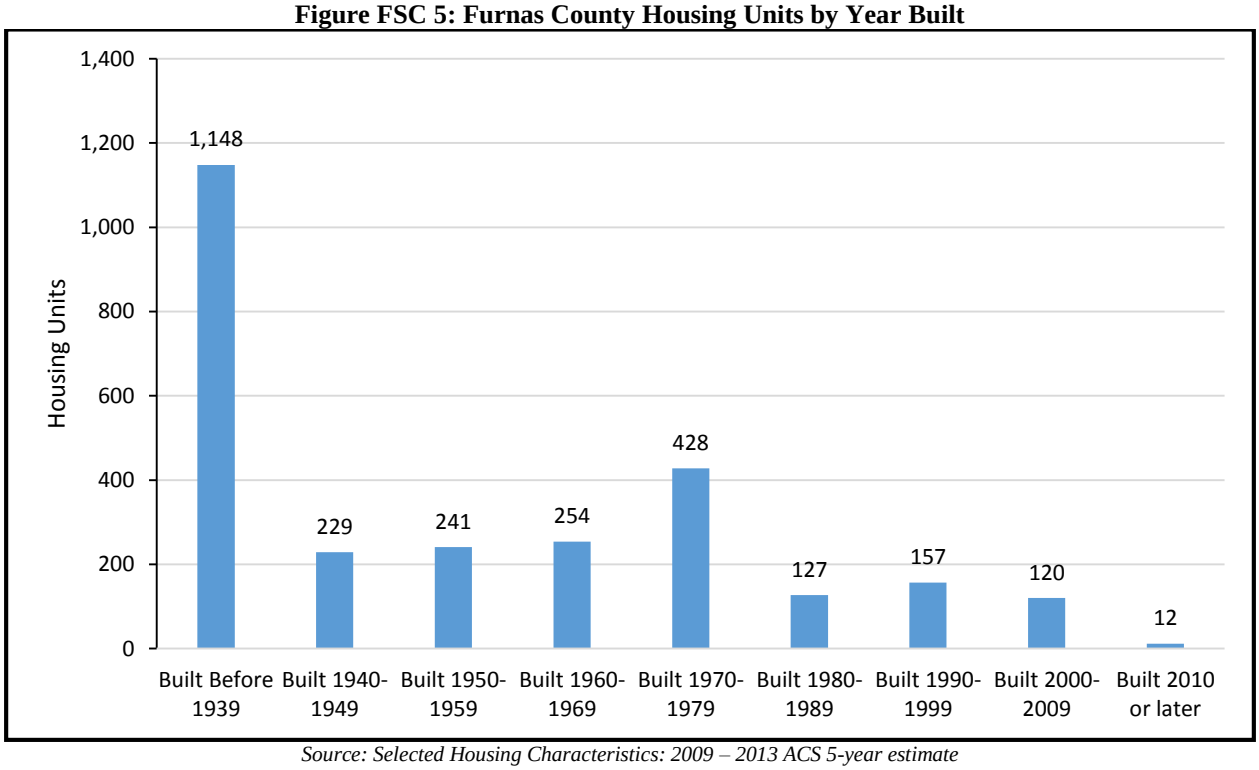
Jurisdiction	Median Household Income[1]	Per Capita Income[1]	Median Home Value[2]	Median Rent[2]
Nebraska	$51,672	$26,899	$128,000	$706
Furnas County	$39,603	$51,458	$56,400	$488
Arapahoe	$37,813	$23,285	$62,700	$669
Beaver City	$30,982	$17,035	$34,600	$447
Cambridge	$38,235	$22,065	$63,500	$471
Edison	$21,429	$14,762	$22,500	$558
Hendley	$34,000	$25,150	$18,800	-
Holbrook	$17,500	$16,671	$32,500	$563
Oxford	$39,922	$23,978	$41,000	$513
Wilsonville	$35,625	$21,143	$27,500	$450

1Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (Table FSC 6) Furnas County has 2,716 housing units with 82 percent of those units occupied. Five communities Beaver City, Edison, Holbrook, Oxford, and Wilsonville and the county have vacancy rates that are over 15 percent. These vacant buildings are more susceptible to damage from high winds, severe thunderstorms, and tornados. 3.8 percent of the county's homes are classified as mobile homes. Over 42 percent of homes were built before 1939 (

Figure FSC **5**). Vacant buildings, mobile homes, and aging housing stock are susceptible to high winds, severe thunderstorms and tornados. Residents living near or in these types of structures will be vulnerable to severe weather hazards. Ninety-nine percent of the county's homes were built prior to the first FIRM for the county in 2009. Houses built prior to this year may not be constructed above the base flood elevation.

Figure FSC 5: Furnas County Housing Units by Year Built



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table FSC 6: Furnas County Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Furnas County (Total)	2,215	81.6%	501	18.4%		1,602	72.3%	613	27.7%
Furnas County (Unincorporated)	379	82.9%	78	17.1%		268	70.7%	111	29.3%
Arapahoe	454	90.8%	46	9.2%		315	69.4%	139	30.6%
Beaver City	287	72.5%	109	27.5%		216	75.3%	71	24.7%
Cambridge	506	87.1%	75	12.9%		331	65.4%	175	34.6%
Edison	40	50.6%	39	49.4%		35	87.5%	5	%12.5%
Holbrook	62	81.6%	14	18.4%		52	83.9%	10	16.1%
Oxford	416	83.9%	80	16.1%		316	76%	100	24%
Wilsonville	53	47.7%	58	52.3%		53	100%	0	0%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Structural Inventory

The structural valuation for Furnas County is outlined in

***Table* FSC 7.**

Table FSC 7: Furnas County Structural Valuation

Furnas County	Structure Valuation
Structure Type	**Total Value**
Commercial/Industrial	$24,770,560
Agriculture	$24,502,590
Residential	$112,912,940
Public/Quasi Public	$1,425,975
Total	$163,612,065

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Furnas County planning team as a part of the plan update. Table7 provides a summary of the type and location of critical facilities for the County.

Table FSC 7: List of Critical Facilities

Critical Facility Number	Critical Facility	Location
1	Furnas County Court House	Beaver City
2	Southern Valley Schools	Furnas County

Furnas County does not have any critical facilities located within the 1% annual floodplain.

Levees

There is one levee located in Furnas County. The levee is located in Cambridge. The levee does not provide 1% annual flood protection.

Dams

There are 50 dams in Furnas County. None of these dams have been identified as a high hazard dam.

Table FSC 8: Dams in Furnas County

	Number of Dams	Minimal	Low	Significant	High
Furnas County	50	7	37	3	0
Planning Area	175	33	125	3	2

Source: NDNR

Table FSC 9 shows the high hazard dams that could affect jurisdictions within Furnas County.

Table FSC 9: High Hazard Dams That Could Affect Furnas County

NIDID	Dam Name	County	Down Stream Jurisdictions
NE01073	Medicine Creek Dam	Frontier	Cambridge

Source: NDNR

Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of 25 chemical storage sites in Furnas County, and six of these sites house materials categorized as hazardous.

Table FSC **10** lists facilities that house hazardous materials only.

Table FSC 10: Chemical Storage Fixed Sites

Facility	Address	Hazardous Material
Ag Valley Co-Op Non Stock	40827 Highway 6/34, Cambridge	Anhydrous Ammonia, Paraquat Dichloride
Ag Valley Co-Op Non Stock	72133 US Highway 136, Edison	Paraquat Dichloride
Cambridge Telephone Company	622 Paxton St., Cambridge	Sulfuric Acid
Century Link	108 E Bright St, Oxford	Sulfuric Acid
Level 3 Communications LLC	72294 Road 429, Arapahoe	Sulfuric Acid
Nebraska Corn Processing LLC	107 Potter St., Cambridge	Cyclohexylamine, Sulfuric Acid

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there two historic sites located in Furnas County. There is one site in the 1% annual floodplain.

Table FSC 11: National Historic Registry

Site Name	Date Listed	Classification	In Floodplain?
Cambridge State Aid Bridge	6/29/1992	Structure	Yes
W. H. Faling House	11/22/1999	Building	No

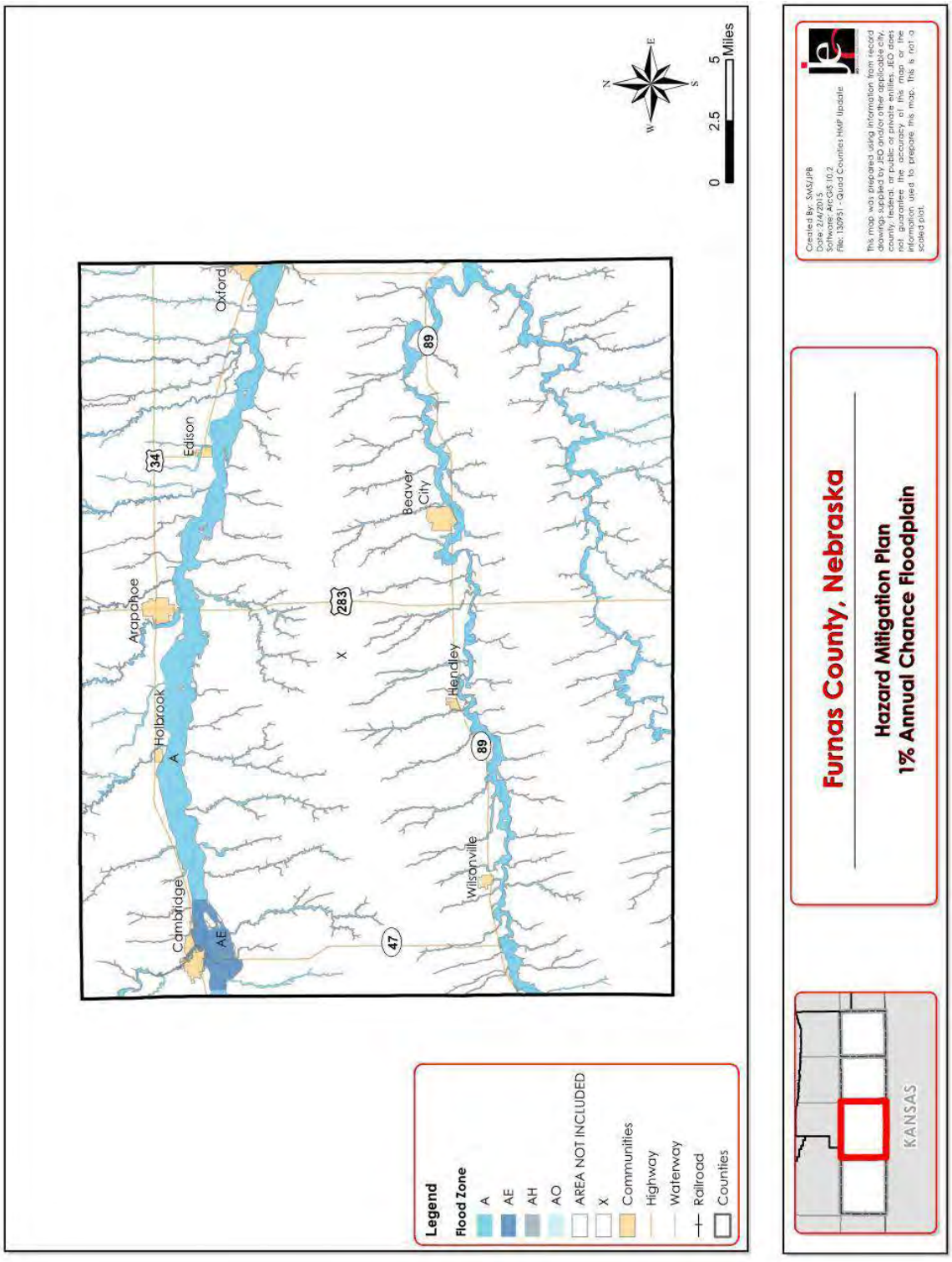
Source: Nebraska State Historical Society

Future Development Trends

Furnas County expects that structures will be built in both the incorporated and unincorporated areas of the county. New structures in the incorporated areas will likely be housing units (single family homes) and commercial structures. In the unincorporated areas new structures will most likely be new farming operations. It will be important that residential areas be protected from site specific hazards such as flood prone areas. See the participant sections of the communities for their own future development trends.

Figure FSC 6 shows the 1% annual floodplain for Furnas County. The county has no critical facilities in the 1% annual floodplain. There are no repetitive loss properties in the county. The initial FIRM for Furnas County was developed in March of 2009. Furnas County does participate in the NFIP, with two policies in effect worth $112,000 as of February 28, 2015.

Figure FSC 6: Furnas County 1% Annual Chance Floodplain



Risk Assessment

Hazard Identification

Table FSC 12 is a risk assessment identified specifically for the county. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table FSC 12: Furnas County Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	2014 HIRA	Specific Concerns Identified
Agricultural Animal Disease	Yes	High	None
Agricultural Plant Disease	Yes	High	None
Chemical Spills (Fixed Site)	No	N/A	None
Chemical Spills (Transportation)	No	High	None
Dam Failure	No	High	None
Drought	Yes	High	None
Earthquake	Yes	Medium	None
Extreme Heat	Yes	N/A	None
Flooding*	Yes	High	Property damages
Grass/Wildfire	Yes	High	None
Hail	Yes	N/A	None
High Winds*	Yes	N/A	Property damages and potential injuries
Levee Failure	No	High	None
Severe Thunderstorm*	Yes	High	Property damages, potential injuries, power outages
Severe Winter Storm*	Yes	High	Property damages, potential injuries, power outages
Terrorism	No	High	None
Tornado*	Yes	High	Significant property damages, potential loss of life

** Identified as a top concern by the local planning team*

The top hazards in Furnas County are flooding, severe thunderstorms, severe winter storms, and tornados. These hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrences

The events recorded by NCDC are broken down by two types: county-based and zone-based events. The county-based records are events that affect the jurisdictions within the county while the zone-based records are those affecting the zone that include the county as part of the affected zone. Please refer to specific villages or cities within the county for the previous county-based severe weather events retrieved from NCDC. For zone-based events, there are 91 recorded events from 1996 to 2014. Of those 91 events 11 resulted in damages. Table FSC 13 provides a summary of the events that resulted in damage.

Table FSC 13: Furnas County NCDC Severe Weather Events

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
4/6/2001	High Wind	52 kts. / 60 mph	0	0	$5,000
11/24/2001	High Wind	-	0	0	$2,080
3/1/2002	Winter Storm	-	0	0	$5,000
4/18/2004	High Wind	52 kts. / 60 mph	0	0	$5,000

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
11/27/2005	Blizzard	-	0	0	$250,000
3/21/2006	Winter Storm	-	0	0	$50,000
4/2/2006	High Wind	35 kts./ 40 mph	0	0	$20,000
11/26/2006	Winter Weather	-	0	0	$5,000
12/29/2006	Ice Storm	-	0	0	$1,000,000
12/1/2007	Ice Storm	-	0	0	$20,000
12/11/2007	Winter Storm	-	0	0	$100,000

Source: NCDC

Since NCDC data provides limited information on crop losses, additional crop loss information from 2000-2014 was gathered from the Risk Management Agency (RMA) located within the United States Department of Agriculture (USDA). RMA information is only available at the county level so additional data is not provided for the individual jurisdictions. The RMA data shows greater impacts to crops than all of the NCDC data. This discrepancy occurs because all the crop losses for every event may not be reported to NCDC like it is to RMA. In Table FSC 14, the total crop loss is provided for each hazard type along with the number of events or records over the 15 year period. Annual crop loss was calculated by diving the total crop loss by the number of years, which is 15 years.

Table FSC 14: Furnas County RMA Loss Data

Hazard Type	Number of Records	Total Crop Loss	Annual Crop Loss
Extreme Cold	104	$729,331	$52,095
Drought	214	$90,795,070	$6,485,362
Flooding	12	$140,382	$10,027
Hail Events	157	$20,955,129	$1,496,795
Heat	109	$8,348,438	$596,317
Severe Thunderstorms	0	$0	$0
Tornados	1	$3,267	$233
High Wind	103	$9,234,786	$659,628
Plant Disease	12	$116,282	$8,306
Other	12	$182,980	$3,070

Source: USDA, RMA Cause of Loss 2000-2014
** Amounts rounded to the nearest dollar*

Flooding

There have been eight flooding events for the Furnas County. Of those eight events four events were flash floods and the other four were riverine floods. The Riverine floods caused $180,000 in property damage while the flash floods caused $55,000 in property damage. RMA reported a total loss of $140,382 from all types of flooding.

The county has no critical facilities in the 1% annual floodplain. There are no repetitive loss properties in the county. The initial FIRM for Furnas County was developed in March of 2009. Furnas County does participate in the NFIP, with two policies in effect worth $112,000 as of February 28, 2015.

High Winds

The NCDC reported 15 high wind events between January 1996 and December 2014 that resulted in $32,080 in property damages. RMA reported $9,234,786 in crop damages due to high winds.

Severe Thunderstorms
The NCDC reported 86 severe thunderstorms (wind, rain, and lightning) and 170 hail events between January 1996 and December 2014 that resulted in $84,310,000 in property damage. RMA reported $30,189,915.

Severe Winter Storms
NCDC reported 72 severe winter storms for Furnas County that resulted in $1,430,000 in property damage. RMA reported $729,331 in crop damage.

Tornados
NCDC reported seven tornados in Furnas County that resulted in $333,000 in property damage. Five of the seven tornados were rated an F/EF 0 and two tornados were rated an F/EF 1.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Unincorporated County Governance
The jurisdiction of Furnas County includes all unincorporated areas within the County boundaries. The Furnas County government structure is a three member Board of Commissioners. The Furnas County government includes the following departments and offices:

- Assessor
- Attorney
- Clerk
- Clerk of the District Court
- Clerk Magistrate
- Emergency Manager / Zoning Administrator
- Extension
- Highway Superintendent
- Sheriff
- Treasurer
- Veterans Services
- Weed Superintendent

Table FSC 15: Furnas County Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	Yes
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes, 2014
	Natural Resources Protection Plan	No
	Open Space Preservation Plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	Yes, 2010
	Building Codes	No
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire	Yes

Survey Components/Subcomponents		Comments
	safety, household preparedness, environmental education)	
	Natural Disaster or Safety related school programs	No
	StormReady Certification	Yes
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the

Table FSC **15** were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Furnas County has a Local Emergency Operations Plan that was last updated in 2014. The plan addresses natural and man-made disasters. This plan provides a clear assignment of responsibility during an emergency.

Furnas County has floodplain regulations that were last updated in 2010. The regulations meet minimum Federal and State requirements. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

Furnas County has the administrative staff and technical and fiscal capabilities to implement some mitigation projects without assistance. Larger projects such as safe rooms or drainage improvements may require that the county look to partner with the LRNRD, and other regional and state agencies. Through this update process, the planning team reviewed previously identified mitigation projects and added new projects as well.

Mitigation Strategy

Completed Mitigation Projects

Description	**Warning Systems**
Analysis	Implement Code Red for the county
Goal/Objective	Goal 4/ Objective 4.3
Hazard(s) Addressed	All Hazards
Funding	County funds
Timeline	Completed
Lead Agency	Board of Supervisors, Emergency Manager
Action since 2010 plan	Began using Code Red system in 2011

New/Ongoing Mitigation Projects

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP. Enable property owners to purchase insurance protection against flood losses.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	County General Funds
Timeline	Ongoing
Priority	Medium
Lead Agency	County Board, Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	Existing Staff
Potential Funding	County General Funds
Timeline	Ongoing
Priority	Low
Lead Agency	Floodplain Administrator
Action since 2010 plan	Will continue to work with the state to ensure proper management of floodplain. Will continue to assist local communities as requested.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	County General Funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	County Board, County Emergency Manager
Action since 2010 plan	Will need to gather information and work to develop in the future.

Description	Emergency Exercise: Hazardous Spill
Analysis	Utilize exercise to prepare for potential explosions or hazardous spills. Ensure that nearby businesses and residents have appropriate plans in place.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	Chemical Spills (Transportation)
Estimated Cost	$1,000+
Potential Funding	County General Funds, PDM, HMGP
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Furnas County Emergency Manager
Action since 2010 plan	This is a new action

Description	Shelter in Place
Analysis	Provide shelter in place training to facilities housing vulnerable populations (nursing homes, childcare facilities, schools, etc.).
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$1,000+
Potential Funding	County General Funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Furnas County Emergency Manager
Action since 2010 plan	This is a new action

Description	Develop an Agricultural Disease Response Action Plan
Analysis	Coordinate with farmers, USDA, UNL, and other local actors to develop a plan of action to contain or respond to disease outbreaks.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Agricultural Disease (Plant and Animal)
Estimated Cost	$10,000+
Potential Funding	County General Funds, PDM, USDA grant
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Furnas County Emergency Manager
Action since 2010 plan	This is a new action

Description	Agricultural Disease Outbreak Emergency Exercise
Analysis	Conduct an outbreak exercise with producers, emergency managers, veterinarians, extension agents, etc. to identify areas for improvement and become familiar with procedures.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	Agricultural Disease (Plant and Animal)
Estimated Cost	$3,000+
Potential Funding	County Gernal Funds, PDM, HMGP, USDA grant
Timeline	2 – 5 years
Priority	Low
Lead Agency	Furnas County Emergency Manager
Action since 2010 plan	This is a new action

Description	Mortality Management Plan
Analysis	Develop a routine and plan for emergency disposal of diseased animals which prevents the spread of disease.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Agricultural Disease (Animal)
Estimated Cost	$3,000+
Potential Funding	County General Funds, PDM, HMGP, USDA
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Furnas County Emergency Manager
Action since 2010 plan	This is a new action

Description	Alert/Warning Sirens
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or the placement of new sirens. Install new sirens and remote activation where lacking.
Goal/Objective	Goal 4/ Objective 4.3
Hazard(s) Addressed	All Hazards
Estimated Cost	$15,000+
Potential Funding	County General Funds, PDM, HMGP
Timeline	5+ years
Priority	Medium
Lead Agency	Local jurisdictions in County
Action since 2010 plan	This is a new action

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities and shelters.
Goal/Objective	Goal 2/ Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$3,500+ depending on site requirements
Potential Funding	County General Funds, PDM, HMGP
Timeline	2-5 years
Priority	Medium
Lead Agency	Furnas County Emergency Management
Action since 2010 plan	Identified Courthouse and emergency shelters as potential locations for generators.

Description	Emergency Operations
Analysis	Identify and establish an Emergency Operations Center.
Goal/Objective	Goal 4/ Objective 4.1
Hazard(s) Addressed	All Hazards
Estimated Cost	Unknown
Potential Funding	County General Funds, PDM, HMGP
Timeline	2-5 years
Priority	High
Lead Agency	Furnas County Emergency Management, Sheriff
Action since 2010 plan	This is a new action

Description	Infrastructure Assessment Study
Analysis	Conduct an assessment of bridges in the county and assess other potential areas of concern.
Goal/Objective	Goal 5/ Objective 5.2
Hazard(s) Addressed	All Hazards
Estimated Cost	$2,500+ per bridge estimate
Potential Funding	County General Funds, NDOR
Timeline	2-5 years
Priority	Medium
Lead Agency	Furnas County Roads Department
Action since 2010 plan	This is a new action

Description	Facility Monitoring
Analysis	Install security cameras in/around critical facilities and key infrastructure.
Goal/Objective	Goal 1/ Objective 1.1
Hazard(s) Addressed	Terrorism
Estimated Cost	$1,000+
Potential Funding	County General Funds
Timeline	2-5 years
Priority	High
Lead Agency	Furnas County Emergency Management, Sherriff
Action since 2010 plan	This is a new action

Description	Develop and Distribute Educational Materials
Analysis	Work to develop and distribute educational materials related to drought and drought impacts. Topics addressed may include, but are not limited to: xeriscaping, low-flow fixtures, smart irrigation systems, water collection devices/rain barrels, permeable surfaces, rain gardens, etc.
Goal/Objective	Goal 3/ Objective 3.1
Hazard(s) Addressed	Drought
Estimated Cost	$1,000+
Potential Funding	County General Funds
Timeline	2-5 years
Priority	Medium
Lead Agency	Furnas County Emergency Management
Action since 2010 plan	This is a new action

Description	Develop a Drought Management Plan
Analysis	Work with relevant stakeholders to develop a drought management plan. The drought management plan would identify water monitoring protocols, outline drought responses, identify opportunities to reduce water consumption, and establish the jurisdictional management procedures.
Goal/Objective	Goal 2/ Objective 2.2
Hazard(s) Addressed	Drought
Estimated Cost	$10,000+
Potential Funding	County General Funds, PDM, HMGP
Timeline	2-5 years
Priority	Medium
Lead Agency	Furnas County Emergency Management
Action since 2010 plan	This is a new action

Description	Remove Flow Restrictions
Analysis	Conduct a preliminary drainage assessment and/or design bridge improvements to reduce and/or alleviate flooding. Bridges typically serve as flow restrictions along streams and rivers. Cleanout and reshaping channel segments at bridge crossings can increase conveyance, reducing the potential for flooding. Replacing modifying bridges and other flow restrictions may be necessary to eliminate flooding threats and damages.
Goal/Objective	Goal 2/ Objective 2.2
Hazard(s) Addressed	Flooding
Estimated Cost	$5,000+
Potential Funding	County General Funds, HMGP, PDM
Timeline	2-5 years
Priority	Medium
Lead Agency	Furnas County Roads Department
Action since 2010 plan	This is a new action

Description	Fire Prevention Program: Planning and Training
Analysis	Participate in the Nebraska Forest Service Wildland Fire Protection Program which provides services in wildfire suppression training, equipment, pre-suppression planning, wildfire preventions, and aerial fire suppression.
Goal/Objective	Goal 3/ Objective 3.1
Hazard(s) Addressed	Grass/Wildfires
Estimated Cost	$500+
Potential funding	County General Funds
Timeline	2-5 years
Priority	Low
Lead Agency	Furnas County Emergency Management
Action since 2010 plan	This is a new action

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	County General Funds
Timeline	2-5 Years
Priority	High
Lead Agency	County Commissioners
Action since 2010 plan	Not yet started

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 – 100,000+
Potential Funding	HMGP, PDM, DNR, MRNRD, County General Funds
Timeline	5+ Years
Priority	Medium
Lead Agency	County Commissioners
Action since 2010 plan	Not yet started

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 to $100,000+
Potential Funding	County General Funds
Timeline	5+ Years
Priority	Medium
Lead Agency	County Commissioners
Action since 2010 plan	Not yet started

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	County General Funds, PDM, HMGP
Timeline	2 – 5 years
Priority	High
Lead Agency	Furnas County Emergency Manager
Action since 2010 plan	Currently identifying facilities in need of weather radios

Removed Mitigation Projects

Description	Flood Prone Property Acquisition
Analysis	Voluntary acquisition and demolition of properties prone to flooding will reduce the general threat of flooding for communities. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.
Hazard(s) Addressed	Flooding
Reason for Removal	No repetitive loss properties in the county

Description	Stabilize/Anchor Fertilizer, Fuel and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement. If left unanchored tanks could present major threat to property and safety in a tornado or high wind event.
Hazard(s) Addressed	Tornados and High Winds
Reason for Removal	No longer needed

City of Arapahoe

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The City of Arapahoe participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Arapahoe attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Arapahoe, the top concerns that were identified through this planning process include grass/wildfire, hail, severe thunderstorms, severe winter storms, and tornados.

The following people were involved in the development of Arapahoe's Participant Section:

Table APH 1: City of Arapahoe Plan Contributors

Name	Title	Department / Organization
Chris Middagh	President of Council	City of Arapahoe
Roger Powell	Furnas County Emergency Manager	Furnas County

This section contains important information about the City of Arapahoe relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

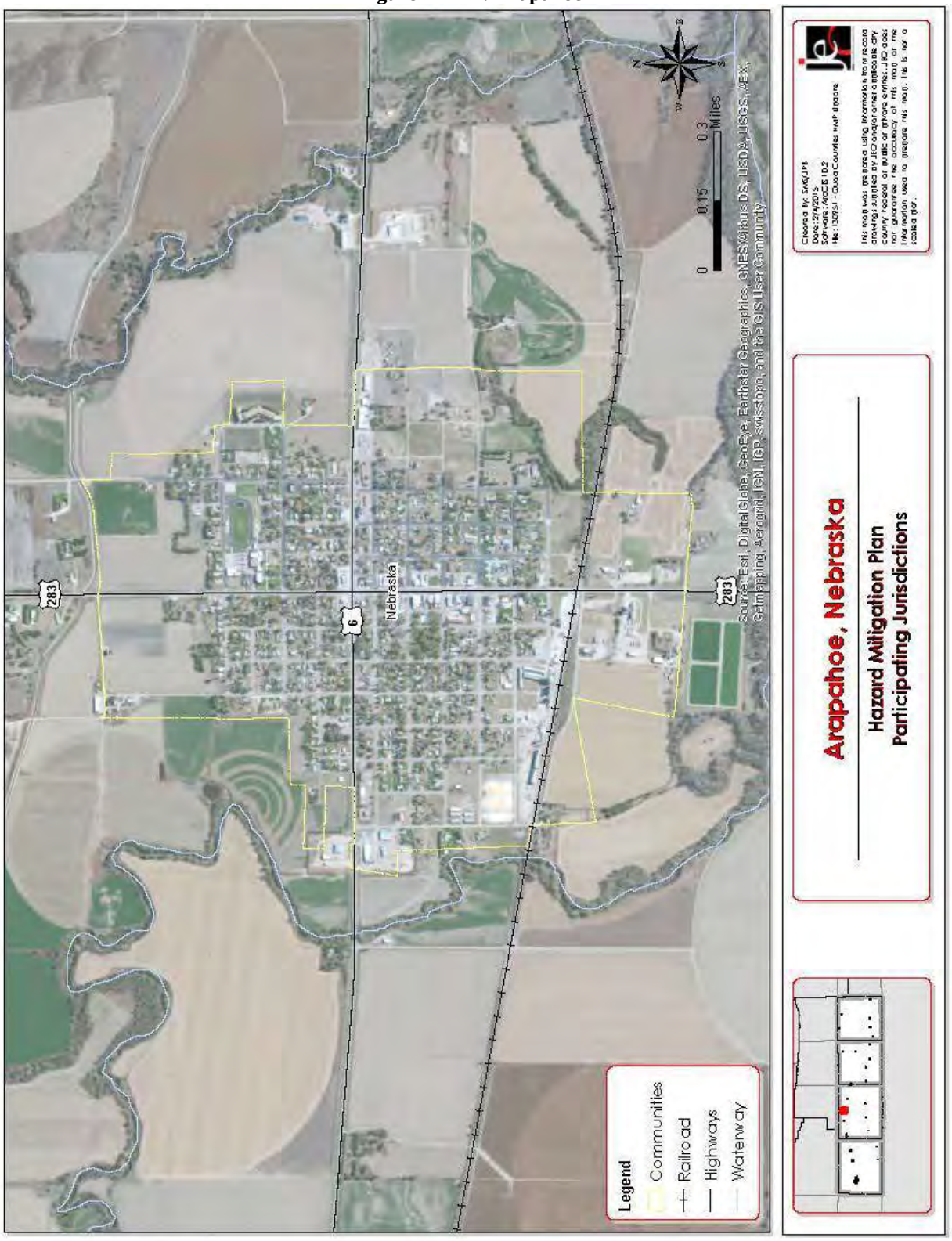
Location/Geography

Arapahoe is a city located in the north central portion of Furnas County. The City of Arapahoe covers an area of 640 acres and has an elevation of 2,178 feet above sea level. Arapahoe is 51 miles southwest of Kearney. The topographic region Arapahoe lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. They city has two creeks that pass nearby. Muddy Creek passes to the west of the city and Elk Creek passes to the east of the city.

Transportation

Figure APH 1 shows the transportation routes for the City of Arapahoe. The city has two major highways US HWY 6 and US HWY 283. According to the Nebraska Department of Roads the average daily traffic count for US HWY 6 to the east of Arapahoe is 2,640 vehicles per day with 445 of those being heavy trucks. US HWY 6 to the west of Arapahoe averages 2,470 vehicles per day with 430 of those being heavy trucks. US HWY 283 has an average traffic count of 1,415 vehicles with 250 of those being heavy trucks north of Arapahoe and 1,045 vehicles with 225 of those being heavy trucks to the south of the city. The city also has one rail line that passes through the southern portion of the city.

Figure APH 1: Arapahoe



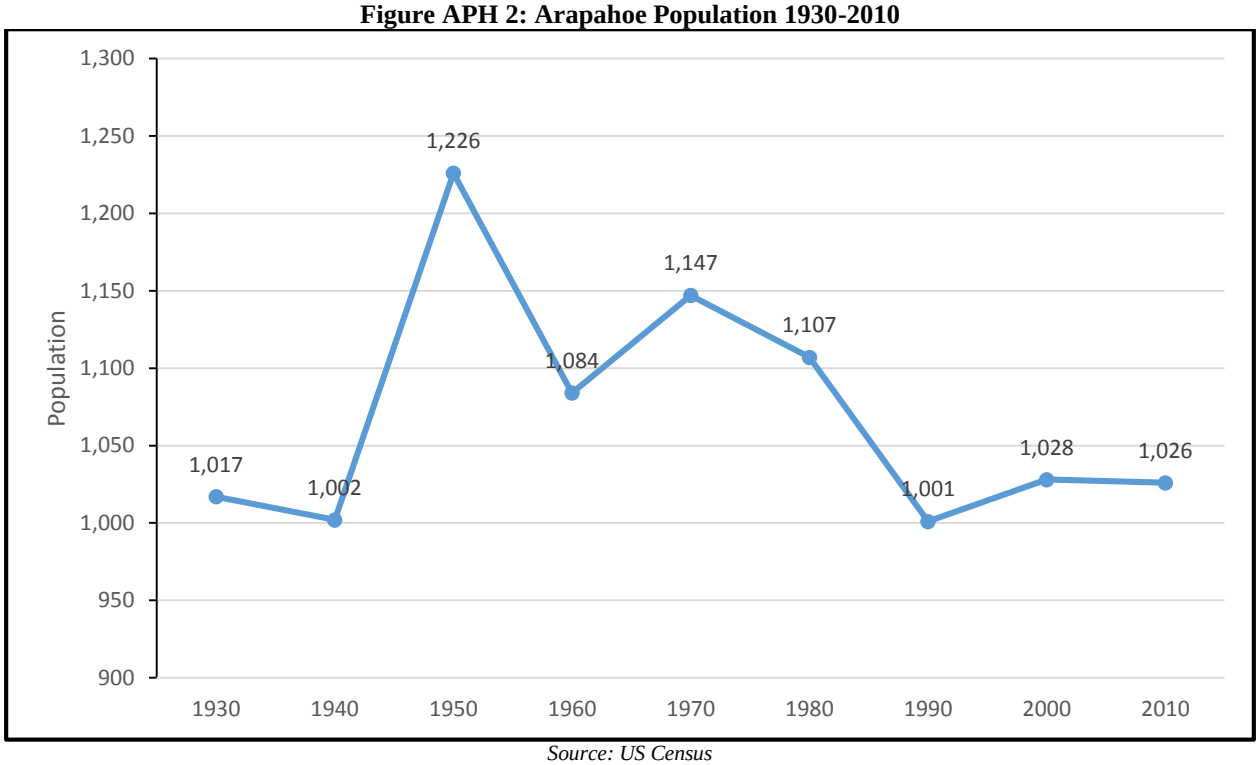
Climate

All the climate data for the city has been taken from a station located in Cambridge (251415). Please refer to the *Cambridge Section* for a climate summary for the city.

Demographics

Figure APH 2 displays the population for Arapahoe from 1930 to 2010. Since 2000 the population has leveled out and remained relatively stable around 1,025. A stable in population results in a reliable tax revenue for the city, which can make it easier implement mitigation projects.

Figure APH 2: Arapahoe Population 1930-2010



Source: US Census

Table APH 22 illustrates the age distribution and median age for Furnas County in comparison to the City of Arapahoe. The city has roughly the same percentage of the population over the age of 64 around 23 percent. The median age for the city is about one year younger than that of the county.

Table APH 2: Arapahoe Age Distribution

Age	Furnas County	Arapahoe
<5	5.2%	6.7%
5-64	71.7%	69.7%
>64	23.1%	23.6%
Median	47.4	46.3

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the City of Arapahoe in

Table **APH** 3. The median home value for the city is $6,300 more than that of the county and rent values are $180 higher. The median income for the city is $13,600 less than that of the county. The lower income and higher cost of living could lead to a future decline in population.

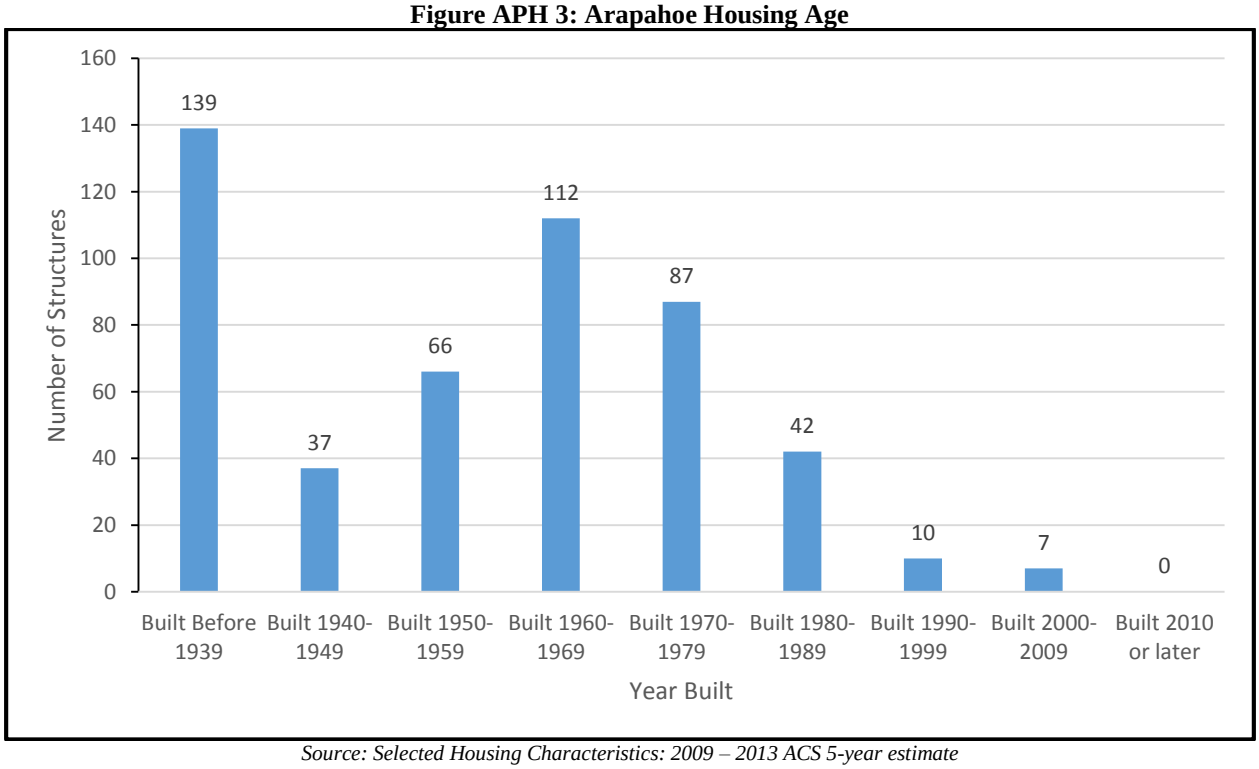
Table APH 3: Arapahoe Housing Value and Income

	Furnas County	Arapahoe
Median Household Income[1]	$51,458	$37,813
Per Capita Income[1]	$22,068	$23,285
Median Home Value[2]	$56,400	$62,700
Median Rent[2]	$488	$669

[1]Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Figure APH **3**) the city has 500 housing units with 91 percent of those units occupied (
Table APH 4). There are nine mobile homes located in the city. Over 48 percent of the city's housing stock was built before 1960. Although there are mobile homes in the community, they are not located in a single identified mobile home park in the city, but are spread throughout the city. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados.

Figure APH 3: Arapahoe Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table APH 4: Arapahoe Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Furnas County	2,215	81.6%	501	18.4%		1,602	72.3%	613	27.7%
Arapahoe	454	90.8%	46	9.2%		315	69.4%	139	30.6%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the City of Arapahoe are agriculture and forestry (22.1%), educational services and health care (16.1 %), and manufacturing (13.6%).

The major employers for the City of Arapahoe include Cargill, Arapahoe Public Schools, and Paulsen Inc.

Structural Inventory

GIS parcel data was not available for communities within Furnas County. Data from the Nebraska Department of Revenue Property Assessment Division that provides valuations of property by sector was used for communities in Furnas County. Results from the structural inventory completed for the City of Arapahoe and are found in Table APH 5.

Table APH 5: Arapahoe Sutural Inventory and Valuation

Jurisdiction	Commercial/Industrial	Agriculture	Residential	Public/Quasi Public	Total
Arapahoe	$6,531,292	$258,000	$20,582,749	$898,729	$28,270,770

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Arapahoe planning team as a part of the plan update. Table6 and

Figure **APH 4** provide a summary of the type and location of critical facilities for the jurisdiction.

Table APH 6: List of Critical Facilities

Critical Facility Number	Critical Facility
1	City Shop
2	Green River Church
3	State Road Department
4	Catholic Church
5	Lutheran Church
6	Water Tower
7	Bus Barn
8	Elementary School
9	High School
10	Episcopal Church
11	Hunt Nebraska
12	Methodist Church
13	Fire Hall
14	City Hall
15	Legion Hall
16	Good Samaritan Nursing Home
17	Power Plant
18	Church of Christ

Figure APH 4: Arapahoe Critical Facilities Map

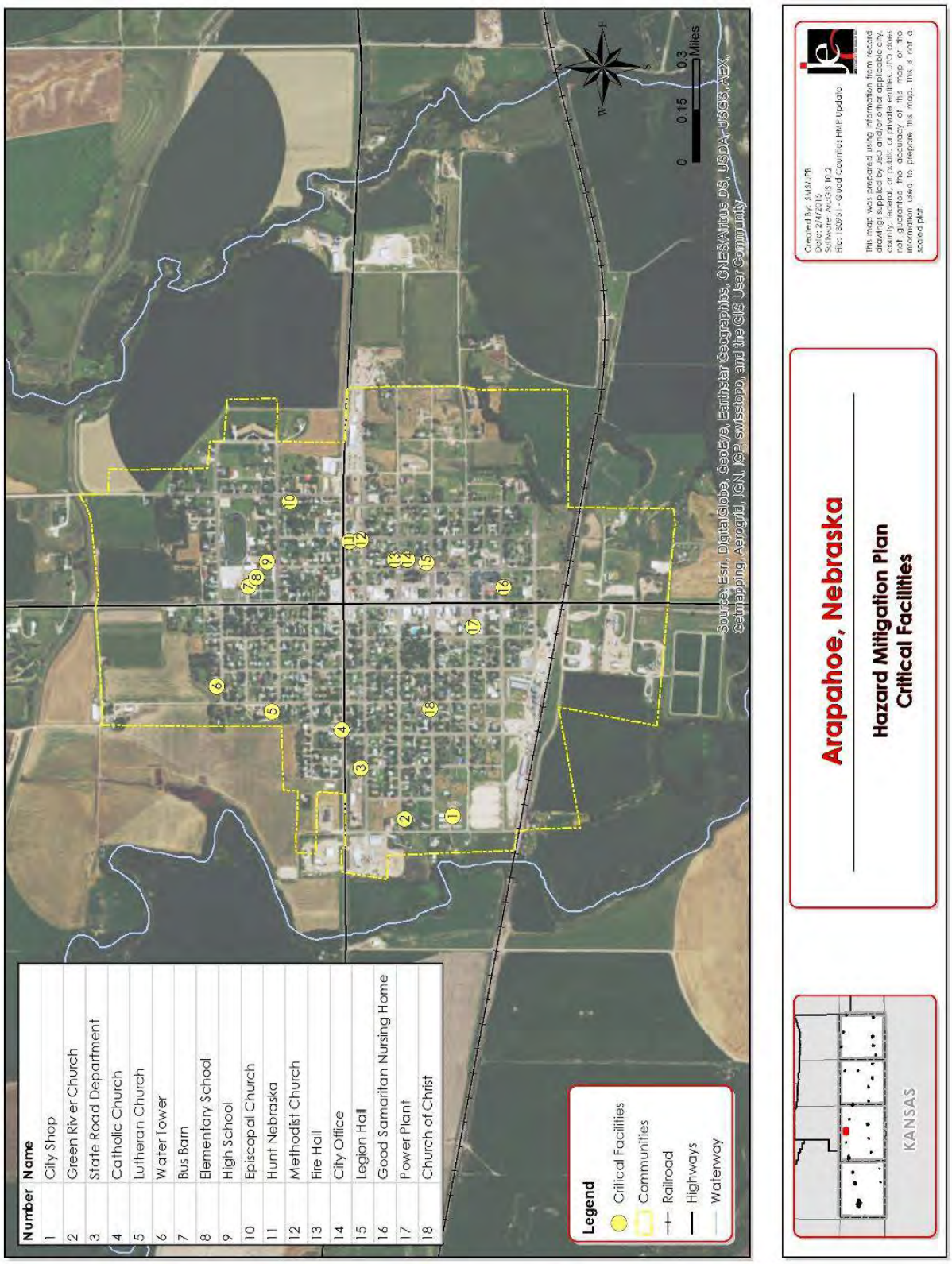
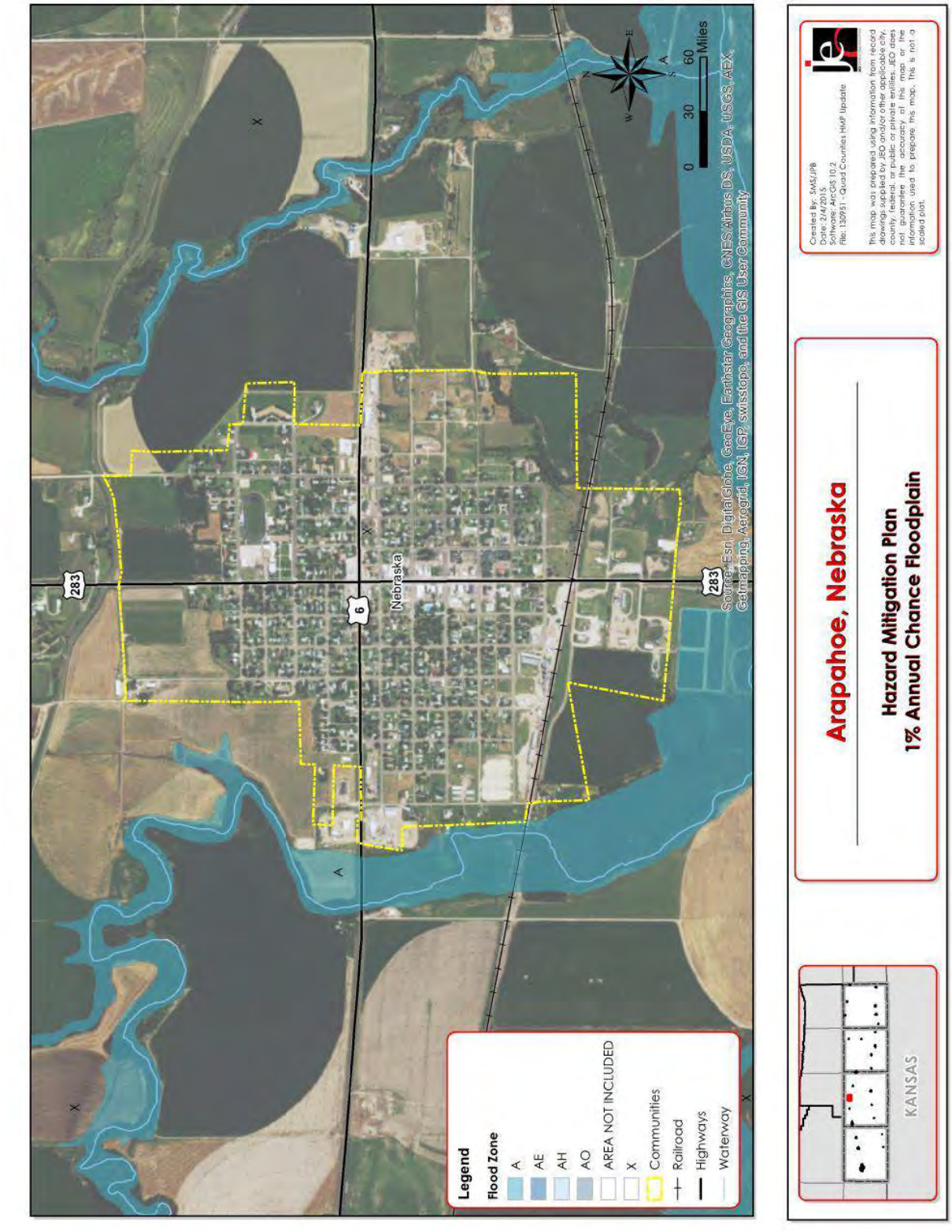


Figure APH 5 shows the 1% annual flood risk area for the City of Arapahoe. The city has no structures or critical facilities in the floodplain. There are no repetitive loss properties in the city. The initial FIRM for Arapahoe of was developed in March of 2009. Arapahoe does not participate in the NFIP due to the lack of structures in the floodplain and lack of reported damages. However, the jurisdiction has identified participation in the NFIP as a mitigation action.

Figure APH 5: Arapahoe 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of six chemical storage sites in the City of Arapahoe, and one of these houses materials that are categorized as hazardous. Table APH 7 lists only facilities that house hazardous materials.

Table APH 7: Chemical Storage Fixed Site

Facility	Address	Hazardous Material
Level 3 Communications LLC	72294 Road 429, Arapahoe	Sulfuric Acid

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sites located in the City of Arapahoe.

Future Development Trends

No residential or commercial developments are currently planned for the next five years. Any future development will be discouraged in hazardous areas, such as the floodplain.

Risk Assessment

Hazard Identification

Table APH8 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table APH 8: Arapahoe Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Sites)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfire*	Yes	Property damage, potential injuries or loss of life
Hail*	Yes	Property damage
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damage, power outages
Severe Winter Storm*	Yes	Power outages
Terrorism	No	None
Tornado*	Yes	Significant property damages, potential injuries or loss of life

** Identified as a top concern by the local planning team*

The top five hazards in Arapahoe are grass/wildfire, hail, severe thunderstorms, severe winter storms, and tornados. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 37 severe weather events from 1996 to 2014 in the City of Arapahoe. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table APH 9 provides a summary of events that caused damage.

Table APH 9: Arapahoe Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
7/7/1996	Thunderstorm Wind	55 kts./ 63 mph	0	0	$25,000
7/28/1996	Hail	1.75 in.	0	0	$5,000
6/11/1997	Hail	1.75 in.	0	0	$75,000
6/15/1997	Hail	1.25 in.	0	0	$40,000
5/21/1998	Hail	1.5 in.	0	0	$5,000
5/2/1999	Tornado	F0	0	0	$15,000
5/14/1999	Thunderstorm Wind	52 kts./60 mph	0	0	$15,000
6/29/2000	Hail	1 in.	0	0	$200,000
5/29/2004	Thunderstorm Wind	70 kts./ 81 mph	0	0	$150,000
5/28/2005	Hail	2 in.	0	0	$30,000
7/9/2005	Thunderstorm Wind	61 kts./ 70 mph	0	0	$25,000
7/9/2005	Thunderstorm Wind	52 kts./60 mph	0	0	$25,000
7/9/2005	Thunderstorm Wind	52 kts./60 mph	0	0	$25,000
7/12/2007	Thunderstorm Wind	52 kts./60 mph	0	0	$30,000
8/7/2007	Thunderstorm Wind	52 kts./60 mph	0	0	$25,000
5/29/2008	Hail	2.75 in.	0	0	$25,000
6/5/2008	Hail	1.75 in.	0	0	$5,000
5/5/2009	Hail	1 in.	0	0	$5,000
7/22/2009	Hail	1 in.	0	0	$10,000
7/8/2013	Thunderstorm Wind	61 kts./ 70 mph	0	0	$4,000
6/1/2014	Lightning		0	0	$15,000
6/6/2014	Thunderstorm Wind	52 kts./60 mph	0	0	$25,000
6/14/2014	Hail	2.75 in.	0	0	$250,000
6/14/2014	Hail	1.75 in.	0	0	$75,000

Source: NCDC

Grass/Wildfire

According to the Nebraska Forest Service, there have been 88 wildfires near Arapahoe from 2000 to 2014. These wildfires have burned a total of 1,444 acres. The local firefighting resources were determined to be sufficient to handle local events. The water supply is also sufficient for local events.

Hail

The NCDC reported 18 hail events in Arapahoe between January 1996 and December 2014 that resulted in $725,000 in property damages.

Severe Thunderstorms
Severe thunderstorms occur several times a year in Arapahoe and the rest of the planning area. The NCDC recorded 16 severe thunderstorms between January 1996 and December 2014. These storms resulted in $364,000 in property damages. Severe thunderstorms have the potential to cause significant property damages and power outages.

Severe Winter Storms
Severe winter weather occurs in Arapahoe and the planning area annually. NCDC reports severe winter storms at the county level. According to the NCDC, Furnas County had 72 severe winter storms between January 1996 and December 2014.

Tornado
NCDC only reports one tornado occurring in Arapahoe from 1996 to 2014. This tornado was rated as an F0 tornadic event. The tornado touched down just west of town and caused $15,000 in property damages.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed0 by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance
The City of Arapahoe is governed by a mayor and a six member city council. The City of Arapahoe government includes the following departments and offices:

- Utilities
- Attorney
- Clerk
- Library
- Fire and Rescue

Table APH 2: Arapahoe Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	Yes
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No

Survey Components/Subcomponents		Comments
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	No
	Building Codes	Yes
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	No
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No

Survey Components/Subcomponents		Comments
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table APH 2 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Arapahoe has an annex to the Furnas County Local Emergency Operations Plan, which was last updated in 2014. This plan discusses a number of hazards that can affect the community. The plan also provides a clear assignment of responsibility during an emergency.

The Furnas County Comprehensive Plan addresses certain hazards such as flooding. The plan discourages development within hazardous areas, such as the floodplain. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

Arapahoe has the administrative staff and technical and fiscal capabilities to implement some mitigation projects without assistance. Larger projects such as drainage improvements may require that the city look to partner with Furnas County, LRNRD, and other regional and state agencies. Through this update process, the planning team reviewed previously identified mitigation projects and added new projects as well.

Mitigation Strategy

New/Ongoing Mitigation Projects

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to critical facilities
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$20,000 to $50,000 per generator
Funding	Municipal funds, PDM, HMGP
Timeline	2-5 years
Priority	High
Lead Agency	City Council
Action since 2010 plan	Identified Fire Hall as needing backup generator

Description	Stormwater System and Drainage Improvements
Analysis	Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Municipal funds

Description	Stormwater System and Drainage Improvements
Timeline	2 – 5 years
Priority	Medium
Lead Agency	City Council
Action since 2010 plan	Not yet started

Description	Participate in the NFIP
Analysis	Participate in the NFIP. Enable property owners to purchase insurance protection against flood losses.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Municipal funds
Timeline	2-5 years
Priority	High
Lead Agency	City Council
Action since 2010 plan	Does not currently participate.

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	HMGP, PDM, Municipal funds
Timeline	1 year
Priority	Medium
Lead Agency	Emergency Manager, Fire Department
Action since 2010 plan	Not yet started

Removed Mitigation Projects

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer needed.

Arapahoe Public Schools

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

Arapahoe Public Schools participated in this hazard mitigation plan in order to reduce the risk to life for its faculty, staff, and students, as well and to its property from hazards. Their participation was extensive; a representative from Arapahoe Public Schools attended every public meeting, met individually with members from the planning team, completed all hazard identification and project identification worksheets, engaged the general public in the planning process, and assisted in interdepartmental coordination and data analysis.

For Arapahoe Public Schools, the issues of top concern that were identified through this planning process include severe thunderstorms, severe winter storms and tornados.

The following people were heavily involved in the development of Arapahoe Public Schools' Participant Section:

Table ARPS 1: The School District Plan Contributors

Name	Title	Department / Organization
Charles Curnyn	Superintendent	Arapahoe Public Schools
Roger Powell	Furnas County Emergency Manager	Furnas County

This section contains important localized information about the school district relevant to hazard mitigation, including the following elements:

- Location / Services
- Demographics
- Critical Facilities
- Plan Integration
- Risk Assessment
- Administration / Capability Assessment
- Mitigation Actions

Location/Services

Arapahoe Public Schools operates two schools within the City of Arapahoe. The school district provides services to students in the communities of Arapahoe, Edison, and Holbrook.

Demographics

There are 330 students enrolled in Arapahoe Public Schools. During the 2014-2015 school year there were 200 students in the elementary school and 131 students in the high school. The school district also employs 35 faculty and staff.

In the 2013-2014 school year the district had about 44 percent of students in the school on free or reduced lunch. The school had a mobility rate of 12 percent during the 2013-2014 school year. About 20 percent of students are reported as being in Special Education. Table ARPS 2 shows the number of students by race and ethnicity for the 2013-2014 school year. The Department of Education did not report the number of students who are classified as English Learners.

Table ARPS 2: Number of Students by Race

Year	American Indian/Alaskan Native	Asian	Black/African American	Hispanic	Native Hawaiian or Other Pacific Islander	White	Two or More Races
2013-2014	3	2	1	10	0	301	6

Source: Nebraska Department of Education

Critical Facilities

The school district operates two facilities. These facilities are listed below, along with information indicating the school's address, the year the structure was built, previously hazard damages, it's location in a Special Flood Hazard Area, the presence of a tornado safe room, the presence of a weather radio, and the structure's value.

Table ARPS 3

School	Arapahoe Elementary School
Address	610 Walnut St. Arapahoe, NE
Damages	None
Structure in Floodplain	No
Number of Students	200
Number of Staff	35
Tornado Safe Rooms	No
Weather Radio	No
Building Valuations	$6,254,696

School	Arapahoe High School
Address	610 Walnut St. Arapahoe, NE
Damages	None
Structure in Floodplain	No
Number of Students	131
Number of Staff	35
Tornado Safe Rooms	No
Weather Radio	No
Building Valuations	$6,254,697

Risk Assessment

Table ARPS 4 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table ARPS 4

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Fixed Sites	No	None
Chemical Transportation	No	None
Dam Failure	No	None
Drought	Yes	None
Earthquakes	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfires	Yes	None
Hail	No	None
High Winds	No	None
Levee Failure	No	None
Severe Thunderstorms*	Yes	Injuries or loss of life possible
Severe Winter Storms*	Yes	Injuries or loss of life possible
Terrorism	No	None
Tornados*	Yes	Injuries or loss of life possible

**Identified as a top concern by the jurisdiction*

Severe Thunderstorms

Severe thunderstorms occur multiple times annually within the Arapahoe school district. There have been no recorded damages from severe thunderstorms within the school district. Severe thunderstorms have the potential to cause damage to the school, trees, and lead to power outages.

Severe Winter Storms

Severe winter storms occurs annually within the Arapahoe school district. Although there have been no recorded damages from severe winter storms, the school district may be vulnerable to impacts. Severe winter weather can cause damage to the school roof, trees, and lead to power outages.

Tornados

Tornados have the potential to cause significant damages and loss of life. There have been previous occurrences of tornados within the school district, however, there has not been any damages associated with those events.

Plan Integration

Building safe and smart communities can be accomplished through effective plan integration. Integrating hazard mitigation principles into other local planning mechanisms can greatly increase a school district's level of resiliency. This planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. Available plans were analyzed using

guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

The school district has an emergency operations plan, which indicates the proper procedures during situations such as: severe storms, tornados, fire, active shooter, etc. The school also conducts an annual safety audit as a requirement of Rule 10. Rule 10 is the mandated rules and procedures for accreditation by Nebraska Department of Education. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Administration/Capability Assessment

The school district has a superintendent, two principals, and 5 assistant principals. The school board is made up of a six member panel. The school district also has two administrative secretaries (one for the elementary school and one for the high school) and a bookkeeper.

The school's superintendent would be main actor in overseeing the implementation of mitigation actions in school facilities. The school currently does a number of education and outreach programs These programs include natural disaster and safety related school programs (tornado, fire, and shelter-in-place drills) as well as ongoing public education and information programs (through the Local Safety Committee).

Mitigation Actions

Completed Mitigation Actions

The school district did not identify any specific mitigation actions in the previous plan.

New Mitigation Actions

Description	**Backup Generators**
Analysis	Provide a portable or stationary source of backup power to critical facilities.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$35,000
Potential Funding	HMGP, PDM, School Funds
Timeline	2-5 years
Priority	High
Lead Agency	School Board, Superintendent
Action since 2010 plan	Not yet started. This is a new action

Description	**Safe Rooms**
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as school buildings.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, School Funding
Timeline	2 – 5 years
Priority	Medium
Lead Agency	School Board, Superintendent
Action since 2010 plan	Not yet started. This is a new action

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City of Beaver City

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The City of Beaver City participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Beaver City attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Beaver City, the top concerns that were identified through this planning process include drought, severe thunderstorms, severe winter storms, and tornados. The following people were heavily involved in the development of Beaver City's Participant Section:

Table BVC 1: City of Beaver City Plan Contributors

Name	Title	Department / Organization
Angie Woodring	Beaver City Clerk	Beaver City

This section contains important information about the City of Beaver City relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

Location/Geography

Beaver City is located in the east central portion of Furnas County. Beaver City covers an area of 448 acres and have an elevation of 2,178 feet above sea level. Beaver City is 56 miles southwest of Kearney. The topographic region Beaver City lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. Beaver City has one waterway that is near the city. Beaver Creek is located to the south of the city and does flow through the southeast portion of the city.

Transportation

Figure BVC 1 shows the major transportation routes for Beaver City. There is one major highway that passes through the city which in NE HWY 89. According to the Nebraska Department of Roads the average daily traffic count for NE HWY 89 is 730 vehicles to the east of the city with 65 of those being heavy trucks and 710 vehicles with 70 of those being heavy trucks to the west of the city. There is one rail line that runs through the south portion of Beaver City.

Figure BVC 1: Beaver City

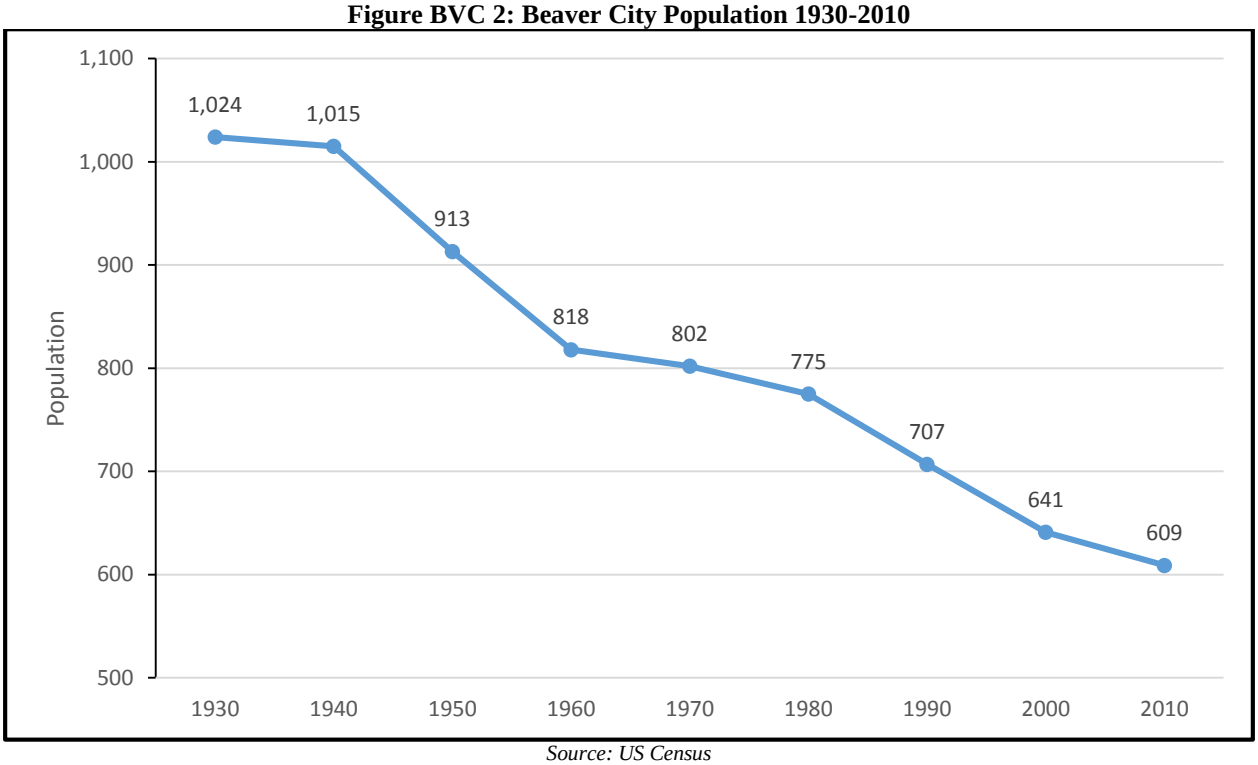
Climate

All the climate data for the city has been taken from a station located in Beaver City (250640). Please refer to the *Furnas County Section* for a climate summary for the city.

Demographics

Figure BVC 2 displays the population for Beaver City from 1930 to 2010. The population for Beaver City has declined since 1930. A decrease in population results in a decrease in tax revenue for the city, which can make it more difficult to fiscally implement mitigation projects.

Figure BVC 2: Beaver City Population 1930-2010



Source: US Census

Table BVC2 illustrates the age distribution and median age for Furnas County in comparison to Beaver City. The city has roughly the same percentage of the population over the age of 64 around 23 percent. The median age for the city is about the same as the median age for the county.

Table BVC 2: Beaver City Age Distribution

Age	Furnas County	Beaver City
<5	5.2%	6.9%
5-64	71.7%	69.7%
>64	23.1%	23.6%
Median	47.4	47.1

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the City of Beaver City in Table BVC3. The median home value for the city is $21,800 lower than that of the county, and rent values are about $40 lower than the county. The population has decreased in the last decade as noted in the demographic section, the lower cost of living compared with the rest of the county may be due to the aging housing stock. As these structures age they may be more vulnerable to hazards if they are not cared for.

Table BVC 3: Beaver City Housing Value and Income

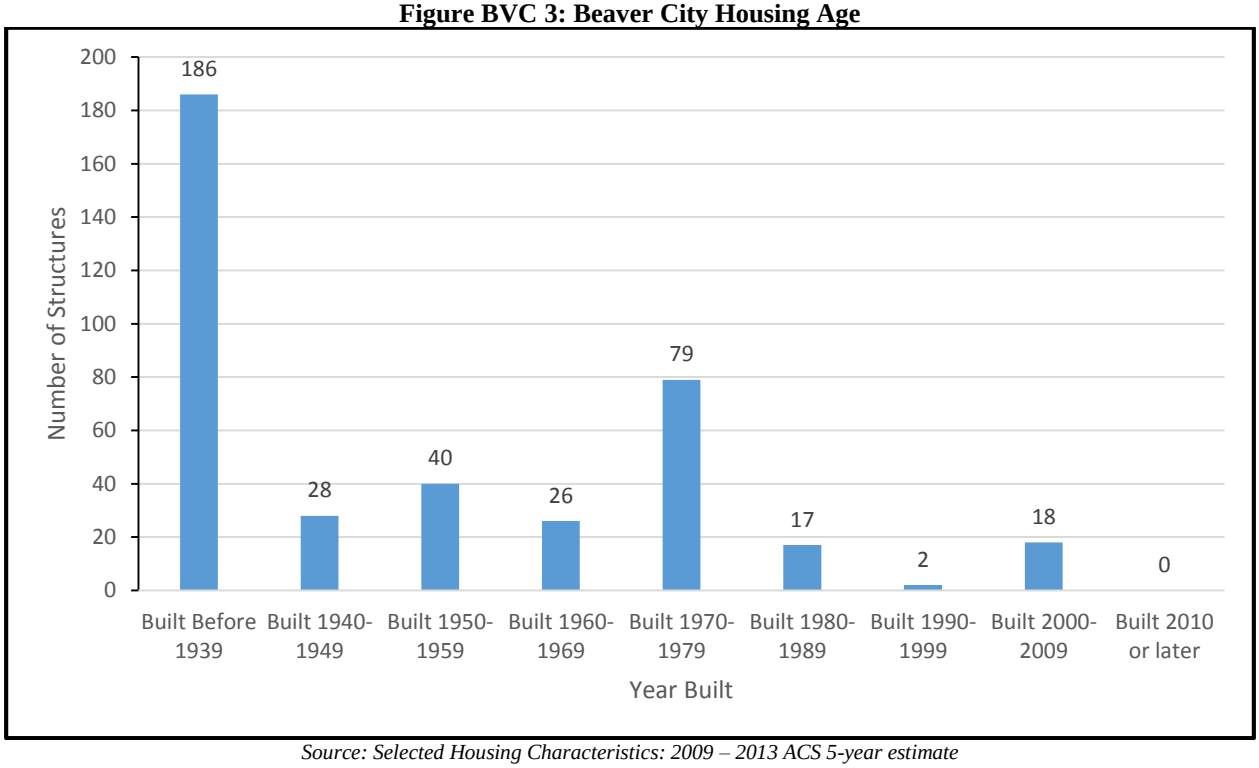
	Furnas County	Beaver City
Median Household Income[1]	$51,458	$30,982
Per Capita Income[1]	$22,068	$17,035
Median Home Value[2]	$56,400	$34,600
Median Rent[2]	$488	$447

[1]*Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate*
[2]*Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate*

According to the U.S. Census Bureau data (Figure BVC 3) the city has 396 housing units with 73 percent of those units occupied (

Table **BVC**4). Vacant structures are more likely to fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. Nearly eight percent of the city's housing stock is classified as mobile homes. Over 64 percent of the city's housing stock was built before 1960. Although there are mobile homes in the community, they are not located in a single identified mobile home park. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados.

Figure BVC 3: Beaver City Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table BVC 4: Beaver City Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Furnas County	2,215	81.6%	501	18.4%		1,602	72.3%	613	27.7%
Beaver City	287	72.5%	109	27.5%		216	75.3%	71	24.7%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the City of Beaver City are educational services and health care (24.4%), retail trade (18.8 %), and manufacturing (12.5%).

The major employers for the City of Beaver City include the courthouse, nursing home, and Kaufman Trailers. A large percentage of residents commute to other communities, including Norton, Kansas.

Structural Inventory

GIS parcel data was not available for communities within Furnas County. Data from the Nebraska Department of Revenue Property Assessment Division that provides valuations of property by sector was used for communities in Furnas County. Results from the structural inventory completed for the City of Beaver City and are found in Table BVC 5.

Table BVC 5: Beaver City Structural Inventory and Valuation

Jurisdiction	Commercial/Industrial	Agriculture	Residential	Public/Quasi Public	Total
Beaver City	$2,020,002	$288,000	$9,094,784	$372,098	$11,774,884

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Beaver City planning team as a part of the plan update. Table BVC **2**6 is a summary of the type and location of critical facilities for the jurisdiction.

Table BVC 2: Critical Facilities

Critical Facility Number	Critical Facility
1	Courthouse
2	Senior Center
3	7th Day Adventist
4	Christian Church
5	Presbyterian Church
6	Evangelical Church
7	Methodist Church
8	Library
9	Community Building
10	Friendship Center
11	Free Methodist Church
12	Community Church
13	City Office/ Fire Department
14	Ambulance Building

Critical Facility Number	Critical Facility
15	Soil Office
16	Post Office
17	Light Plant
18	Fairgrounds
19	Fairgrounds
20	Kaufman Trailers
21	Ball Fields
22	Southern Valley Elementary

Figure BVC 4: Beaver City Critical Facilities Map

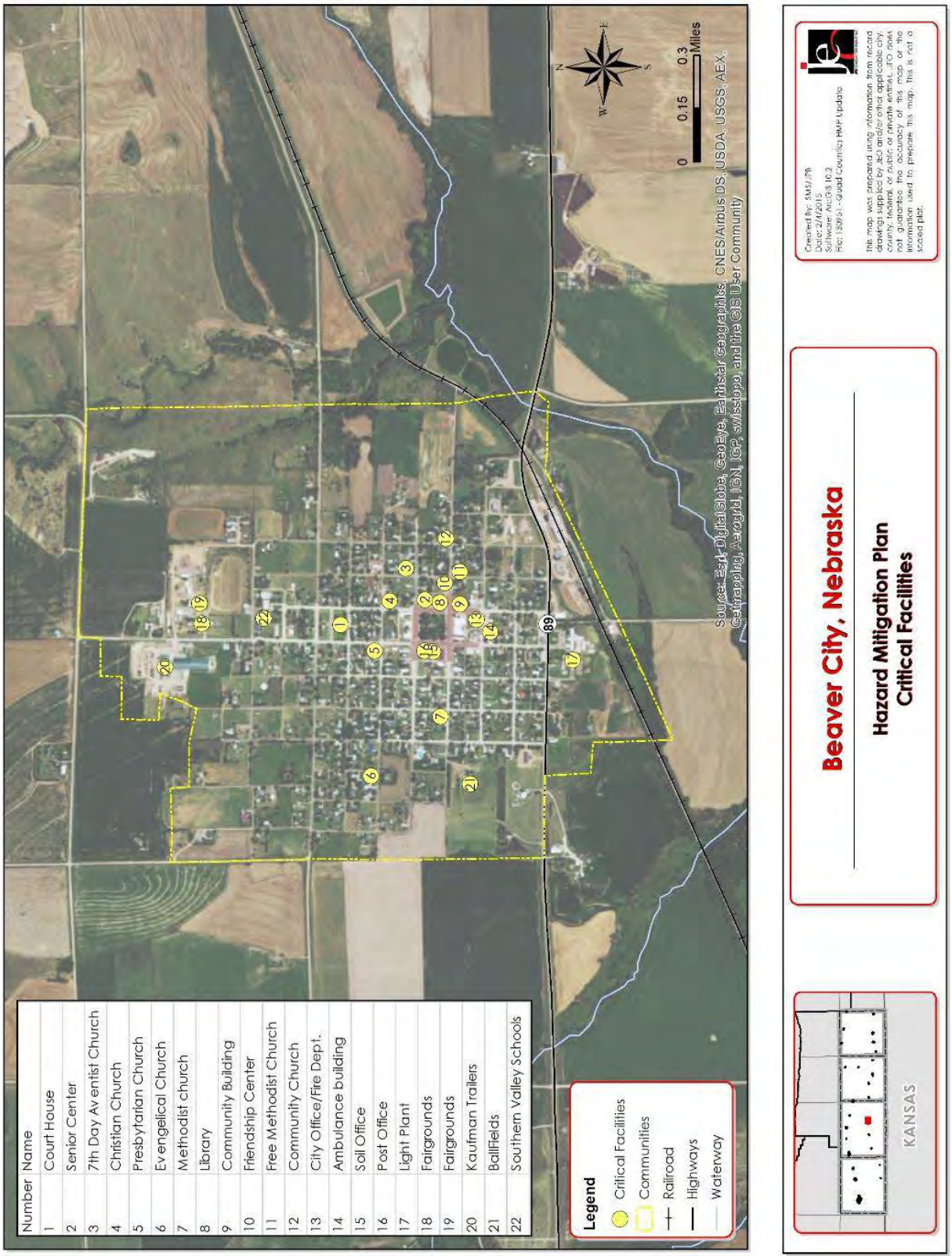
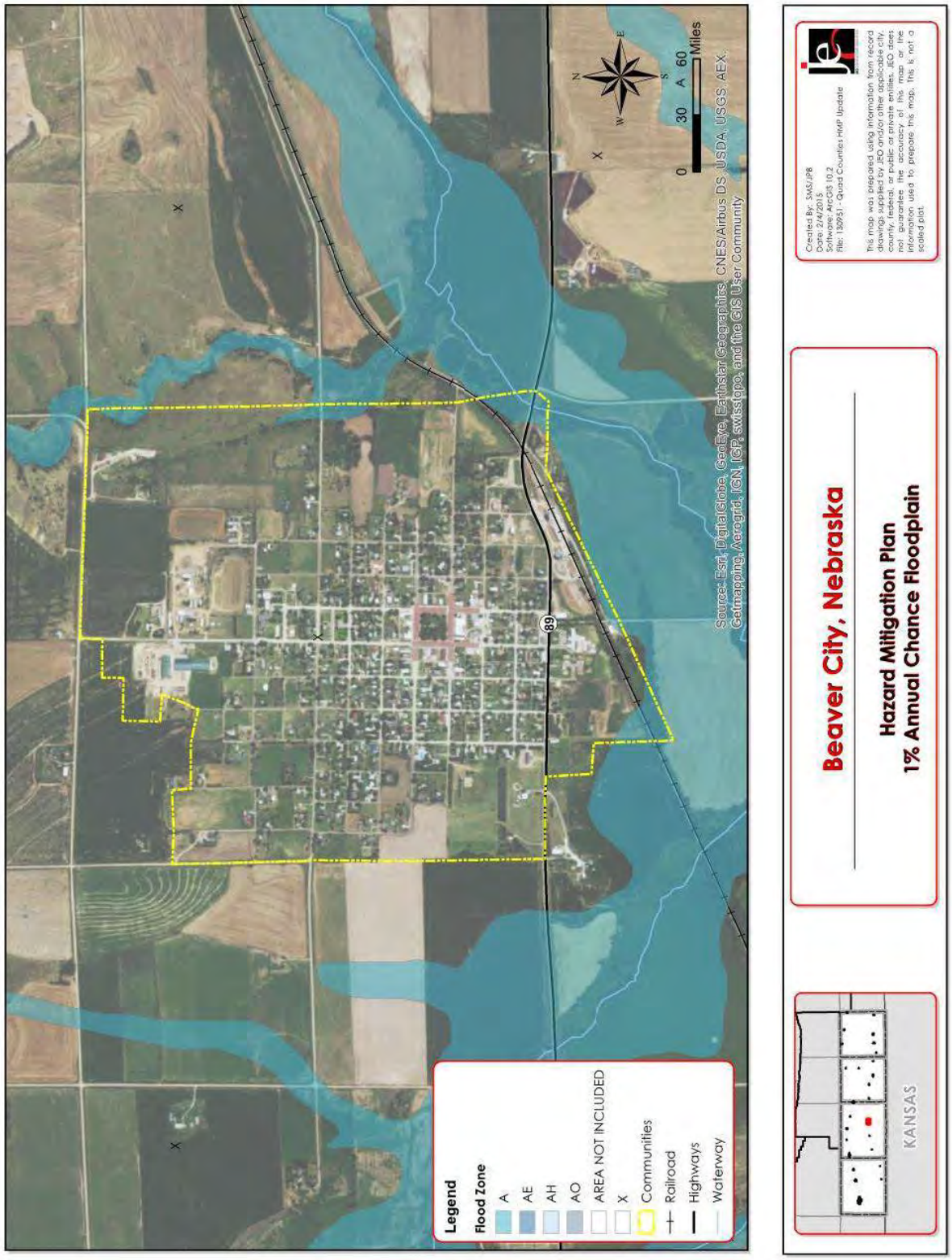


Figure BVC **5** shows the 1% annual flood risk area for the City of Beaver City. The city has no structures or critical facilities in the floodplain. The initial FIRM for Beaver City was developed in August of 1988 and revised in March of 2009. Beaver City does participate in the NFIP, but does not have any policies in effect as of February 28, 2015.

Figure BVC 5: Beaver City 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are no chemical storage sites in the City of Beaver City

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sites located in the Beaver City.

Future Development Trends

In the past five years, several old houses have been torn down. No new residential or commercial developments are planned in the next five years. Future development will be discouraged in hazardous areas, such as the floodplain.

Risk Assessment

Hazard Identification

Table BVC 7 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table BVC 7: Beaver City Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought*	Yes	Economic impacts
Earthquake	No	None
Extreme Heat*	Yes	Strain on electrical infrastructure, power outages, potential injuries
Flooding	No	None
Grass/Wildfire	Yes	None
Hail	Yes	None
High Winds	Yes	None
Levee Failure	No	None
Severe Thunderstorms*	Yes	Property damages and injuries
Severe Winter Storm*	Yes	Property damages, power outages, and injuries
Terrorism	No	None
Tornado*	Yes	Significant property damages, and potential loss of life

** Identified as a top concern by the local planning team*

The top hazards in Beaver City are drought, extreme heat, severe thunderstorms, severe winter storms and tornados. These hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 42 severe weather events from 1996 to 2014 in Beaver City. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table BVC8 provides a summary of the events that caused damage.

Table BVC 8: Beaver City Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/6/1996	Hail	1.25 in.	0	0	$5,000
8/4/1996	Lightning	-	0	0	$3,000
6/27/1999	Thunderstorm Wind	69 kts./ 79 mph	0	0	$200,000
6/19/2000	Hail	0.75 in.	0	0	$40,000
6/29/2000	Thunderstorm Wind	61 kts./ 70 mph	0	0	$1,000,000
6/29/2000	Thunderstorm Wind	56 kts./ 64mph	0	0	$200,000
9/14/2001	Heavy Rain	6 in.	0	0	$10,000
5/22/2004	Tornado	F0	0	0	$10,000
5/22/2004	Tornado	F1	0	0	$300,000
5/22/2007	Hail	1 in.	0	0	$5,000
7/8/2007	Thunderstorm Wind	52 kts./ 60 mph	0	0	$10,000
7/31/2009	Hail	1 in.	0	0	$10,000
6/14/2012	Hail	1.75 in.	0	0	$50,000

Source: NCDC

Drought

The NDMC reported that Beaver City experienced 317 months in at least D2 drought. The longest drought of at least D2 began in July 1954 and ended in January 1965. The city has not reported any losses or having to implement water restrictions due to drought. Drought was named a top concern by the local planning team because this hazard can cause negative economic impacts to the local economy.

The city does not have a drought monitoring board or drought plan. The city does not require native plantings of irrigation limits on residents. The city has sufficient water supply and is not looking for additional sources.

Extreme Heat

Extreme heat occurs several times a year in Beaver City. During extreme heat events, electricity needs can strain the electrical infrastructure resulting in power outages. Power outages during these extreme heat events can led to injuries and be potentially lethal to vulnerable populations.

Severe Thunderstorms

NCDC reported 16 severe thunderstorm (wind, lighting and rain) events and 24 hail events between January 1996 and December 2014 that resulted in $1,533,000 in property damage.

Severe Winter Storms

NCDC reported 72 severe winter storm events for Furnas County, including Beaver City. These storms resulted in $1,425,000 in property losses.

Tornados

The NCDC reported two tornados for the city between January 1996 and December 2014. An F1 tornado in May 2004 caused $300,000 in property damage. The other tornado that occurred was an F0 and it occurred in May 2004 and caused $10,000 in property damage.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

The City of Beaver City is governed by a mayor and a six member city council. The City of Beaver City government includes the following departments and offices:

- Utilities Department
- Clerk
- Volunteer Fire Department

Table BVC 9: Beaver City Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes

Survey Components/Subcomponents		Comments
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	Yes, Consultant
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process

also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table BVC9 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Beaver City has an annex to the Furnas County Local Emergency Operations Plan, which was last updated in 2014. This plan discusses a number of hazards that can affect the community. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The City of Beaver City has the administrative staff and technical and fiscal capabilities to implement some mitigation projects without assistance. Larger projects such as safe rooms or drainage improvements may require that the city look to partner with the county emergency management, Furnas County, LRNRD, and other regional and state agencies. Through this update process, the planning team reviewed previously identified mitigation projects and added new projects as well.

Mitigation Strategy

Completed Mitigation Projects

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to critical facilities
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$20,000 to $50,000 per generator
Funding	Municipal funds
Lead Agency	City Council
Action since 2010	Completed. Purchased portable generator in 2013.

Description	Alert/Warning Sirens
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or upgraded. Install new sirens and remote activation where lacking.
Goal/Objective	Goal 4 /Objective 4.3
Hazard(s) Addressed	All Hazards
Estimated Cost	$15,000+
Funding	Municipal funds
Lead Agency	City Council, Emergency Manager
Action since 2010	Completed. New siren was purchased in 2012 and located at 912 R Street.

New/Ongoing Mitigation Projects

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as schools, and critical facilities.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Village funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Utility Superintendent
Action since 2010	Not yet started

Description	Stormwater System and Drainage Improvements
Analysis	Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, City funds

Description	Stormwater System and Drainage Improvements
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Utility Superintendent
Action since 2010	Not yet started

Description	NFIP Continuation and Enforcement
Analysis	Enforcement of floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs); and Description of community assistance and monitoring activities.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	N/A
Timeline	Ongoing
Priority	Medium
Lead Agency	Floodplain Administrator
Action since 2010	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Goal/Objective	Goal 5/Objective 5.2
Hazard(s) Addressed	Severe winter storms, severe thunderstorms, tornados, high winds
Estimated Cost	$2,000
Potential Funding	Municipal funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Clerk, City Council
Action since 2010	Not yet started

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	Municipal funds
Timeline	2 – 5 years
Priority	Low
Lead Agency	City Council, Fire Department, Emergency Manager
Action since 2010	Not yet started

Removed Mitigation Projects

Description	Hazardous Tree Removal
Analysis	Identify and remove hazardous trees and limbs
Hazard(s) Addressed	Severe Thunderstorms, Tornados, High Winds, and Severe Winter Storms
Reason of Removal	This is a regular part of city maintenance program. City employees continually identify and remove hazardous trees and tree limbs.

Description	Stabilize/Anchor Fertilizer, Fuel, and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement. If left unanchored tanks could present major threat to property and safety in a tornado or high wind event.
Hazard(s) Addressed	Flooding, High Winds
Reason for Removal	No unanchored tanks in community.

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer needed. No streams in need of stabilization.

Description	Floodplain Regulation Enforcements and Updates
Analysis	Continue to enforce local floodplain regulations for structures located in the 1% annual floodplain. Strict enforcement of the type of development and elevations of structures should be considered through issuance of building permits by any Nebraska city. Continue education of building inspectors or Certified Floodplain Managers.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer needed as mitigation action. Regular part of maintaining good standing in the NFIP. This mitigation action and floodplain management are included within the NFIP Continuation and Enforcement mitigation action.

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer needed as mitigation action. Regular part of maintaining good standing in the NFIP. This mitigation action and floodplain regulation enforcements and updates are included within the NFIP Continuation and Enforcement mitigation action.

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Hazard(s) Addressed	All hazards
Reason for Removal	No facilities are in need of weather radios at this time.

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City of Cambridge

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The City of Cambridge participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Cambridge attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Cambridge, the top concerns that were identified through this planning process include drought, flooding, severe thunderstorms, severe winter storms, and tornados.

The following local representatives were involved in the development of Cambridge's Participant Section:

Table CBG 1: City of Cambridge Plan Contributors

Name	Title	Department / Organization
Greg Howerter	Sewer Plant Operator	City of Cambridge
Micheal Tomlin	Water Operator	City of Cambridge
Clint Wickizer	Lineman	City of Cambridge
David Houghtelling	Utilities Supervisor	City of Cambridge
Kandra Kinne	City Clerk	City of Cambridge
Mark Harpst	Cambridge Mayor	City of Cambridge
Roger Powell	Furnas County Emergency Manager	Furnas County

This section contains important information about the City of Cambridge relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

Location/Geography

Cambridge is a city located in the northwest portion of Furnas County. The City of Cambridge covers an area of 512 acres and has an elevation of 2,264 feet above sea level. Cambridge is approximately 64 miles southwest of Kearney. The topographic region Cambridge lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. There are two waterways that are near the city. Medicine Creek flows through the north portion of the city and joins the Republican River south of the eastern city limits. The Republican River flows south of the city.

Transportation

Figure CBG **1** shows the major transportation routes for the city. There are two major highways that pass through the city US HWY 6 and NE HWY 47 According the Nebraska Department of Roads the average daily traffic count for US HWY 6 is 2,820 vehicles with 365 of those being heavy trucks passing to the east of the city, and 3,050 vehicles with 390 of those being heavy trucks passing to the west of the city. NE HWY 47 ends in the city and has an average daily traffic count of 745 vehicles with 75 of those being heavy trucks. There is one rail line that runs through the south portion of the city. Chemicals are normally transported through the city. The only critical facility located along the main transportation routes is the Hospital located on Highway 6 and about 200 yards from the rail line.

Figure CBG 1: Cambridge

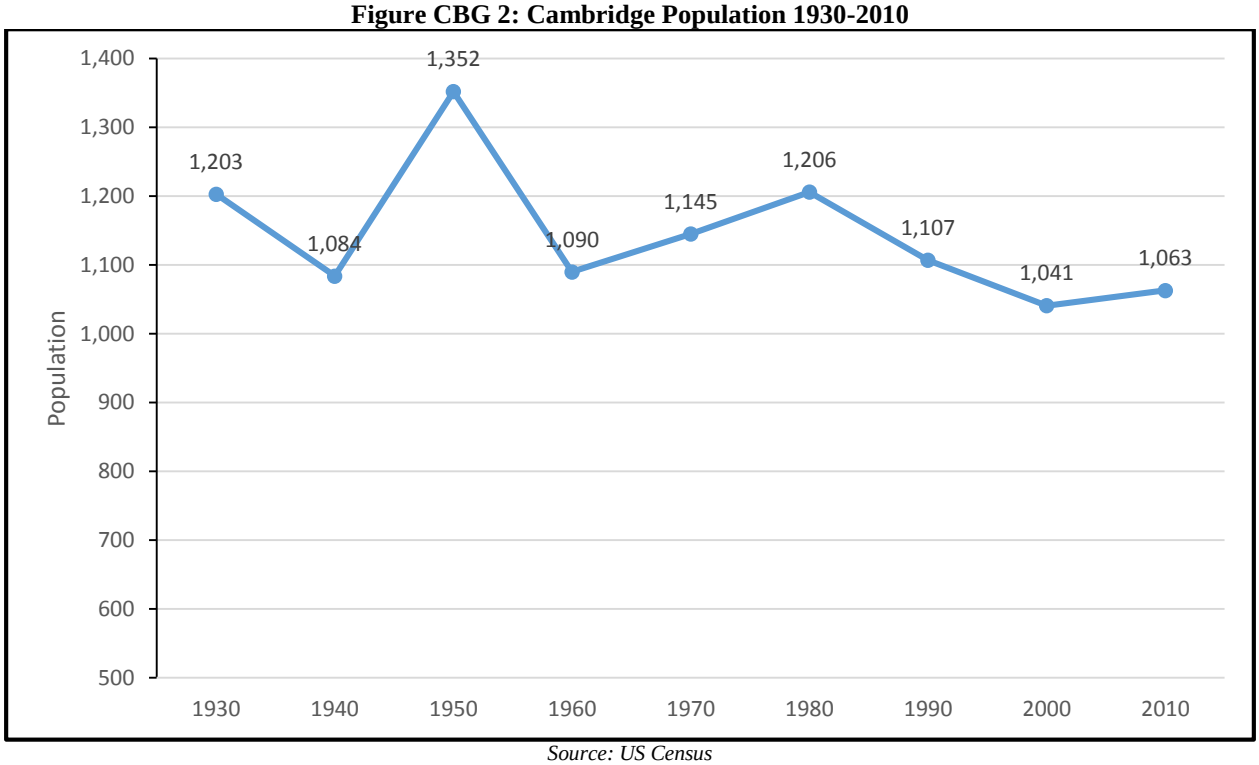
Climate

Please refer to the *Furnas County Section* for a climate summary for the city.

Demographics

Figure CBG 2 displays the population for Cambridge from 1930 to 2010. The population has fluctuated since 1930. A fluctuating population goes through periods of growth and decline. When there is a decrease in population it results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects. When there is a growing population that results in more tax revenue for the community to implement hazard mitigation projects.

Figure CBG 2: Cambridge Population 1930-2010



Source: US Census

Table CBG2 illustrates the age distribution and median age for Furnas County in comparison to the City of Cambridge. The city has a higher percentage of population over the age of 64 by about 3 percent. The median age for the city and county is about the same.

Table CBG 2: Cambridge Age Distribution

Age	Furnas County	Cambridge
<5	5.2%	5.4%
5-64	71.7%	68.3%
>64	23.1%	25.9%
Median	47.4	47.6

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the City of Cambridge in Table CBG3. The median home value for the city is $7,100 more than that of the county, and rent values are very comparable. The median income for the city is $13,200 less than that of the county. The lower income and higher cost of living could explain the fluctuation in population discussed in the demographic section.

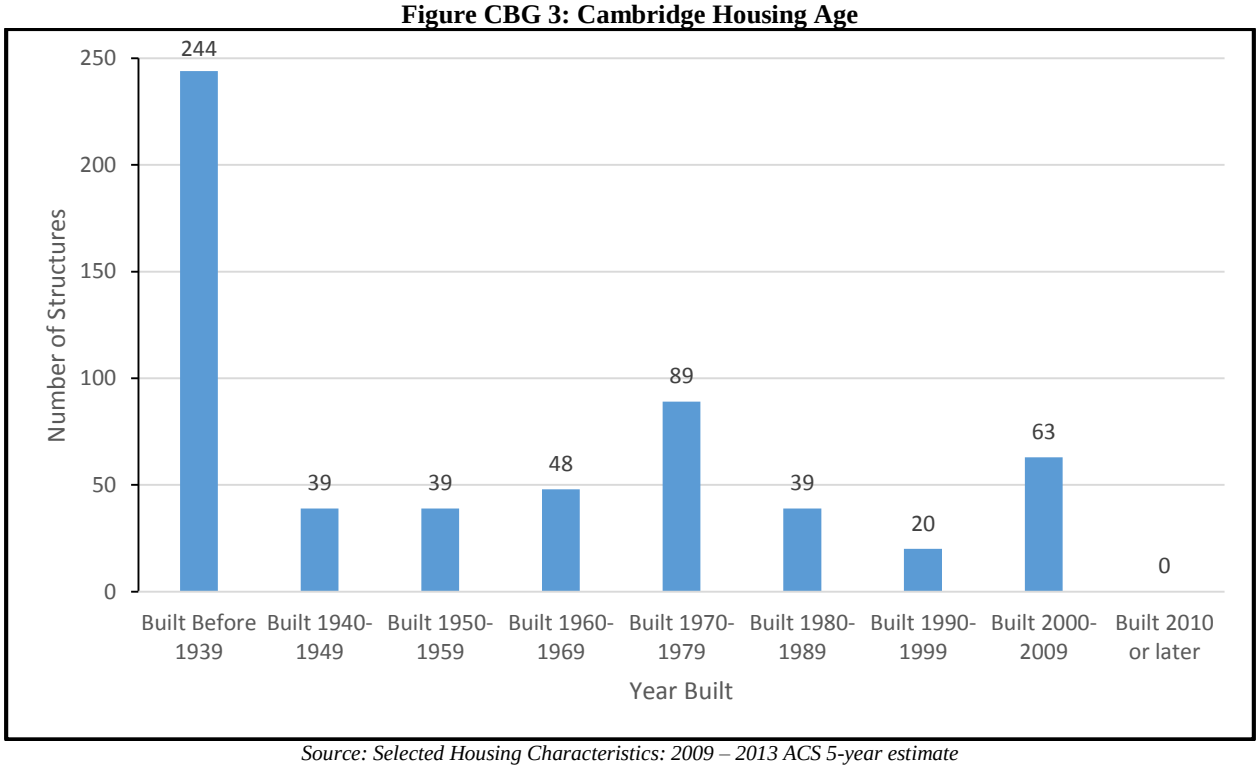
Table CBG 3: Cambridge Housing Value and Income

	Furnas County	Cambridge
Median Household Income[1]	$51,458	$38,235
Per Capita Income[1]	$22,068	$22,065
Median Home Value[2]	$56,400	$63,500
Median Rent[2]	$488	$471

1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Figure CBG **3**) the city has 581 housing units with 87 percent of those units occupied (
Table CBG **44**). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. There are 10 mobile homes located in the village. Over 55 percent of the city's housing stock was built before 1960. Although there are mobile homes in the community, they are not located in a single identified mobile home park in the city, but are spread throughout the city. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados. Over 79 percent of the city's housing was built before the first FIRM for the city in 1980. Houses built prior to this year may not be constructed above the base flood elevation.

Figure CBG 3: Cambridge Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table CBG 4: Cambridge Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Furnas County	2,215	81.6%	501	18.4%		1,602	72.3%	613	27.7%
Cambridge	506	87.1%	75	12.9%		331	65.4%	175	34.6%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the City of Cambridge are educational services and health care (35.2%), retail trade (12.6%), and transportation and warehousing, and utilities (9%).

The major employers for the City of Cambridge include Tri-Valley Health System, Cambridge Public School, Twin Valleys Public Power District, Nebraska Corn Processers, and Frenchman Cambridge Irrigation.

Structural Inventory

GIS parcel data was not available for communities within Furnas County. Data from the Nebraska Department of Revenue Property Assessment Division that provides valuations of property by sector was used for communities in Furnas County. Results from the structural inventory completed for the City of Cambridge and are found in Table CBG 5

Table CBG 5: Cambridge Structural Inventory and Valuation

Jurisdiction	Commercial/Industrial	Agriculture	Residential	Public/Quasi Public	Total
Cambridge	$4,516,566	$84,000	$24,037,291	$749,974	$29,387,831

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Cambridge planning team as a part of the plan update. Table CBG6 and

Figure CBG 4 is a summary of the type and location of critical facilities for the jurisdiction. Three critical facilities have backup generators and one facility has an area that can be used for shelter during storms, but it is not built to the FEMA 361 requirements.

Table CBG 6: Critical Facilities

Critical Facility Number	Critical Facility
1	Water Tower
2	Cambridge Manor
3	Cambridge Hospital
4	Twin Valley Public Power
5	St. Paul Lutheran Church
6	Cambridge Public School
7	St. John Catholic Church
8	Congregational Church
9	Methodist Church
10	Power Plant
11	Museum & Library
12	Baptist Church
13	Community Building & City Office
14	U.S. Post Office
15	Department of Natural Resources
16	Senior Center
17	Medical Clinic
18	Fire Barn
19	Ethanol Plant
20	Sewer Plant

Figure CBG 4: Cambridge Critical Facilities Map

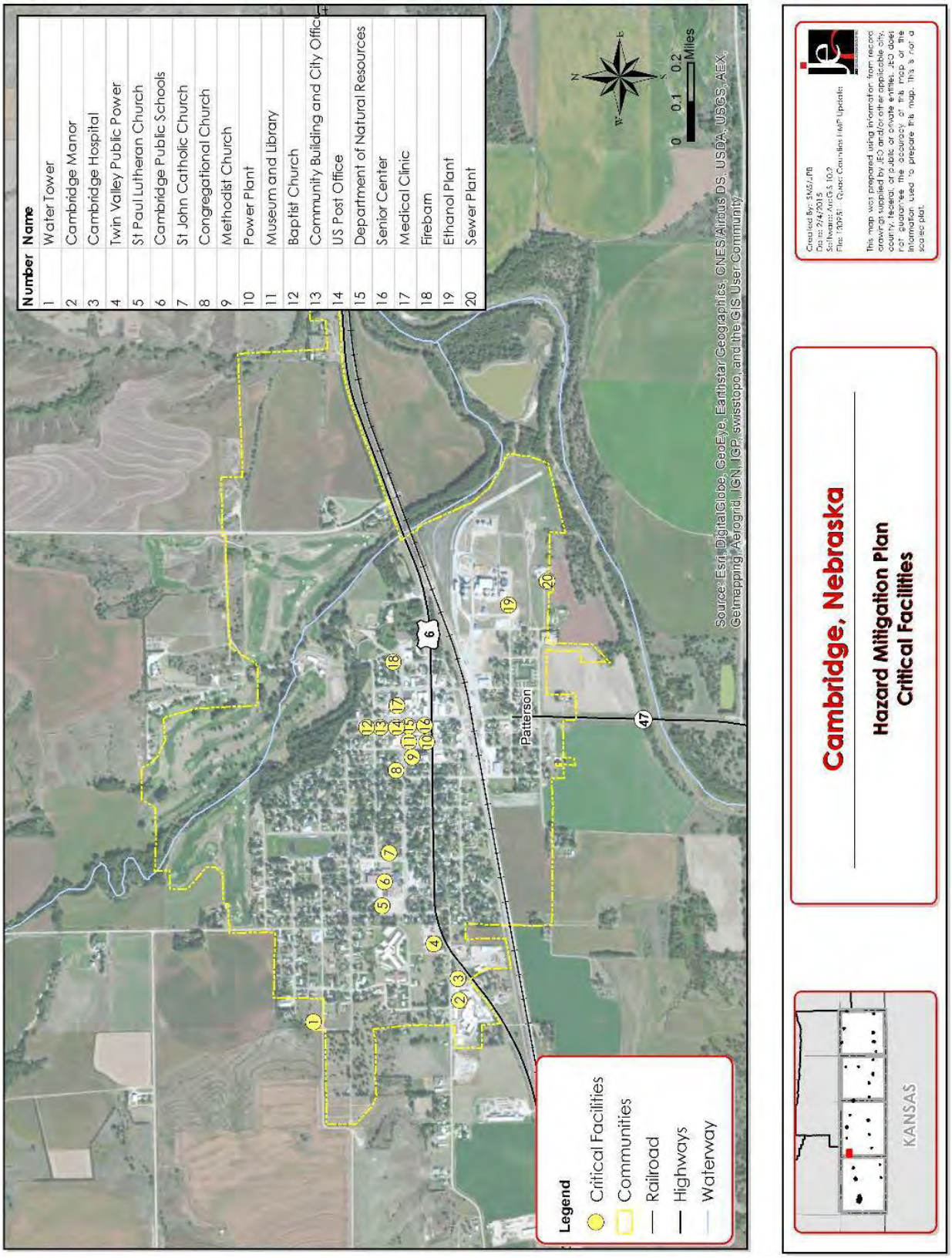


Figure CBG 5 shows the 1% annual floodplain for the City of Cambridge. The city has 2 commercial buildings and 7 residential structures in the floodplain. There are no critical facilities located in the floodplain. The initial FIRM for Cambridge was developed in March of 1980 and revised in March of 2009.Cambridge does participate in the NFIP, with three policies in effect worth $337,000 as of February 28, 2015.

Figure CBG 5: Cambridge 1% Annual Chance Floodplain

Levees

There is one levee located in the village. Figure CBG 6 shows the location of the levee. The levee is 1.31 miles in length and protects 576.84 acres. The levee is owned by the city of Cambridge. The levee does not provide 1% annual flood protection.

Figure CBG 6: Cambridge Levee Location

Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of six chemical storage sites in the City of Cambridge and three of these house materials that are categorized as hazardous. Table CBG7 lists facilities that house hazardous materials only. In addition to the facilities listed Extreme Ag Inc. stores pesticides and herbicides at its facility. The hospital is less than a half mile from Ag Valley Co-op and Nebraska Corn is located within the city limits. The local volunteer fire department would be the first response if a spill were to occur. The Furnas County Sheriff and Furnas County Emergency Manager would also respond to a chemical spill.

Table CBG 7: Chemical Storage Fixed Sites

Facility	Address	Hazardous Material
Ag Valley Co-Op Non Stock	40827 Highway 6/34, Cambridge	Anhydrous Ammonia, Paraquat Dichloride
Cambridge Telephone Company	622 Paxton St., Cambridge	Sulfuric Acid
Nebraska Corn Processing LLC	107 Potter St., Cambridge	Cyclohexylamine, Sulfuric Acid

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there two historic sites located in the City of Cambridge. There is one site in the 1% annual floodplain.

Table CBG 8: National Historic Registry

Site Name	Date Listed	Classification	In Floodplain?
Cambridge State Aid Bridge	6/29/1992	Structure	Yes
W. H. Faling House	11/22/1999	Building	No

Source: Nebraska State Historical Society

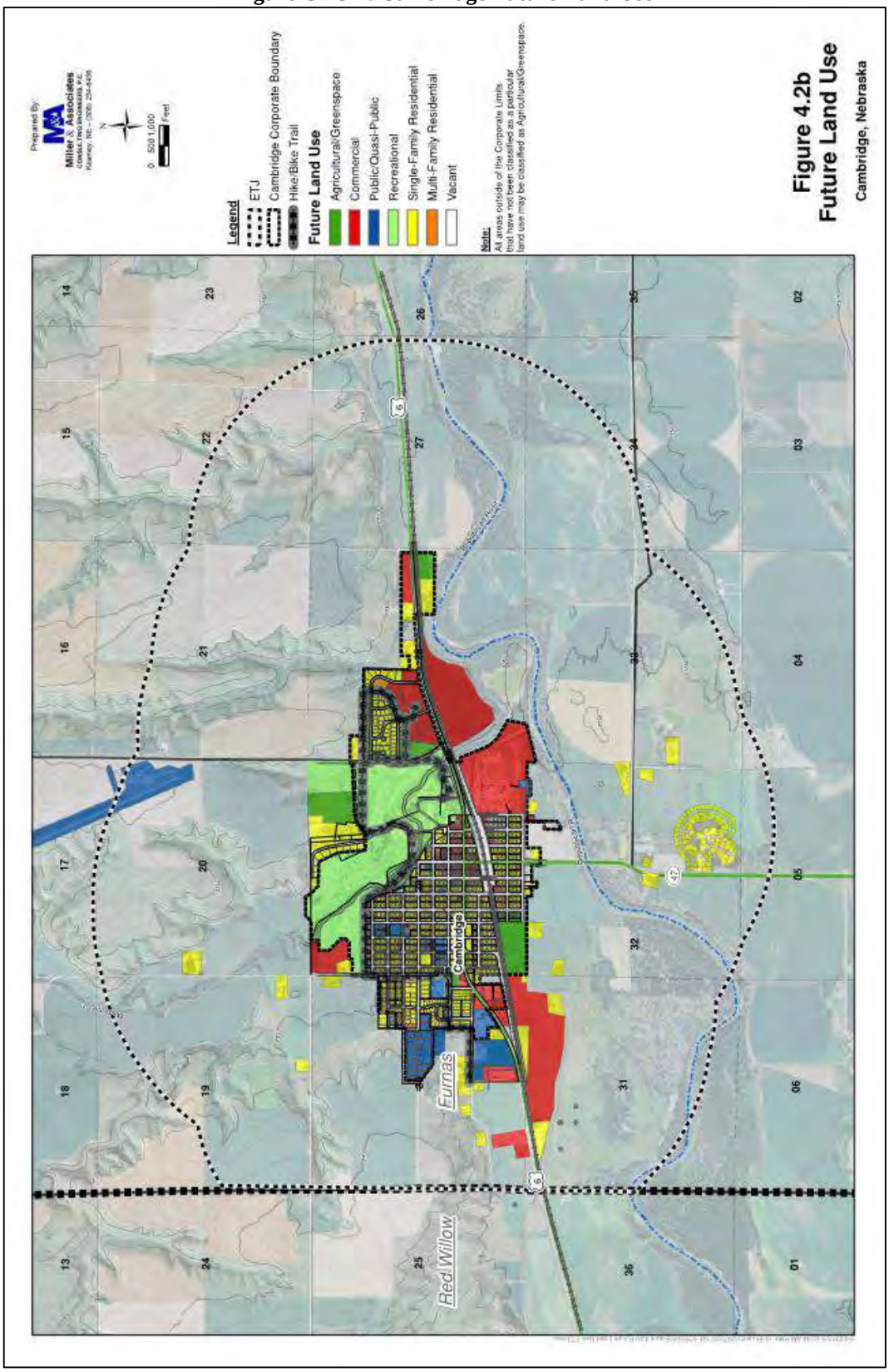
Future Development Trends

In the last five years Cambridge has added three new businesses (Extreme Ag Inc., a truck stop, and a new hotel). The city has also added new housing. The city has added a new subdivision that will has lots for residential and businesses to develop. There are also other sites within the city available for new businesses.

The 1% annual floodplain as indicated in Figure CBG 5 shows the southern and extreme eastern portions of the city are within the floodplain. The city will continue to enforce its floodplain ordinances to restrict any future development into these flood hazard areas. The floodplain ordinance requires that any new construction have the lowest floor, including the basement, elevated to at least a one foot above the base flood elevation.

According the city's comprehensive plan there is currently a shortage of market rate homes in the city. There are some vacant lots that could be used for infill development. However, if the vacant lots are going to be developed adjacent lots would need to be combined to provide enough space to build a home of today's standards. While some proposed residential developments are in the floodplain the majority of new residential developments will take place outside of the 1% annual floodplain. Any commercial development the city would prefer to see it take place on the Highway 6 corridor. Commercial development could also take place along the east and west sides of the city since they border Highway 6 as well.

Figure CBG 7: Cambridge Future Land Use



Risk Assessment

Hazard Identification

Table CBG9 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table CBG 9: Cambridge Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought*	Yes	Economic impacts
Earthquake	No	None
Extreme Heat	Yes	None
Flooding*	Yes	Property damages
Grass/Wildfire	Yes	None
Hail	Yes	None
High Winds	Yes	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damages, power outages, and injuries
Severe Winter Storm*	Yes	Property damages, power outages, and injuries
Terrorism	No	None
Tornado*	No	Significant property damages, loss of life

** Identified as a top concern by the local planning team*

The top five hazards in Cambridge are drought, flooding, severe thunderstorms, severe winter storms and tornados. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 36 severe weather events from 1996 to 2014 in the City of Cambridge. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table CBG10 provides a summary of events that caused damage.

Table CBG 10: Cambridge Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/6/1996	Hail	1 in.	0	0	$5,000
5/14/1999	Thunderstorm Wind	61 kts./ 70 mph	0	0	$10,000
6/29/2000	Thunderstorm Wind	55 kts./ 63 mph	0	0	$100,000
5/26/2002	Hail	1.5 in.	0	0	$30,000
5/29/2004	Thunderstorm Wind	61 kts./ 70 mph	0	0	$150,000
6/10/2004	Hail	2 in.	0	0	$10,000
9/14/2004	Hail	1.75 in.	0	0	$30,000
6/9/2005	Hail	2 in.	0	0	$25,000

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
7/9/2005	Thunderstorm Wind	52 kts. / 60 mph	0	0	$25,000
6/16/2006	Thunderstorm Wind	52 kts./ 60 mph	0	0	$20,000
5/22/2007	Hail	1.25 in.	0	0	$5,000
5/29/2007	Thunderstorm Wind	56 kts./ 64 mph	0	0	$15,000
6/26/2008	Hail	1 in.	0	0	$10,000
5/22/2008	Hail	1.75 in.	0	0	$20,000
6/6/2014	Thunderstorm Wind	56 kts./ 64 mph	0	0	$25,000
6/14/2014	Hail	1 in.	0	0	$1,000,000
6/14/2014	Thunderstorm Wind	70 kts./ 81 mph	0	0	$1,000,000

Source: NCDC

Drought

The NDMC reported that Cambridge experienced 317 months in at least D2 drought. The longest drought of at least D2 began in July 1954 and ended in January 1965. The city did not report any monetary losses from drought.

The city does not have a drought monitoring board or drought plan. Cambridge does have a drought ordinance. The city will monitor water supply during drought and will implement voluntary water restrictions if necessary. Cambridge does not require native plantings of irrigation limits on residents. The city has sufficient water supply and is not looking for additional sources.

Flooding

There have been no flooding events for the City of Cambridge. There are no repetitive flood loss properties in the City of Cambridge as of March 2015. Cambridge is a member of the NFIP, with three policies in effect worth $337,000 as of February 28, 2015. In addition to the 1% annual floodplain, the southwest area of the city has poor storm water drainage that can cause localized flooding in that part of the city.

Table CBG 11: Structures in the Floodplain

Value of Structures in Floodplain	Number of Structures Affected	Number of Structures in Community	Percentage of Affected Structures
$528,394	9	567	15.8%

Source: Furnas County Assessor

Cambridge had a drainage study done recently, but nothing transpired. The city regularly updates and enforces floodplain regulations.

Severe Thunderstorms

NCDC reported 15 severe thunderstorm (wind, rain, and lightning) events between January 1996 and December 2014 that resulted in $11,585,000 in property damage.

Municipal facilities have insurance to reduce vulnerability. The city does have surge protectors to protect devices that contain municipal records. The city's critical facilities have weather radios. Only one percent of power lines within the city are buried. There are three critical facilities have backup generators. Cambridge is a Tree City USA, which reduces damages caused by trees.

Severe Winter Storms
Severe winter weather occurs annually within Cambridge and the planning area. NCDC reported 15 severe winter storm events for within Furnas County. These storms resulted in $1,270,000 in property losses.

The city does not have designated snow routes and does not use snow fences. The streets in the city are cleared by city staff. Snow removal resources have been determined sufficient for the city for local events.

Tornados
There have been no tornados reported by NCDC for the city. According to the Storm Prediction Center there was one F0 tornado in 1971 that did affect the city.

The city has taken steps to increase the community's resilience to tornados. The city does backup municipal records. The county offers text alerts to residents and pager alerts are available for fire department volunteers. Most residents can take shelter in their homes during tornados; residents can also seek shelter at the community center and hospital. There are no safe rooms that would meet the standards set forth by FEMA in the community.

Capability Assessment
Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance
The City of Cambridge is governed by a mayor and a six member city council. Cambridge also has the following offices or departments:

- Clerk/Treasurer
- Economic Development
- Utilities
- Library
- Pool

Table CBG 12: Cambridge Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes, 2013
	Capital Improvements Plan	Yes
	Hazard Mitigation Plan	Yes
	Economic Development Plan	Yes
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	Yes
	Storm Water Management Plan	No
	Zoning Ordinance	Yes, 2015
	Subdivision Regulation/Ordinance	Yes, 2015
	Floodplain Ordinance	Yes
	Building Codes	Yes, IBC 2009
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	Yes
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	Yes
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire	No

Survey Components/Subcomponents		Comments
	safety, household preparedness, environmental education)	
	Natural Disaster or Safety related school programs	Yes
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the

Table **CBG**2 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraphs present a summary of the findings of this analysis.

The Comprehensive Plan, updated in 2013, outlines long term goals for Cambridge. The plan also contains a number of action items that could be coordinated with action items listed in the mitigation plan.

Cambridge has an annex to the Furnas County Local Emergency Operations Plan. This plan provides clear assignment of responsibility during an emergency.

The zoning ordinance discourages development in hazardous areas as well as prohibits development within wetlands, floodways, or floodplains. Cambridge's floodplain ordinance meet Federal and State requirements. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The City of Cambridge has the administrative staff and fiscal capabilities to implement some mitigation projects without assistance. Larger projects such as safe rooms or drainage improvements may require that the city look to partner with the county emergency management, Furnas County, LRNRD, and other regional and state agencies. Through this update process, the planning team reviewed previously identified mitigation projects and added new projects as well.

Mitigation Strategy

Completed Mitigation Projects

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1)

Description	Tree City USA
	establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Severe winter storms, severe thunderstorms, tornados, high winds
Timeline	Completed
Lead Agency	City Council, Utilities Department
Action since 2010 plan	Been a Tree City since 1996

Description	Warning Systems
Analysis	Implement Code Red for the city
Goal/Objective	Goal 4/ Objective 4.3
Hazard(s) Addressed	All Hazards
Timeline	Completed
Lead Agency	Board of Supervisors, Emergency Manager
Action since 2010 plan	Code Red in place through Furnas County Emergency Management

New/Ongoing Mitigation Projects

Description	Backup Generators
Analysis	Provide a safe backup power supply for the community.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$1,500,000
Potential Funding	HMGP, PDM, City funds
Timeline	1 year
Priority	High
Lead Agency	City Council, City Utilities, Twin Valleys Public Power District
Action since 2010 plan	Identified need to install two 2 Mwh Generators at the Community Building/ City Offices and Fire Barn. Installed generator at substation.

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, City Taxes, City Funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	City Council, City Utilities
Action since 2010 plan	This project has not been started.

Description	Stormwater System and Drainage Improvements
Analysis	Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$232,000
Potential Funding	HMGP, PDM, CDBG
Timeline	1 year
Priority	High
Lead Agency	City Council
Action since 2010 plan	This project has not yet started.

Description	Floodplain Regulation Enforcements and Updates
Analysis	Continue to enforce local floodplain regulations for structures located in the 1% annual floodplain. Strict enforcement of the type of development and elevations of structures should be considered through issuance of building permits by any Nebraska city. Continue education of building inspectors or Certified Floodplain Managers.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	General funds
Timeline	Ongoing
Priority	Medium
Lead Agency	City Council, Floodplain Administrator
Action since 2010 plan	Make sure Floodplain Regulations are enforced and up to date. Ensure continuing education of Floodplain Administrator.

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	General funds
Timeline	Ongoing
Priority	Medium
Lead Agency	City Council, Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	HMGP, PDM, General funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	City Council, Fire Department
Action since 2010 plan	Will need to gather information and work to develop in the future.

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	HMGP, PDM, General funds
Timeline	2 – 5 years
Priority	High
Lead Agency	City Council, County Emergency Manager
Action since 2010 plan	Facilities in need include City Office , Power Plant, Sewer Plant, Hospital, School, and Fire Department.

Description	Alert Sirens
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or the placement of new sirens
Goal/Objective	Goal 4/Objective 4.2

Description	Alert Sirens
Hazard(s) Addressed	All hazards
Estimated Cost	$20,000
Potential Funding	HMGP, PDM, General funds
Timeline	1 Year
Priority	High
Lead Agency	City Staff, Emergency Management
Action since 2010 plan	Not yet started, this is a new action.

Description	Designated Snow Routes
Analysis	Develop designated snow routes
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Severe Winter Storm
Estimated Cost	N/A
Potential Funding	General funds
Timeline	2 Years
Priority	Medium
Lead Agency	City Council
Action since 2010 plan	Not yet started, this is a new action.

Description	Civil Service Improvements
Analysis	Purchase additional snowplow
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	Severe Winter Storm
Estimated Cost	N/A
Potential Funding	General funds
Timeline	2-5 Years
Priority	Low
Lead Agency	Street department
Action since 2010 plan	Not yet started, this is a new action.

Description	Power, Service, Electrical, and Water Distribution Lines
Analysis	Work with local Public Power District or electric department to identify vulnerable transmission and distribution lines and plan to bury lines underground or retrofit existing structures to be less vulnerable to storm events. Electrical utilities should be required to use underground construction methods where possible for future installation of power lines.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe Thunderstorm, Severe Winter Storm, Tornados, High Winds
Estimated Cost	N/A
Potential Funding	General Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Street department
Action since 2010 plan	This is a new action. Identified downtown as area of need.

Removed Mitigation Projects

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Hazard(s) Addressed	Flooding
Reason for Removal	This action is redundant with 'maintain good standing in NFIP' mitigation action.

Cambridge Public Schools

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

Cambridge Public Schools participated in this Hazard Mitigation Plan in order to reduce the risk to life for its faculty, staff, and students, as well and to its property from hazards. Their participation was extensive; a representative from Cambridge Public Schools attended every public meeting, met individually with members from the planning team, completed all hazard identification and project identification worksheets, engaged the general public in the planning process, and assisted in interdepartmental coordination and data analysis.

For Cambridge Public Schools, the hazards of greatest concern that were identified through this planning process include flooding, severe thunderstorms, severe winter storms, tornados, and wildfires.

The following people were involved in the development of Cambridge Public Schools' Participant Section:

Table CPS 1: School District Plan Contributors

Name	Title	Department / Organization
Rob Gregory	Superintendent	Cambridge Public Schools
Roger Powell	Furnas County Emergency Manager	Furnas County

This section contains important localized information about the school district relevant to hazard mitigation, including the following elements:

- Location / Services
- Demographics
- Critical Facilities
- Plan Integration
- Risk Assessment
- Administration / Capability Assessment
- Mitigation Actions

Location/Services

Cambridge Public Schools operates two schools within the City of Cambridge. The school district provides services to students in the communities of Cambridge, Bartley, Wilsonville, Holbrook, and Arapahoe.

Demographics

There are 336 students enrolled in Cambridge Public Schools. During the 2015-2016 school year there were 156 students in the elementary school and 180 students in the high school. The school district also employs approximately 75 faculty and staff.

In the 2015-2016 school year the district had about 49 percent of students in the school on free or reduced lunch. The school had a mobility rate of seven percent during the 2015-2016 school year. About 14 percent of students are reported as being in Special Education. Table CPS 2 shows the number of students by race and ethnicity for the 2015-2016 school year. The Department of Education did not report the number of students who are classified as English Learners.

Table CPS 2: Number of Students by Race

Year	American Indian/Alaskan Native	Asian	Black/African American	Hispanic	Native Hawaiian or Other Pacific Islander	White	Two or More Races
2013-2014	0	0	1	8	0	327	0

Source: Nebraska Department of Education, Cambridge Public Schools

Critical Facilities

The school district operates one facility. The facility consists of two buildings. The information about each of the buildings are listed below, along with information indicating the school's address, the year the structure was built, previously hazard damages, it's location in a Special Flood Hazard Area, the presence of a tornado safe room, the presence of a weather radio, and the structure's value. In addition to the one site for the schools, there are two gyms that are owned by the school district.

Table CPS 3

School	Cambridge Elementary School
Address	1003 Nelson St. Cambridge, NE
Damages	None
Structure in Floodplain	Yes
Number of Students	156
Number of Staff	75
Tornado Safe Rooms	No
Weather Radio	No
Building Valuations	$6,700,200

School	Cambridge High School
Address	1003 Nelson St. Cambridge, NE
Damages	None
Structure in Floodplain	Yes
Number of Students	180
Number of Staff	75
Tornado Safe Rooms	No
Weather Radio	No
Building Valuations	$6,700,200

Risk Assessment

Table CPS 4 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table CPS 4: Cambridge Public Schools Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Drought	Yes	None
Earthquake	No	None
Extreme Heat	Yes	None
Flooding*	Yes	Property damages
Grass/Wildfire*	No	Property damages, loss of life
Hail	Yes	None
High Winds	Yes	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damages, power outages
Severe Winter Storm*	Yes	Power outages, dangerous travel conditions
Terrorism	No	None
Tornado*	No	Property damages, injuries/loss of life

**Identified as a hazard of greatest concern*

For more information regarding these area wide hazards, please see Section Four: Risk Assessment. The following provides school district specific information, reported in Cambridge's Risk Assessment Summary that is relevant to each of the hazards of greatest concern.

Flooding
Cambridge Public Schools is located within the floodplain. Although the school district did not identify any damages from flooding in the past, flash flooding caused by excessive rain could cause significant damages.

Grass/Wildfire
There have been no identified damages to Cambridge Public Schools from wildfire in the past, however wildfires do occur frequently in the county and the planning area. The school district performs a fire drill monthly, and partners with the local fire department to teach the students fire preparedness.

Severe Thunderstorms
Severe thunderstorms occur several times annually within Cambridge. These storms have the potential to result in: power outages, flooding due to excessive rain, and property damage from lightning or hail. Cambridge Public Schools do have identified shelter areas for students in the event of a severe storm.

Severe Winter Storms
Severe winter weather occurs annually within Cambridge. Severe winter storms can cause power outages, resulting in dangerous conditions for vulnerable populations. These storms also affect transportation routes that students, parents and staff use to travel to and from school.

Tornados
Although tornados have not occurred in Cambridge in the past, tornadic events occur quite frequently within the planning area and the rest of the state. Tornados have the potential to cause significant damages, injuries, and fatalities. The school has identified shelter areas for students in the events of a tornado. Cambridge Public Schools also performs a tornado drill annually.

Plan Integration

Building safe and smart communities can be accomplished through effective plan integration. Integrating hazard mitigation principles into other local planning mechanisms can greatly increase a school district's level of resiliency. This planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. Available plans were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Cambridge Public Schools conducts an annual safety audit as a requirement of Rule 10. Rule 10 is the mandated rules and procedures for accreditation by the Nebraska Department of Education. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Administration/Capability Assessment

The school district has a superintendent and one principal. The school board is made up of a six member panel. The school district also has four administrative secretaries (one for the elementary school, one for the high school, an activities secretary, and a business secretary).

The school's superintendent would be main actor in overseeing the implementation of mitigation actions in school facilities. The school currently does a number of education and outreach programs. These programs include natural disaster and safety related school programs (an annual tornado drill, fire drills monthly, and an active shooter/lockdown drill annually). The Furnas County Sheriff's Department helps the school with the active shooter drill and the Fire Department provides assistance for escape in case of a fire.

Mitigation Actions

Completed Mitigation Actions

The school district did not identify any specific mitigation actions in the previous plan.

New Mitigation Actions

Description	**Backup Generators**
Analysis	Provide a safe back-up power supply.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$35,000
Potential Funding	HMGP, PDM, School Funds
Timeline	2-5 years
Priority	High
Lead Agency	School Board, Superintendent
Action since 2010 plan	Not yet started. This is a new action

Description	**Safe Rooms**
Analysis	Design and construct storm shelters and safe rooms in school buildings.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, School Funding
Timeline	2 – 5 years
Priority	Medium
Lead Agency	School Board, Superintendent
Action since 2010 plan	Not yet started. This is a new action

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Village of Edison

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Edison participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Edison attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Edison, the top concerns that were identified through this planning process include hail, high winds, severe thunderstorms, severe winter storms, and tornados.

The following people were involved in the development of Edison's Participant Section:

Table EDN 1: Village of Edison Plan Contributors

Name	Title	Department / Organization
Kent Tidyman	Board Chairperson	Village of Edison
Janet Warner	Village Clerk	Village of Edison
Roger Powell	Furnas County Emergency Manager	Furnas County

This section contains important information about the Village of Edison relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
  - Population Trends
  - Population by Age
  - Housing and Income Data
  - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

Location /Geography

Edison is a village located in the northeast portion of Furnas County. The Village of Edison covers an area of 192 acres and has an elevation of 2,113 feet above sea level. Edison is approximately 46 miles southwest of Kearney. The topographic region Edison lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. The Republican River flows south of the village.

Transportation

Figure EDN 1 shows the major transportation routes for the village. The village has one major highway, US HWY 136. According to the Nebraska Department of Roads the average daily traffic count for Edison

is 560 vehicles with 80 of those being heavy trucks passing to the east of the village, and 775 vehicles with 115 of those being heavy trucks passing to the north of the village. This highway is used to transport chemicals and hazardous materials with the most common being petroleum and fertilizer. The fire hall and community church are located along the highway and could be affected by a spill if it were to occur. There is also one railway that runs through the north portion of the village.

Figure EDN 1: Edison

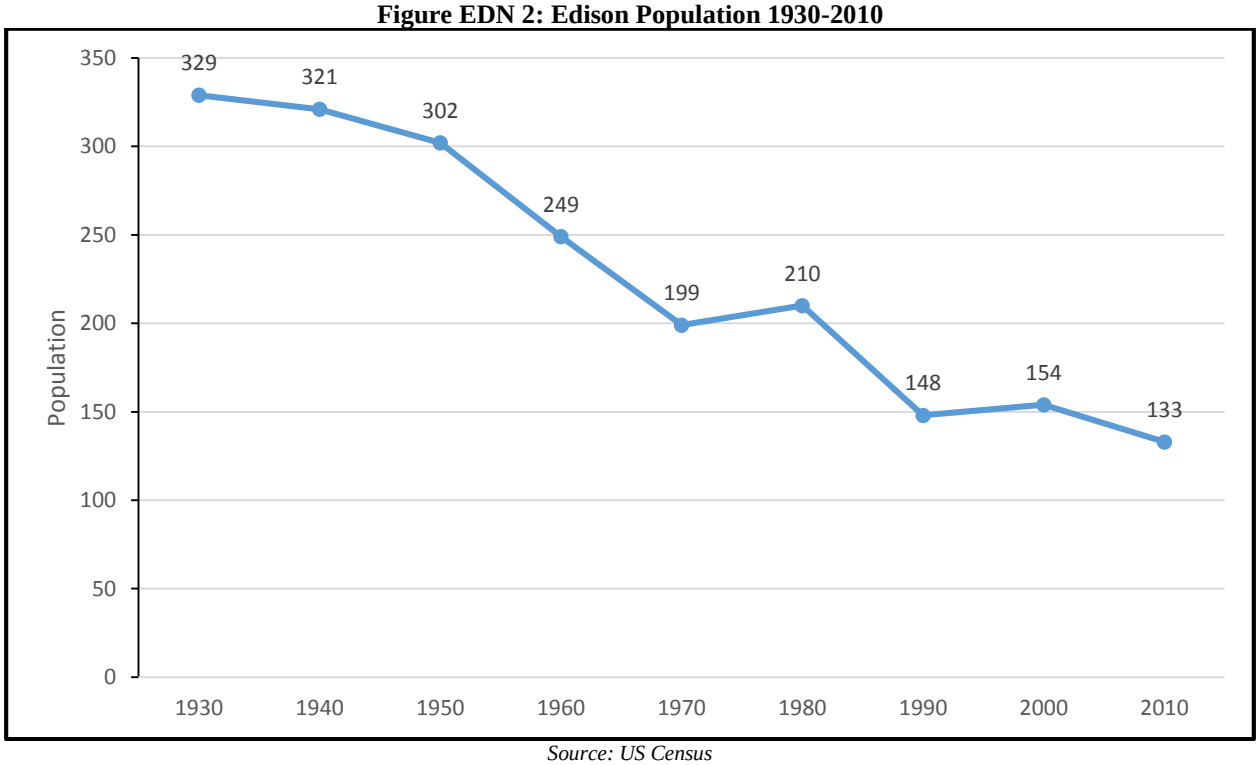
Climate

All the climate data for the village has been taken from a station located in Beaver City (250640). Please refer to the *Furnas County Section* for a climate summary for the village.

Demographics

Figure EDN 2 displays the population for Edison from 1930 to 2010. The population for Edison has declined since 1930. From 2000 to 2010 the village lost approximately 14 percent of its population. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure EDN 2: Edison Population 1930-2010



Source: US Census

Table EDN2 illustrates the age distribution and median age for Furnas County in comparison to the Village of Edison. The village has a lower portion population over the age of 64 than that of the county by about six percent. The village also have a younger median age by about two years.

Table EDN 2: Edison Age Distribution

Age	Furnas County	Edison
<5	5.2%	4.5%
5-64	71.7%	78.9%
>64	23.1%	16.6%
Median	47.4	45.4

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Edison in Table EDN3. The median home value for the village is $33,900 less than that of the county, and the rent values are about $70 higher for the village. The low home cost and high rents imply that there is a poor rental market within the village. The population has decreased in the

last decade as noted in the demographic section, the lower cost of living compared with the rest of the county may be due to the aging housing stock. As these structures age if they are not cared for they may continue to increase the vulnerabilities to hazards.

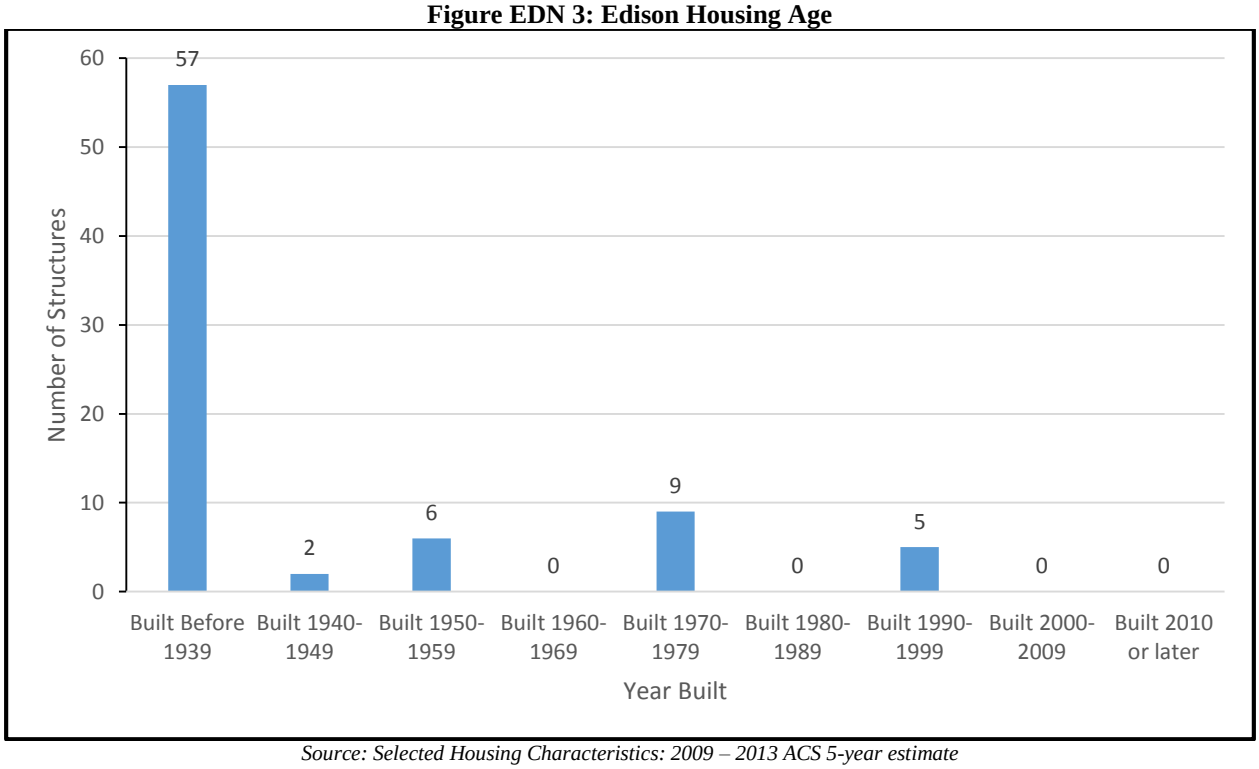
Table EDN: Edison Housing Value and Income

	Furnas County	Edison
Median Household Income[1]	$51,458	$21,429
Per Capita Income[1]	$22,068	$14,762
Median Home Value[2]	$56,400	$22,500
Median Rent[2]	$488	$558

1Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (Figure EDN 3) the village has 79 housing units with 51 percent of those units occupied (Table EDN4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. There are four mobile homes located in the village. Although there are mobile homes in the community, they are not located in a single identified mobile home park in the village, but are spread throughout the village. Over 82 percent of the village's housing stock was built before 1960. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados.

Figure EDN 3: Edison Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table EDN 4: Edison Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Furnas County	2,215	81.6%	501	18.4%		1,602	72.3%	613	27.7%
Edison	40	50.6%	39	49.4%		35	87.5%	5	12.5%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Edison are educational services and health care (20%), arts, entertainment and recreation (16%), and other services not public administration (16%).

The major employers for the Village of Edison include Ag Valley Co-op. There are a large number of residents who commute to Arapahoe, Holdrege, or Oxford for employment as well.

Structural Inventory

Results from the structural inventory completed for the Village of Edison are found in Table EDN5. GIS parcel data was not available for communities within Furnas County.

Table EDN 5: Edison Structural Inventory

Jurisdiction	Commercial/Industrial	Agriculture	Residential	Public/Quasi Public	Total
Edison	$3,750,061	$78,000	$1382,160	$330,614	$5,540,835

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Edison planning team as a part of the plan update. Table EDN6 and

Figure EDN 4 provide a summary of the type and location of critical facilities for the jurisdiction. Only the well has a backup generator, while the Fire Hall, Church, and Community Building can all be used for shelter during a storm.

Table EDN 6: Critical Facilities

Critical Facility Number	Critical Facility
1	Fire Hall
2	Church
3	Water Tower
4	Post Office
5	Community Building
6	Well

Figure EDN 4: Edison Critical Facilities Map

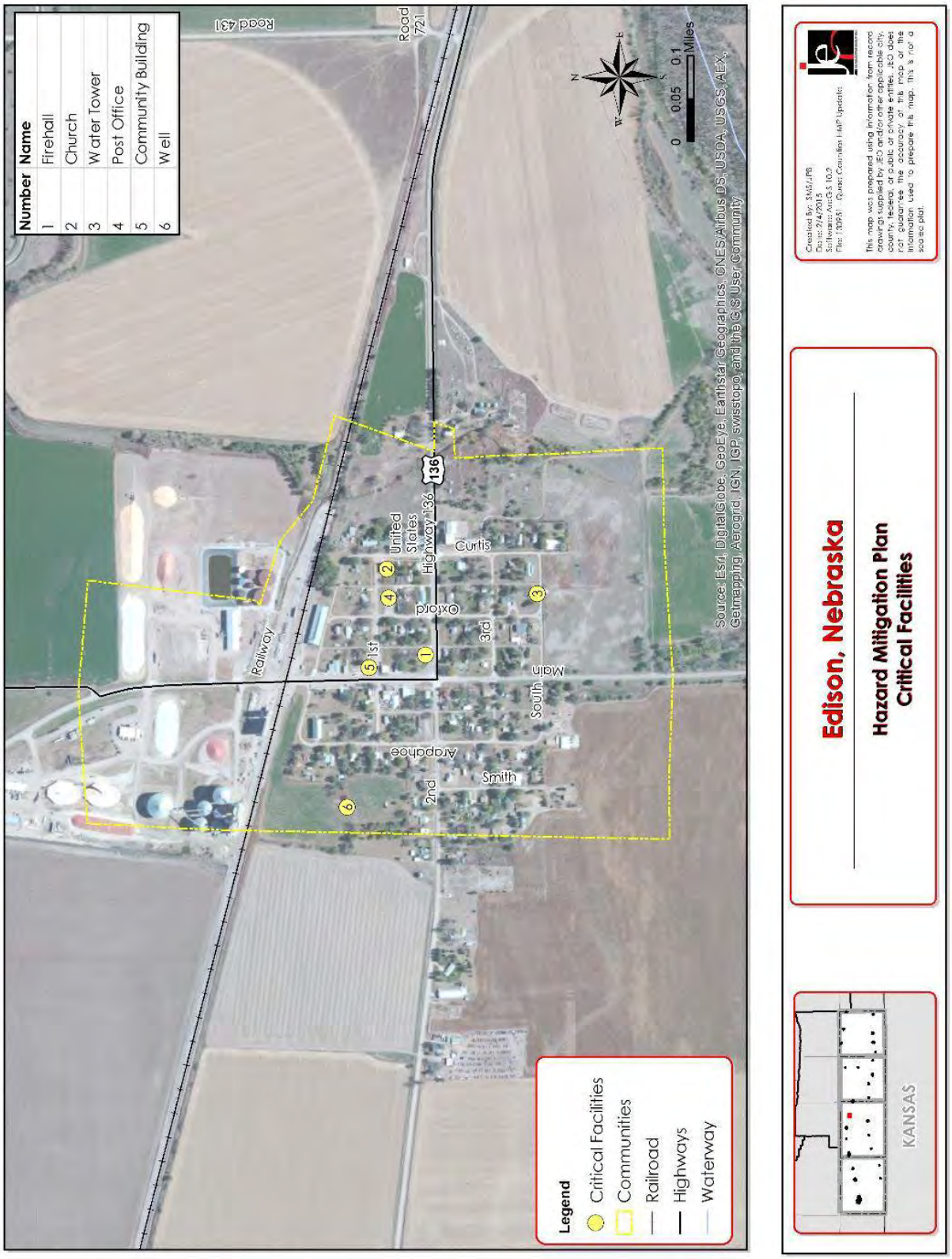


Figure EDN 5 shows the 1% annual flood risk area for the Village of Edison. The village has 18 commercial buildings and 2 residential structures in the floodplain. There are no repetitive loss structures in the village. There are no critical facilities located in the floodplain. The initial FIRM for the village was developed in March of 2009. The village does not participate in the NFIP due to the lack of local interest. Participation in the NFIP will be reevaluated as circumstances change and local support grows.

Figure EDN 5: Edison 1% Annual Chance Floodplain

Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there is one chemical storage site in the Village of Edison, and this site does house materials that are categorized as hazardous. Table EDN7 lists only facilities that house hazardous materials.

Table EDN 7: Chemical Storage Fixed Sites

Facility	Address	Hazardous Material
Ag Valley Co-Op Non Stock	72133 US Highway 136, Edison	Paraquat Dichloride

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sites located in the Village of Edison. However, the local planning team identified an old school located south of the railroad on the highway that is a historic monument.

Future Development Trends

According to census data, Edison's population is declining. The local planning team indicated that the lack of jobs is contributing to the population decline. In the past five years, some buildings have been demolished. No residential or commercial development is planned for the next five years within Edison. However, any development that does occur will be discouraged in hazardous areas.

Risk Assessment

Hazard Identification

Table EDN 8 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table EDN 8: Edison Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfire	Yes	None
Hail*	Yes	Damage to structures and property
High Winds*	Yes	Damage to structures, utilities, and trees
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damage, power outages
Severe Winter Storm*	Yes	Power outages
Terrorism	No	None
Tornado*	Yes	Significant property damages, loss of life

** Identified as a top concern by the local planning team*

The hazards of greatest concern to Edison are hail, high winds, severe thunderstorms, severe winter storms, and tornados. These hazards that raise the greatest concerns for the community are discussed in detail below.

Historical Occurrence

The NCDC reported 28 severe weather events from 1996 to 2014 in the Village of Edison. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table EDN 9 provides a summary of the events that caused damage.

Table EDN 9: Edison Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
7/3/1996	Thunderstorm Wind	90 kts./103 mph	0	0	$180,000
8/4/2008	Flash Flood	4 in.	0	0	$30,000
6/15/2002	Hail	1.5 in.	0	0	$25,000
6/5/2008	Hail	1.75 in.	0	0	$25,000
4/14/2012	Hail	1.75 in.	0	0	$150,000
7/10/2011	Thunderstorm Wind	52 kts./ 60 mph	0	0	$50,000
6/13/2001	Tornado	F0	0	0	$8,000
6/14/2014	Thunderstorm Wind	70 kts./80mph	0	0	$1,000,000

Source: NCDC

Dam Failure

Although dam failure was not identified as a concern by the local planning team, dam failure may impact Edison. According to the Furnas County LEOP, failure of the Trenton Dam in Hitchcock County would result in inundation of areas along the Republican River slightly greater than the 100 year floodplain.

Hail

The NCDC reported 21 hail events in Edison from 1996 to 2014. These hail events caused $150,000 in property damages. Critical facilities in Edison are fitted with hail resistant building materials. Despite this, critical facilities have been damaged by hail in the past. Municipal facilities are insured for hail damage.

High Winds

High wind events are reported as zonal events by the NCDC, therefore there are no recorded occurrences. However, the local planning team indicated that high wind events occur frequently within Edison. High wind events can cause significant damages to trees, powerlines, and buildings.

Severe Thunderstorms

Severe thunderstorms occur several times annually in Edison and the planning area. The NCDC reported three thunderstorms in Edison from 1996 to 2014 that have caused $1,230,000 in property damages. Critical municipal records are protected with surge protectors on electronic devices. Critical facilities do not have backup generators.

Severe Winter Storms

Severe winter weather occurs annually in Edison and the planning area. Severe winter weather can cause power outages resulting in dangerous conditions for vulnerable populations. After a winter storm, streets are cleared by a village tractor. Snow removal resources are sufficient for local events.

Tornados
The NCDC reported one tornado in Edison from 1996 to 2014. This brief tornado did not hit the village directly, only causing $8,000 in property damages. Tornadic events have the potential to cause significant damages and loss of life. Edison does not have a safe room within the community. However, residents seeking shelter can go to the bank or church in the event of a tornado.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities as well as described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance
The Village of Edison is governed by five member village board with a chairperson. In addition to the village board the village has the following positions and boards.

- Clerk
- Treasurer
- Utility Superintendent
- Health Board
- Nuisance Committee
- Fire Department

Table EDN 2: Edison Capabilities Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No

Survey Components/Subcomponents		Comments
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	No
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	Yes, Consultant
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table EDN 2 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

The village does not have the planning resources to develop many plans. The village does have an emergency operations plan because it is required by the county, and the village can participate with the county. The emergency operations plan addresses all the natural hazards that can affect the village and the major concern of the village is if the well were to stop working. The plan does provide clear responsibility of the fire department and utility superintendent's roles during an emergency situation.

Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The Village of Edison has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from strong partnerships, such as with the county and LRNRD, and will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Projects

Description	**Backup Generators**
Analysis	Provide a safe back-up power supply.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$15,000+
Funding	Village General Funds
Timeline	Completed
Lead Agency	Village Board, Utility Superintendent
Action since 2010 plan	Purchased and installed backup generator on the north well.

New/Ongoing Mitigation Projects

Description	**Safe Rooms**
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as schools, and other critical facilities.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Village Taxes, Village General Funds
Timeline	5+ years
Lead Agency	Village Board, Fire Chief
Action since 2010 plan	Are in the planning phase. Identified the safe room should hold 20 – 50 residents, but do not have a site defined.

Description	**Public Awareness / Education**
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these

Description	Public Awareness / Education
	hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	HMGP, PDM, Village General Funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Utility Superintendent, Fire Department
Action since 2010 plan	Need to inform residents of hazards that may affect town and water conservation methods

Description	Comprehensive Disaster/Emergency Response/Rescue Plan
Analysis	Establish or update Comprehensive Village Disaster and Emergency Response/Rescue Plan
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	Tornados, High Winds, Severe Winter Storms, Severe Thunderstorms
Estimated Cost	$6,000+
Potential Funding	HMGP, PDM, Village General Funds
Timeline	2 – 5 years
Priority	High
Lead Agency	Village Board
Action since 2010 plan	Will need to gather information and work to develop in the future.

Description	Alert/Warning Sirens
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or upgraded. Install new sirens and remote activation where lacking.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$15,000+
Potential Funding	HMGP, PDM, Village General Funds
Timeline	2 – 5 years
Priority	High
Lead Agency	Fire Department
Action since 2010 plan	Need to update the current siren that is located at the Fire Hall.

Description	Updating Sewer Plant
Analysis	Design and construct a sewer treatment plant for the village
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$200,000+
Potential Funding	HMGP, PDM, CDBG, Village General Funds
Timeline	2 – 5 years
Priority	High
Lead Agency	Utility Superintendent
Action since 2010 plan	Need to update the old Sewer Plant southeast of the village.

Removed Mitigation Projects

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Hazard(s) Addressed	Flooding
Reason for Removal	Have culverts and drainage in place to move stormwater out of town.

Description	**Stream Bank Stabilization/Grad Control Structure/ Channel Improvement**
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	No streams flow through the village.

Description	**Warning Systems**
Analysis	Improve city cable TV interrupt warning system and implement telephone interrupts system such as Reverse 911
Hazard(s) Addressed	All Hazards
Reason for removal	There is no village cable TV, and many residents do not have landlines for Reverse 911.

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Village of Holbrook

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Holbrook participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Holbrook attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Holbrook, the top concerns that were identified through this planning process include: agricultural plant disease, flooding, hail, high winds, severe thunderstorms, and tornados. The following people were heavily involved in the development of Holbrook's Participant Section:

Table HBC 1: Village of Holbrook Plan Contributors

Name	Title	Department / Organization
Ron Brown	Holbrook Superintendent	Village of Holbrook
Tiffany Hock	Holbrook Clerk	Village of Holbrook

This section contains important information about the Village of Holbrook relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

Location/Geography

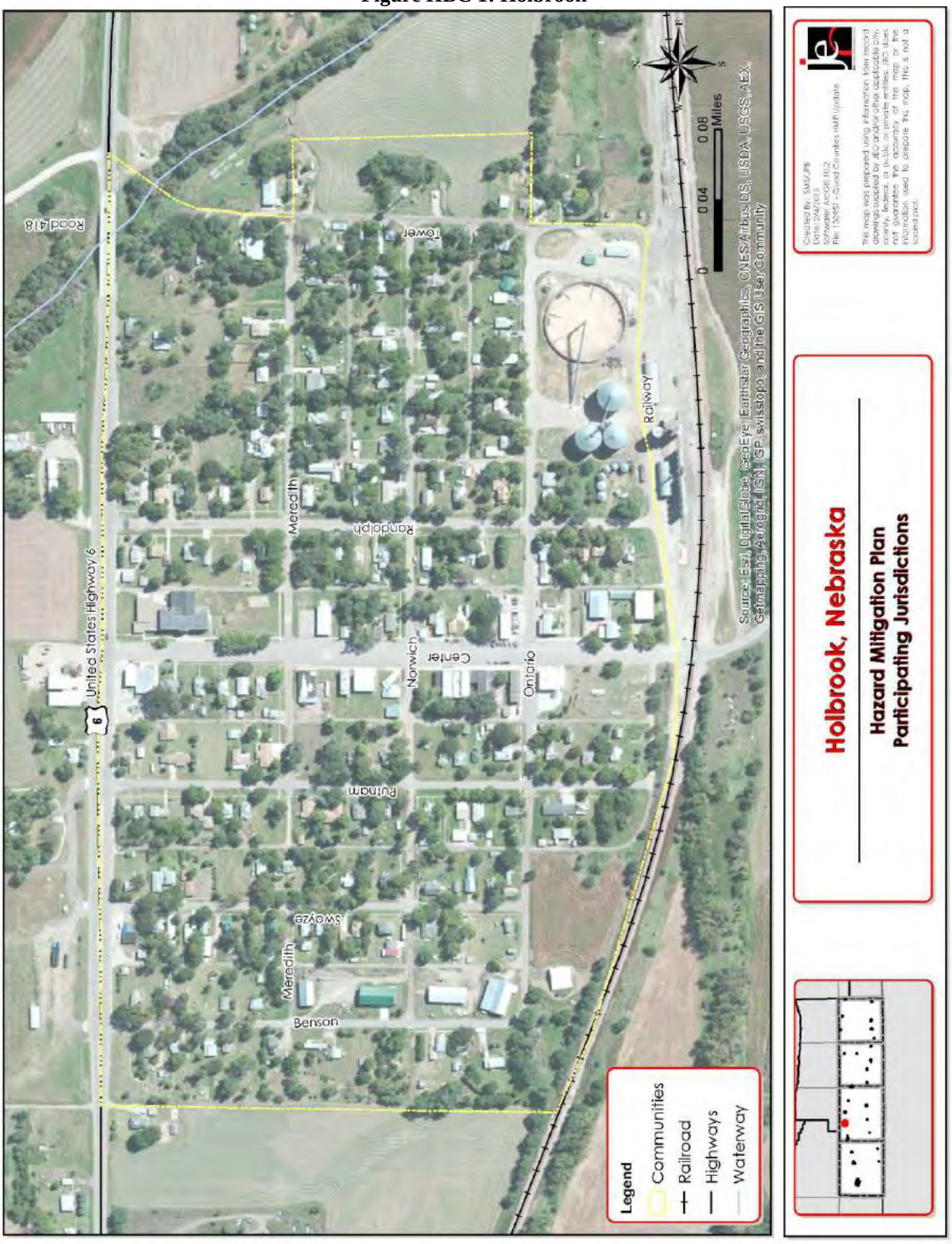
Holbrook is a village located in the northern portion of Furnas County. The Village of Holbrook covers an area of 128 acres and has an average elevation of 2,211 feet above sea level. Holbrook is approximately 57 miles southwest of Kearney. The topographic region Holbrook lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. There is one waterway near the village. Deer Creek runs along the north and east of the village.

Transportation

Figure HBC 1 shows the major transportation routes for the village. There is one major highway for the village US HWY 6. According to the Nebraska Department of Roads the average daily traffic count for the village is 2,470 vehicles with 425 of those being heavy trucks passing to the east of the village and 2,610

vehicles with 330 of those being heavy trucks passing to the west of the village. There is one railway that runs along the southern border of the village.

Figure HBC 1: Holbrook



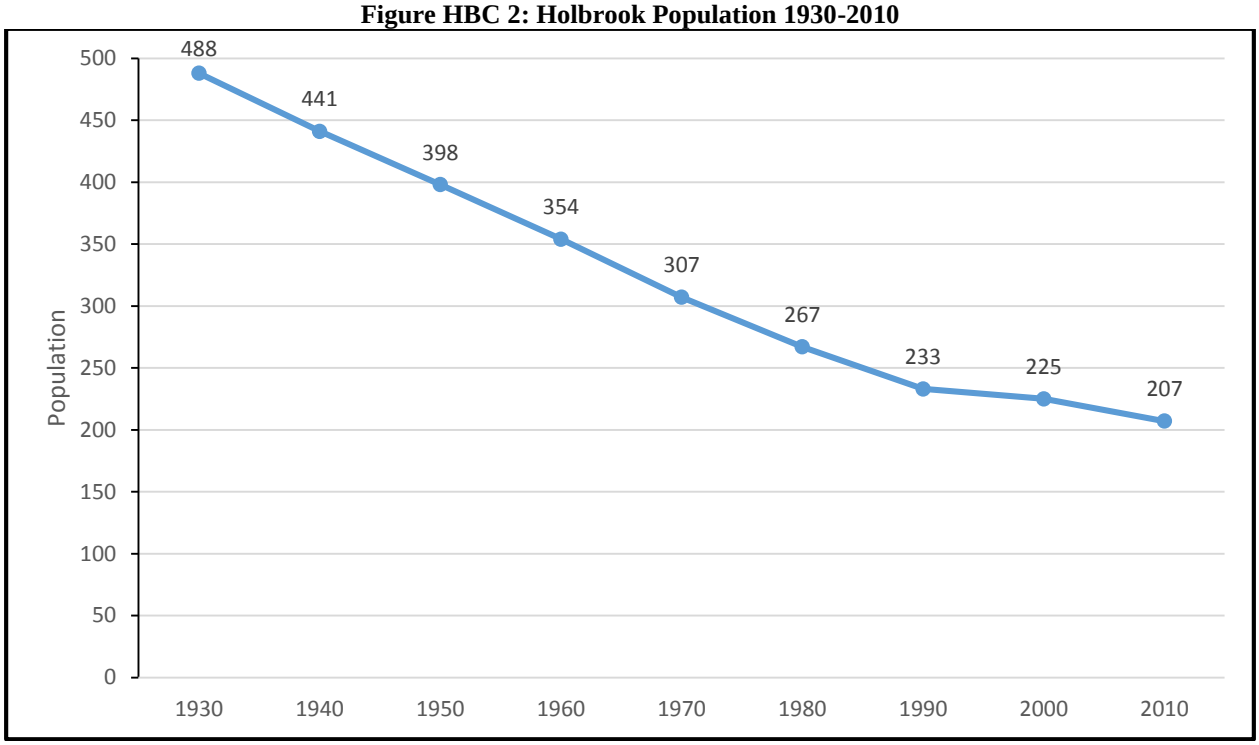
Climate

All the climate data for the village has been taken from a station located in Beaver City. Please refer to the *Furnas County Participant Section* for a climate summary for the village.

Demographics

Figure HBC **2** displays the population from 1930 to 2010. The population for Holbrook has steadily fallen since 1930. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure HBC 2: Holbrook Population 1930-2010



Source: US Census

Table HBC 2 illustrates the age distribution and median age for Furnas County in comparison to the Village of Holbrook. The village has a lower percentage of population over the age of 64 than that of the county by about five percent. The village also have a lower median by about four years.

Table HBC 2: Holbrook Age Distribution

Age	Furnas County	Holbrook
<5	5.2%	6.8%
5-64	71.7%	74.9%
>64	23.1%	18.3%
Median	47.4	43.8

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Holbrook in Table HBC3. The median home value for the village is $23,900 less than that of the county. The median rent value for the village is $75 higher than that of the county. The population has decreased in the last decade as noted in the demographic section, the lower cost of living

compared with the rest of the county may be due to the aging housing stock. As these structures age if they are not cared for they may continue to increase the vulnerabilities to hazards.

Table HBC 3: Holbrook Housing Value and Income

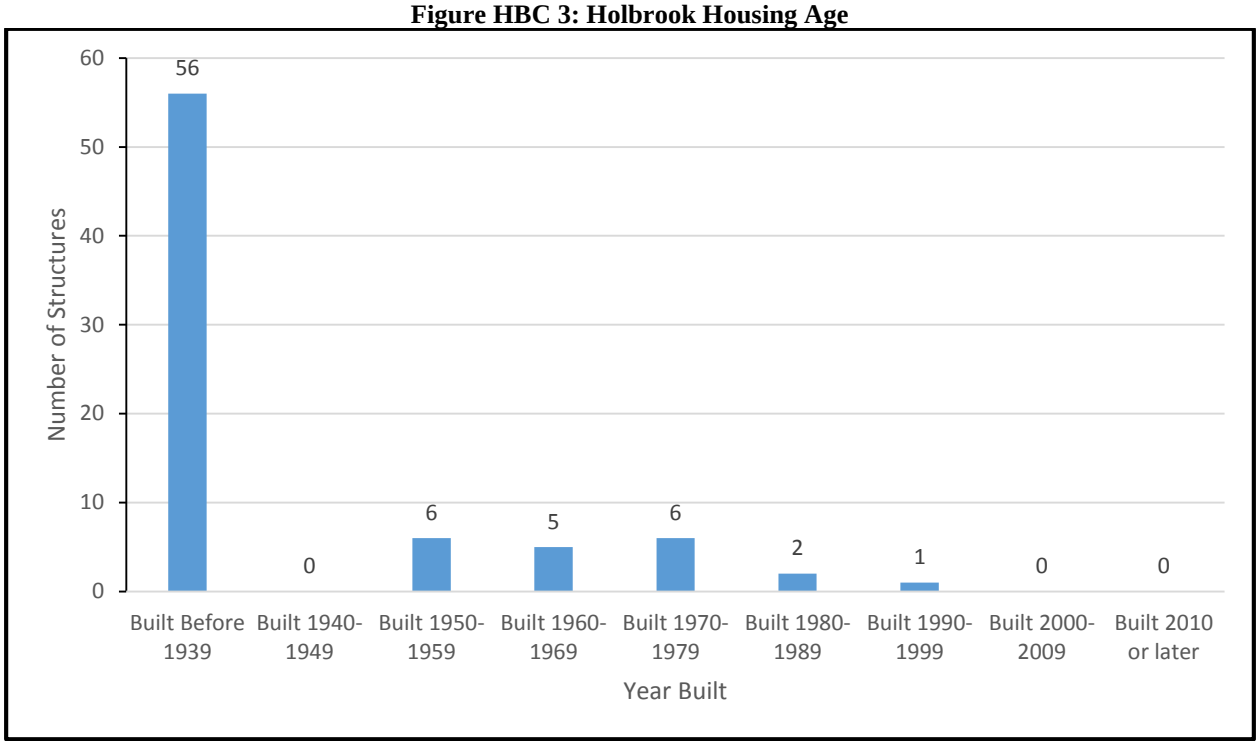
	Furnas County	Holbrook
Median Household Income[1]	$51,458	$17,500
Per Capita Income[1]	$22,068	$16,671
Median Home Value[2]	$56,400	$32,500
Median Rent[2]	$488	$563

1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (Figure HBC 3) the village has 76 housing units with 82 percent of those units occupied (

Table **HBC**4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. There are five mobile homes located in the village. Over 82 percent of the village's housing stock was built before 1960. Although there are mobile homes in the community, they are not located in a single identified mobile home park, but are spread throughout the village. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados.

Figure HBC 3: Holbrook Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table HBC 4: Holbrook Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Furnas County	2,215	81.6%	501	18.4%		1,602	72.3%	613	27.7%
Holbrook	62	81.6%	14	18.4%		52	83.9%	10	16.1%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Holbrook are agriculture and forestry (14%), other services not public administration (14%), arts, entertainment and recreation (12.3%), and professional scientific, and management (12.3%).

The major employers for the Village of Holbrook include: Ag Valley Co-op, Village of Holbrook, and Twin Valleys Public Power District.

Structural Inventory

Results from the structural inventory completed for the Village of Holbrook are found in Table HBC 5. GIS parcel data was not available for communities within Furnas County.

Table HBC 5: Holbrook Structural Inventory

Jurisdiction	Commercial/Industrial	Agriculture	Residential	Public/Quasi Public	Total
Holbrook	$1,132,852	$36,000	$2,346,703	$146,548	$3,662,103

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Holbrook planning team as a part of the plan update. Table HBC 6 and

Figure HBC 4 are summaries of the type and location of critical facilities for the jurisdiction.

Table HBC 6: Critical Facilities List

Critical Facility Number	Critical Facility
1	Central Plains Development Center
2	Community Building
3	Fire and EMS Building
4	U.S. Post Office
5	Baptist Church
6	Water Tower
7	Sewer Lift Station
8	Water Control Station
9	Electric Substation

Figure HBC 4: Holbrook Critical Facilities Map

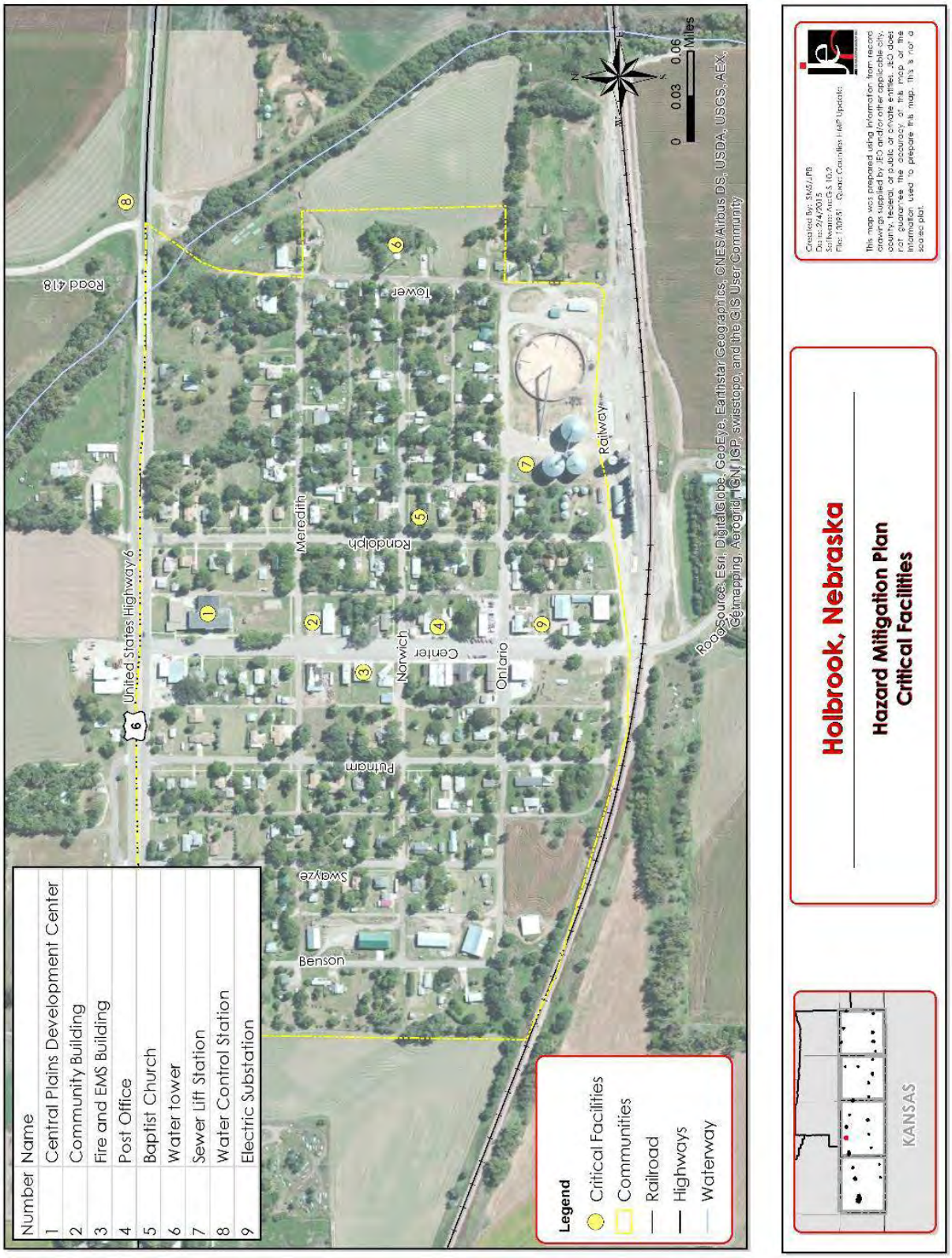


Figure HBC 5 shows the 1% annual flood risk area for the Village of Holbrook. The village does not have any structures or critical facilities in the floodplain. There are no repetitive loss properties in the village. The initial FIRM for Holbrook was developed in March of 2009. The village does not participate in the NFIP due to the lack of structures within the floodplain. Holbrook has identified participation in the NFIP as a mitigation action.

Figure HBC 5: Holbrook 1% Annual Chance Floodplain

Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there is one chemical storage site in the Village of Holbrook, and this site does not house materials that are categorized as hazardous.

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sites located in the Village of Holbrook.

Future Development Trends

There are no residential or commercial development planned within Holbrook in the next five years. Any development will be discouraged in hazardous areas such as the floodplain.

Risk Assessment

Hazard Identification

Table HBC 7 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table HBC 7: Holbrook Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease*	No	Economic impacts
Chemical (Fixed Site)	No	None
Chemical (Transportation)	No	None
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat	Yes	None
Flooding*	Yes	Washed out roads, property damage
Grass/Wildfire*	Yes	Out of date equipment
Hail*	Yes	Property damages
High Winds*	Yes	Damage to property and trees, injuries
Levee Failure	No	None
Severe Thunderstorm*	Yes	Damage to property and trees, injuries
Severe Winter Storm	Yes	None
Terrorism	No	None
Tornado*	No	Property damages, loss of life

** Identified as a top concern by the local planning team*

The top hazards in Holbrook are agricultural plant disease, flood, grass/wildfires, hail, high winds, severe thunderstorms, and tornados. These hazards raise the greatest concerns for the community and are discussed in detail.

Historical Occurrence

The NCDC reported 14 severe weather events from 1996 to 2014 in the Village of Holbrook. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as

blizzards, winter storms, and high winds. Table HBC **8**8 provides a summary of the events that caused damage.

Table HBC 8: Holbrook Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/29/2000	Thunderstorm Wind	61 kts./ 70 mph	0	0	$100,000
7/20/2000	Hail	1.75 in.	0	0	$10,000
5/29/2004	Thunderstorm Wind	61 kts./ 70 mph	0	0	$150,000
7/12/2006	Thunderstorm Wind	70 kts./ 81 mph	0	0	$25,000
10/17/2007	Hail	1.75 in.	0	0	$50,000
5/6/2008	Hail	1 in.	0	0	$5,000
3/28/2012	Hail	1 in.	0	0	$50,000

Source: NCDC

Agricultural Plant Disease
This hazard is a concern to Holbrook, as it is estimated that 95 percent of the village's income is from farming. The local planning team indicated that an occurrence of plant disease will also result in price increases.

Flooding
Although there are no structures within the floodplain, flooding is still a concern for the village. There are many unpaved roads that have been washed out due to flooding evets in the past. Water flows east to west in Holbrook. Some residents have had minor flooding in their basements. Flooding mainly occurs on the outskirts of town. There was a drainage study done in January 2014.

Grass/Wildfires
Wildfires occur frequently in the area outside of Holbrook. In the spring of 2014, there was a big wildfire north east of town. During the fire some equipment stopped working, including a chainsaw. Much of the firefighters' equipment is out of date, including their fire truck.

Hail
Hail is a common occurrence in Holbrook. Hail events can cause significant property damages. According to NCDC data, hail events have caused $115,000 in property damage since 1996.

High Winds
The NCDC reports high wind events at the county level, therefore there are no recorded high wind events in Holbrook. However, the local planning team indicated that high wind events occur frequently in Holbrook. After a recent high wind event, a person was trapped in their house due to a tree that fell down.

Severe Thunderstorms
Every year in Holbrook, there is a power outage due to a thunderstorm. Trees get knocked down. Trees don't get trimmed. Holbrook has some clean up equipment such as a backhoe and bucket truck to respond after the event of a severe thunderstorm.

Tornados
Tornados have the potential to cause severe property damages and loss of life. Holbrook lost its ambulance and EMT response time is now severely increased. Many houses have basements or a cellar.

The Village of Holbrook has made several efforts to mitigate losses from tornados:

- The village is in the process of removing a trailer house
- Installed tornado siren
- Have Reverse 911 warning system
- Holbrook has Mutual Aid Agreement with neighboring communities
- Have chain of command emergency plan

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

The Village of Holbrook is governed by a five member Village Board and chairman. The village also has the following departments and staff:

- Clerk
- Fire Department
- EMT squad

Table HBC 2: Holbrook Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	No
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes

Survey Components/Subcomponents		Comments
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	Yes
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	No
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	County
	Civil Engineering	Yes, Contract
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	Yes
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table HBC 2 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

The Village of Holbrook has an annex to the Furnas County Local Emergency Operations Plan. This plan addresses natural and manmade hazards that can affect the village. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The Village of Holbrook has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from strong partnerships, such as with the county and LRNRD, and will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Projects

Description	**Drainage Study/Stormwater Master Plan**
Analysis	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 to $20,000
Potential Funding	HMGP, PDM, Village Funds
Status	Drainage study completed by Miller & Associates in 2014.

Description	**Emergency Communications**
Analysis	Establish an action plan to improve communication between agencies to better assist residents and businesses during and following emergencies. Establish inner-operable communications.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	Flooding
Estimated Cost	$1,000+
Potential Funding	Village Funds
Status	Completed since 2010.

New/Ongoing Mitigation Projects

Description	**Backup Generators**
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Winter Storms, Severe Thunderstorms, Flooding
Estimated Cost	$20,000 to $50,000 per generator
Potential Funding	HMGP, PDM, Village Funds, Private entities
Timeline	2-5 Years
Priority	High

Description	Backup Generators
Lead Agency	Emergency Manager, Clerk
Action since 2010	Not yet started.

Description	Participate in the NFIP
Analysis	Participate in the NFIP to allow residents to purchase flood insurance.
Goal/Objective	Goal 2/ Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Low
Lead Agency	Village Board
Action since 2010	Not yet started.

Description	Stormwater System and Drainage Improvements
Analysis	Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 to $100,000+
Potential Funding	HMGP, PDM, Village Funds
Timeline	5+ Years
Priority	Low
Lead Agency	Village Board
Action since 2010	Drainage study done in 2014

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvements
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 to $100,000+
Potential Funding	HMGP, PDM, Village Funds
Timeline	2-5 Years
Priority	High
Lead Agency	Village Board
Action since 2010	Not yet started

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs.
Goal/Objective	Goal 5/Objective 5.2
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Estimated Cost	1,000+
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Village Board, Clerk
Action since 2010	Not yet started

Description	Public Awareness/Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. Also, educate citizens on water conservation methods, evacuation plans, etc. In addition, purchasing equipment such as overhead projectors and laptops.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All
Estimated Cost	$500+
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Village Board, Emergency Manager, Clerk
Action since 2010	Not yet started

Removed Mitigation Projects

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Reason for Removal	Determined to be no longer needed

Description	Flood Prone Property Acquisition
Analysis	Voluntary acquisition and demolition of properties prone to flooding will reduce the general threat of flooding for communities. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.
Hazard(s) Addressed	Flooding
Reason for Removal	No flood prone properties within Holbrook. No local interest at this time.

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Village of Oxford

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Oxford participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Oxford attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Oxford, the top concerns that were identified through this planning process include chemical spills during transportation, drought, flooding, grass/wildfire, and severe thunderstorms.

The following people were involved in the development of Oxford's Participant Section:

Table OXF 1: Village of Oxford Plan Contributors

Name	Title	Department / Organization
Duane Hoffman	Public Works Director	Village of Oxford
Roger Powell	Furnas County Emergency Manager	Furnas County

This section contains important information about the Village of Oxford relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

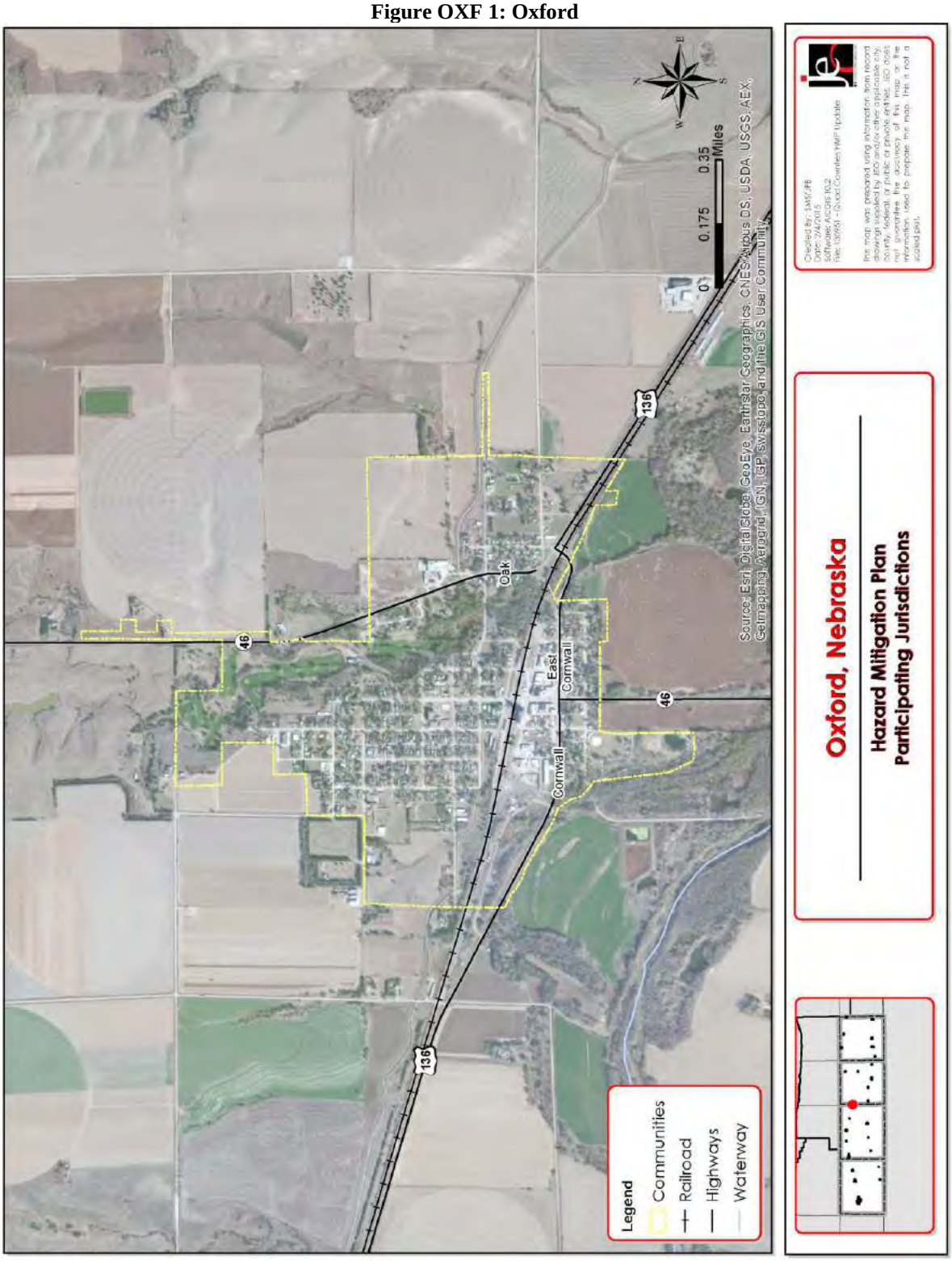
Location/Geography

Oxford is a village that is located partially in Furnas and Harlan counties. The Village of Oxford covers an area of 576 acres and has an elevation of 2,077 feet above sea level. Oxford is 45 miles southwest of Kearney. The topographic region Oxford lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. There is one water way near the village. The Republican River passes to the south of the village.

Transportation

Figure OXF 1 shows the major transportation routes for the village. There are two highways through the village US HWY 136 and NE HWY 46. According to the Nebraska Department of Roads the average daily traffic counts for US HWY 136 are 545 vehicles with 45 of those being heavy trucks passing to the east of the village and 605 vehicles with 85 of those being heavy trucks passing to the west of the village. The traffic counts for NE HWY 46 are 760 vehicles with 65 of those being heavy trucks passing to the north of the village, and 925 vehicles with 85 of those being heavy trucks passing to the south of the village. There is one railway that passes through the south portion of the village.

Figure OXF 1: Oxford



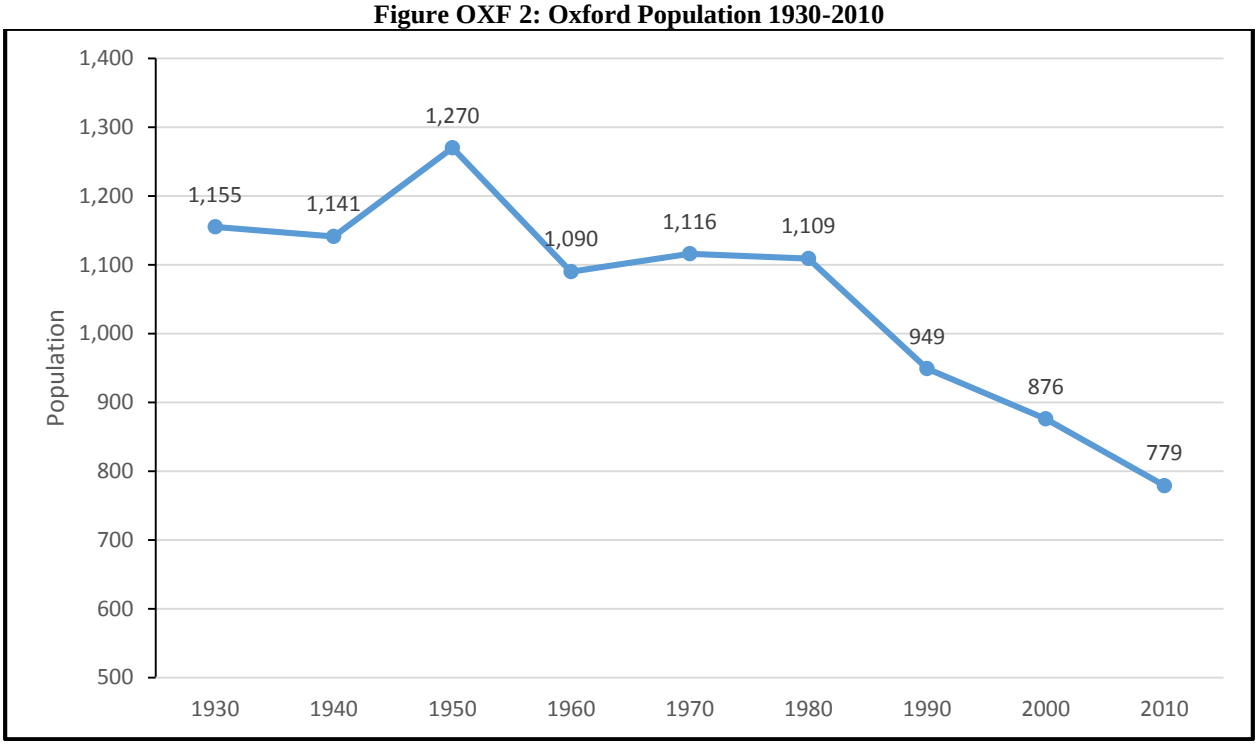
Climate

All the climate data for the village has been taken from a station located in Beaver City (250640). Please refer to the *Furnas County Section* for a climate summary for the village.

Demographics

Figure OXF 2 displays the population for Oxford from 1930 to 2010. Since 1950 the population has declined. Between 2000 and 2010 the village lost 11 percent of its population. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure OXF 2: Oxford Population 1930-2010



Source: US Census

Table OXF 2 illustrates the age distribution and median age for Furnas and Harlan Counties in comparison to the Village of Oxford. Oxford has a lower percentage of population over the age of 64 than of both Furnas and Harlan Counties by about three percent for each. The median age for the village is about one year younger than Furnas County and three years younger than Harlan County.

Table OXF 2: Oxford Age Distribution

Age	Furnas County	Harlan County	Oxford
<5	5.2%	5.3%	4.9%
5-64	71.7%	71.2%	75.3%
>64	23.1%	23.5%	19.8%
Median	47.4	49.2	46.2

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the counties as a whole are compared with the Village of Oxford in Table OXF 3. The median home value for the village is $15,400 less than Furnas County and $34,100 less than Harlan County. The median rent value is in between the value of the two counties. The population has decreased in the last decade as noted in the demographic

section, the lower cost of living compared with the rest of the counties may be due to the aging housing stock. As these structures age if they are not cared for they may continue to increase the vulnerabilities to hazards. According to the local planning team, the entire town in blighted.

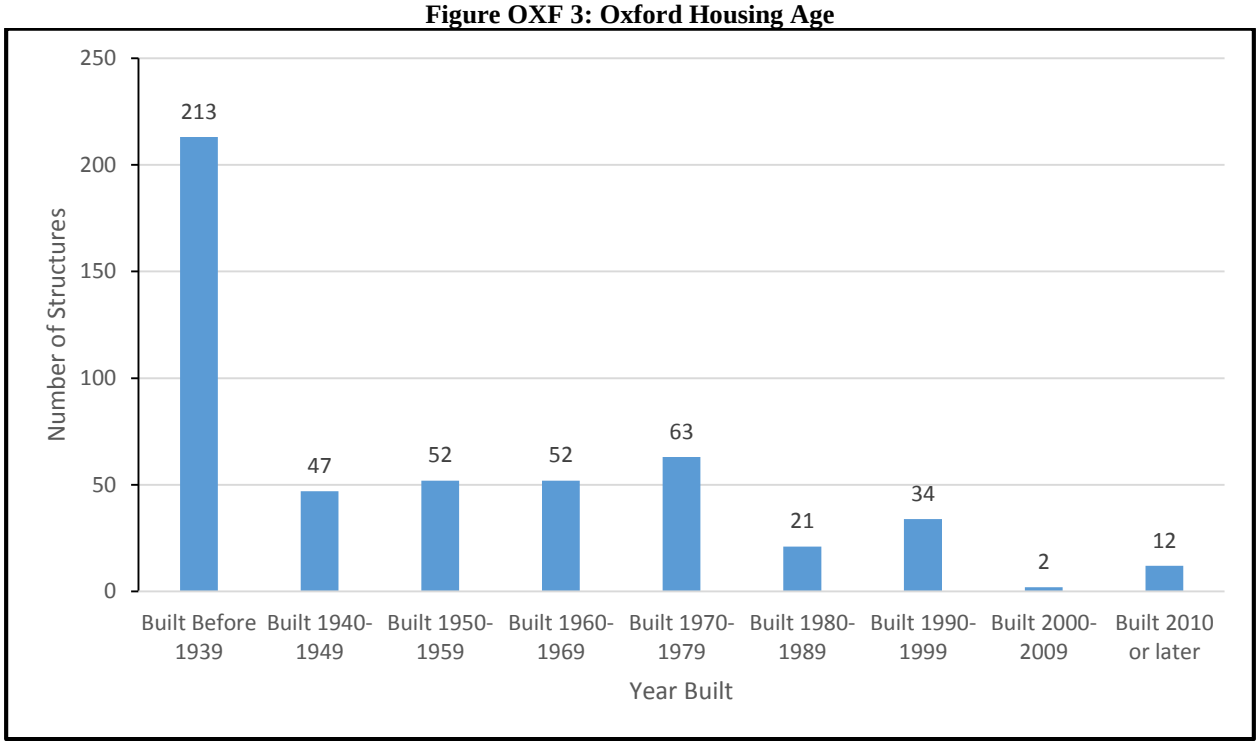
Table OXF 3: Oxford Housing Value and Income

	Furnas County	Harlan County	Oxford
Median Household Income[1]	$51,458	$54,862	$39,922
Per Capita Income[1]	$22,068	$25,322	$23,978
Median Home Value[2]	$56,400	$75,100	$41,000
Median Rent[2]	$488	$546	$513

1Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Figure OXF **3**) the village has 496 housing units with 84 percent of those units occupied (Table OXF **44**). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. Just over 4 percent of the village's housing stock is classified as mobile homes. Over 63 percent of the village's housing stock was built before 1960. Although there are mobile homes in the community, they are not located in a single identified mobile home park, but are spread throughout the village. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados. 98 percent of the village's housing was built before the first FIRM for the village in 2009. Houses built prior to this year may not be constructed above the base flood elevation. The eastern half of the village is located in the floodplain.

Figure OXF 3: Oxford Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table OXF 4: Oxford Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Furnas County	2,215	81.6%	501	18.4%		1,602	72.3%	613	27.7%
Harlan County	1,573	64.8%	853	35.2%		1,226	77.9%	347	22.1%
Oxford	416	83.9%	80	16.1%		316	76%	100	24%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Oxford are educational services and health care (18.6%), retail trade (12.1%), and transportation and warehousing, and utilities (10.3%).

The major employers for the Village of Oxford are focused on agriculture related education. A large percentage of residents commute to Holdrege for employment.

Structural Inventory

GIS parcel data was not available for communities within Furnas County. Data from the Nebraska Department of Revenue Property Assessment Division that provides valuations of property by sector was used for communities in Furnas County. Results from the structural inventory completed for the Village of Oxford in Table OXF5. GIS parcel data was not available for communities within Furnas County.

Table OXF 5: Oxford Structural Inventory and Valuation

Jurisdiction	Commercial/Industrial	Agriculture	Residential	Public/Quasi Public	Total
Oxford	$4,431,946	$102,000	$14,993,004	$331,979	$19,858,929

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Oxford planning team as a part of the plan update.

Table **OXF** 6 and

Figure ***OXF* 4** provide a summary of the type and location of critical facilities for the jurisdiction.

Table OXF 6: Critical Facilities

Critical Facility Number	Critical Facility
1	Evangelical Free Church
2	ESU Church
3	Clinic
4	Baptist Church
5	Daycare
6	School
7	Senior Center
8	Water Tower
9	Methodist Church
10	Catholic Church
11	Theatre, Library
12	Power Plant
13	Spirit of the Rock Church
14	Fire Hall
15	Village Office
16	Post Office
17	Lutheran Church
18	Wells #5 & #6
19	Well #7
20	Sewer Lift Station

Figure OXF 4: Oxford Critical Facilities Map

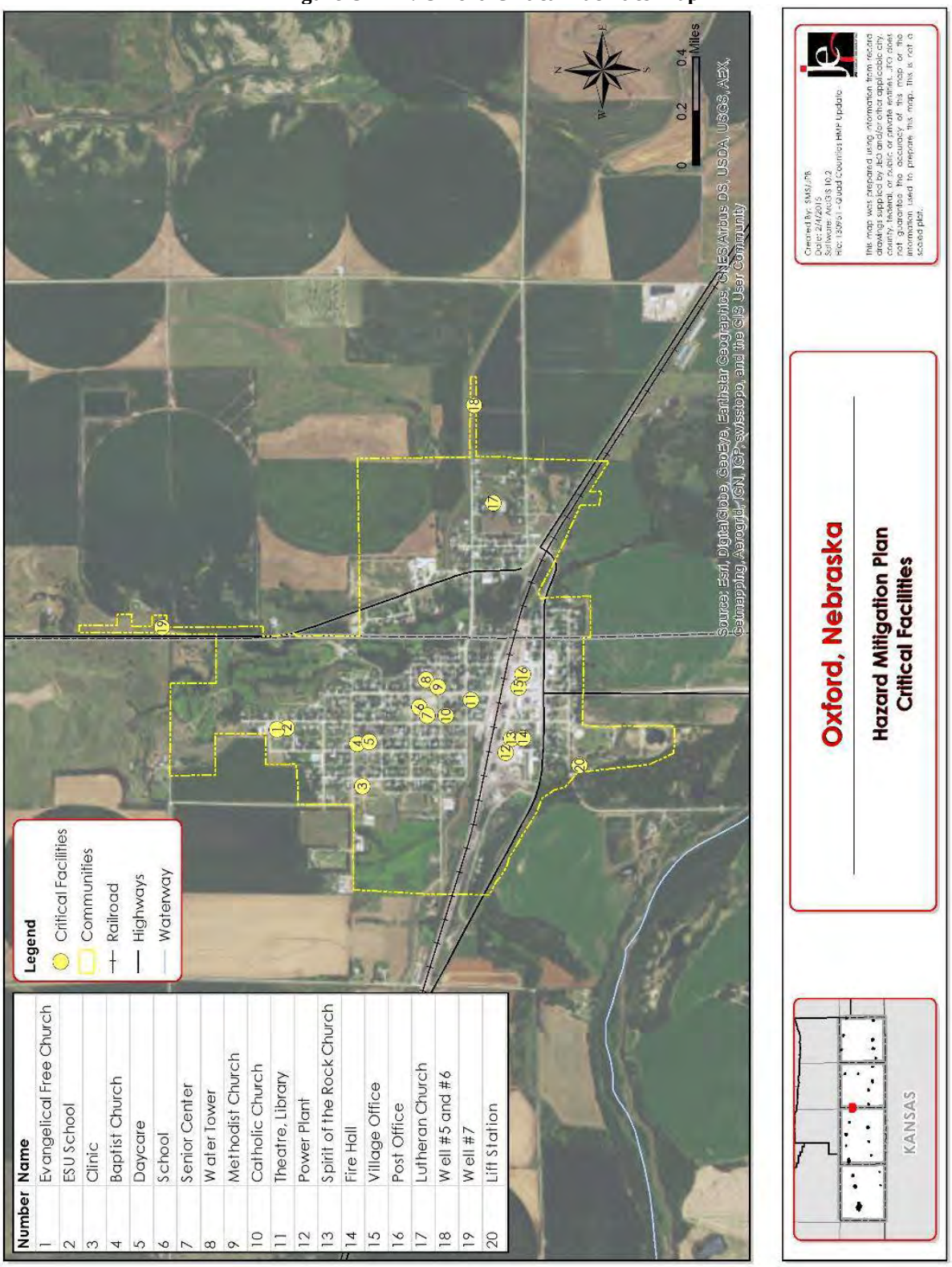
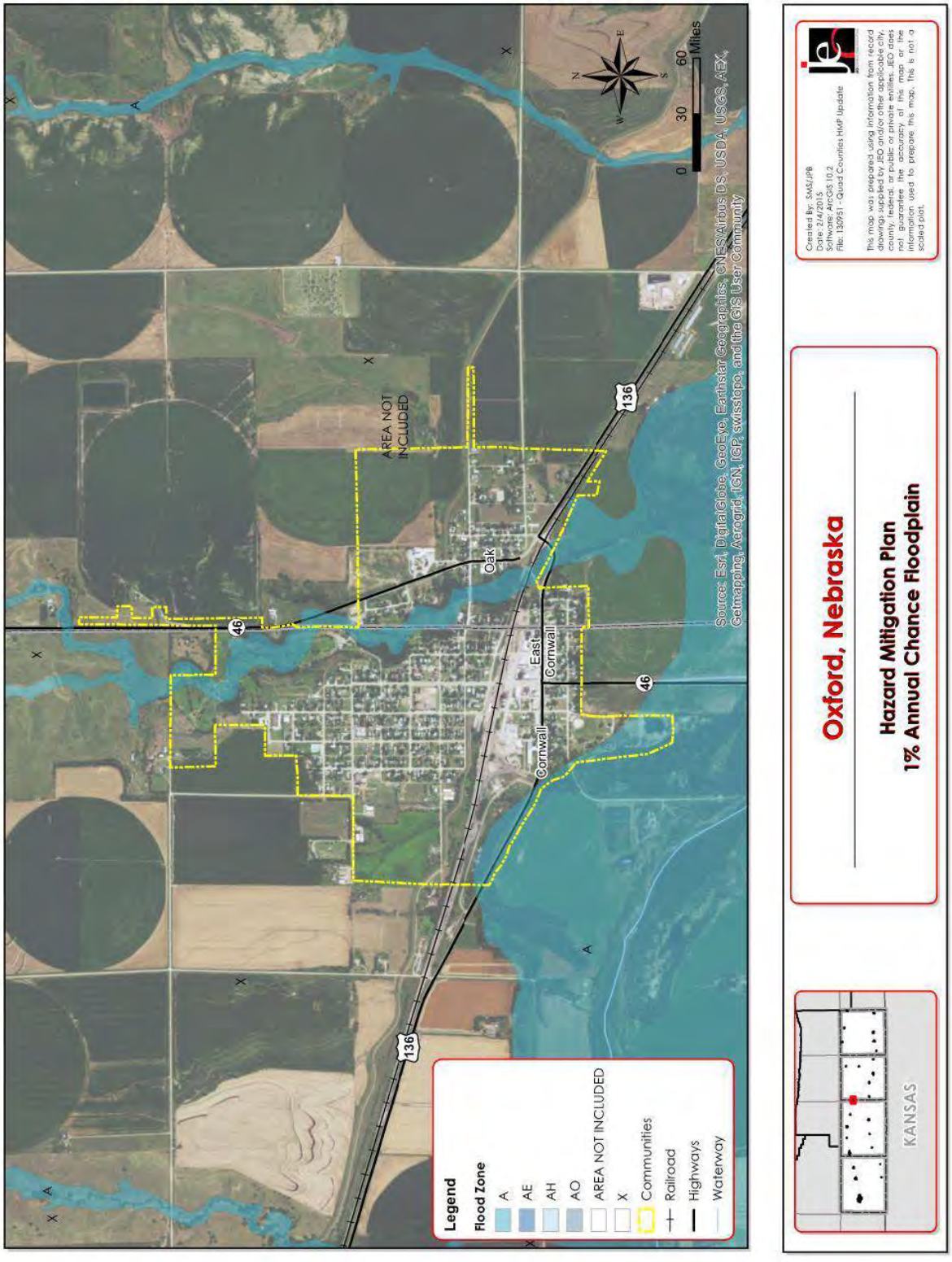


Figure OXF 5 shows the 1% annual flood risk area for the Village of Oxford. The village has no structures or critical facilities in the floodplain. There are no repetitive loss properties in the village. The initial FIRM for Oxford of was developed in March of 2009. Oxford does participate in the NFIP, with two policies in effect worth $230,000.

Figure OXF 5: Oxford 1% Annual Chance Floodplain



Chemical Storage Fixed Site

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of three chemical storage sites in the Village of Oxford, and all of these house materials that are categorized as hazardous. Table OXF7 lists only facilities that house hazardous materials.

Table OXF 7: Chemical Storage Fixed Sites

Facility	Address	Hazardous Material
Cargill Ag Horizons	71853 A Rd, Oxford	Paraquat Dichloride
Century Link	108 E Bright St., Oxford	Sulfuric Acid
Merricks of Nebraska LLC	600 Oak St., Oxford	Formaldehyde Solution

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sites located in the Village of Oxford.

Future Development Trends

According to the census data, Oxford's population is declining. Factors such as a lack of jobs, and an older population are leading to this decline. There are no new residential or commercial developments planned in the next five years. Any new development will be discouraged in hazardous areas such as the floodplain.

Risk Assessment

Hazard Identification

Table OXF8 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table OXF 8: Oxford Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)*	No	Limited resources to respond
Dam Failure	No	None
Drought*	Yes	Economic impacts
Earthquake	No	None
Extreme Heat	Yes	None
Flooding*	Yes	Property damage
Grass/Wildfire*	Yes	Damage to property and crops, potential loss of life
Hail	Yes	None
High Winds	Yes	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Damage to property and utilities, power outages
Severe Winter Storm	Yes	None
Terrorism	No	None
Tornado	Yes	None

** Identified as a top concern by the local planning team*

The top five hazards in Oxford are chemical spills during transportation, drought, flooding, grass/wildfire, and severe thunderstorms. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 51 severe weather events from 1996 to 2014 in the Village of Oxford. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table OXF 9 provides a summary of the events that caused damage.

Table OXF 9: Oxford Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/11/1997	Hail	1 in.	0	0	$25,000
6/28/1999	Thunderstorm Wind	55 kts./ 63 mph	0	0	$5,000
3/7/2000	Thunderstorm Wind	52 kts./ 60 mph	0	0	$75,000
6/29/2000	Thunderstorm Wind	61 kts./ 70 mph	0	0	$250,000
5/9/2001	Hail	1 in.	0	0	$10,000
6/3/2001	Thunderstorm Wind	52 kts./ 60 mph	0	0	$40,000
7/8/2004	Thunderstorm Wind	52 kts./ 60 mph	0	0	$25,000
5/7/2005	Hail	1.75 in.	0	0	$25,000
8/21/2005	Lightning	-	0	0	$200,000
6/24/2006	Thunderstorm Wind	52 kts./ 60 mph	0	0	$5,000
7/21/2006	Thunderstorm Wind	54 kts./ 62 mph	0	0	$10,000
7/21/2006	Thunderstorm Wind	60 kts./ 69 mph	0	0	$10,000
9/15/2006	Hail	1 in.	0	0	$10,000
5/22/2007	Hail	1 in.	0	0	$5,000
9/6/2007	Hail	2.75 in.	0	0	$500,000
5/24/2011	Flood	-	0	0	$50,000
3/28/2012	Hail	1 in.	0	0	$10,000
4/14/2014	Tornado	EF0	0	0	$75,000
6/14/2014	Hail	1.75 in.	0	0	$75,000

Source: NCDC

Chemical Spills (Transportation)

Chemical spills along transportation routes was identified as a top concern by the local planning team. There are two highways that run through the village, US HWY 136 and NE HWY 46. There is also a railway that passes through the southern portion of the village. Chemicals are regularly transported along these routes. There have been no spills identified in the past. The local response would have limited resources to contain a spill of hazardous materials.

Drought

The Village of Oxford relies heavily on the surrounding agricultural economy. A sustained drought would have severe economic consequences on the community. Oxford does not have a drought response plan. The water supply has been identified as sufficient.

Flooding
The NCDC reported one flooding event for the Village of Oxford. The event caused $50,000 in property damage and closed US Highway 136 due to water on the road. There are no repetitive flood loss properties in the Village of Oxford as of March 2015. Oxford is a member of the NFIP, with two policies in effect totaling $230,000 as of February 28, 2015. The local planning team indicated that the golf course experiences periodic flooding.

Grass/Wildfire
According to the Nebraska Forest Service, there have been 50 wildfires near Oxford from 2000 to 2014. These wildfires have burned 16 acres of forest and 61 acres of crop land. The local planning team indicated that recent wildfires have been caused by farm machinery and hay bales catching on fire. The local firefighting resources were determined to be sufficient to handle local events. The water supply was determined to be sufficient for local events.

Severe Thunderstorms
Severe thunderstorms occur several times a year in Oxford and the rest of the planning area. The NCDC recorded eight thunderstorm wind events from 1996-2014 that caused a total of $420,000 in property damages. The NCDC also recorded a lightning strike in 2005 that caused $200,000 in property damages. Oxford experiences at least one power outage per year, for approximately 30 minutes. Critical facilities are in need of backup generators. It is estimated that five percent of Oxford's electrical lines are buried.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance
The Village of Oxford is governed by a five member Board of Trustees led by a chairperson. The village also has the following departments/offices: Clerk/Treasurer, Public Works, Fire Chief, Water/Wastewater Operator, Sewer/Street/Water Commissioner, and Economic Development.

Table OXF 2: Oxford Capabilities Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	No
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire	No

Survey Components/Subcomponents		Comments
	safety, household preparedness, environmental education)	
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the

Table OXF **2** were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Oxford has an annex to the Furnas County Local Emergency Operations Plan, which was last updated in 2014. This plan discusses a number of hazards that can affect the community. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The Village of Oxford has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from strong partnerships, such as with the county and LRNRD, and will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

New/Ongoing Mitigation Projects

Description	**Develop a Drought Management Plan**
Analysis	Work with relevant stakeholders to develop a drought management plan. The drought management plan would identify water monitoring protocols, outline drought responses, identify opportunities to reduce water consumption, and establish the jurisdictional management procedures.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Drought
Estimated Cost	$2,000
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Water Department
Action since 2010	This is a new action. Not yet started

Description	**Assess Vulnerability to Drought Risk**
Analysis	The jurisdiction will review relevant plans and municipal systems to identify factors which may increase drought impacts or gaps in planning and service delivery. This may include but is not limited to: assessing water distribution system(s), reviewing well levels and identifying alternative water sources (if needed), examining water intensive consumers, review of water pricing structures, considering the need for municipal water meters, and other locally appropriate actions.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Drought
Estimated Cost	$2,000
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Water Department
Action since 2010	This is a new action. Not yet started

Description	**Monitor Drought Conditions**
Analysis	Establish specific drought monitoring protocols. These protocols will serve as triggers for implementing drought response actions.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Drought
Estimated Cost	$2,000
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium

Description	**Monitor Drought Conditions**
Lead Agency	Water Department
Action since 2010	This is a new action. Not yet started

Description	**Establish Formal Drought Response Protocols**
Analysis	Establish a response protocol for times of drought. This may include, but is not limited to: lawn watering restrictions, requirements for water intensive businesses (i.e. car washes, golf courses, etc.) responses for local facilities (swimming pools, public fountains, etc.)
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	Drought
Estimated Cost	$3,000
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Water Department
Action since 2010	This is a new action. Not yet started

Description	**Source Water Contingency Plan**
Analysis	Evaluate and locate new sources of groundwater to ensure adequate supplies to support the existing community and any additional growth which may occur.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Drought
Estimated Cost	$5,000
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Water Department
Action since 2010	This is a new action. Not yet started

Description	**Incorporate Native Species into Municipal Landscapes**
Analysis	Work to incorporate native species of plants into municipal landscapes when updates/improvements are implemented.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Drought
Estimated Cost	$2,000
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Water Department
Action since 2010	This is a new action. Not yet started.

Description	**Develop Comprehensive Plan**
Analysis	Develop comprehensive plan. Integrate plan with Hazard Mitigation Plan components.
Goal/Objective	Goal 6/Objective 6.1
Hazard(s) Addressed	All hazards
Estimated Cost	$10,000+
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Village Board
Action since 2010	This is a new action. Not yet started

Description	**Backup Power Generators**
Analysis	Provide a safe back-up power supply for critical facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Potential Funding	HMGP, PDM, Village Funds
Timeline	2-5 Years
Priority	Medium

Description	Backup Power Generators
Lead Agency	Village Board, Fire Department
Action since 2010 plan	Not yet started

Description	Hazardous Tree Removal
Analysis	Identify and remove hazardous trees and limbs.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Severe Thunderstorms, Tornados, High Winds, and Severe Winter Storms
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Village Board, Fire Department
Action since 2010 plan	Not yet started

Description	Power, Service, Electrical, and Water Distribution Lines
Analysis	Communities can work with their local Public Power Districts or Electric Department to identify vulnerable transmission and distribution lines and plan to bury lines underground or retrofit existing structures to be less vulnerable to storm events. Electrical utilities shall be required to use underground construction methods where possible for future installation of power lines.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Village Funds
Timeline	2 – 5 years
Priority	High
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as schools, and critical facilities.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Village Funds
Timeline	2 – 5 years
Priority	High
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Stabilize/Anchor Fertilizer, Fuel and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement. If left unanchored tanks could present major threat to property and safety in a tornado or high wind event.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados and High Winds
Estimated Cost	1,000+
Potential Funding	Private funds
Timeline	2-5 Years
Priority	Low
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Stormwater System and Drainage Improvements
Analysis	Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding

Description	Stormwater System and Drainage Improvements
Estimated Cost	$10,000 - $100,000+
Potential Funding	HMGP, PDM, CDBG
Timeline	2-5 Years
Priority	Medium
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Goal/Objectives	Goal 2/ Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 - $100,000+
Potential Funding	HMGP, PDM, CDBG, Village Funds
Timeline	5+ Years
Priority	Low
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Drainage Study/Stormwater Master Plan
Analysis	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 - $50,000
Potential Funding	HMGP, PDM, CDBG, Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Goal/Objective	Goal 5/Objective 5.2
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Estimated Cost	$1,000+
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Low
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+

Description	Public Awareness / Education
Potential Funding	Village Funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's water tanks/trucks, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles and identifying and training additional personnel for emergency response.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Wildfires
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Village Funds, CDBG
Timeline	5+ Years
Priority	Medium
Lead Agency	Village Board, Fire Department
Action since 2010 plan	Not yet started

Description	Alert/Warning Sirens
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or upgraded. Install new sirens and remote activation where lacking.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$15,000+
Potential Funding	Village Funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	Village Funds
Timeline	2 – 5 years
Priority	Low
Lead Agency	Fire Department, Village Board
Action since 2010 plan	Not yet started

Description	NFIP Continuation and Enforcement
Analysis	Enforcement of floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs); and description of community assistance and monitoring activities.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Timeline	Ongoing
Priority	High
Lead Agency	Village Board, Floodplain Administrator
Action since 2010 plan	Have participated in NFIP since November 2008. Oxford continues to enforce floodplain regulations, and participate in community assistance and monitoring activities.

Removed Mitigation Projects

Description	Flood Prone Property Acquisition
Analysis	Voluntary acquisition and demolition of properties prone to flooding will reduce the general threat of flooding for communities. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.
Hazard(s) Addressed	Flooding
Reason for Removal	No repetitive loss properties in the village.

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Village of Wilsonville

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Wilsonville participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Wilsonville attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Wilsonville, the top concerns that were identified through this planning process include agricultural animal disease, grass/wildfire, hail, severe thunderstorms, and tornados. The following people were involved in the development of Wilsonville's Participant Section:

Table WLS 1: Village of Wilsonville Plan Contributors

Name	Title	Department / Organization
Roger Powell	Furnas County Emergency Manager	Furnas County
Eve Bell	Clerk	Wilsonville

This section contains important information about the Village of Wilsonville relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

Location/Geography

Wilsonville is a village located in the southwest portion of Furnas County. The Village of Wilsonville covers an area of 192 acres and has an elevation of 2,303 feet above sea level. Wilsonville is 67 miles southwest of Kearney. The topographic region Wilsonville lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. There are no major water ways near the village.

Transportation

Figure WLS 1 shows the major transportation routes for the village. There is one highway in Wilsonville NE HWY 89. According to The Nebraska Department of Roads the average daily traffic county for NE HWY 89 is 395 vehicles with 60 of those being heavy trucks passing to the east of the village and 335 vehicles with 65 of those being heavy trucks passing to the west of the village. There is one railway that passes through the center of town.

Figure WLS 1: Wilsonville

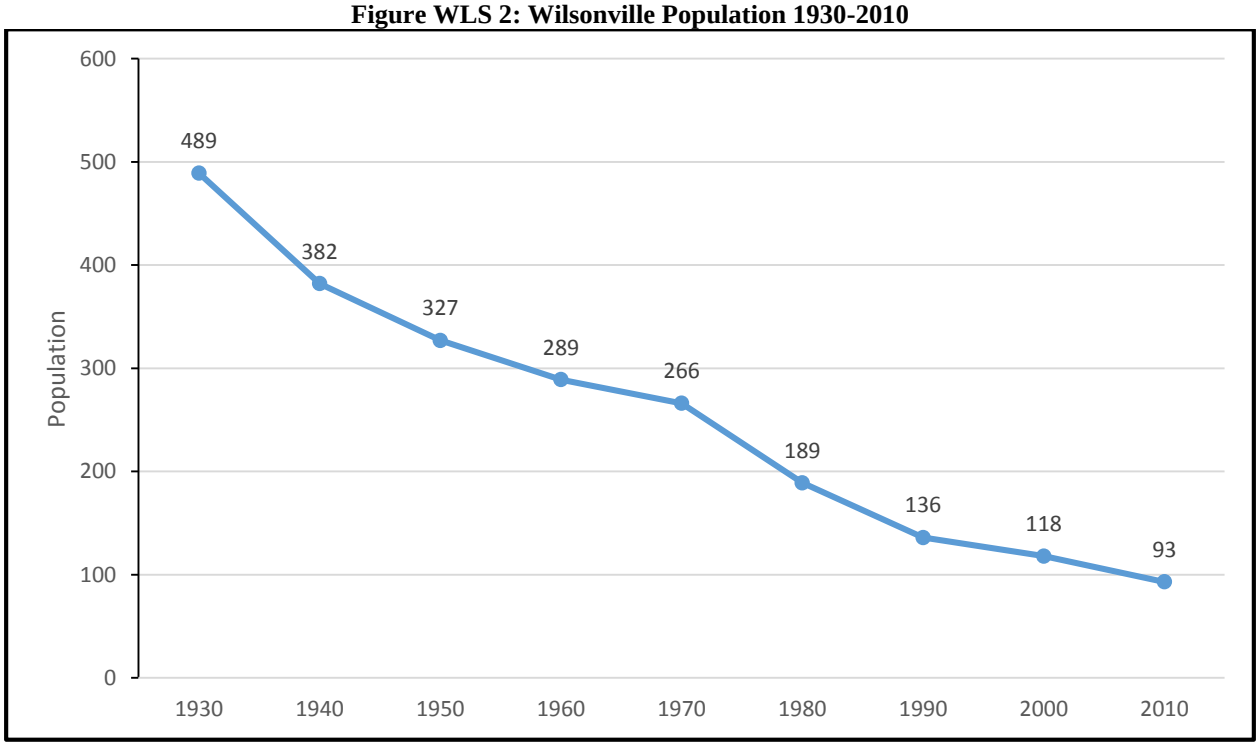
Climate

All the climate data for the village has been taken from a station located in Beaver City (250640). Please refer to the *Furnas County Section* for a climate summary for the village.

Demographics

Figure WLS **2** displays the population for Wilsonville from 1930 to 2010. The population of Wilsonville has been steadily declining since 1930. From 2000 to 2010, the village lost approximately 22 percent of its population. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure WLS 2: Wilsonville Population 1930-2010



Source: US Census

Table WLS 2 illustrates the age distribution and median age for Furnas County in comparison to the Village of Wilsonville. The village has roughly the same percentage of the population over the age of 64 around 23 percent. The median age for the village is four years older than that of the county.

Table WLS 2: Wilsonville Age Distribution

Age	Furnas County	Wilsonville
<5	5.2%	2.2%
5-64	71.7%	74%
>64	23.1%	23.8%
Median	47.4	51.4

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Wilsonville in Table WLS 3. The median home value for the village is $28,900 less than that of the county, and median rent is about $40 lower than that of the county. The

population has decreased in the last decade as noted in the demographic section, the lower cost of living compared with the rest of the county may be due to the aging housing stock. As these structures age if they are not cared for they may continue to increase the vulnerabilities to hazards.

Table WLS 3: Wilsonville Housing Value and Income

	Furnas County	Wilsonville
Median Household Income[1]	$51,458	$35,625
Per Capita Income[1]	$22,068	$21,143
Median Home Value[2]	$56,400	$27,500
Median Rent[2]	$488	$450

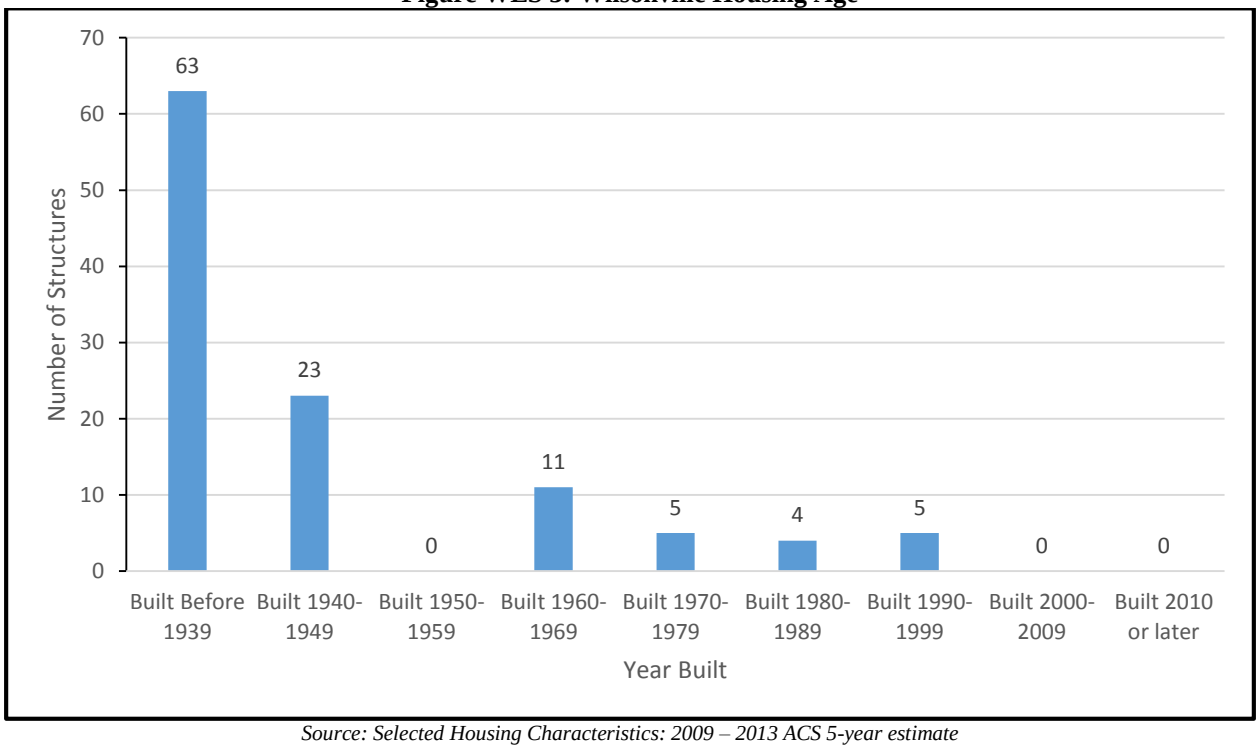
1 Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2 Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Figure WLS **3)** the village has 111 housing units with 48 percent of those units occupied (

Table **WLS** 4). The local planning team indicated that the percentage of vacant structures within Wilsonville is closer to 25 percent. The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. As a large percentage of the residential structures in the community are vacant, the community is vulnerable to blighted conditions within the village.

There are four mobile homes located in the village. Over 77 percent of the village's housing stock was built before 1960. Although there are mobile homes in the community, they are not located in a single identified mobile home park, but are spread throughout the village. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados.

Figure WLS 3: Wilsonville Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table WLS 4: Wilsonville Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Furnas County	2,215	81.6%	501	18.4%		1,602	72.3%	613	27.7%
Wilsonville	53	47.7%	58	52.3%		53	100%	0	0%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Wilsonville are educational services and health care (37.3%), agriculture and forestry (27.3%), and retail trade (13.6%). The major employer in the Village of Wilsonville is Ag Valley Coop. Many residents also commute to Cambridge for work.

Structural Inventory

Results from the structural inventory completed for the Village of Wilsonville are found in Table WLS 5.

Table WLS 5: Wilsonville Structural Inventory and Valuation

Jurisdiction	Commercial/Industrial	Agriculture	Residential	Public/ Quasi-Public	Total
Wilsonville	$330,134	$120,000	$1,314,919	$85,263	$1,850,316

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Wilsonville planning team as a part of the plan update. Table WLS 6 and

Figure ***WLS* 4** provide a summary of the type and location of critical facilities for the jurisdiction.

Table WLS 6: Critical Facilities List

Critical Facility Number	Critical Facility
1	Methodist Church
2	Baptist Church
3	Post Office
4	Library
5	Fire Department

Figure WLS 4: Wilsonville Critical Facilities Map

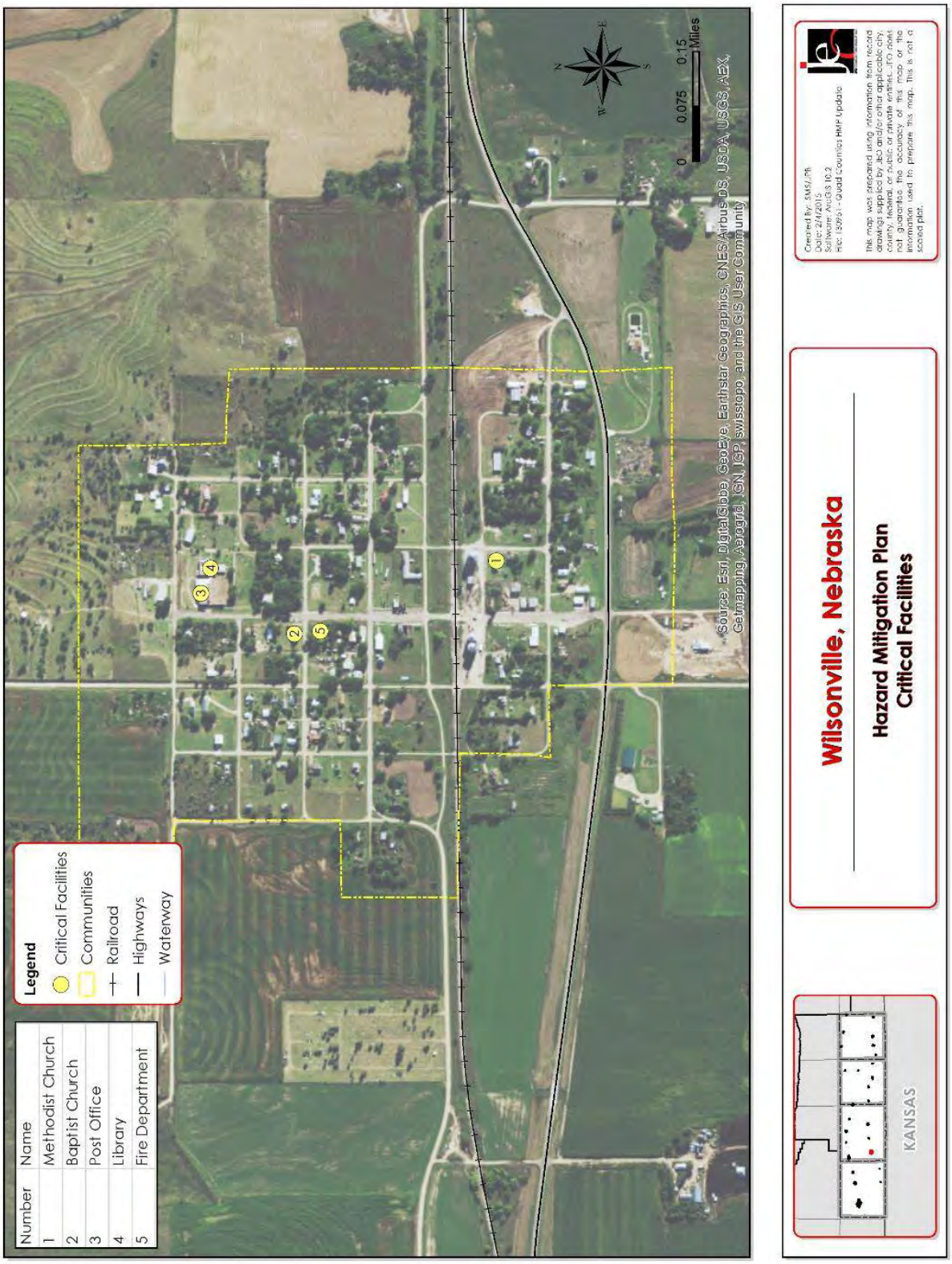
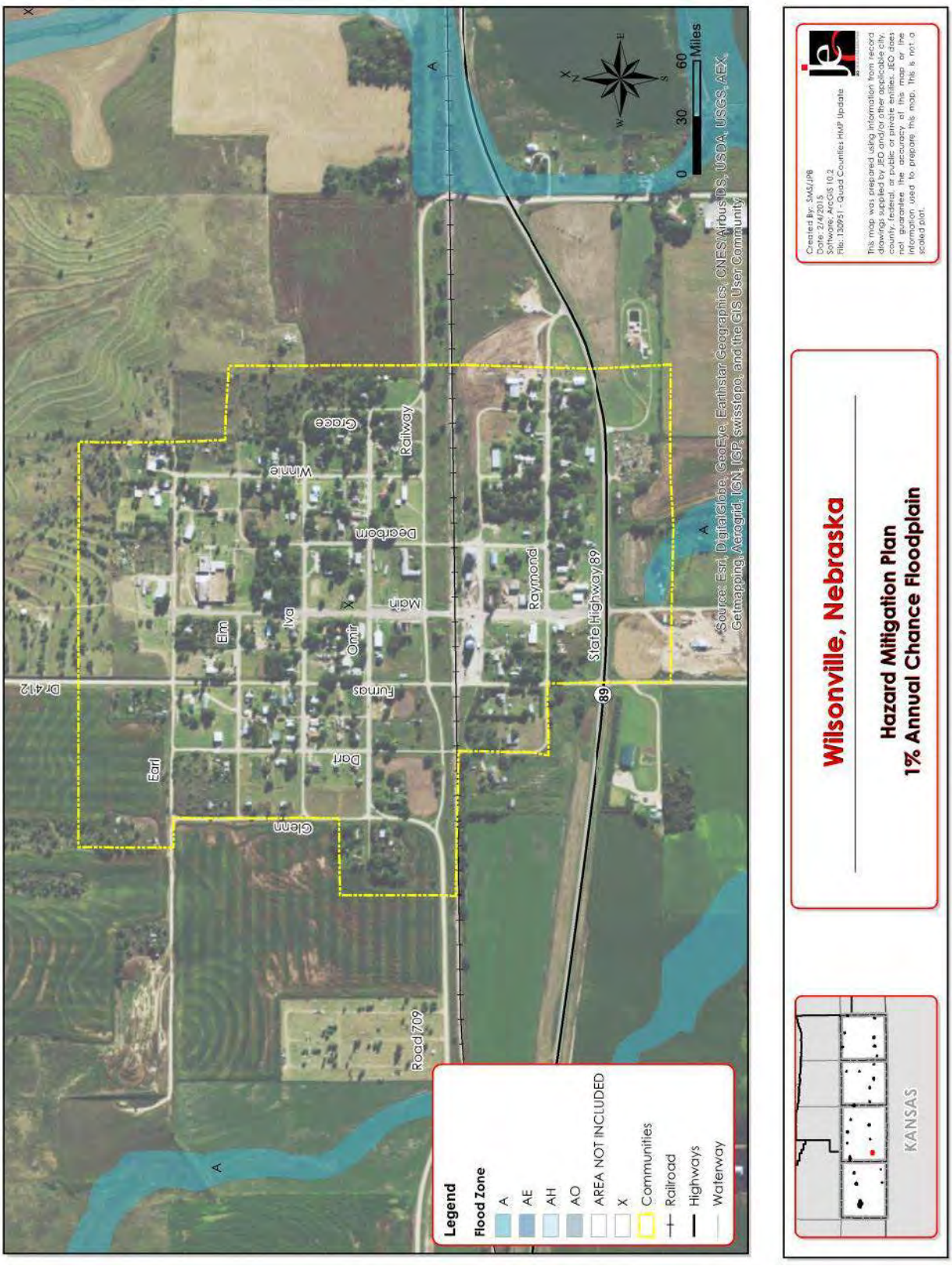


Figure WLS 5 shows the 1% annual flood risk area for the Village of Wilsonville. The village has no structures or critical facilities in the floodplain. There are no repetitive loss properties in the village. The initial FIRM for the Village as developed in November of 2001 and revised in March of 2009. Wilsonville does participate in the NFIP, but it does not have any polices in effect as of February 28, 2015.

Figure WLS 5: Wilsonville 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of 10 chemical storage sites in the Village of Wilsonville, and none of these sites house materials that are categorized as hazardous.

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sites located in the Village of Wilsonville.

Future Development Trends

According to the Census data, Wilsonville's population is declining. Factors that contribute to that decline are the age of the residents and the poor job market. Ag Valley Coop built a new grain handling facility and fueling station in 2015. There are no residential or commercial development planned in the next five years. Any future development will be discouraged in hazardous areas such as the floodplain.

Risk Assessment

Hazard Identification

Table WLS 7 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table WLS 7: Wilsonville Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease*	Yes	Economic impacts
Agricultural Plant Disease	Yes	None
Chemical Spills (Fixed Site)	No	None
Chemical (Transportation)	No	None
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfire*	Yes	Property damages, injuries
Hail*	Yes	Property damages
High Winds	Yes	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damages, injuries
Severe Winter Storm	Yes	None
Terrorism	No	None
Tornado*	Yes	Property damages, loss of life

** Identified as a top concern by the local planning team*

The top five hazards in Wilsonville are agricultural animal disease, grass/wildfire, hail, severe thunderstorms, and tornados. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 38 severe weather events from 1996 to 2014 in the Village of Wilsonville. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table WLS 8 provides a summary of the events that caused damage.

Table WLS 8: Wilsonville Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/19/2000	Hail	1.75 in.	0	0	$40,000
6/29/2000	Thunderstorm Wind	56 kts./ 64 mph	0	0	$200,000
7/20/2000	Hail	1 in.	0	0	$5,000
6/13/2001	Hail	1.25 in.	0	0	$20,000
8/11/2001	Hail	0.75 in.	0	0	$25,000
5/26/2002	Thunderstorm Wind	58 kts./ 67	0	0	$30,000
5/8/2003	Hail	1.75 in.	0	0	$25,000
5/22/2004	Hail	1.75in.	0	0	$25,000
5/29/2004	Thunderstorm Wind	61 kts./ 70 mph	0	0	$150,000
6/10/2004	Hail	1.75 in.	0	0	$10,000
9/14/2004	Hail	1.75 in.	0	0	$30,000
7/17/2005	Hail	1.75 in.	0	0	$25,000
6/24/2006	Thunderstorm Wind	52 kts./ 60 mph	0	0	$5,000
5/29/2007	Thunderstorm Wind	52 kts./ 60 mph	0	0	$2,000
6/5/2008	Hail	1 in.	0	0	$2,000
7/13/2011	Hail	1.75 in.	0	0	$25,000
7/13/2011	Hail	1.25 in.	0	0	$25,000
6/14/2012	Hail	1.5 in.	0	0	$50,000
7/9/2013	Hail	1.75 in.	0	0	$25,000

Source: NCDC

Agricultural Animal Disease

An outbreak of agricultural disease would be devastating to the local economy. The local planning team identified that populations of cows and pigs are of greatest concern. The Furnas County LEOP has procedures in place in the event of agricultural animal disease. Furnas County Emergency Management has a citizen notification system. Furnas County Emergency Management also has handouts and pamphlets available to educate residents.

Grass/Wildfire

The Nebraska Forest Service reported eight wildfires near Wilsonville from 2000 to 2014. The local planning team indicated that many additional wildfires went unreported during that time. These fires burned a total of 35.7 acres. Water supply and firefighting equipment are sufficient to combat local fires. Wilsonville has a mutual aid agreement with neighboring fire departments.

Hail

According to NCDC data, Wilsonville has experienced 29 hail events from January 1996 to December 1996. These events caused $332,000 in property damages. Municipal facilities are insured for hail damage.

Severe Thunderstorms
Severe thunderstorms occur several times annually within Wilsonville and the rest of the planning area. The NCDC reports that there have been eight severe thunderstorms in Wilsonville between January 1996 and December 2014. These reported storms caused $387,000 in property damages. In the event of a power outage due to a severe thunderstorm, Wilsonville has a backup generator for their water well.

Tornados
NCDC reports that there has been one tornadic event near Wilsonville from January 1996 to December 2014. This F0 tornado touched down northwest of Wilsonville in May 2002 and did not cause any damage. In the event of a tornado, Wilsonville has a tornado siren and Furnas County Emergency Management offers text alerts to warn residents of the impending severe weather. The community does not have a safe room; however residents seeking shelter can go to the Baptist Church.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance
The Village of Wilsonville is governed by a five member Village Board, led by a Chairperson. The Village of Wilsonville government also includes a Clerk/Treasurer, and Fire Chief.

Table WLS 2: Wilsonville Capabilities Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	Yes
	Storm Water Management Plan	No

Survey Components/Subcomponents		Comments
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	Yes
	Building Codes	No
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table WLS 2 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Wilsonville has an annex to the Furnas County Local Emergency Operations Plan, which was last updated in 2014. This plan discusses a number of hazards that can affect the community. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The Village of Wilsonville has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from partnerships with the county and LRNRD, and will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

New/Ongoing Mitigation Projects

Description	**Safe Rooms**
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as schools and other critical facilities.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Village Funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	**NFIP Continuation and Enforcement**
Analysis	Enforcement of floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs); and Description of community assistance and monitoring activities.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Village Funds
Timeline	Ongoing
Priority	Medium
Lead Agency	Floodplain Administrator, Village Board
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	**Weather Radios**
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards

Description	Weather Radios
Estimated Cost	$50/radio
Potential Funding	Village Funds, HMGP, PDM
Timeline	2 – 5 years
Priority	High
Lead Agency	Village Board, Fire Department, Emergency Manager
Action since 2010 plan	Determined potential locations of weather radios as Village Office and Fire Station

Removed Mitigation Projects

Description	Floodplain Regulation Enforcements and Updates
Analysis	Continue to enforce local floodplain regulations for structures located in the 1% annual floodplain. Strict enforcement of the type of development and elevations of structures should be considered through issuance of building permits by any Nebraska city. Continue education of building inspectors or Certified Floodplain Managers.
Hazard(s) Addressed	Flooding
Reason for Removal	No updates are necessary at this time. This mitigation action and floodplain management are included within the NFIP Continuation and Enforcement mitigation action.

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer needed as an action. This mitigation action and floodplain regulation enforcements and updates are included within the NFIP Continuation and Enforcement mitigation action.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Hazard(s) Addressed	All hazards
Reason for Removal	This action will be handled by Furnas County Emergency Management

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Harlan County

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

Harlan County participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Harlan County's participation was extensive; a representative from Harlan County attended every public meeting, met individually with members from the planning team, completed all hazard identification and project identification worksheets, engaged the general public in the planning process, and assisted in interdepartmental coordination and data analysis.

For Harlan County, the top concerns that were identified through this planning process include agricultural animal disease, drought, severe thunderstorms, severe winter storms, and tornados.

The following people were heavily involved in the development of Harlan County's Participant Section:

Table HNC 1: Harlan County Plan Contributors

Name	Title	Department / Organization
Chris Becker	Harlan County Sheriff	Harlan County
Lonny Hanna	Harlan County Board Vice Chair	Harlan County

This section contains important information about Franklin County relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
    - Business Profile
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

County Profile

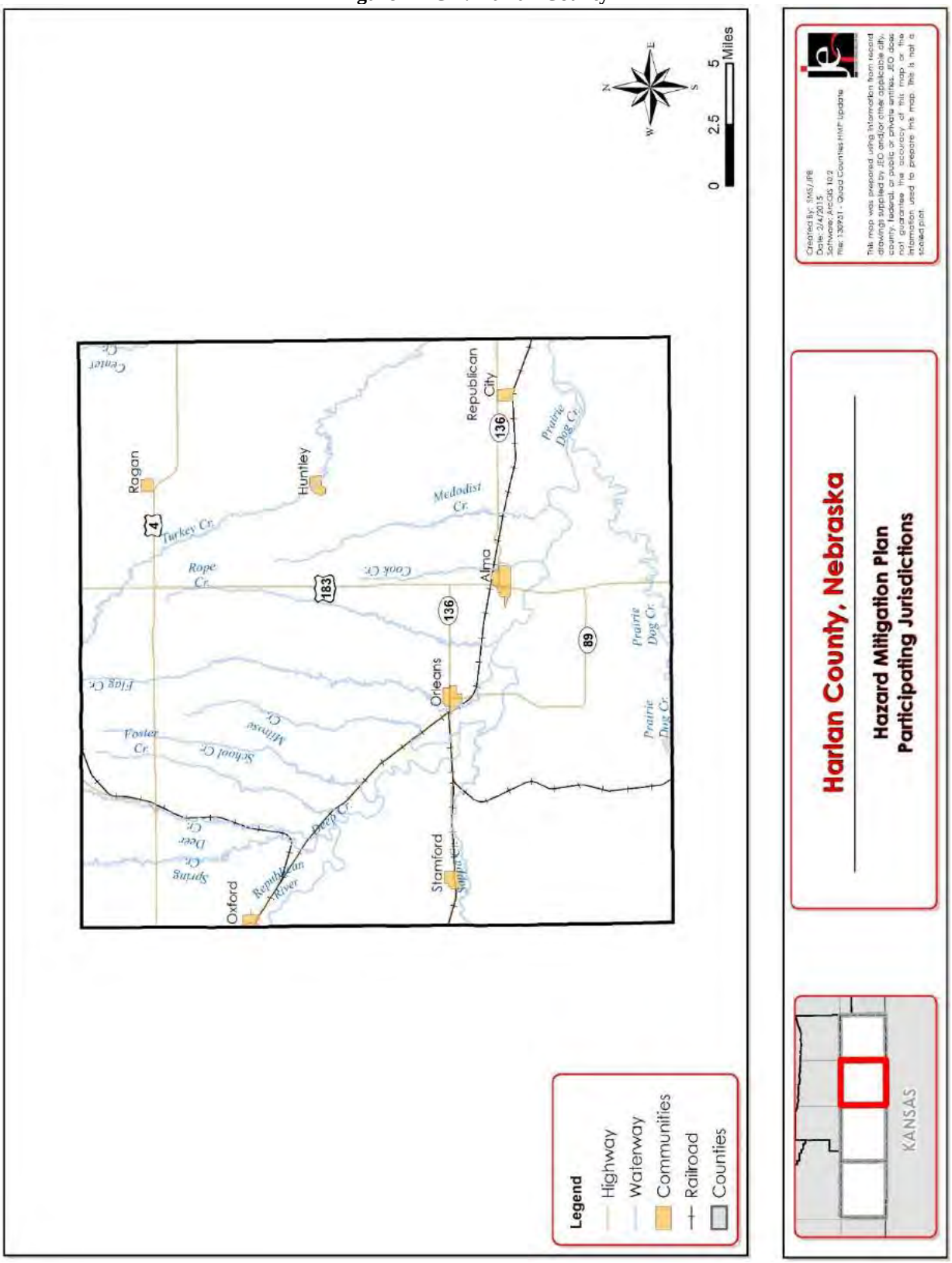
Location/Geography

Harlan County is located in the south-central Nebraska. The counties adjacent to it are: Franklin, Furnas, Kearney, and Phelps counties in Nebraska; and Norton and Phillips counties in Kansas. Harlan County is approximately 2,028 feet above sea level and covers an area of 574 square miles. The Republican River traverses through the county and the Harlan County Reservoir is in the southeast corner. This lake is Nebraska's second largest lake with 13,250 acres of water surface and 75 miles of shoreline.

Transportation

Figure HNC **1** shows the major transportation routes through the county. There are three main highways across the county: US Highway 136, US Highway 183, and NE Highway 4 (which joins US Highway 6). According to the Nebraska Department of Roads, the average daily traffic count for US Highway 136 is 675 vehicles with 75 of those being heavy trucks. The traffic count for US Highway 183 is 2,970 vehicles with 395 of those being heavy trucks. The traffic count for NE Highway 4 is 505 vehicles with 55 of those being heavy trucks at the eastern border and 105 vehicles with 15 of those heavy trucks at the NE Highway 4 – US Highway 6 junction. US Highway 6 has a traffic count of 2,455 vehicles with 295 of those being heavy trucks at the border with Phelps County, and 2,050 vehicles with 365 of those being heavy trucks at the western border.

Figure HNC 1: Harlan County

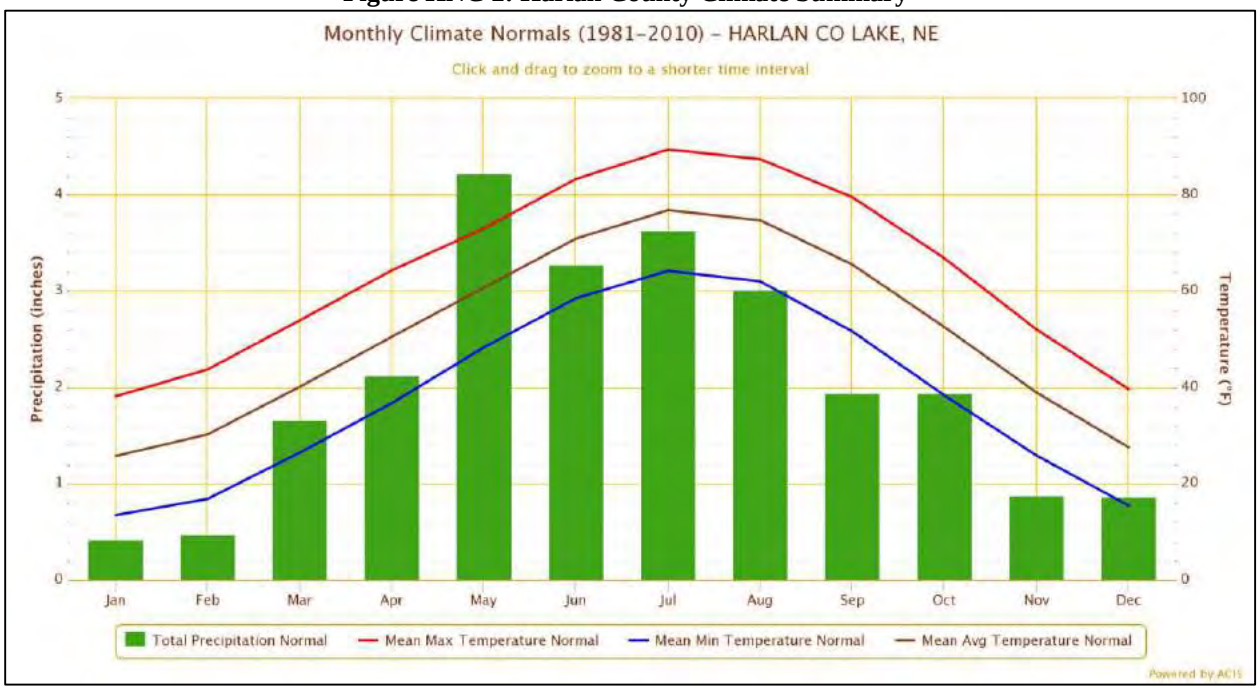


Climate

Weather data for Harlan County is taken at the Harlan County Lake, a representative location for the rest of the county. The normal high temperature for the month of July is 88.9ºF, and the normal low temperature for the month of January is 11.6ºF. The record high for the county of 111ºF set in July 1954, and the record low for the county of 35ºF below zero was set in in December 1964. On average Harlan County receives 24.13 inches of rain and 18.5 inches of snow.

Figure HNC **2** provides a summary of the climate normals for Harlan County.

Figure HNC 2: Harlan County Climate Summary

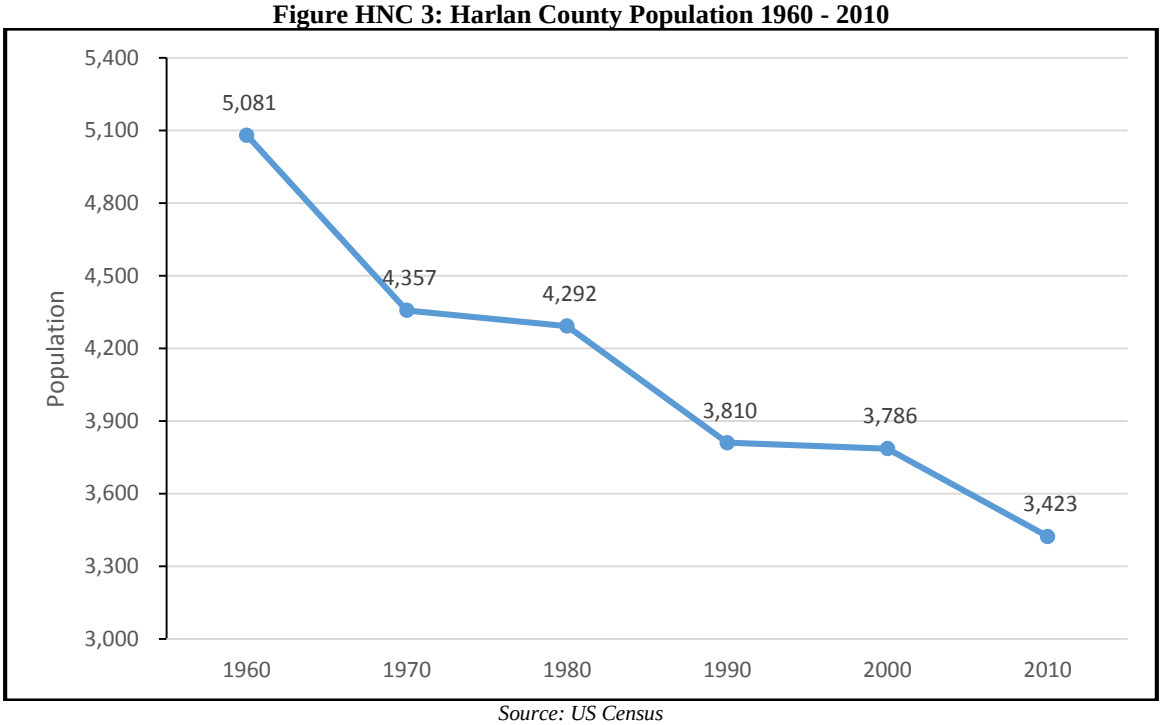


Source: SCACIS

Demographics

Figure HNC **3** shows the population from 1960 to 2010. The population of Harlan County has been declining since 1960. This is notable for hazard mitigation because communities with declining population may have a higher level of unoccupied housing that is not being up kept. Decreasing populations can also represent decreasing tax revenue for the county which could make implementation of mitigation actions more fiscally challenging.

Figure HNC 3: Harlan County Population 1960 - 2010



Source: US Census

Table HNC 2 shows the population for the county compared to each community in the county from 2000 to 2010. The county saw population decrease by about 10 percent since 2000. The villages of Huntley and Stamford both lost around 30 percent of their populations. The villages of Oxford and Ragan both lost over 10 percent of their populations. According to the local planning team, the aging population and lack of employment opportunities has contributed to the declining population. As communities experience population decline, they become more vulnerable to the impacts from hazards. Declining populations often result in higher rates of empty or vacant properties, declining or poorly maintained infrastructure, and reduced response and recovery capabilities.

Table HNC 2: Harlan County Population Trends

Jurisdiction	2000 Population	2010 Population	% Change	2020 Projected Population
Harlan County (Total)	3,786	3,423	-9.6%	3,094
Harlan County (Unincorporated)	747	710	-5.0%	675
Alma	1,214	1,133	-6.7%	1,057
Huntley	67	44	-34.3%	29
Orleans	425	386	-9.2%	350
Oxford	876	779	-11.1%	693
Ragan	46	38	-17.4%	31
Republican City	209	150	-28.2%	108
Stamford	202	183	-9.4%	166

Source: US Census Bureau – 2000, 2010

Table HNC 3 illustrates the age distribution and median age for Harlan County in comparison to the state, the villages of Huntley, Orleans, Oxford (partially) Ragan, Republican City, and Stamford, and the city of Alma. Four of the communities have a higher percentage of population over the age of 64 than that of the county. Three communities and the state have a lower percentage of the population over the age of 64 than

that of the county. Three communities have a median age older than that of the county. Two communities have a median age that is within one of the median age of the county. Three communities and the state have a median age that is younger than that of the county.

Table HNC 3: Harlan County Age Distribution

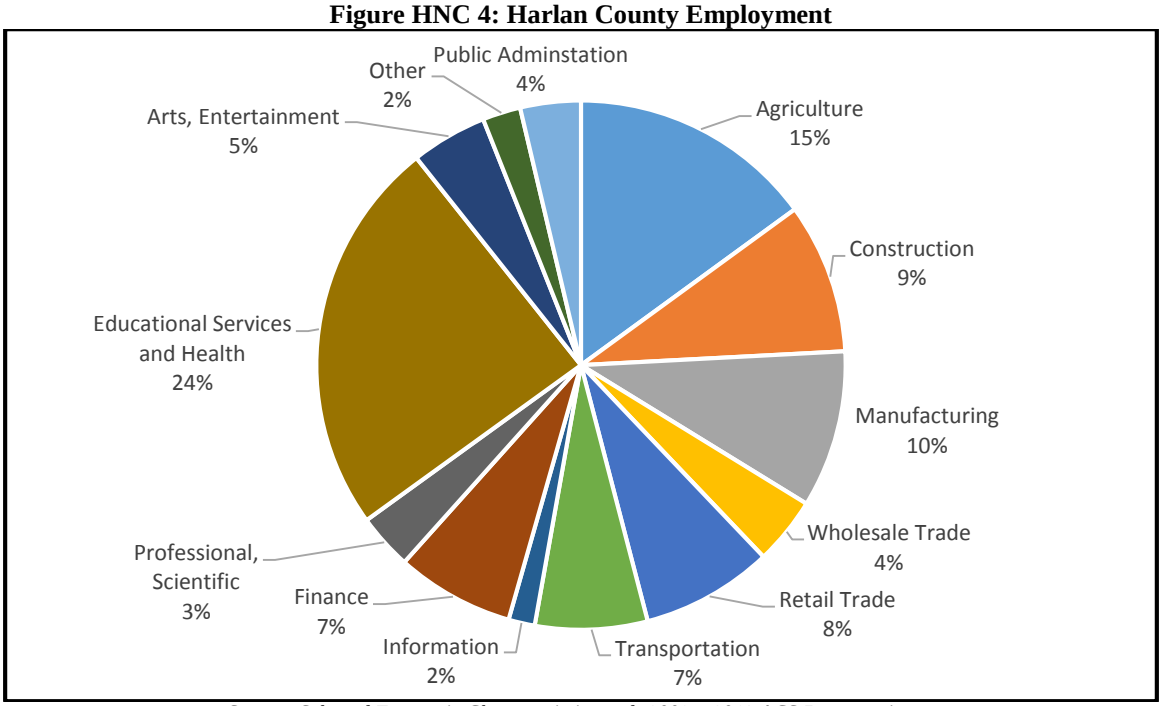
Age	Nebraska	Harlan County	Alma	Huntley	Orleans	Oxford	Ragan	Republican City	Stamford
<5	7.2%	5.3%	5.8%	0%	3.1%	4.9%	0%	4%	4.9%
5-64	79.2%	71.2%	66%	90.9%	68.7%	75.3%	81.6%	57.3%	68.3%
>64	13.6%	23.5%	28.2%	9.1%	28.2%	19.8%	18.4%	38.7%	26.8%
Median	36.2	49.2	49.6	47.0	50.0	46.2	50.5	59.8	45.5

Source: U.S. Census Bureau, 2010

Employment

Figure HNC **4** shows the employment by industry for Harlan County. Harlan County had 108 businesses with 632 paid employees according to the 2012 U.S. Economic Census.

Figure HNC 4: Harlan County Employment



Source: Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate

The top sector for employment in the county is educational services and health employing approximately 24 percent of the population. This is in part due to the Harlan County Health System having a hospital in Alma, a clinic in Arapahoe and Cambridge, and three options for senior living. There is one school district in the county (Alma Public Schools). Agriculture is the second highest sector for employment with about 15 percent of the population.

Agriculture

The agricultural and forestry industry accounts for 15 percent of employment in the county, ranking it second of all industries, it is an integral part of the economy and local communities. For example, other industries such as transportation are related to the agricultural industry as some of their transports include crops, feed, and animals for farmers. Harlan County's 360 farms (Table HNC 4) covers 312,759 acres of

land, which accounts for 88 percent of the surface land in the county. Crops and livestock are the visible parts of the agricultural economy, but many related businesses contribute as well by producing, processing and marketing farm and food products. These businesses generate income, employment and economic activity throughout the region.

Table HNC 4: Agricultural Inventory

Agricultural Assets	Inventory
Number of Farms	360
Land in Farms	312,759 acres
Estimated market values of land & buildings (per farm)	$2,677,534
Crop Lands	211,804 acres
Cattle Inventory	44,133 head

Source: USDA Census of Agriculture, 2012

Housing and Economics

The median household income, per capita income, home value and rent for the county as a whole are compared with the villages of Huntley, Orleans, Oxford, Ragan, Republican City, and Stamford and the city of Alma in Table HNC 5. The median household income for the county is $54,862 with a median home value of $75,100. The median household income is about $3,200 more than that of the state and the median home value is $52,900 less than that of the state. The higher income and lower cost of living compared to that of the state may make contribute to any future population stabilization in the county.

Table HNC 5: Harlan County Housing Value and Income

	Nebraska	Harlan County	Alma	Huntley	Orleans	Oxford	Ragan	Republican City	Stamford
Median Household Income[1]	$51,672	$54,862	$35,417	$33,438	$38,750	$39,922	$80,278	$38,750	$36,406
Per Capita Income[1]	$26,899	$25,322	$25,275	$14,503	$19,198	$23,978	$25,581	$24,997	$19,419
Median Home Value[2]	$128,000	$75,100	$72,000	$66,300	$41,800	$41,000	-	$66,600	$44,400
Median Rent[2]	$706	$546	$484	-	$489	$513	-	$475	$444

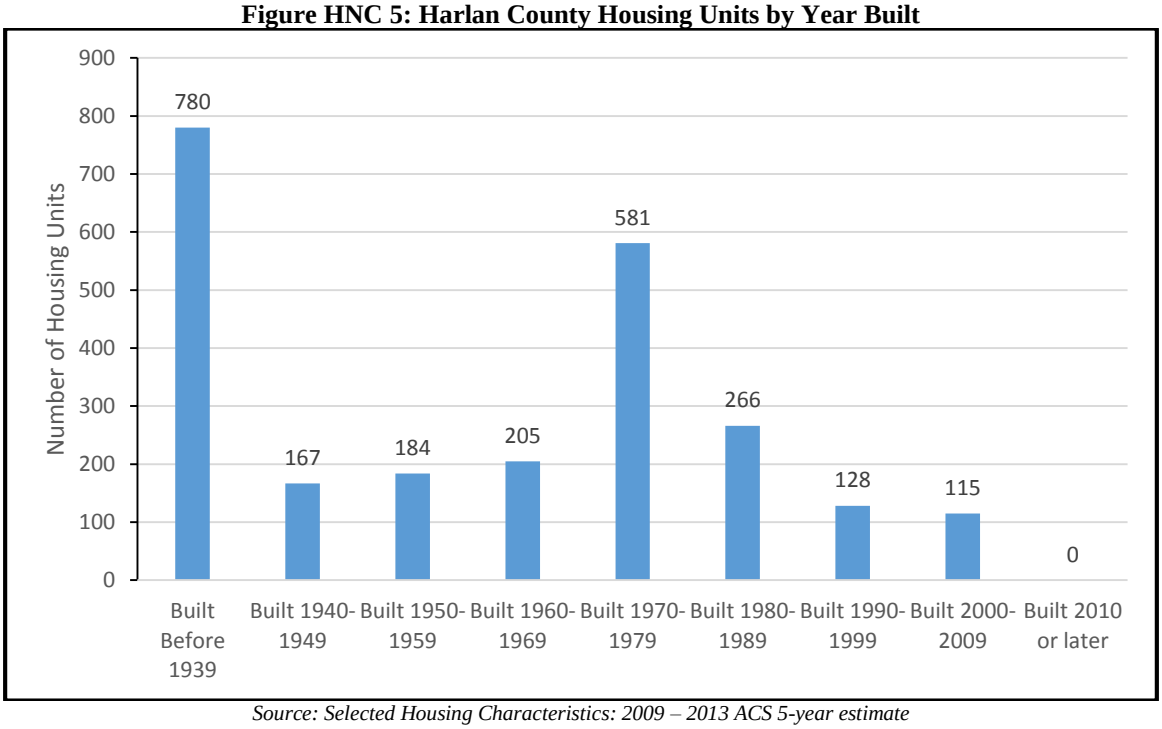
1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Table HNC **6**) Harlan County has 2,426 housing units with 81.2 percent of those units occupied. Five communities Huntley, Orleans, Oxford, Republican City, and Stamford have vacancy rates that are over 15 percent. 23 percent of the county's homes are classified as mobile homes. Over 32 percent of the county's housing units were built before 1939 (
There are mobile home parks located throughout the county, in Alma, and in Republican City.

Figure HNC 5). Vacant buildings, mobile homes, and aging housing stock are susceptible to high winds, severe thunderstorms and tornados. Residents living near or in these types of structures will be vulnerable to severe weather hazards. Nearly all of the county's homes were built prior to the first FIRM for the county in 2009. Houses built prior to this year may not be constructed above the base flood elevation. Floodplains go through the incorporated areas of Huntley, Orleans, and Oxford.

There are mobile home parks located throughout the county, in Alma, and in Republican City.

Figure HNC 5: Harlan County Housing Units by Year Built



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table HNC 6: Harlan County Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Harlan County (Total)	1,573	64.8%	853	35.2%		1,226	77.9%	347	27.7%
Harlan County (Unincorporated)	213	31.3%	468	68.7%		175	82.2%	38	17.8%
Alma	528	87.9%	73	12.1%		387	73.3%	141	26.7%
Huntley	13	37.1%	22	62.9%		13	100%	0	0%
Orleans	191	75.2%	63	24.8%		151	79.1%	40	20.9%
Oxford	416	83.9%	80	16.1%		316	76%	100	24%
Ragan	16	88.9%	2	11.1%		11	68.8%	5	31.3%
Republican City	109	46.2%	127	53.8%		93	85.3%	16	14.7%
Stamford	87	82.9%	18	17.1%		80	92%	7	8%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Structural Inventory

The planning team requested GIS parcel data from the Assessor for each county. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table HNC 7.

Table HNC 7: Structural Inventory

Jurisdiction	Number of Parcels with Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Value of Improvements in Floodplain
Harlan County	2,381	$159,462,725	$66,973	$21,121,745

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Harlan County planning team as a part of the plan update. Table HNC 8 provides a summary of the type and location of critical facilities for the County.

Table HNC 8: List of Critical Facilities

Critical Facility Number	Critical Facility	Location
1	Harlan County Court House	Alma

Harlan County does not have any critical facilities located in the 1% annual floodplain.

Levees

There are no levees located in Harlan County.

Dams

There are 46 dams in Harlan County. Of these, one dam has been identified as a high hazard dam.

Table HNC 9: Dams in Harlan County

	Number of Dams	Minimal	Low	Significant	High
Harlan County	46	6	36	0	1
Planning Area	175	33	125	3	2

Source: NDNR

Table HNC 10 shows the high hazard dams that could affect jurisdictions within Harlan County.

Table HNC 10: High Hazard Dam that could affect Harlan County

NIDID	Dam Name	County	Downstream Jurisdiction
NE01066	Harlan County Dam	Harlan	Naponee

Source: NDNR

Chemical Storage Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of 11 chemical storage sites in Harlan County, and five of these sites house materials categorized as hazardous. Table HNC 81 lists facilities that house hazardous materials only.

Table HNC 81: Chemical Storage Fixed Sites

Facility	Address	Hazardous Material
Cargill Ag Horizons	71853 A Rd, Oxford	Paraquat Dicholoride
Cargill Ag Horizons	11398 719 Rd, Alma	Paraquat Dicholoride
CHS Agri Services Center	1001 N Highway 183,Alma	Dimethoate, Paraquat Dichloride
Frontier Communications	709 1st St, Alma	Sulfuric Acid
Merricks of Nebraska LLC	600 Oak St, Oxford	Formaldehyde Solution

Source: Nebraska Department of Environmental Quality

CHS is located near the Harlan County Hospital and Good Samaritan Care Facility. CHS and Merricks of Nebraska is located in populated areas that could be impacted if there was a chemical spill.

Historic Sites

According to the National Register of Historic Places for Nebraska, there are four historic sites located in Harlan County. There are three sites in the 1% annual floodplain.

Table HNC 92: National Historic Registry

Site Name	Date Listed	Classification	In Floodplain?
Alma Auditorium and Sale Barn	7/11/2014	Building	No
Sappa Creek Bridge	6/29/1992	Structure	Yes
Prairie Dog Creek Bridge	6/29/1992	Structure	Yes
Turkey Creek Bridge	6/29/1992	Structure	Yes

Source: Nebraska State Historical Society

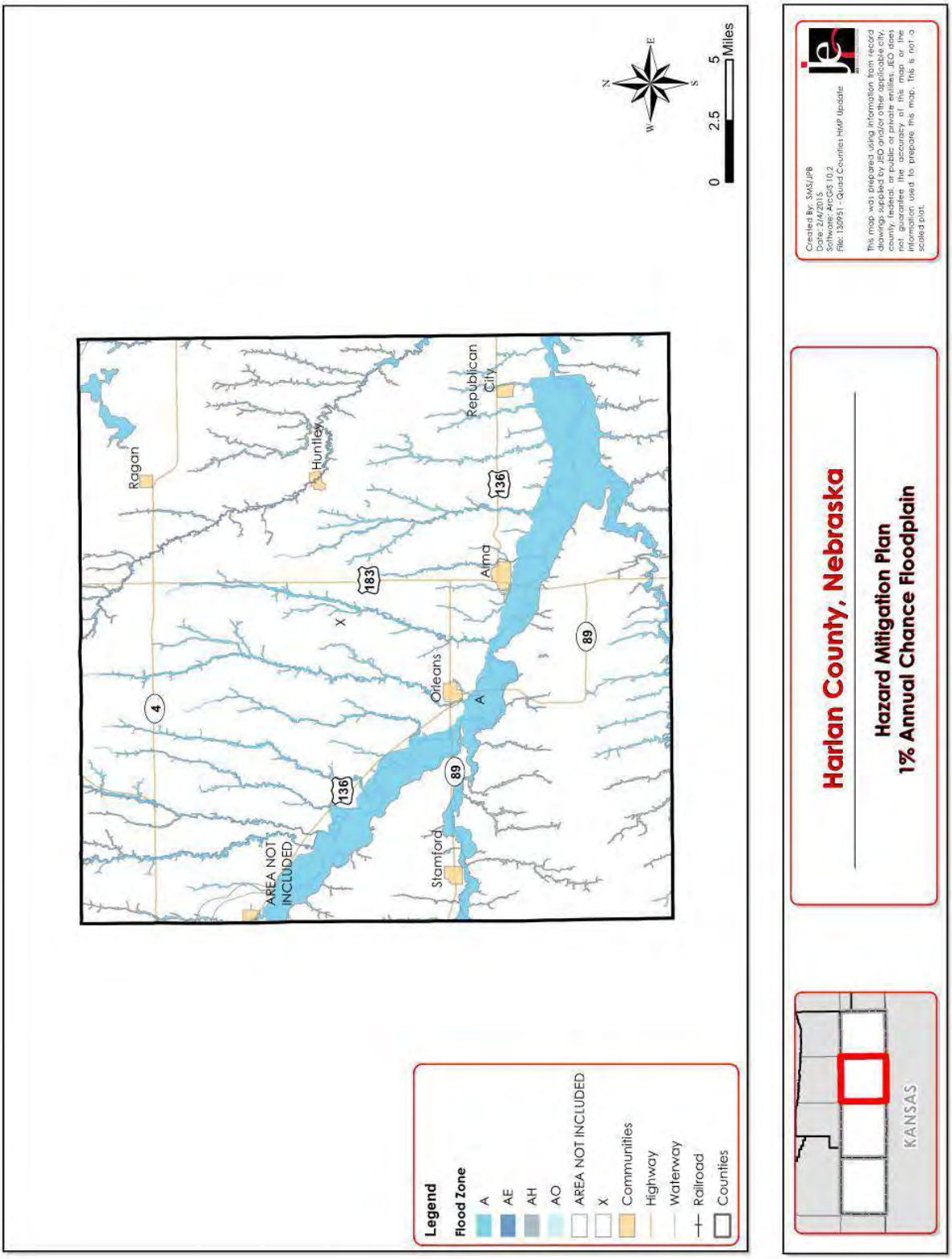
Future Development Trends

Harlan County expects that structures will be built in both the incorporated and unincorporated areas of the county. New structures in the incorporated areas will likely be housing units (single family homes) and commercial structures. In the unincorporated areas new structures will most likely be new farming operations. It will be important that residential areas be protected from site specific hazards such as flood prone areas. See the participant sections of the communities for their own future development trends.

Flooding

Figure HNC 6 shows the 1% annual floodplain for Harlan County. There are no critical facilities in the floodplain. There are no repetitive loss properties in the county. The initial FIRM for the Harlan County was developed in February of 2009. Harlan County does participate in the NFIP, with six policies in effect worth $696,500 as of February 28, 2015.

Figure HNC 6: Harlan County 1% Annual Chance Floodplain



Risk Assessment

Hazard Identification

Table HNC 103 is a risk assessment identified specifically for the county. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table HNC 103: Harlan County Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	2014 HIRA	Specific Concerns Identified
Agricultural Animal Disease*	Yes	Medium	Economic impacts
Agricultural Plant Disease	Yes	Medium	None
Chemical Spills (Fixed Site)	Yes	N/A	None
Chemical Spills (Transportation)	No	Medium	None
Dam Failure	No	High	Inundation of structures, loss of life
Drought*	Yes	High	Economic impacts
Earthquake	No	Medium	None
Extreme Heat	Yes	N/A	None
Flooding	Yes	High	None
Grass/Wildfire	Yes	Medium	None
Hail	Yes	N/A	None
High Winds	Yes	N/A	None
Levee Failure	No	High	None
Severe Thunderstorm*	Yes	High	Property damages, power outages
Severe Winter Storm*	Yes	High	Property damages, power outages
Terrorism	No	Medium	None
Tornado*	Yes	High	Significant property damages, loss of life, lack of available shelter

** Identified as a top concern by the local planning team*

The top five hazards in Harlan County are animal disease, drought, severe thunderstorm, severe winter storms, and tornados. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The events recorded by NCDC are broken down by two types: county-based and zone-based events. The county-based records are events that affect the jurisdictions within the county while the zone-based records are those affecting the zone that include the county as part of the affected zone. Please refer to specific villages or cities within the county for the previous county-based severe weather events retrieved from NCDC. For zone-based events, there are 110 recorded events from 1996 to 2014. Of those 110 events 12 resulted in damages.

Table HNC **11**4 provides a summary of the events that caused damage to the county.

Table HNC 114: Harlan County NCDC Severe Weather Events

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
10/9/1997	High Wind	55 kts./ 63 mph	0	0	$25,000
11/24/2001	High Wind	52 kts./ 60 mph	0	0	$2,080

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
3/1/2002	Winter Storm	6-12 in	0	0	$5,000
2/4/2004	Winter Storm	8-12 in.	0	0	$5,000
4/18/2004	High Wind	52 kts./ 60 mph	0	0	$5,000
11/27/2005	Blizzard	-	0	0	$250,000
3/20/2006	Winter Storm	8-10 in	0	0	$50,000
4/2/2006	High Wind	35 kts/ 40 mph	0	0	$20,000
11/26/2006	Winter Weather	-	0	0	$5,000
12/29/2006	Ice Storm	0.5 in.	0	0	$1,000,000
12/1/2007	Ice Storm	0.5 in.	0	0	$20,000
12/10/2007	Winter Storm	2-6 in.	0	0	$100,000

Source: NCDC

Since NCDC data provides limited information on crop losses, additional crop loss information from 2000-2014 was gathered from the Risk Management Agency (RMA) located within the United States Department of Agriculture (USDA). RMA information is only available at the county level so additional data is not provided for the individual jurisdictions. The RMA data shows greater impacts to crops than all of the NCDC data. This discrepancy occurs because all the crop losses for every event may not be reported to NCDC like it is to RMA. In Table HNC 12, the total crop loss is provided for each hazard type along with the number of events or records over the 15 year period. Annual crop loss was calculated by diving the total crop loss by the number of years, which is 15 years.

Table HNC 12: Harlan County RMA Loss Data

Hazard Type	Number of Records	Total Crop Loss	Annual Crop Loss
Extreme Cold	99	$613,354	$43,811
Drought	206	$47,917,432	$3,422,6674
Flooding	7	$30,767	$2,198
Hail Events	176	$11,743,355	$838,811
Heat	111	$6,257,603	$446,972
High Wind	98	$3,617,215	$258,373
Plant Disease	21	$214,201	$15,300

Source: USDA, RMA Cause of Loss 2000-2014
** Amounts rounded to the nearest dollar*

Agricultural Animal Disease

The Nebraska Department of Agriculture reported two cases of animal disease in Harlan County since 2014. There was one case of bovine viral diarrhea and one case of paratuberculosis. Any widespread outbreak of animal disease in the livestock on the county could have devastating economic impacts on the county since the county is reliant on agriculture as a major economic contributor. In the past year the county only reported two incidents which limits the impacts on the county.

The livestock population of most concern for Harlan County is the cattle population. Almost half of the farms in the county have cattle on them which is more than any other livestock located in the county. There are plans in development that will deal with the protocol to deal with a disease outbreak.

Recently in the northeast portion of the state there has been an outbreak of avian flu. Harlan County is not concerned with an avian flu outbreak due to the low number of farms with poultry.

Dam Failure

There are 46 dams in Harlan County. Of these, Harlan County Dam has been identified as a high hazard dam. Although dam failure was not identified as a significant concern to the local planning team, dam failure is addressed in this section due to the presence of a high hazard dam. According to NDNR, the failure of a dam with a high hazard classification would likely lead to loss of life.

Table HNC 135: Dams in Harlan County

	Number of Dams	Minimal	Low	Significant	High
Harlan County	46	6	36	0	1
Planning Area	175	33	125	3	2

According to the Harlan County LEOP, if the Harlan County Dam were to fail, it would affect the Republican River as far East as Kansas City. The area affected would be slightly greater than the 100-year floodplain. The most significant impacts would be in Naponee and Franklin, which would approach 100 percent inundation. If the dam were to fail, emergency housing would be available for displaced residents.

Drought

The NDMC reported that Beaver City experienced 119 months in at least D2 drought. The longest drought of at least D2 began in April 1956 and ended in June 1962. RMA reported the county lost $47,917,432 in crop between 2000 and 2014. The county defines drought based on dryland crops and the amount of rain that has fallen compared to normal rainfall.

The county does not have a drought monitoring board or a drought plan in place. The water supply for the county is sufficient to meet the demands of the county. The county does meter irrigation wells as a way to monitor water needs and conserve water if needed. The county does not establish irrigation limits although the NDNR can shut-off irrigation during droughts based on the water rights in Nebraska and the Republican River Compact.

Severe Thunderstorms

NCDC reported 40 severe thunderstorm (wind, lighting and rain) events between January 1996 and December 2014 that resulted in $3,288,000 in property damage. A storm in May of 2014 caused damage across Harlan County due to high winds.

The county does have a backup generator on the courthouse. There are surge protectors on electronic devices to protect county records. There have been very few if any power lines that have been buried across the county. The county has not provided weather radios to the critical facilities but it does offer Code Red to its residents.

Severe Winter Storms

NCDC reported 63 severe winter storm events for Harlan County. These storms resulted in $1,435,000 in property losses. RMA reported $613,354 in crop losses due to extreme cold.

The county has not had any critical facilities damaged by a winter storm. The county does use snow fences along U.S. Highway 136. The county has sufficient snow removal equipment and crews.

Tornados

The NCDC reported six tornados for the county between January 1996 and December 2014. An EF1 tornado in June 2011 caused $250,000 in property damage. The other five storms were all rated F/EF0. One F0 caused $150,000 in May 2004 and an EF0 in April 2012 caused $75,000. RMA did not report any losses from tornados.

The county does has not had any critical facilities hit by a tornado and does not have any safe rooms available for residents to seek shelter in. The county does have systems to backup county records. The county does provide education on tornados on local television stations.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Unincorporated County Governance

The jurisdiction of Harlan County includes all unincorporated areas within the county boundaries. The Harlan County government structure is a seven member Board of Supervisors. The Harlan County government includes the following departments and offices:

- Assessor's Office
- Sheriff's Office
- County Attorney
- County Treasurer
- County Clerk
- Election Commissioner
- Register of Deeds
- Health and Human Services
- District Court Clerk
- Highway Superintendent
- Veterans Services
- Weed Superintendent
- Zoning

Table HNC 146: Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes
	Building Codes	No
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes
	Ongoing public education or information program (e.g., responsible water use, fire	Yes

Survey Components/Subcomponents		Comments
	safety, household preparedness, environmental education)	
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the

Table HNC **14**6 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraphs present a summary of the findings of this analysis.

Harlan County has a Local Emergency Operations Plan that was last updated in 2013. The hazards of highest concern within this plan are winds and snow. The plan provides a clear assignment of responsibility during an emergency.

The Harlan County Comprehensive Plan and Zoning Regulations was approved and adopted by the Harlan County Board of Supervisors in 2001. The comprehensive plan and zoning regulations both prohibit development in hazardous areas such as the floodplain. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

Harlan County has the administrative staff and technical and fiscal capabilities to implement some mitigation projects without assistance. Larger projects such as safe rooms or drainage improvements may require that the county look to partner with the LRNRD, and other regional and state agencies. Through this update process, the planning team reviewed previously identified mitigation projects and added new projects as well.

Mitigation Strategy

Completed Mitigation Projects

Description	**Backup Generators**
Analysis	Provide a safe backup power supply for critical facilities.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$30,000
Funding	County General Funds
Timeline	Completed
Lead Agency	Emergency Manager
Action since 2010 plan	Installed a generator in the courthouse

Description	Participate in the NFIP
Analysis	Participate in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Funding	County General Funds
Timeline	Completed/ Ongoing to maintain status in NFIP
Lead Agency	County Board, Floodplain Administrator
Action Since 2010	Have participated since March 2010

Description	Warning Systems
Analysis	Provide Code Red Program to residents
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$10,000
Funding	County General Funds
Timeline	Completed
Lead Agency	County Sheriff/Emergency Manager
Action Since 2010	Began using in 2011

New/Ongoing Mitigation Projects

Description	Hazardous Tree Removal
Analysis	Identify and remove hazardous trees and limbs
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Estimated Cost	$20,000
Potential Funding	HMGP, PDM, County General Funds
Timeline	Ongoing
Priority	Medium
Lead Agency	County Board, Highway Superintendent
Action since 2010 plan	Trees are removed as necessary.

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, County General Funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	County Board, Emergency Manager
Action since 2010 plan	This project has not been started.

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$232,000
Potential Funding	HMGP, PDM, CDBG, County General Funds
Timeline	1 year
Priority	High
Lead Agency	County Board
Action since 2010 plan	This project has not been started.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	County General Funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	County Board, County Sheriff/Emergency Manager
Action since 2010 plan	Will need to gather information and work to develop in the future.

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	County General Funds, HMGP
Timeline	2 – 5 years
Priority	High
Lead Agency	City Council, County Emergency Manager
Action since 2010 plan	Facilities in need include City Office , Power Plant, Sewer Plant, Hospital, School, and Fire Department.

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP. Enable property owners to purchase insurance protection against flood losses.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	County General Funds
Timeline	Ongoing
Priority	Medium
Lead Agency	County Board, Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Removed Mitigation Projects

Description	Flood Prone Property Acquisition
Analysis	Voluntary acquisition and demolition of properties prone to flooding will reduce the general threat of flooding for communities. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.
Hazard(s) Addressed	Flooding
Reason for Removal	No repetitive loss properties in the county

City of Alma

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The City of Alma participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Alma attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Alma, the top concerns that were identified through this planning process include animal disease, chemical spills during transportation, drought, severe thunderstorms, and severe winter storms. The following local representatives were involved in the development of Alma's Participant Section:

Table ALM 1: City of Alma Plan Contributors

Name	Title
Doug Wilson	Alma City Administrator
Chris Becker	Harlan County Sheriff

This section contains important information about the City of Alma relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

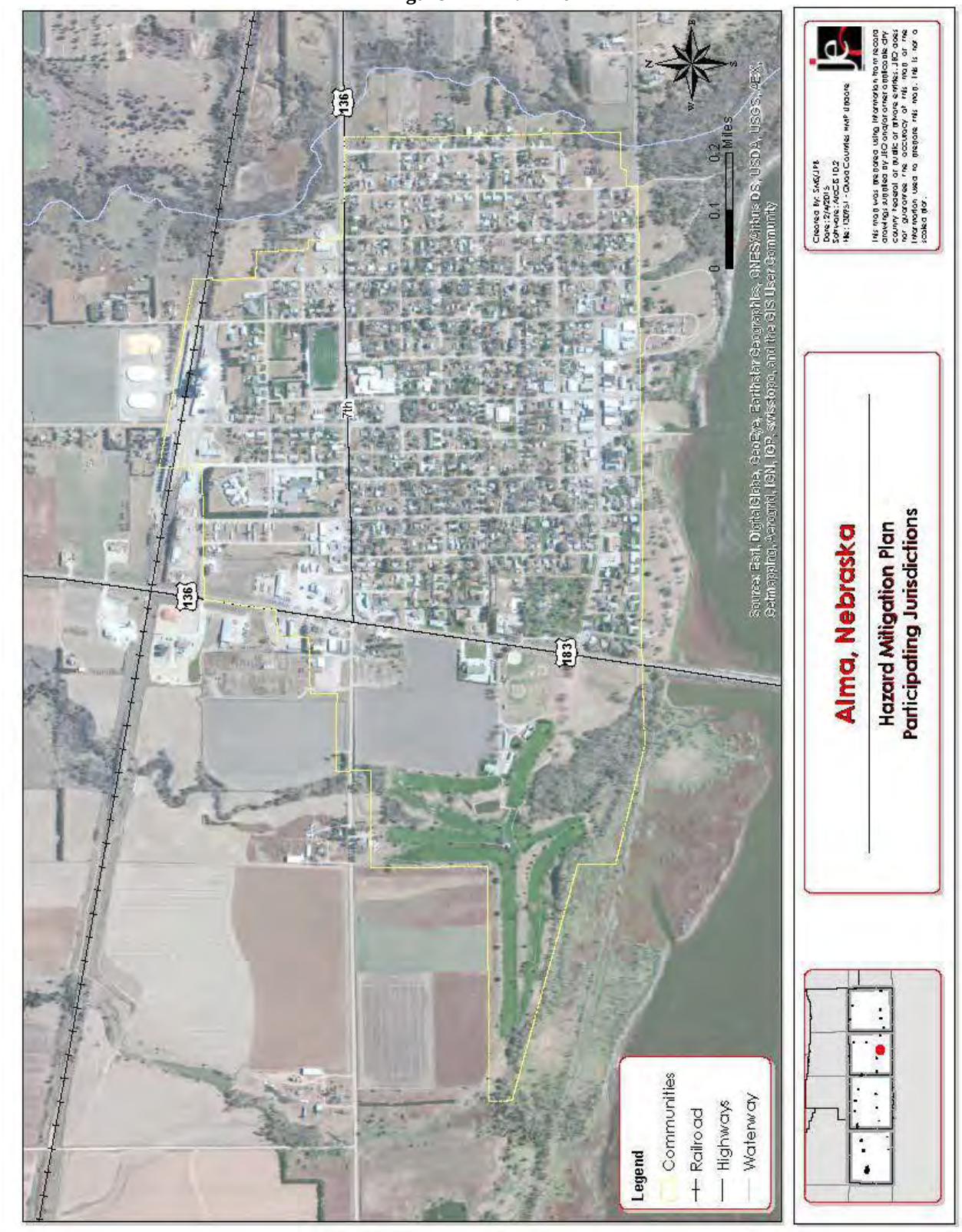
Location/Geography

Alma is a city located in the south portion of Harlan County. The City of Alma covers an area of 448 acres and has an elevation of 1,975 feet above sea level. Alma is 44 miles south of Kearney. The Harlan County Reservoir is just to the south of the city.

Transportation

Figure ALM 1 shows the major transportation routes for the city. There are two major highways in the city US HWY 136 and US HWY 183. According to the Nebraska Department of Roads the average daily traffic count for US HWY 136 is 990 vehicles with 95 of those being heavy trucks passing to the east of the city. The traffic count for US HWY 183 is 3,795 vehicles with 450 of those being heavy trucks passing to the north of the city and 1,585 vehicles with 520 of those being heavy trucks passing to the south of the city.

Figure ALM 1: Alma



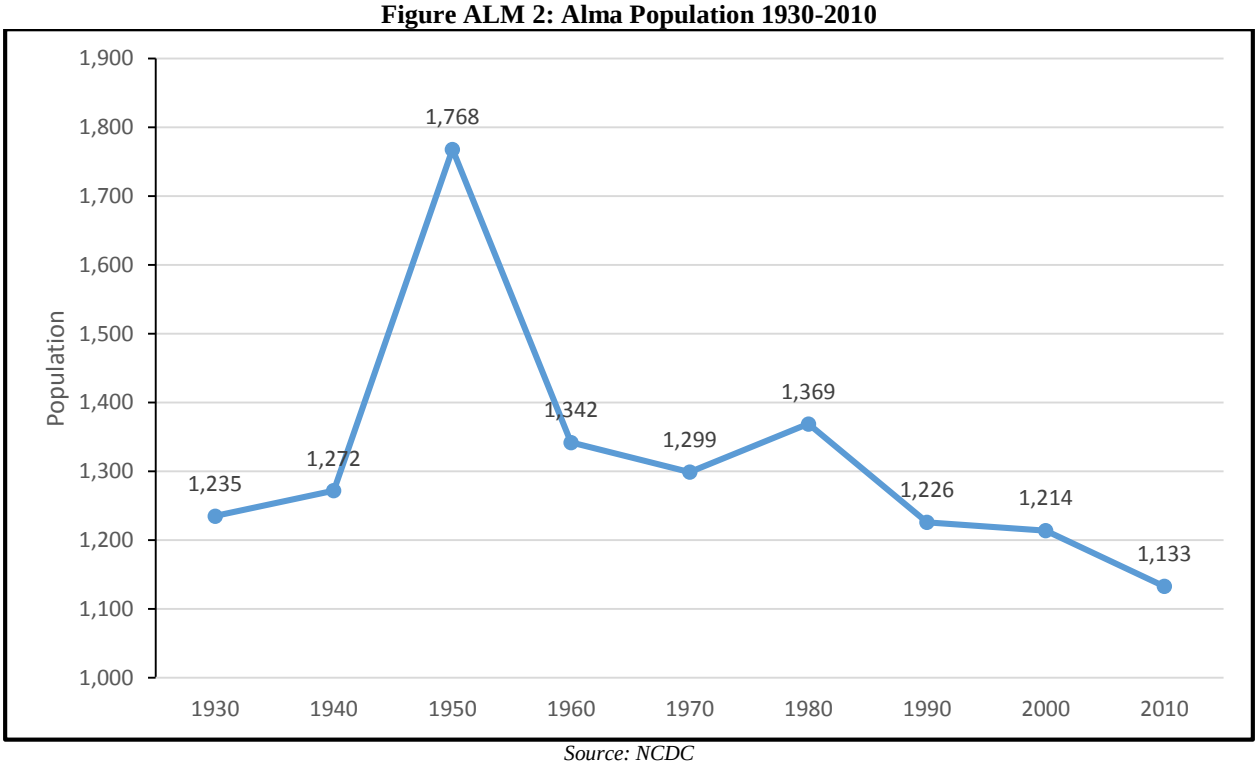
Climate

All the climate data for the county has been taken from a station located at the Harlan County Lake (253595). Please refer to the *Harlan County Section* for a climate summary for the city.

Demographics

Figure ALM 2 displays the population for Alma from 1930 to 2010. Since 1950 the population has declined. A decrease in population results in a decrease in tax revenue for the city, which can make it more difficult to fiscally implement mitigation projects.

Figure ALM 2: Alma Population 1930-2010



Source: NCDC

Table ALM 2 illustrates the age distribution and median age for Harlan County in comparison to the City of Alma. The city has a higher percentage of population over the age of 64 than that of the county by about five percent. The median age for the city and county are about the same.

Table ALM 2: Alma Age Distribution

Age	Harlan County	Alma
<5	5.3%	5.8%
5-64	71.2%	66%
>64	23.5%	28.2%
Median	49.2	49.6

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the City of Alma in Table ALM 3. The median home value for the city is $3,100 less than that of the county, and rent values are $60 less than the county. The population has decreased in the last decade as noted in the demographic section, the lower cost of living compared with the rest of the county may be due to the aging housing stock. If these structures are not cared for as they age, they may continue to increase the vulnerabilities to hazards.

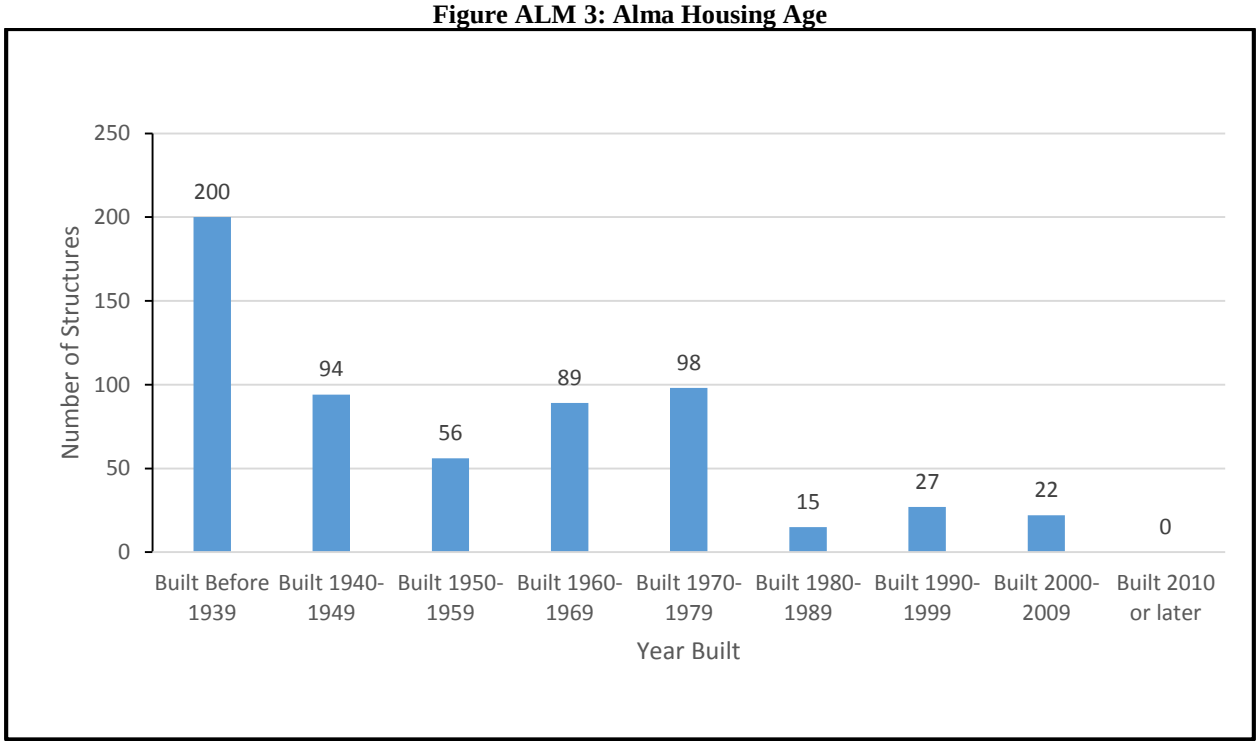
Table ALM 3: Alma Housing Value and Income

	Harlan County	Alma
Median Household Income[1]	$54,862	$35,417
Per Capita Income[1]	$25,322	$25,275
Median Home Value[2]	$75,100	$72,000
Median Rent[2]	$546	$484

1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (Figure ALM 3) the city has 601 housing units with 65 percent of those units occupied (
Table ALM 4). Four houses in the city's housing stock are classified as mobile homes and 59 percent of the city's housing stock was built before 1960. There is one mobile home park in the community located between Kennedy St and Kauk Ave, and Meyer Ave and 10th St. There are currently 14 mobile homes located within the mobile home park In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados. About 100 percent of the city's homes were built prior to the first FIRM for the city in 2009. Houses built prior to this year may not be constructed above the base flood elevation.

Figure ALM 3: Alma Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table ALM 4: Alma Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Harlan County	1,573	64.8%	853	35.2%		1,226	77.9%	347	22.1%
Alma	528	87.9%	73	12.1%		387	73.3%	141	26.7%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the City of Alma are educational services and health care (36.4%), retail trade (13.3%), and construction (8.1%).

The major employers for the City of Alma include Harlan County Health System, Alma Public Schools, and Good Samaritan Society. In addition residents of the city also commute to Holdrege.

Structural Inventory

The planning team requested GIS parcel data from the Assessor for each county. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table ALM 5.

Table ALM 5: Alma Structural Inventory and Valuation

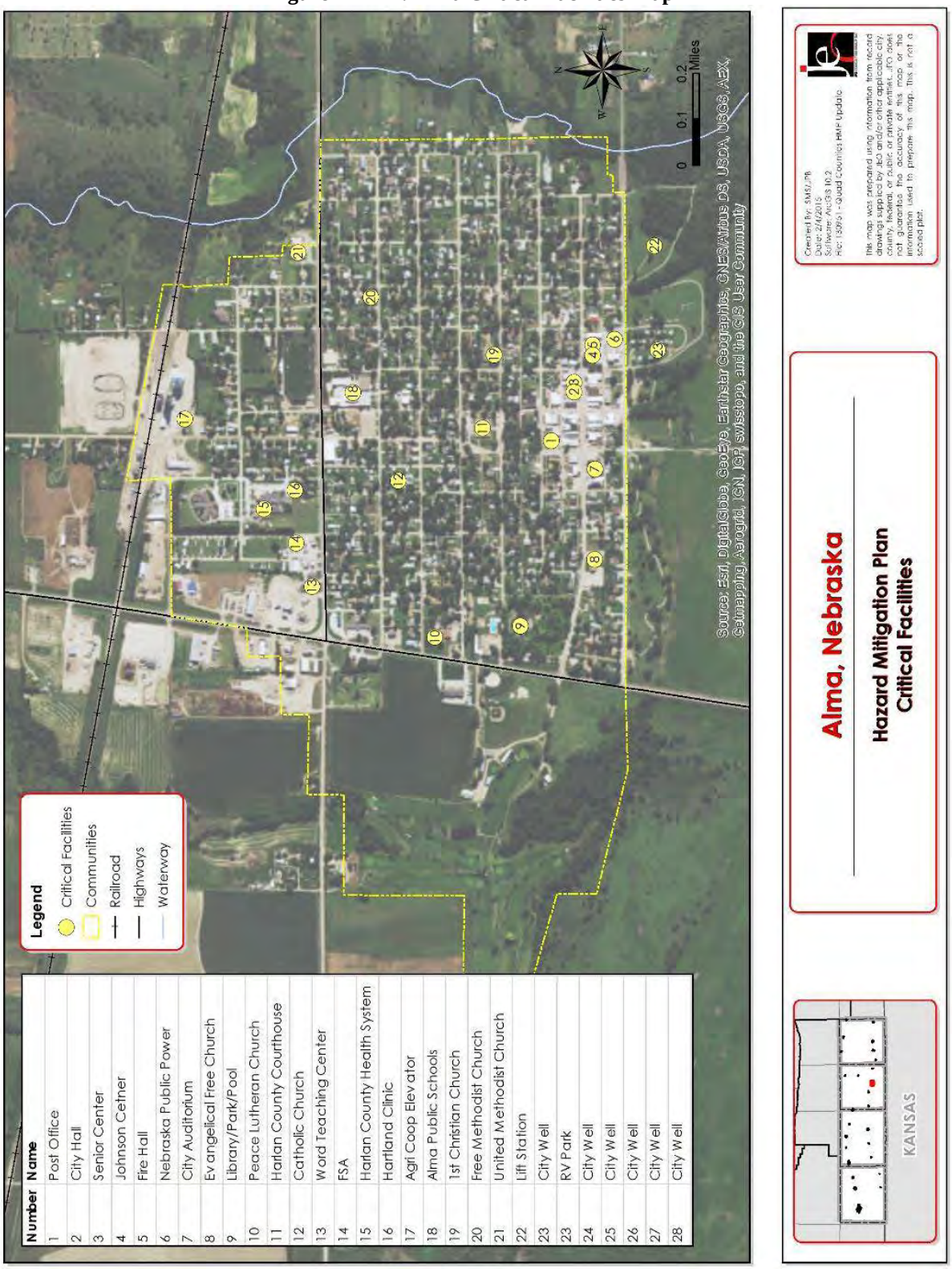
Jurisdiction	Number of Parcels with Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Value of Improvements in Floodplain
Alma	648	$36,512,975	$56,347	$144,130

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

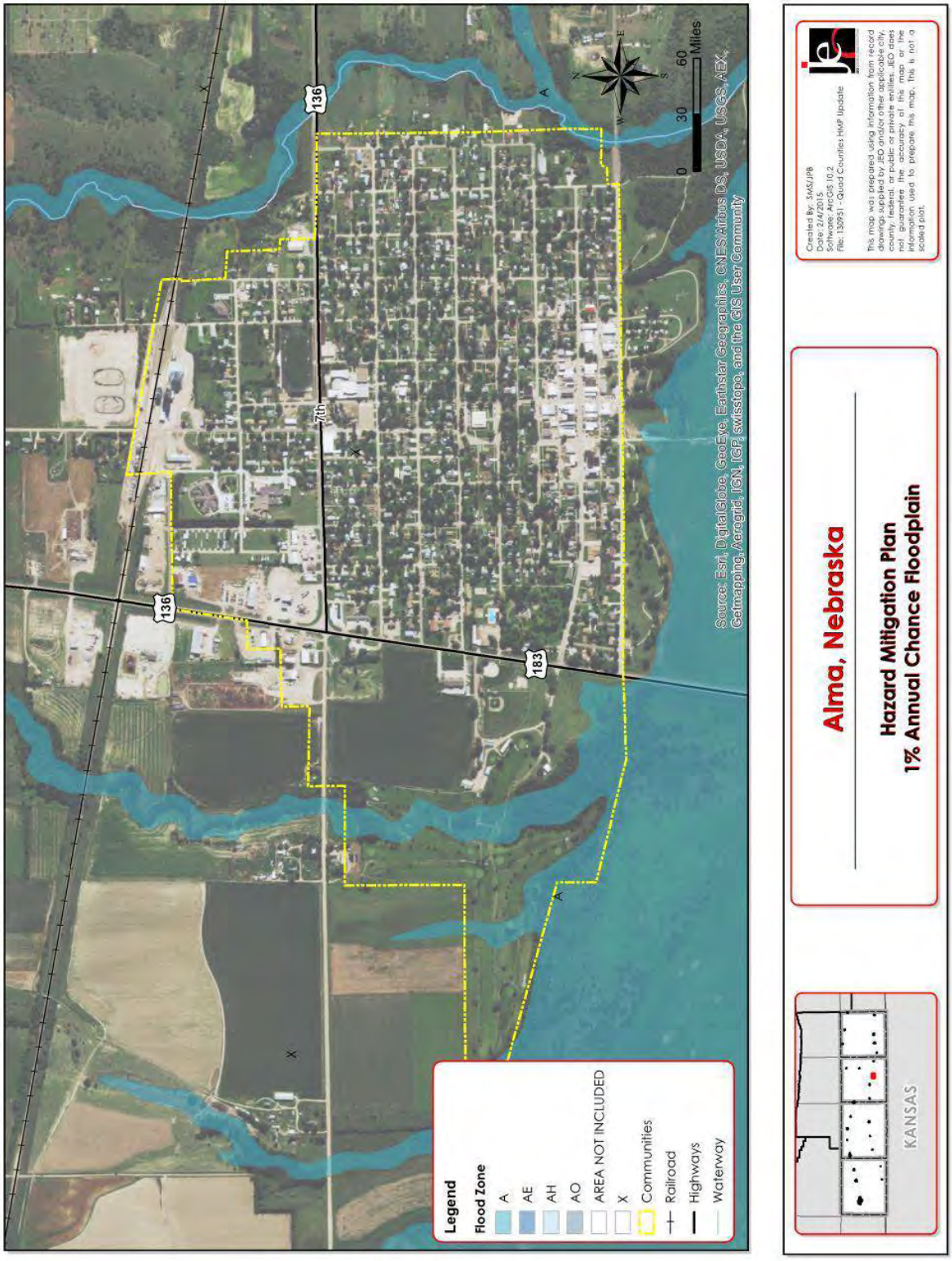
Critical facilities were identified during the 2010 planning process and updated by the Alma planning team as a part of the plan update. **Error! Reference source not found.** provides a summary of the type and location of critical facilities for the jurisdiction. The city does not have any critical facilities in the 1% annual floodplain. Two critical facilities the county courthouse and the hospital have backup generators. The courthouse also has an area that can be used for shelters during storms, but they are not built to FEMA 361 requirements.

Figure ALM 4: Alma Critical Facilities Map



Error! Reference source not found. shows the 1% annual floodplain for the City of Alma. The city has no structures or critical facilities in the floodplain. There are no repetitive loss properties in the city. The initial FIRM for Alma of was developed in February of 2009. Alma does participate in the NFIP, with one policy in effect worth $280,000 as of February 28, 2015.

Figure ALM 5: Alma 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of six chemical storage sites in the City of Alma, and three of these house materials that are categorized as hazardous. **Error! Reference source not found.** list facilities that house hazardous materials only. In addition to the facilities listed there are three other chemical storage facilities in the city: Nebraskaland Aviation, the Alma airport, and Muckel Crop Dusting. The hospital and Good Samaritan-Villa Nursing Home are located near Nebraskaland Aviation. If a chemical spill were to occur the Alma Fire Department and the Harlan County Sheriff's Office would respond.

Table ALM 2: Chemical Storage Fixed Sites

Facility	Address	Hazardous Material
Cargill AgHorizons	11398 719 Rd, Alma	Paraquat Dichloride
CHS Agri Service Center	1001 N Highway 183, Alma	Dimethoate, Paraquat Dichloride
Frontier Communications	709 1st St, Alma	Sulfuric Acid

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there is one historic site located in Alma. The site is not in the 1% annual floodplain.

Table ALM 3: National Historic Registry

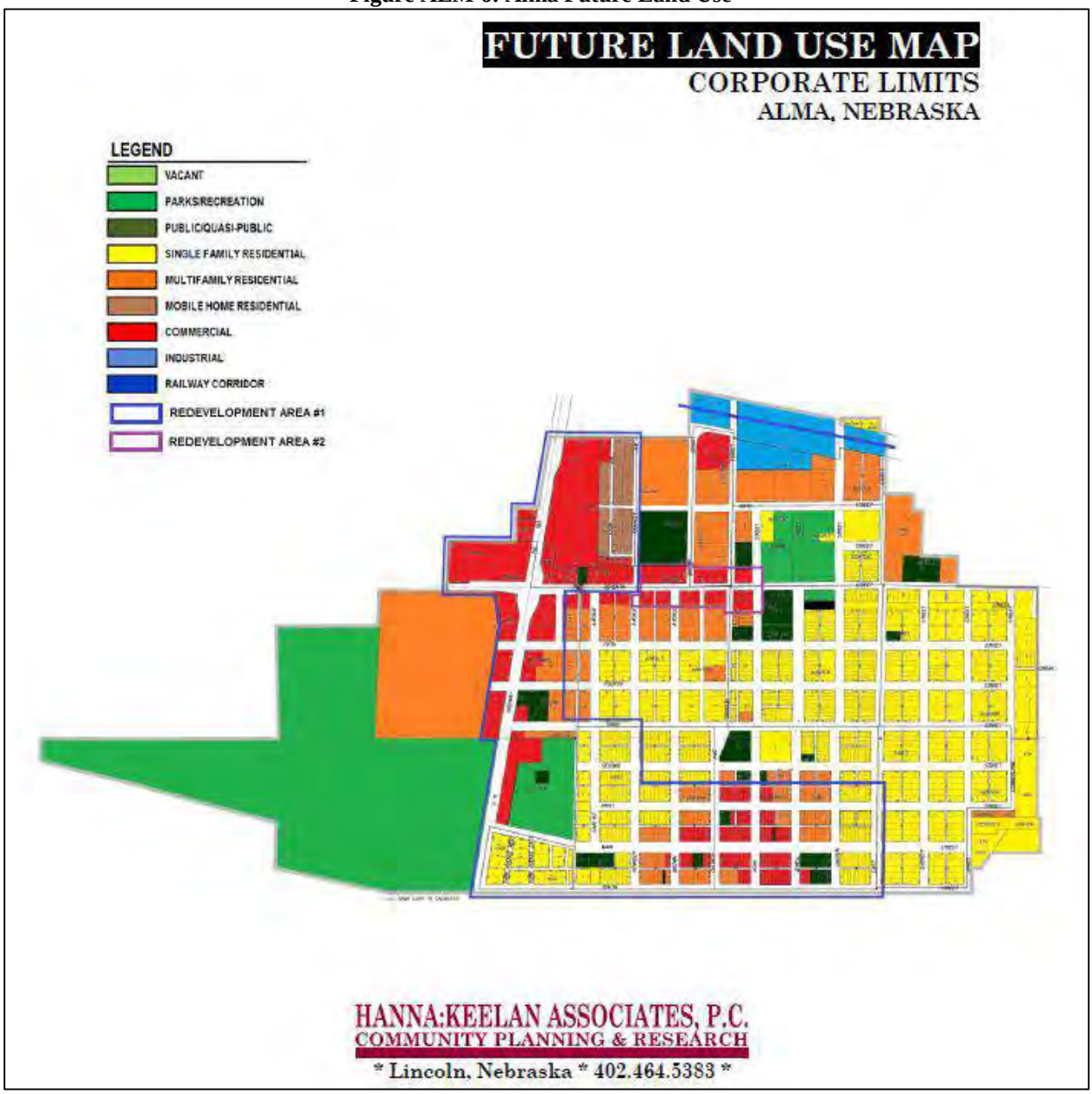
Site Name	Date Listed	Classification	In Floodplain?
Alma Auditorium and Sale Barn	7/11/2014	Building	No

Source: Nebraska State Historical Society

Future Development Trends

There has been no new development in the city over the past five years. And there are no new housing development or businesses planned for the next five years. In the city's comprehensive plan from 2011 Alma identified two areas designated for redevelopment. The first area for redevelopment includes Downtown Alma and the Highway 183 Corridor. The second redevelopment area includes the Highway 136 corridor between Highway 183 and John Street. The redevelopment areas will consist of primarily commercial lots. However, Redevelopment area one does have some residential areas. The plan suggests that single family development should occur within established neighborhoods or new subdivision areas inside the city limits before allowing development to take place in designated growth areas. The plan suggests multifamily development on vacant tracks of land and as a way to replace dilapidated single family homes adjacent to Downtown Alma. Multifamily developments are also planned to buffer areas of higher commercial and industrial uses from low density single family developments. Mobile home development should take place in the current mobile home park between Kennedy St and Kauk Ave, and Meyer Ave and 10th St. There are vacant parcels for the addition of new mobile homes if the vacant parcels become filled, additional development should be sought outside the city's current corporate limits. **Error! Reference source not found.** shows the proposed future land use for the city.

Figure ALM 6: Alma Future Land Use



Risk Assessment

Hazard Identification

Table ALM 4 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table ALM 4: Alma Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease*	No	Local economic impacts
Agricultural Plant Disease	No	Local economic impacts
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)*	No	Property damages or injuries possible
Dam Failure	No	None
Drought*	Yes	Drop in well levels
Earthquake	No	None
Extreme Heat*	Yes	Injuries or loss of life possible
Flooding	No	None
Grass/Wildfire	Yes	Property damage
Hail	Yes	Local economic impacts
High Winds*	No	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damage and injuries or loss of life possible
Severe Winter Storm*	Yes	Property damage and injuries or loss of life possible
Terrorism	No	None
Tornado*	Yes	Property damage and injuries or loss of life possible

** Identified as a top concern by the local planning team*

The top five hazards in Alma are agricultural animal disease, chemical spills during transportation, drought, severe thunderstorms, and severe winter storms. These hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 27 severe weather events from 1996 to 2014 in the City of Alma. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds.

Table ALM 5 provides a summary of events that caused damage in the city.

Table ALM 5: Alma Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/27/1999	Thunderstorm Wind	69 kts./ 79 mph	0	0	$150,000
6/27/1999	Thunderstorm Wind	69 kts./ 79 mph	0	0	$100,000
7/20/2000	Hail	0.75 in.	0	0	$2,000

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/3/2001	Thunderstorm Wind	52 kts./ 60 mph	0	0	$60,000
8/23/2001	Thunderstorm Wind	56 kts./ 64 mph	0	0	$10,000
5/14/2007	Hail	1 in.	0	0	$5,000
7/7/2008	Hail	1 in.	0	0	$5,000
6/14/2012	Thunderstorm Wind	52 kts./ 60 mph	0	0	$15,000
9/6/2012	Hail	1.25 in.	0	0	$8,000
6/6/2014	Thunderstorm Wind	61 kts./ 70 mph	0	0	$25,000
6/14/2014	Thunderstorm Wind	70 kts./ 80 mph	0	0	$2,000,000

Source: NCDC

Animal Disease

The Nebraska Department of Agriculture reported two animal diseases that appeared in Harlan County in 2014. Even though Alma is considered a city there is still a large area of agriculture near the city that is susceptible to animal disease. The city did not report any animal diseases affecting any farms in the city but the city is concerned if any animal diseases were to occur.

The city reported a large cattle population as being the population of most concern if an outbreak were to occur. The city does not have a plan in place to address an outbreak if it were to occur. The city did say that information on how to address animal disease is available from the Harlan County Extension office.

Chemical Spills (Transportation)

The PHMSA reports that no chemical spills have occurred during transportation through Alma. The city still sees a large number of heavy trucks through the city each day and some of those trucks are transporting hazardous materials. There is also a railroad that passes just to the north of the hospital. There is also the possibility of having chemicals that are transported by trains may leak as well.

The city has six critical facilities located along the major highway transportation routes within the city and two critical facilities located along the railroad. If a spill were to occur the fire department and county sheriff/ emergency manager would respond. The city does not provide any shelter-in-place instructions to residents and those in critical facilities that are located along the major transportation routes.

Drought

The NDMC reported that Alma experienced 119 months in at least D2 drought from 1948 to 2012. The longest drought of at least D2 began in April 1956 and ended in June 1962. The city did not report any monetary losses from drought. As part of the 2012 drought the city did see a slight drop in water levels, but they did not have to enact any restrictions.

The city does not have a drought monitoring board or drought plan. They city has sufficient water supply and does not have a water conservation program or require native plantings.

Severe Thunderstorms

NCDC reported seven severe thunderstorm (wind, rain, and lightning) and 17 hail events between January 1996 and December 2014 that resulted in $2,405,000 in property damage. There was a storm in June of 2014 that damaged roofs in the city with hail and winds.

The city does protect municipal records with surge protectors on electronic devices and has insured municipal buildings. None of the city facilities have a backup generator and the power lines have not been buried. The city does have a local tree board.

Severe Winter Storms

NCDC reported 69 severe winter storm events for Alma. The storms resulted in $1,435,000 in property losses. The city has not experienced normal winter for the last couple of years.

They city has not had any damage to critical facilities from winter weather events. The city does have three snow routes designated: Main Street, Division Street, and Brown Street (the main north-south road to the hospital). The city has its own crews that are responsible to clear the snow from the streets and it the snow removal is sufficient.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

The City of Alma is governed by a mayor and a four member city council. The City of Alma government includes the following departments and offices:

- Airport Authority
- Board of Health
- Housing Rehabilitation
- Board of Zoning Adjustment
- Community Redevelopment
- Housing Authority
- Zoning/Planning Commission
- Library Board
- Golf Board
- Tree Board
- Hiking/Biking Trail Committee
- City Administrator
- Utilities Department
- City Treasurer
- City Clerk

Table ALM 60: Alma Capabilities Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes, 2011
	Capital Improvements Plan	Yes
	Hazard Mitigation Plan	Yes
	Economic Development Plan	Yes
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes, 2011
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	City Superintendent
	Chief Building Official	City Superintendent
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	Yes
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	Yes
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire	Yes

Survey Components/Subcomponents		Comments
	safety, household preparedness, environmental education)	
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the

Table ALM **6**0 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraphs present a summary of the findings of this analysis.

Alma has an annex to the Harlan County Local Emergency Operations Plan, which was last updated in 2013. This plan discusses a number of hazards that can affect the county. The plan also provides a clear assignment of responsibility during an emergency.

Alma also has regulations that discourage development in the floodplain. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The City of Alma has the administrative staff and technical and fiscal capabilities to implement some mitigation projects without assistance. Larger projects such as safe rooms or drainage improvements may require that the city look to partner with the county emergency management, Harlan County, LRNRD, and other regional and state agencies. Through this update process, the planning team reviewed previously identified mitigation projects and added new projects as well.

Mitigation Strategy

Completed Mitigation Projects

Description	**Participate in the NFIP**
Analysis	Participate in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Funding	City Funds
Timeline	Completed/ Ongoing to maintain status in NFIP
Lead Agency	City Council, Floodplain Administrator
Action Since 2010	Have participated since 2009.

Description	**Warning Systems**
Analysis	Implement Code Red for the city
Goal/Objective	Goal 4/ Objective 4.3
Hazard(s) Addressed	All Hazards
Estimated Cost	N/A
Funding	County Funds
Timeline	Completed
Lead Agency	County Sheriff/Emergency Manager, City Council
Action Since 2010	Code Red in Place through Harlan County Emergency Management

New/Ongoing Mitigation Projects

Description	**Safe Rooms**
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	RV Campground Rates
Timeline	1 year
Priority	High
Lead Agency	City Council, RV Park Manager, County Sheriff/Emergency Manager
Action since 2010 plan	Began construction on a storm shelter to hold 25-30 people at the Alma RV Park in July 2015.

Description	**Alert/Warning Sirens**
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or upgraded. Install new sirens and remote activation where lacking.

Description	Alert/Warning Sirens
Goal/Objective	Goal4/Objective 4.3
Hazard(s) Addressed	All Hazards
Estimated Cost	$15,000+
Potential Funding	HMGP, PDM, CDBG, City Taxes,
Timeline	2 – 5 years
Priority	Low
Lead Agency	City Council, City Utilities, County Sheriff/Emergency Manager
Action since 2010 plan	Most of the city's sirens are in need of replacement.

Description	Warning Systems
Analysis	City would like to install Reverse 911
Goal/Objective	Goal4/Objective 4.3
Hazard(s) Addressed	All Hazards
Estimated Cost	$5,000
Potential Funding	HMGP, PDM, CDBG, City Taxes,
Timeline	2 – 5 years
Priority	Medium
Lead Agency	City Council, County Sheriff/Emergency Manager
Action since 2010 plan	Most of the city's sirens are in need of replacement.

Description	Hazardous Tree Removal
Analysis	Identify and remove hazardous limbs and/or trees.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Severe Thunderstorms, Severe Winter Storms, High Winds, Tornados
Estimated Cost	$2,000
Potential Funding	City Budget
Timeline	Ongoing part of city maintenance program
Priority	Low
Lead Agency	Park and Street Departments
Action since 2010 plan	This is a new action.

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Estimated Cost	$1,000+
Potential Funding	City Budget
Timeline	2 Years
Priority	Medium
Lead Agency	Tree Board
Action since 2010 plan	Currently researching the program and requirements

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's water tanks/trucks, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles and identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4 /Objective 4.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms, Wildfires
Estimated Cost	$50,000
Potential Funding	HMGP, PDM, City Budget, CDBG
Timeline	5 Years

Description	**Civil Service Improvements**
Priority	Medium
Lead Agency	Street Department
Action since 2010 plan	This is a new action.

Description	**Maintain Good Standing in the NFIP**
Analysis	Maintain good standing in the NFIP. Enable property owners to purchase insurance protection against flood losses.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	City Budget
Timeline	Ongoing
Priority	Medium
Lead Agency	City Council, Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Village of Huntley

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan

2016

Overview

The Village of Huntly participated in this Hazard Mitigation Plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Huntley attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Huntley, the top concerns that were identified through this planning process include chemical spills during transportation, grass/wildfires, severe thunderstorms, severe winter storms, and tornados. The following local representatives were heavily involved in the development of Huntley's Participant Section:

Table HNT 7: Village of Huntley Plan Contributors

Name	Title
Dale Sprague	Board Member
Lisa Howsden	Treasurer
Chris Becker	Harlan County Sheriff

This section contains important information about the Village of Huntley relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

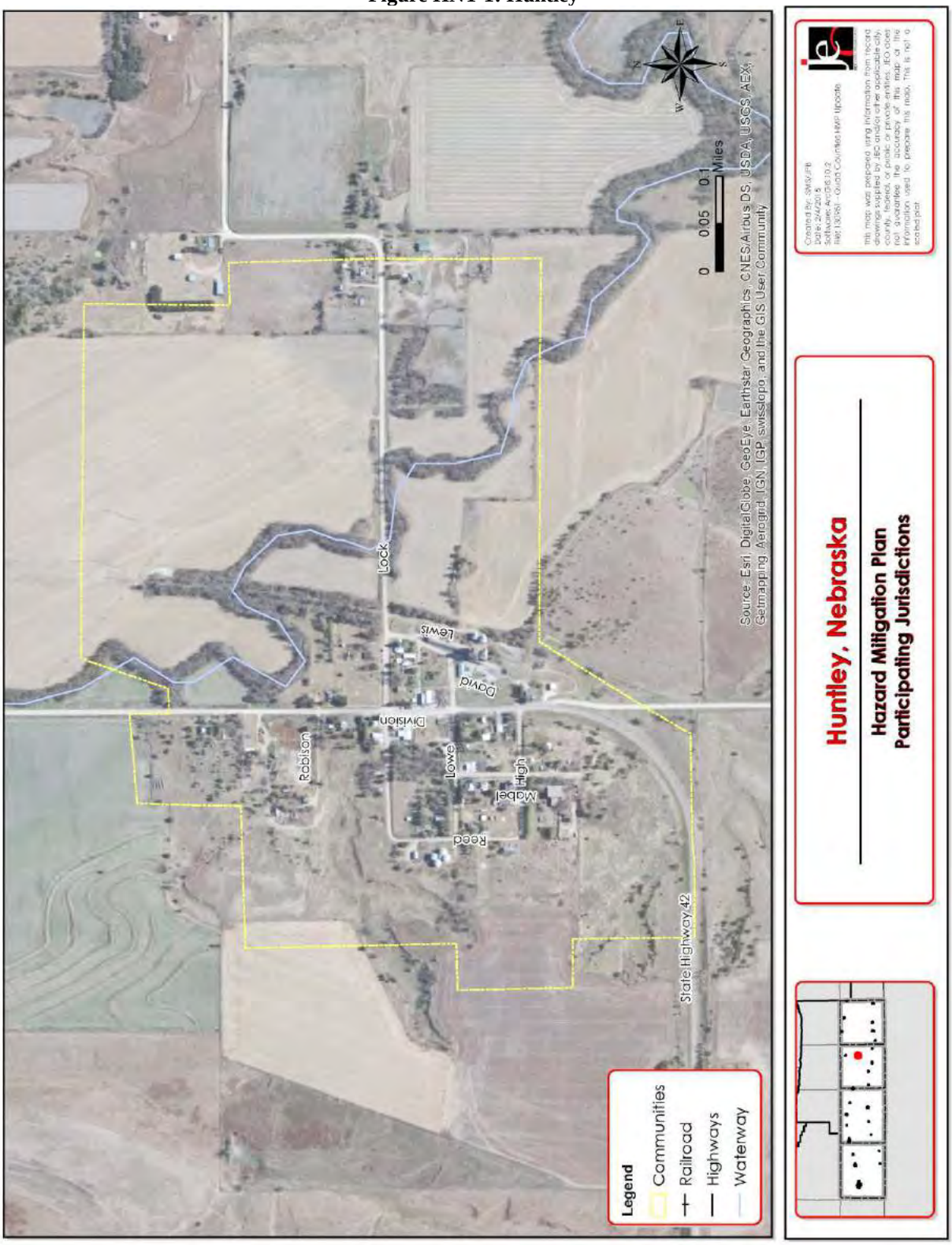
Location/Geography

Huntley is a village located in the eastern portion of Harlan County. The Village of Huntley covers an area of 256 acres and has an elevation of 2,142 feet above sea level. Huntley is 35 miles south of Kearney. The topographic region Huntley lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind.

Transportation

Figure HNT 1 shows the major transportation routes for the city. There is one major highway in the village NE HWY 42. According to the Nebraska Department of Roads the average daily traffic count for NE HWY 42 is 195 vehicles with 20 of those heavy trucks.

Figure HNT 1: Huntley



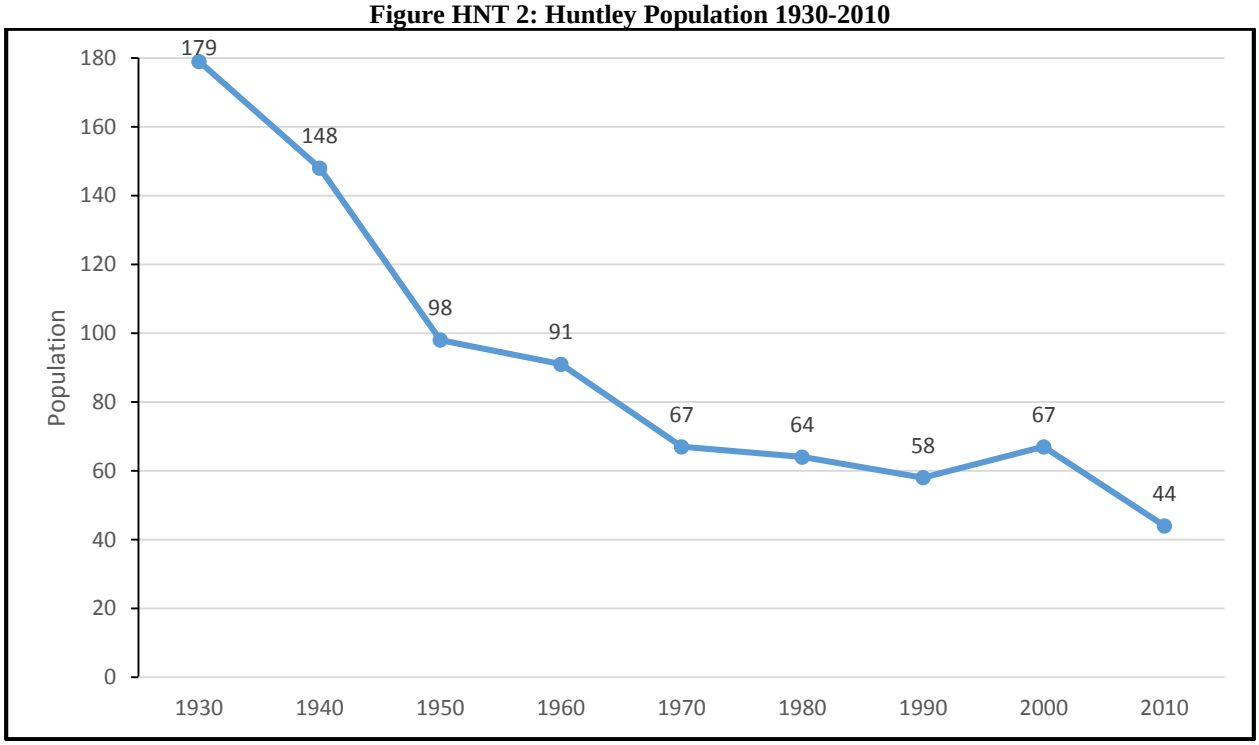
Climate

All the climate data for the county has been taken from a station located at the Harlan County Lake (253595). Please refer to the *Harlan County Section* for a climate summary for the village.

Demographics

Figure HNT 2 displays the population for Huntley from 1930 to 2010. The population of Huntley has been declining since 1930. From 2000 to 2010 the village lost approximately 34 percent of its population. According to the local planning team, the current population is approximately 50 people. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure HNT 2: Huntley Population 1930-2010



Source: US Census Bureau

Table HNT 2 illustrates the age distribution and median age for Harlan County in comparison to the Village of Huntley. The village has a lower population over the age of 64 than that of the county by about 15 percent. The median age for the village also has a lower median age than that of the county by about two years.

Table HNT 2: Huntley Age Distribution

Age	Harlan County	Huntley
<5	5.3%	11%*
5-64	71.2%	88%*
>64	23.5%	1%*
Median	49.2	47.0

Source: U.S. Census Bureau, 2010
**Local Planning Team*

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Huntley in Table HNT 3. The median home value for the village is about

$8,800 less than that of the county, while rent values for the village are not reported. The population has decreased in the last decade as noted in the demographic section, the lower cost of living compared with the rest of the county may be due to the aging housing stock. As these structures age if they are not cared for they may continue to increase the vulnerabilities to hazards.

Table HNT 3: Huntley Housing Value and Income

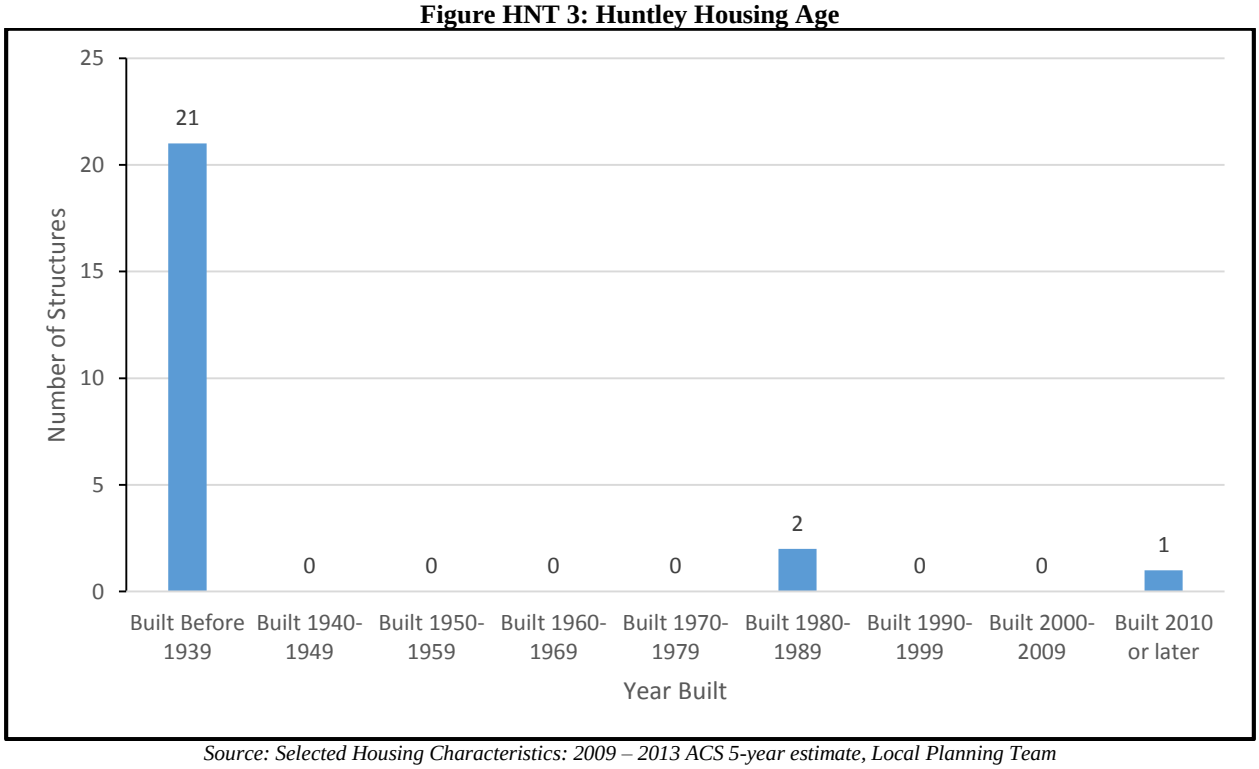
	Harlan County	Huntley
Median Household Income[1]	$54,862	$33,438
Per Capita Income[1]	$25,322	$14,503
Median Home Value[2]	$75,100	$66,300
Median Rent[2]	$546	-

1Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (Figure HNT 3) the village has 35 housing units with 37 percent of those units occupied (

Table HNT 4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. There is one mobile home in the village. 71 percent of the village's housing stock was built before 1960. Residents living within mobile homes and aging structures will be vulnerable to high winds, severe thunderstorms, and tornados. All of the village's homes were built prior to the first FIRM for the village in 2009. Homes built prior to this year may not be constructed above the base flood elevation.

Figure HNT 3: Huntley Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate, Local Planning Team

Table HNT 4: Huntley Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Harlan County	1,573	64.8%	853	35.2%		1,226	77.9%	347	22.1%
Huntley	24*	83.3%	4*	16.6%		24*	100%	0*	0%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate
** Local planning team*

Major Employers

The local planning team indicated that there are no major employers within Huntley. The only business that has employees is Huntley Service. Most residents either farm or commute to Alma or Holdrege for work.

Structural Inventory

The planning team requested GIS parcel data from the Assessor for each county. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. Results from the structural inventory completed for the Village of Huntley in Table HNT 5.

Table HNT 5: Huntley Structural Inventory and Valuation

Jurisdiction	Number of Parcels with Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Value of Improvements in Floodplain
Huntley	41	$1,360,790	$33,190	$160,805

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Huntley did not identify any critical facilities in the 2010 plan. However, during the plan update process, Huntley identified the United Methodist Church as a critical facility.

Table HNT 6: Huntley Structural Inventory and Valuation

Critical Facility Number	Critical Facility
1	United Methodist Church

Figure HNT 4: Huntley Critical Facilities Map

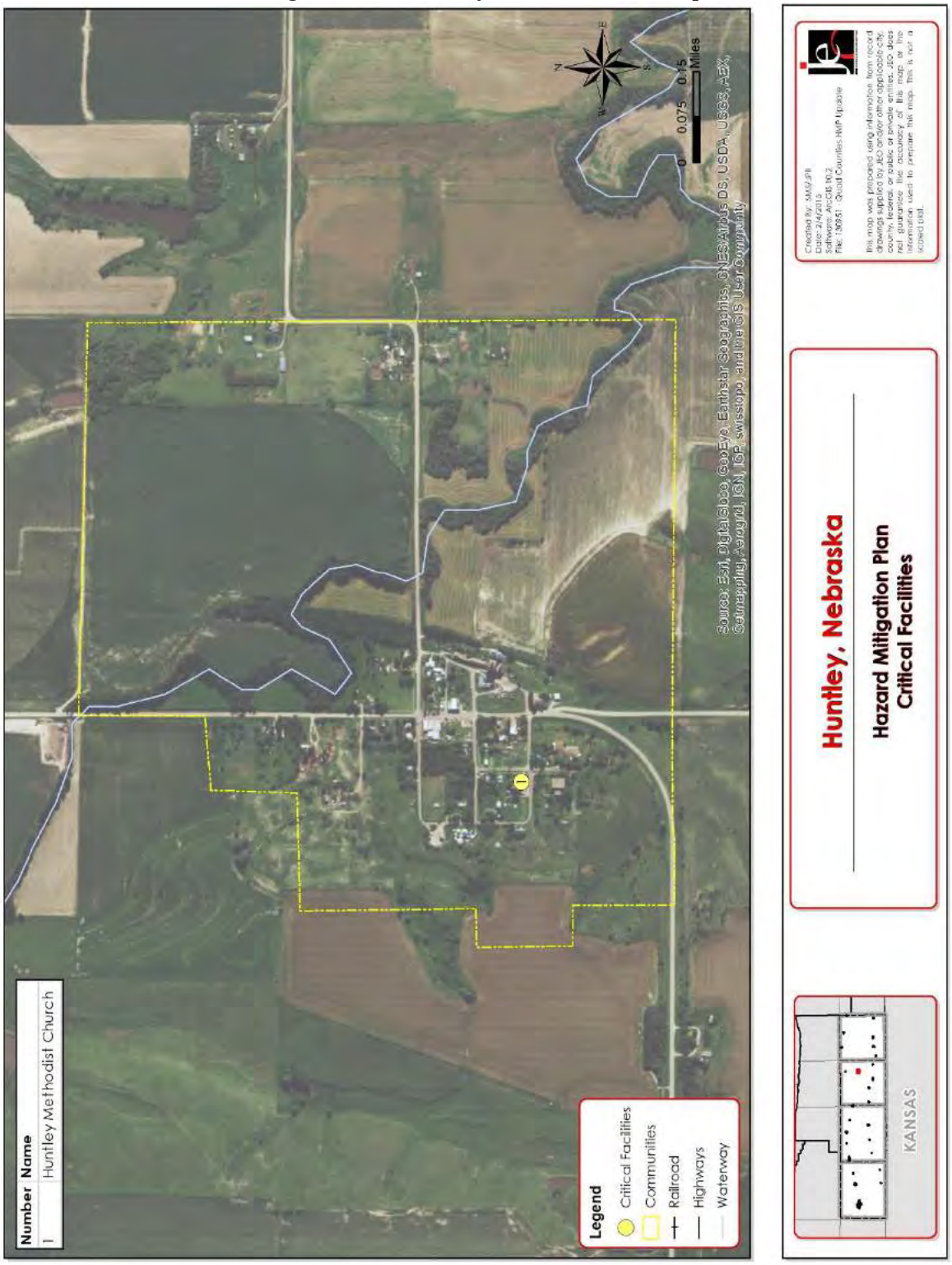
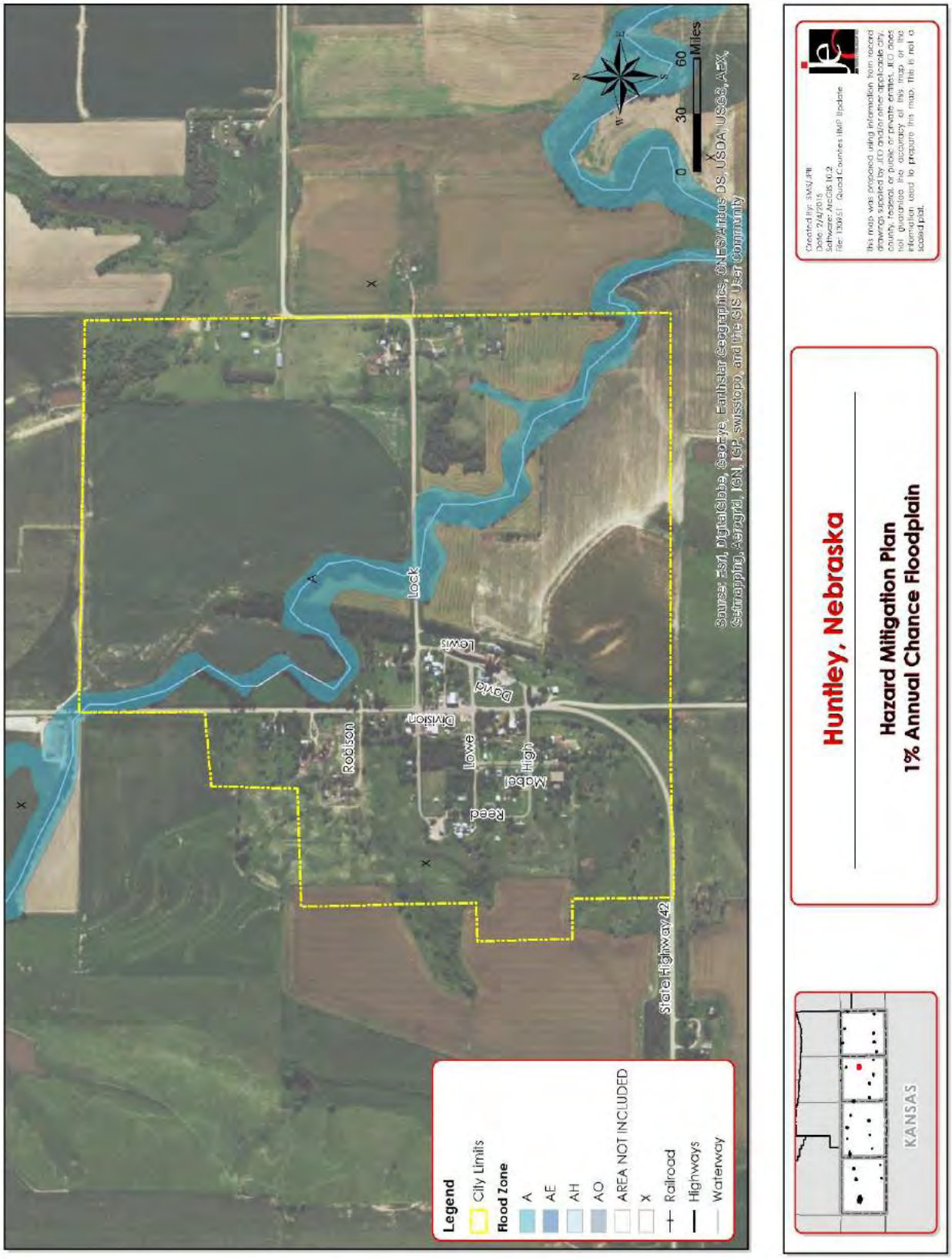


Figure HNT 5 shows the 1% annual floodplain for the Village of Huntley. The village does not have any structures in the floodplain. There are no repetitive loss structures in the village. The initial FIRM for Huntley was developed in February of 2009. Huntley does not participate in the NFIP due to the lack of structures in the floodplain. Huntley will reevaluate participation as circumstances change and local interest grows.

Figure HNT 5: Huntley 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are no chemical storage sites in Huntley.

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sites located in Huntley.

Future Development Trends

There is no development planned in the next five years. Any future development will be discouraged in hazardous areas such as the floodplain.

Risk Assessment

Hazard Identification

Table HNT 7 is a risk assessment identified specifically for the community. Refer to Section Four: Community Based Risk Assessment for an explanation as to what this methodology is.

Table HNT 7: Huntley Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)*	No	Injuries, lack of resources to respond
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfire*	Yes	Property damages, injuries
Hail	No	None
High Winds	No	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damages, power outages
Severe Winter Storm*	Yes	Property damages, power outages
Terrorism	No	None
Tornado*	Yes	Property damages, loss of life, lack of shelter

** Identified as a top concern by the local planning team*

The top five hazards in Huntley are chemical spills (transportation), grass/wildfires, severe thunderstorms, severe winter storms, and tornados. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 9 severe weather events (all hail) from 1996 to 2014 in the Village of Huntley. Table HNT 8 provides a summary of events that caused damage in the village.

Table HNT 8: Huntley Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
5/22/2008	Hail	1.5 in.	0	0	$10,000

Source: NCDC

Chemical Spills

Huntley is surrounded by agricultural uses. The local concern is that trucks carrying fertilizer and other chemicals used in agricultural production frequently travel through the community. The local fire department does not have the necessary equipment to cleanup a hazardous chemical spill.

Grass/Wildfire

There have been no wildfires in Huntley recorded by the Nebraska Forestry Service. However, wildfires do occur in the surrounding area. The local planning team indicated that forty acres were burnt in the spring of 2015. Another 100-150 acres was burnt in wildfires in 2014. Huntley is served by a rural fire district, which has one of the firetrucks located within the village.

Severe Thunderstorms

Severe thunderstorms occur regularly in Huntley and the rest of the planning area. Severe thunderstorms can lead to secondary hazards such as hail, lightning, and flooding. The local planning team indicated that there was a significant event that occurred on Father's Day 2014, which resulted in power outages. In the event of a severe storm, the fire department would check on the vulnerable population within Huntley.

Severe Winter Storm

Severe winter weather occurs every year in Huntley and the rest of the planning area. Significant winter storms have occurred in 1986 and 2006. After the ice storm in 2006, a group of community members came together, talked about the event, and determined there was a need for a generator in town.

Tornados

Tornados have the potential to cause significant property damages and loss of life. Residents have limited options for shelter in the community. The local planning team indicated that most residents have basements to take shelter. However, residents that do not have basements would have to go to the United Methodist Church for shelter. Some residents do have weather radios to stay informed of an impending storm.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and

education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

The Village of Huntley is governed by a village board. The village has a fire hall, town hall, no municipal utilities, and no municipal employees. The minimal tax base income will restrict the community from implementing hazard mitigation projects.

Table HNT 9: Huntley Capabilities Assessment

Survey Components/Subcomponents		Comments
A Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	No
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	No
	Gas/Electric Service Fees	No

Survey Components/Subcomponents		Comments
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table HNT 9 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

The Village of Huntley has an annex to the Furnas County Local Emergency Operations Plan. This plan addresses natural and manmade hazards that can affect the village. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The Village of Huntley has limited fiscal capabilities and administrative support available to implement mitigation projects. The village will continue to benefit from strong partnerships, such as with the county and LRNRD, and will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

New/Ongoing Mitigation Projects

Description	Backup Power Generators
Analysis	Provide a safe backup power supply.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$15,000+
Potential Funding	Village Funds, County Funds, HMGP, PDM
Timeline	2-5 Years
Lead Agency	Village Board
Action since 2010 plan	Not yet started. This is a new action.

Removed Mitigation Projects

Description	Drainage Study/Stormwater Master Plan
Analysis	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer feasible

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP
Hazard(s) Addressed	Flooding
Reason for Removal	Huntley does not participate in NFIP. No local desire to participate due to lack of structures within floodplain.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Hazard(s) Addressed	All hazards
Reason for Removal	County Emergency Management handles education efforts

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer feasible

Description	Alert/Warning Sirens
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or upgraded. Install new sirens and remote activation where lacking.
Hazard(s) Addressed	All hazards
Reason for Removal	No longer feasible

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Hazard(s) Addressed	Flooding
Reason for Removal	Have culverts and drainage in place to move stormwater out of town.

Village of Orleans

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Orleans participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Orleans attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Orleans, the top concerns that were identified through this planning process include drought, severe thunderstorms, severe winter storms, tornados, and wildfires. The following people were involved in the development of Orleans' Participant Section:

Table ORL 1: Village of Orleans Plan Contributors

Name	Title	Department / Organization
Lana Dake	Board Chairperson	Village of Orleans
David Snodgrass	Village Board Member	Village of Orleans

This section contains important information about the Village of Orleans relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

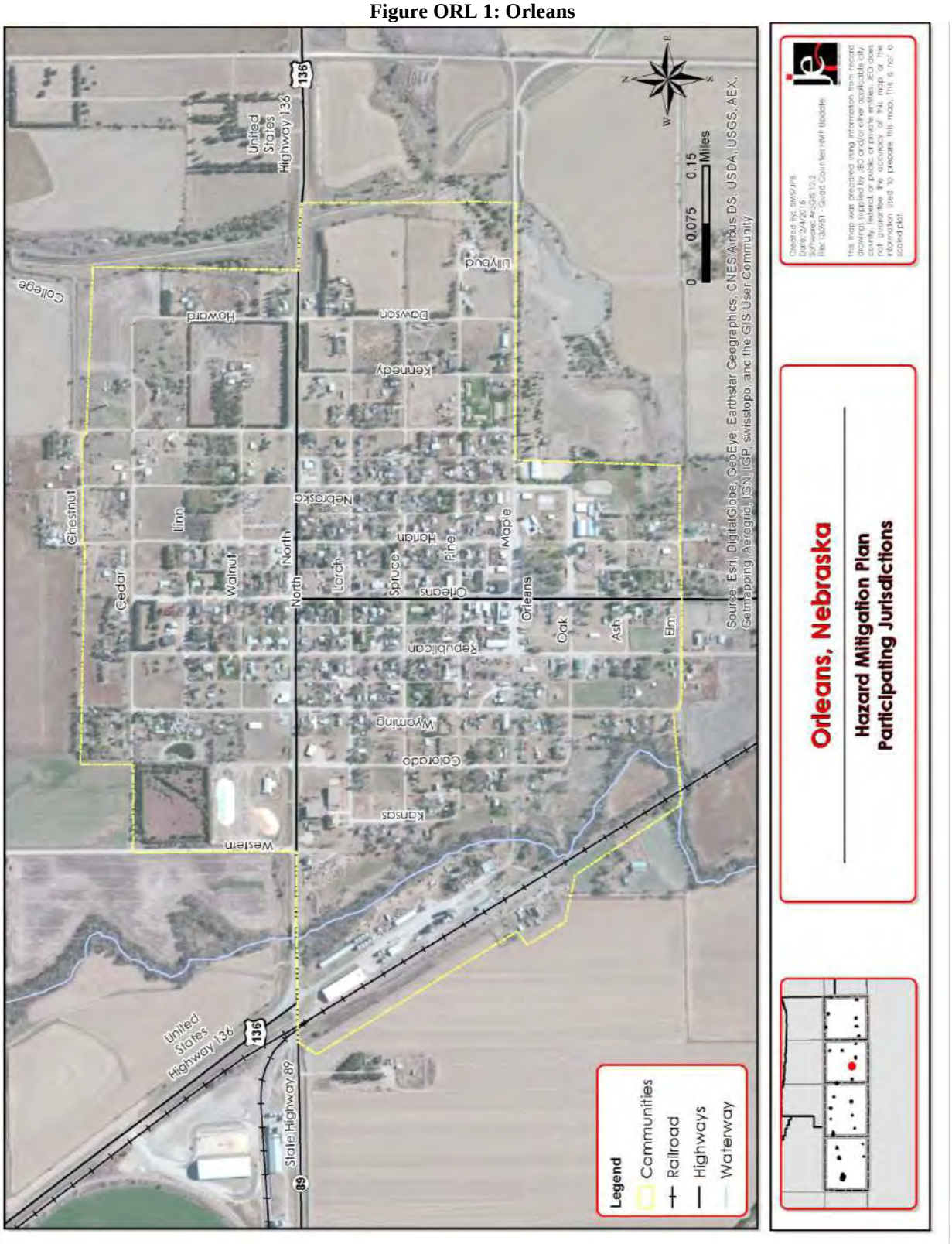
Location/Geography

Orleans is a village located in the south central portion of Harlan County. The Village of Orleans covers an area of 384 acres and has an elevation of 2,011 feet above sea level. Orleans is approximately 44 miles southwest of Kearney. Flag Creek flow through the west portion of the village.

Transportation

Figure ORL 1 shows the major transportation routes for the city. There is two major highway in the village US HWY 136 and NE HWY 89. According to the Nebraska Department of Road the average daily traffic count for US HWY 136 is 525 vehicle per day with 80 of those being heavy trucks passing to the northwest of the village and 1,280 vehicles with 85 of those being heavy trucks passing to the east of the village. The traffic count for NE HWY 89 is 165 vehicles with 10 of those being heavy trucks passing to the south of the village and 670 vehicles with 55 of those being heavy trucks to the passing to the west of the village. There is one railroad that runs through the west portion of the village.

Figure ORL 1: Orleans



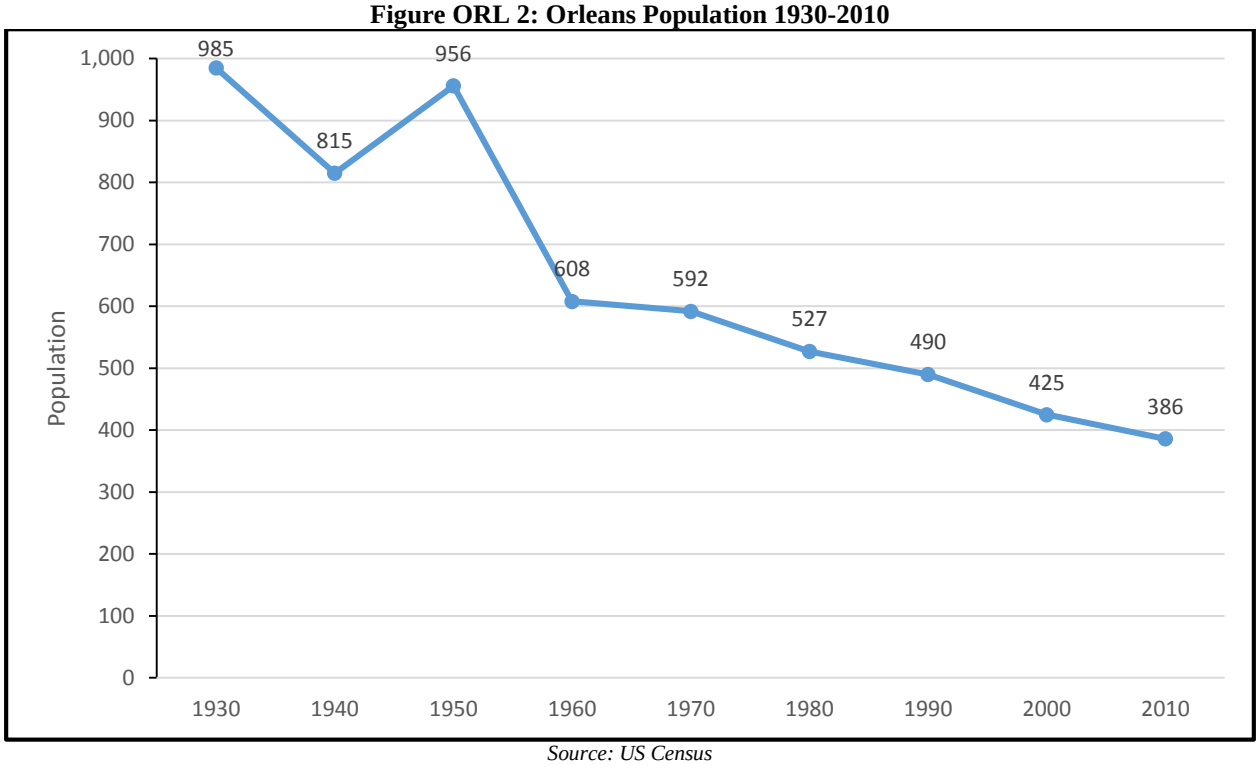
Climate

All the climate data for the county has been taken from a station located at the Harlan County Lake (253595). Please refer to the *Harlan County Section* for a climate summary for the village.

Demographics

Figure ORL 2 displays the population for Orleans from 1930 to 2010. Since 1950, the population has declined. A decrease in population results in a decrease in tax revenue for the village, which can make it more fiscally difficult to implement mitigation projects.

Figure ORL 2: Orleans Population 1930-2010



Source: US Census

Table ORL 2 illustrates the age distribution and median age for Harlan County in comparison to the Village of Orleans. The village has a higher population over the age of 64 than that of the county by about four percent. The median age for the village is also about one year older.

Table ORL 2: Orleans Age Distribution

Age	Harlan County	Orleans
<5	5.3%	3.1%
5-64	71.2%	68.7%
>64	23.5%	28.2%
Median	49.2	50.0

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Orleans in Table ORL 3. The median home values for the village are $33,300 less than the county, and rent values are about $60 lower than the county. The population has decreased in the last decade as noted in the demographic section, the lower cost of living compared with the rest of the county may be due to the aging housing stock. As these structures age if they are not cared for they may continue to increase the vulnerabilities to hazards.

Table ORL 3: Orleans Housing Value and Income

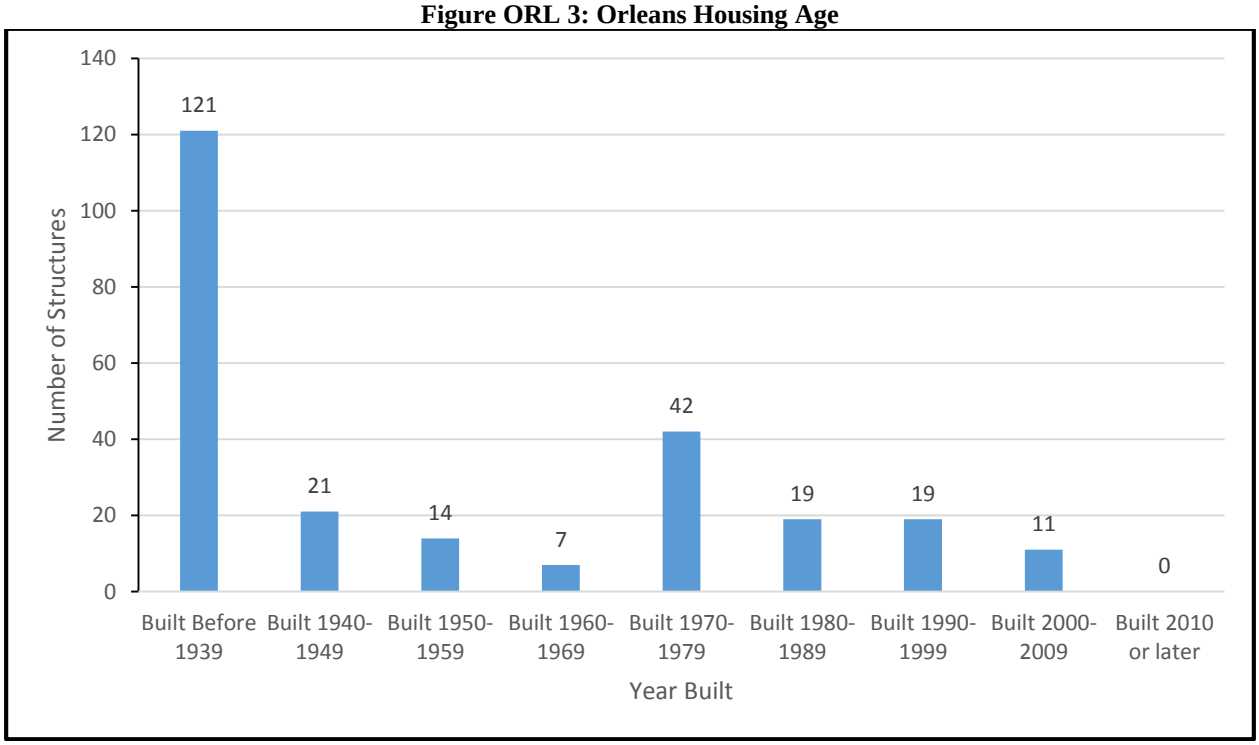
	Harlan County	Orleans
Median Household Income[1]	$54,862	$38,750
Per Capita Income[1]	$25,322	$19,198
Median Home Value[2]	$75,100	$41,800
Median Rent[2]	$546	$489

1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Figure ORL **3**) the village has 254 housing units with 75 percent of those units occupied (

Table ORL 4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. 10.2 percent of the villages' housing stock is classified as mobile homes, and 61 percent of the villages housing stock was built before 1960. Although there are mobile homes in the community, they are not located in a single identified mobile home park in the village, but are spread throughout the village. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados. Over 91 percent of the village's homes were built prior to the first FIRM for the village in 1988. Houses built prior to this year may not be constructed above the base flood elevation.

Figure ORL 3: Orleans Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table ORL 4: Orleans Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Harlan County	1,573	64.8%	853	35.2%		1,226	77.9%	347	22.1%
Orleans	191	75.2%	63	24.8%		151	79.1%	40	20.9%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Orleans are educational services and health care (27.1%), construction (15.6%) and manufacturing (10.1%).

There are no major employers in the Village of Orleans. There are several small businesses who have a few local people working for them. Including the city employees.

Structural Inventory

The planning team requested GIS parcel data from the Assessor for each county. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. Results from the structural inventory completed for the Village of Orleans in Table ORL 5.

Table ORL 5: Orleans Structural Inventory and Valuation

Jurisdiction	Number of Parcels with Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Value of Improvements in Floodplain
Orleans	229	$8,716,395	$38,063	$237,485

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Orleans planning team as a part of the plan update. Table ORL 6 and

Figure ORL provide a summary of the type and location of critical facilities for the jurisdiction.

Table ORL 6: Critical Facilities list

Critical Facility Number	Critical Facility
1	American Legion
2	Gas Station
3	Museum
4	Equipment Storage
5	Museum
6	Post Office
7	Village Office
8	Church
9	County Library and Park
10	Fire House
11	4-H Building
12	New Wine Ministries Church
13	4-H Barn
14	Church
15	Presbyterian Church
16	Grade School and Gym
17	Closed High School
18	Catholic School
19	Catholic Church
20	Village Well
21	Grocery Store
22	Orleans Hotel

Figure ORL 5: Orleans Critical Facilities Map

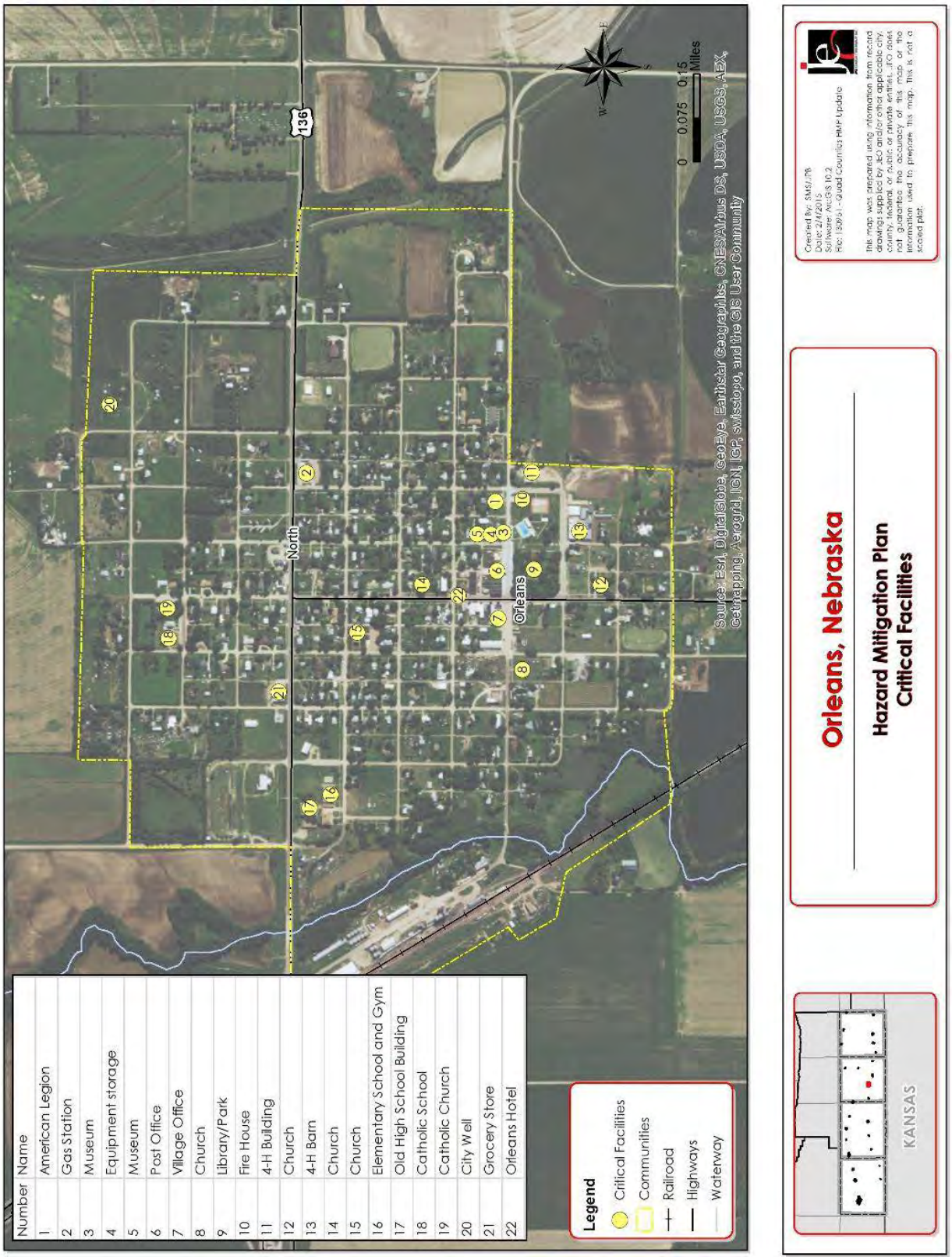
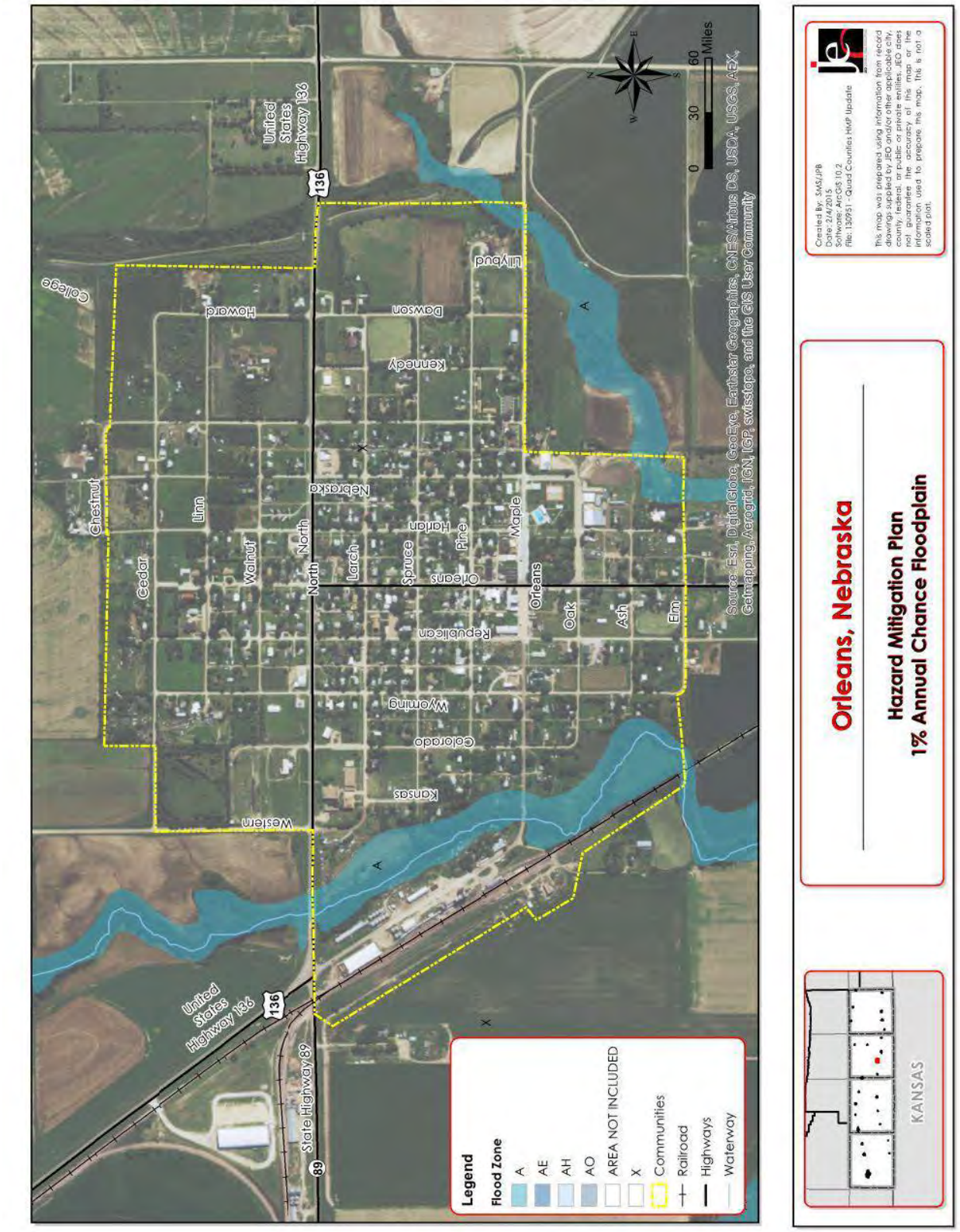


Figure ORL 4 shows the 1% annual floodplain for the Village of Orleans. The village has no structures or critical facilities in the floodplain. There are no repetitive loss properties in the village. The initial FIRM for Orleans was developed in May 1988. Orleans does participate in the NFIP, but does not have any policies in effect as of February 28, 2015.

Figure ORL 4: Orleans 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there is a total of one chemical storage site in the Village of Orleans. This site does not house materials that are categorized as hazardous.

Historic Sites

According to the National Register of Historic Places for Nebraska, there is one historic site located in the Village of Orleans. The site is located in the 1% annual floodplain.

Table ORL 7: National Historic Registry

Site Name	Date Listed	Classification	In Floodplain?
Prairie Dog Creek Bridge	6/29/1992	Structure	Yes

Source: Nebraska State Historical Society

Future Development Trends

There is no residential or commercial development planned in the next five years. Any new development will be discouraged in hazard prone areas, such as the floodplain.

Risk Assessment

Hazard Identification

Table ORL 8 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table ORL 8: Orleans Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Sites)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought*	Yes	Economic impacts
Earthquake	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfire*	Yes	Property damages, equipment needs
Hail	Yes	None
High Winds	Yes	None
Landslide	No	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damages, power outages
Severe Winter Storm*	Yes	Property damages, power outages
Terrorism	No	None
Tornados*	No	Significant property damages, loss of life

** Identified as a top concern by the local planning team*

The top five hazards in Orleans are drought, severe thunderstorms, severe winter storms, tornados, and wildfire. These five hazards that raise the greatest concerns for the community are discussed below in detail.

Historical Occurrence

The NCDC reported 33 severe weather events from 1996 to 2014 in the Village of Orleans. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table ORL 9 provides a summary of events that caused damage in the village.

Table ORL 9: Orleans Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
8/2/1996	Thunderstorm Wind	80 kts./92 mph	0	0	$230,000
8/2/1996	Hail	0.75 in.	0	0	$10,000
8/17/1999	Thunderstorm Wind	51 kts/ 59 mph	0	0	$50,000
7/20/2000	Hail	1.75 in.	0	0	$150,000
6/17/2002	Hail	1.75 in.	0	0	$10,000
5/22/2004	Hail	2 in.	0	0	$100,000
5/22/2008	Hail	1 in.	0	0	$2,000
6/14/2012	Thunderstorm Wind	52 kts./ 60 mph	0	0	$15,000
5/11/2014	Hail	1.5 in.	0	0	$50,000

Source: NCDC

Drought

Drought can have a significant economic impact on the Village of Orleans. The village economy is heavily influenced by the agricultural sector. The Soil Conservation Office monitors drought for the local area. The water supply has been determined to be sufficient for local needs. In the event of a drought, the village would implement watering restrictions.

Grass/Wildfire

According to the Nebraska Forest Service, from 2000-2014, there were seventeen wildfires near Orleans. These fires were relatively small, resulting in the burning of 149 acres. Orleans has a volunteer fire department with a staff of 19 people. The water supply is currently sufficient for firefighting. The fire department's suits will soon need to be replaced. The fire department partners with the schools and library to implement their fire prevention education program.

Severe Thunderstorms

Severe thunderstorms occur several times a year in Orleans and the rest of the planning area. NCDC reported five thunderstorm wind events and one heavy rain event that caused a total of $295,000 in property damages. Critical municipal records are protected with surge protectors on electronic devices. None of the power lines within the village are buried. The local planning team identified a number of facilities in need of backup power generators including: the library, hotel, and well.

Severe Winter Storms

Severe winter weather occurs annually within Orleans and the rest of the planning area. The local planning team indicated that there has not been a major winter storm since 1958. Nebraska Avenue and Republican Avenue are designated snow routes. Streets are cleared by a grader and a loader. The snow removal resources are sufficient for local events.

Tornados
Tornados have the potential to cause significant property damages and loss of life. NCDC reported one tornado that touched down north of Orleans in 2004. The tornado was briefly on the ground and did not cause any recorded property damage. The local planning team reported that in 1989 the New Wine Church was damaged by a tornado. There is no community safe room for residents. However, residents seeking shelter can go to the library, Hotel Orleans, Presbyterian Church, and the Catholic Church. In the event of a tornado, Harlan County Emergency Management offers text alerts. In the event of a disaster, Orleans has mutual aid agreements with neighboring communities.

Capability Assessment
Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance
The Village of Orleans is governed by a five member Village Board led by a chairman. The village also has the following departments that may be able to help implementing hazard mitigation projects:

- Clerk
- Utility Superintendent
- Police Department
- Street Superintendent
- Tree Board

Table ORL 10: Orleans Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	No
	Natural Resources Protection Plan	No
	Open Space Preservation Plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No

Survey Components/Subcomponents		Comments
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table ORL 10 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Orleans has an annex to the Harlan County Local Emergency Operations Plan, which was last updated in 2013. This plan discusses a number of hazards that can affect the county. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

Orleans has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from relationships with the county and the LRNDRD. Orleans will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Projects

Description	**Stormwater System and Drainage Improvements**
Analysis	Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 to $50,000
Funding	Village Funds
Timeline	1 Year
Priority	High
Lead Agency	Village Board
Action since 2010 plan	Cleaned up ditches and evaluated inlets for capacity.

New/Ongoing Mitigation Projects

Description	**Backup Generators**
Analysis	Provide a portable or stationary source of backup power to critical facilities
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$20,000 to $50,000 per generator
Potential Funding	HMGP, PDM, Village funds
Timeline	2-5 Years
Priority	High
Lead Agency	Village Board
Action since 2010 plan	Gained approval for generator at well house. Identified facilities such as hotel and old school as needing generators.

Description	**New Well**
Analysis	Provide a safe backup water supply for the community; replace existing wells affected by drought, increase of demand in water, and additional water for fire protection.
Goal/Objective	Goal 2 /Objective 2.1

Description	New Well
Hazard(s) Addressed	All Hazards
Estimated Cost	$350,000 to $450,000
Potential Funding	HMGP, PDM, Village funds
Timeline	1 Year
Priority	High
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Village funds
Timeline	2 – 5 Years
Priority	High
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Drainage Study/Stormwater Master Plan
Analysis	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 to $100,000
Potential Funding	HMGP, PDM, Village funds
Timeline	2 – 5 Years
Priority	Medium
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Village funds
Timeline	Ongoing
Priority	Medium
Lead Agency	Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Severe winter storms, severe thunderstorms, tornados, high winds
Estimated Cost	$2,000
Timeline	2-5 Years

Description	Tree City USA
Priority	Low
Lead Agency	Clerk, Village Board
Action since 2010 plan	Orleans has established tree board.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	Village Funds
Timeline	2 – 5 Years
Priority	Medium
Lead Agency	Village Board, Fire Department
Action since 2010 plan	Identifying methods for distributing education materials.

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's, water tanks/trucks, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles and identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	All hazards
Estimated Cost	Varies by equipment needed
Potential Funding	HMGP, PDM, Village Board
Timeline	2 – 5 Years
Priority	Low
Lead Agency	Village Board, Fire Department
Action since 2010 plan	Not yet started.

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	HMGP, PDM, Village Funds
Timeline	2 – 5 Years
Priority	Medium
Lead Agency	Village Board, Fire Department
Action since 2010 plan	In process of identifying locations that need weather radios.

Description	Source Water Contingency Plan
Analysis	Evaluate and locate new sources of groundwater to ensure adequate supplies to support the existing community and any additional growth which may occur.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Drought
Estimated Cost	$20,000-25,000
Potential Funding	HMGP, PDM, Village Funds
Timeline	2 – 5 Years
Priority	Medium
Lead Agency	Village Board
Action since 2010 plan	Not yet started. This is a new action.

Removed Mitigation Projects

Description	Stabilize/Anchor Fertilizer, Fuel, and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement. If left unanchored tanks could present major threat to property and safety in a tornado or high wind event.
Hazard(s) Addressed	Flooding, High Winds
Reason for Removal	No unanchored tanks in village.

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer needed. No streams in need of stabilization.

Description	Flood-Prone Property Acquisition
Analysis	Voluntary acquisition and demolition of properties prone to flooding will reduce the general threat of flooding for communities. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer needed, no local support.

Description	Groundwater/Irrigation/Water Conservation Management Plan and Practices
Analysis	Develop and implement a plan/ best management practices to conserve water use and reduce total use (high water use to low water use) and consumption of groundwater resources by citizens and irrigators of agricultural land during elongated periods of drought Identify water saving irrigation projects of improvements such as sprinklers of soil moisture monitoring. Potential restrictions on water could include limitation on lawn watering, car washing, farm irrigation restrictions, or water sold to outside sources. Implement BMPs through water conservation practices such as changes in irrigation management, education on no-till agriculture and use of xeriscaping in communities.
Hazard(s) Addressed	Drought
Reason for Removal	No longer needed.

Description	Floodplain Regulation Enforcements and Updates
Analysis	Continue to enforce local floodplain regulations for structures located in the 1% annual floodplain. Strict enforcement of the type of development and elevations of structures should be considered through issuance of building permits by any Nebraska city. Continue education of building inspectors or Certified Floodplain Managers.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer needed. This action is redundant with 'maintain in good standing with NFIP' action.

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer needed. This action is redundant with 'maintain in good standing with NFIP' action.

Village of Ragan

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Ragan participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Ragan attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Ragan, the top concerns that were identified through this planning process include flooding, hail, severe thunderstorms, severe winter storms, and tornados. The following people were involved in the development of Ragan's Participant Section:

Table RGN 1: Village of Ragan Plan Contributors

Name	Title	Department / Organization
Kelly Winz	Village Clerk	Village of Ragan
Chris Becker	Harlan County Sheriff	Harlan County

This section contains important information about the Village of Ragan relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

Location/Geography

Ragan is a village in the northeast portion of Harlan County. The Village of Ragan covers an area of 192 acres and has an elevation of 2,329 feet above sea level. Ragan is approximately 29 miles southwest of Kearney. The topographic region Ragan lies in is that of the plains. These flat-lying lands above the valley are made from materials of sandstone or stream-deposited silt, clay sand and gravel overlain by wind deposited silt.

Transportation

Figure RGN 1 shows the major transportation routes for the village. There is no major highway that goes through the village although NE HWY 4 passes just south of the village, and provides access to the city. According to the Nebraska Department of Roads the average daily traffic count for NE HWY 4 is 425 vehicles a day with 50 of those being heavy trucks passing to the southeast of the village and 550 vehicles per day with 70 of those being heavy trucks passing to the west of the village.

Figure RGN 1: Ragan

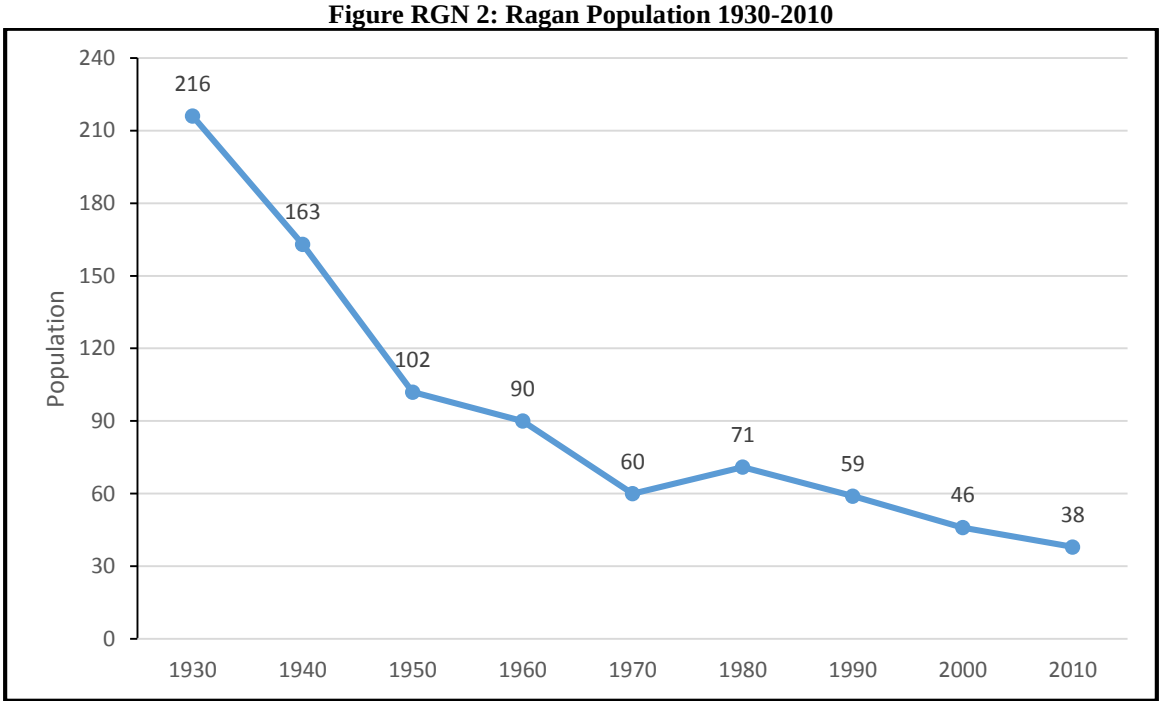
Climate

All the climate data for the county has been taken from a station located at the Harlan County Lake (253595). Please refer to the *Harlan County Section* for a climate summary for the village.

Demographics

Figure RGN **2** displays the population of Ragan from 1930 to 2010. The population of Ragan has been declining since 1930. From 2000 to 2010 the village lost approximately 17 percent of its population. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure RGN 2: Ragan Population 1930-2010



Source: US Census

Table RGN 2 illustrates the age distribution and median age for Harlan County in comparison to the Village of Ragan. The village has a lower percentage of population under the age of 64 than that of the county by about five percent. The village has a higher median age than that of the county by about 11 years.

Table RGN 2: Ragan Age Distribution

Age	Harlan County	Ragan
<5	5.3%	0%
5-64	71.2%	81.6%
>64	23.5%	18.4%
Median	49.2	59.8

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent, for the county as a whole are compared with the Village of Ragan in Table RGN 3. The median home and rent values are not reported for the village. The median income for the village is $25,400 more than the county. The population has decreased in the last decade as noted in the demographic section, the higher income potential compared with the rest of the county may be beneficial to the future of the community's population stability. The

majority of the village's housing stock has been built since 1980. The newer structures will increase the home value similar to that of the county.

Table RGN 3: Ragan Housing Value and Income

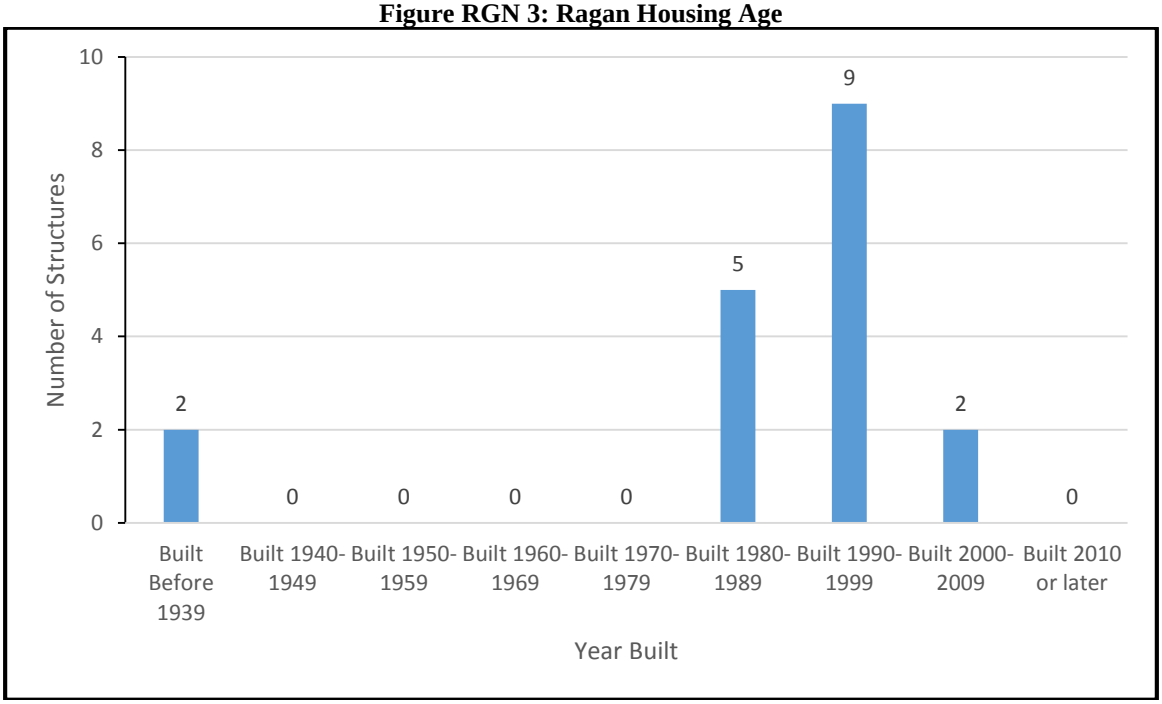
	Harlan County	Ragan
Median Household Income[1]	$54,862	$80,278
Per Capita Income[1]	$25,322	$25,581
Median Home Value[2]	$75,100	-
Median Rent[2]	$546	-

1Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Figure RGN **3**) the village has 18 housing units with 89 percent of those units occupied (

Table **RGN 4)**. 27.8 percent of the village's housing stock is classified as mobile homes and 11 percent of the village's housing stock was built before 1960. Although there are mobile homes in the community, they are not located in a single identified mobile home park in the village, but are spread throughout the village. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados. Nearly all of the village's homes were built prior to the first FIRM for the village in 2009. However, there is no floodplain in the village.

Figure RGN 3: Ragan Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table RGN 4: Ragan Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Harlan County	1,573	64.8%	853	35.2%		1,226	77.9%	347	22.1%
Ragan	16	88.9%	2	11.1%		11	68.8%	5	31.3%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Ragan are retail trade (63.6%), educational services and health care (18.2%), and wholesale trade (18.2%).

The major employers for the Village of Ragan include CPI Co-op.

Structural Inventory

The planning team requested GIS parcel data from the Assessor for each county. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. Results from the structural inventory completed for the Village of Ragan in Table RGN 5.

Table RGN 5: Ragan Structural Inventory and Valuation

Jurisdiction	Number of Parcels with Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Value of Improvements in Floodplain
Ragan	38	$2,983,895	$78,524	$0

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Ragan planning team as a part of the plan update. Table RGN 6 and Figure RGN 4 is a summary of the type and location of critical facilities for the jurisdiction. The village does not have any critical facilities in the 1% annual floodplain.

Table RGN 6: Critical Facilities List

Critical Facility Number	Critical Facility
1	Church
2	Community Center & Fire Hall

There is no floodplain in Ragan. Ragan does participate in the NFIP, but there are no policies in effect as of February 28, 2015. Ragan does not have any parcels within the floodplain.

Figure RGN 4: Ragan Critical Facilities Map

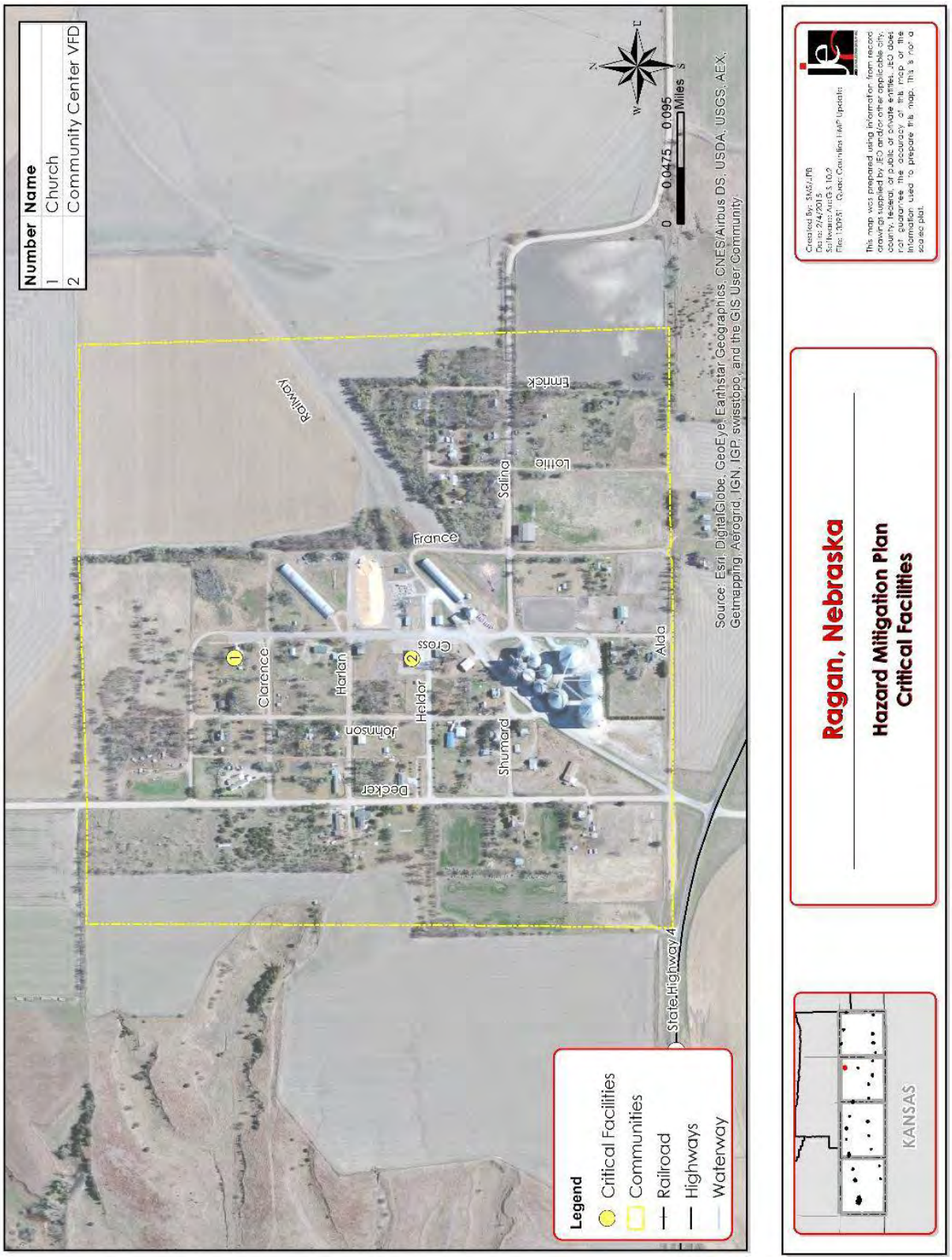
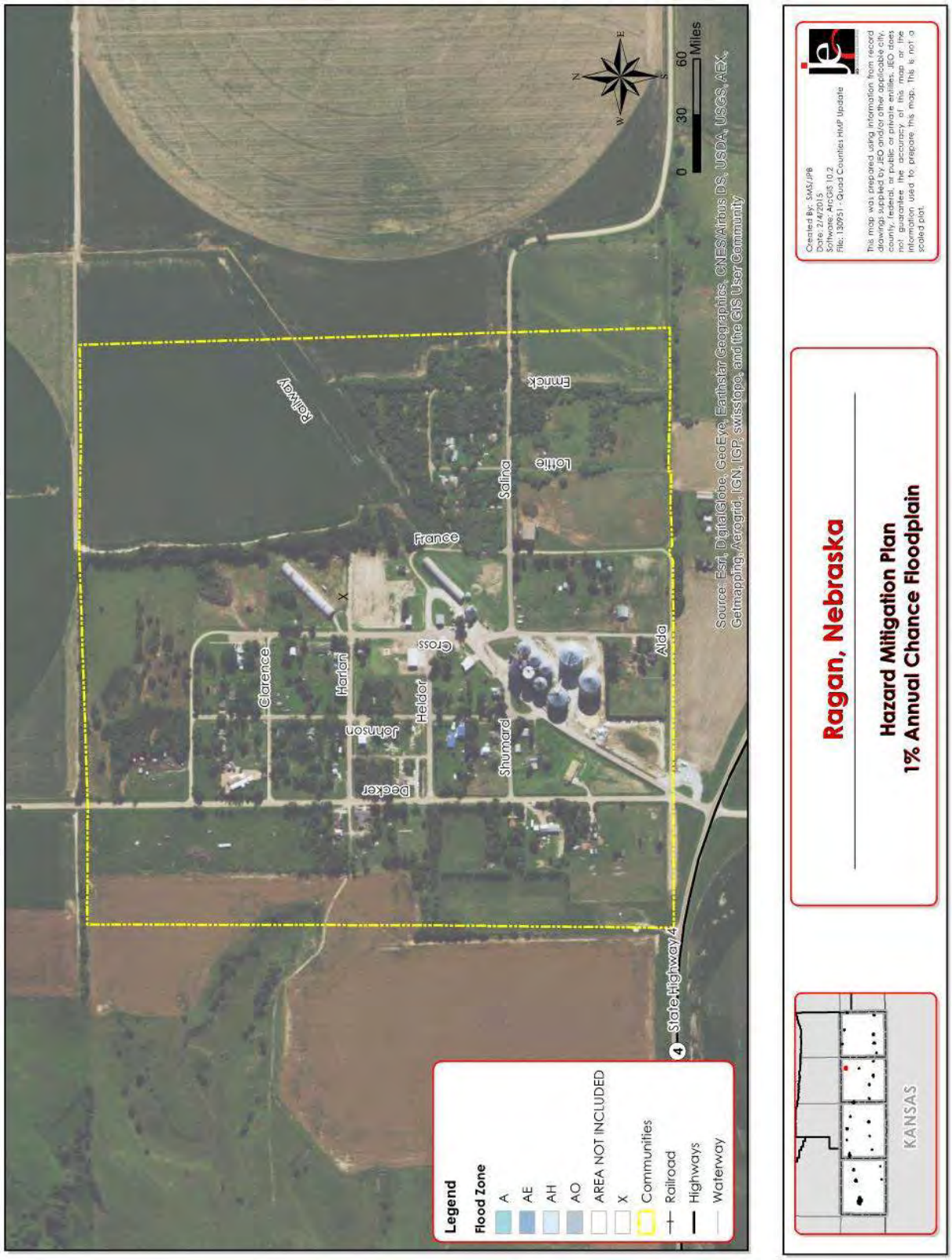


Figure RGN 6: Ragan 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are no chemical storage sites in the Village of Ragan.

Historic Sites

According to the National Register of Historic Places for Nebraska, there is one historic site located near Ragan. The site is in the 1% annual floodplain.

Table RGN 7: National Historic Registry

Site Name	Date Listed	Classification	In Floodplain?
Turkey Creek Bridge	6/29/1992	Structure	Yes

Source: Nebraska State Historical Society

Future Development Trends

There is no commercial or industrial developments planned in the next five years. The population of Ragan is declining. The local planning team indicated that an aging population is contributing to this trend. As the population declines, more vacant properties will be increasingly vulnerable to hazards.

Risk Assessment

Hazard Identification

Table RGN 8**Table ORL 8** is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table RGN 8: Ragan Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat	Yes	None
Flooding*	Yes	Property damages
Grass/Wildfire	Yes	None
Hail*	Yes	Property damages
High Winds	Yes	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damages, injuries, power outages
Severe Winter Storm*	Yes	Property damages, injuries, power outages
Terrorism	No	None
Tornado*	Yes	Significant property damages, loss of life

** Identified as a top concern by the local planning team*

The top five hazards in Ragan are flooding, hail, severe thunderstorms, severe winter storms, and tornados. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 19 severe weather events from 1996 to 2014 in the Village of Ragan. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table RGN 9 provides a summary of events that caused damage in the village.

Table RGN 9: Ragan Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/27/1999	Thunderstorm Wind	69 kts. / 79 mph	0	0	$100,000
5/22/2004	Hail	2.5 in.	0	0	$25,000
5/4/2007	Hail	1 in.	0	0	$5,000
5/22/2008	Hail	1 in.	0	0	$2,000
6/11/2008	Hail	1 in.	0	0	$2,000
6/13/2010	Flash Flood	-	0	0	$10,000
6/14/2012	Hail	1.75 in.	0	0	$75,000

Source: NCDC

Flooding

There are no parcels located within the floodplain in Ragan. Ragan does participate in the NFIP, however there are no policies in effect as February 28, 2015. NCDC reported one flash flood in Ragan that resulted in $10,000 in property damages.

Hail

NCDC reported 14 hail events from 1996 to 2014 in the Village of Ragan. These events led to $109,000 in recorded damages.

Severe Thunderstorms

NCDC reported three severe thunderstorms in Ragan that resulted in $100,000 in property damages. Severe thunderstorms occur several times annually within Ragan and the rest of the planning area. Severe thunderstorms have the potential to cause injuries, property damages, and power outages.

Severe Winter Storms

Severe winter storms occur annually within Ragan and the rest of the planning area. Severe winter storms have the potential to cause injuries, property damages, and power outages.

Tornados

NCDC reported one tornado near Ragan in May 1999. There are no reported damages caused by this tornadic event. Tornados have the potential to cause significant damages and loss of life.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding

locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

The Village of Ragan is governed by five member village board, led by a chairperson. The village also has the following positions that may help implement mitigation projects.

- Clerk
- Treasurer

Table RGN 10: Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No

Survey Components/Subcomponents		Comments
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table RGN **10**10 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Ragan has an annex to the Harlan County Local Emergency Operations Plan, which was last updated in 2013. This plan discusses a number of hazards that can affect the county. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

Ragan has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from relationships with the county and the LRNDRD. Ragan

will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Projects

Description	Participate in the NFIP
Analysis	Participate in the NFIP
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Funding	Village Funds
Timeline	Completed
Lead Agency	Village Board
Action since 2010 plan	Became a NFIP participant in 2009.

New/Ongoing Mitigation Projects

Description	Backup Power Generators
Analysis	Provide a safe back-up power supply.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$5,000+
Potential Funding	HMGP, PDM, Village funds
Timeline	2-5 years
Priority	High
Lead Agency	Village Board, Harlan County Emergency Manager
Action since 2010 plan	Not yet started

Description	Electrical System Looped Distribution/Redundancies
Analysis	Provide looped distribution services and other redundancies in the electrical system as a backup power supply in the event the primary system is destroyed or fails.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Severe thunderstorms, tornados, high winds, and severe winter storms
Estimated Cost	$50,000 per mile
Potential Funding	HMGP, PDM, Village funds
Timeline	5+ years
Priority	Medium
Lead Agency	Village Board, Harlan County Emergency Manager
Action since 2010 plan	Not yet started

Description	Power, Service, Electrical, and Water Distribution Lines
Analysis	Communities can work with their local Public Power District to identify vulnerable transmission and distribution lines and plan to bury lines underground or retrofit existing structures to be less vulnerable to storm events. Electrical utilities shall be required to use underground construction methods where possible for future installation of power lines.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$50,000+ per mile (electrical)
Potential Funding	HMGP, PDM, Village funds
Timeline	5+ years
Priority	Medium
Lead Agency	Village Board, Harlan County Emergency Manager
Action since 2010 plan	Not yet started

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Village funds
Timeline	2 – 5 years
Priority	High
Lead Agency	Village Board
Action since 2010 plan	Not yet started.

Description	Drought Monitoring Plan and Procedures
Analysis	Develop and implement a plan/program to monitor the effects of drought
Goal/Objective	Goal 2 /Objective 2.2
Hazard(s) Addressed	Drought
Estimated Cost	$15,00 to $20,000
Potential Funding	HMGP, PDM, Village funds
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Village Board
Action since 2010 plan	Not yet started.

Description	Groundwater/Irrigation/Water Conservation Management Plan and Practices
Analysis	Develop and implement a plan/best management practices to conserve water use and reduce total use (high water use to low water use) and consumption of groundwater resources by citizens and irrigators of agricultural land during elongated periods of drought. Identify water saving irrigation projects or improvements such as sprinklers of soil moisture monitoring. Potential restrictions on water could include limitation on lawn watering, car washing, farm irrigation restrictions, or water conservation practices such as changes in irrigation management, education on no-till agriculture and use of xeriscaping in communities.
Goal/Objective	Goal 2 /Objective 2.2
Hazard(s) Addressed	Drought
Estimated Cost	$10,000+
Potential Funding	HMGP, PDM, USDA, Village funds
Timeline	2 – 5 years
Priority	Low
Lead Agency	Village Board
Action since 2010 plan	Not yet started.

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Goal/Objective	Goal 5/Objective 5.2
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Estimated Cost	$1,000+
Potential Funding	Village funds
Timeline	2-5 years
Priority	Low
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters,

Description	Public Awareness / Education
	businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's, water tanks/trucks, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles and identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	All hazards
Estimated Cost	Varies by equipment needed
Potential Funding	HMGP, PDM, Village Funds
Timeline	2 – 5 Years
Priority	Low
Lead Agency	Village Board
Action since 2010 plan	Not yet started

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	Village funds, HMGP, PDM
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Village Board, Harlan County Sheriff/ Emergency Manager
Action since 2010 plan	Not yet started

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Village funds
Timeline	Ongoing
Priority	Medium
Lead Agency	Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Removed Mitigation Projects

Description	Stabilize/Anchor Fertilizer, Fuel and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement. If left unanchored tanks could present major threat to property and safety in a tornado or high wind event.
Hazard(s) Addressed	Tornados and High Winds
Reason for Removal	No fuel tanks present at this time.

Description	**Stormwater System and Drainage Improvements**
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer needed. No floodplain or drainage issues located in the village.

Description	**Stream Bank Stabilization/Grade Control Structure/ Channel Improvement**
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	No streams flow through the village.

Description	**Emergency Communications**
Analysis	Establish an action plan to improve communication between agencies to better assist residents and businesses during and following emergencies. Establish inner-operable communications.
Hazard(s) Addressed	All hazards
Reason for Removal	This effort will be led by the county.

Village of Republican City

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Republican City participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Republican City attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Republican City, the top concerns that were identified through this planning process include drought, high winds, severe thunderstorms, severe winter storms, and tornados. The following people were involved in the development of Republican City's Participant Section:

Table REP 1: Village of Republican City Plan Contributors

Name	Title	Department / Organization
Missy Waldo	Clerk	Village of Republican City
Gary Crawford	Village Board Member	Village of Republican City

This section contains important information about the Village of Repulican City relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

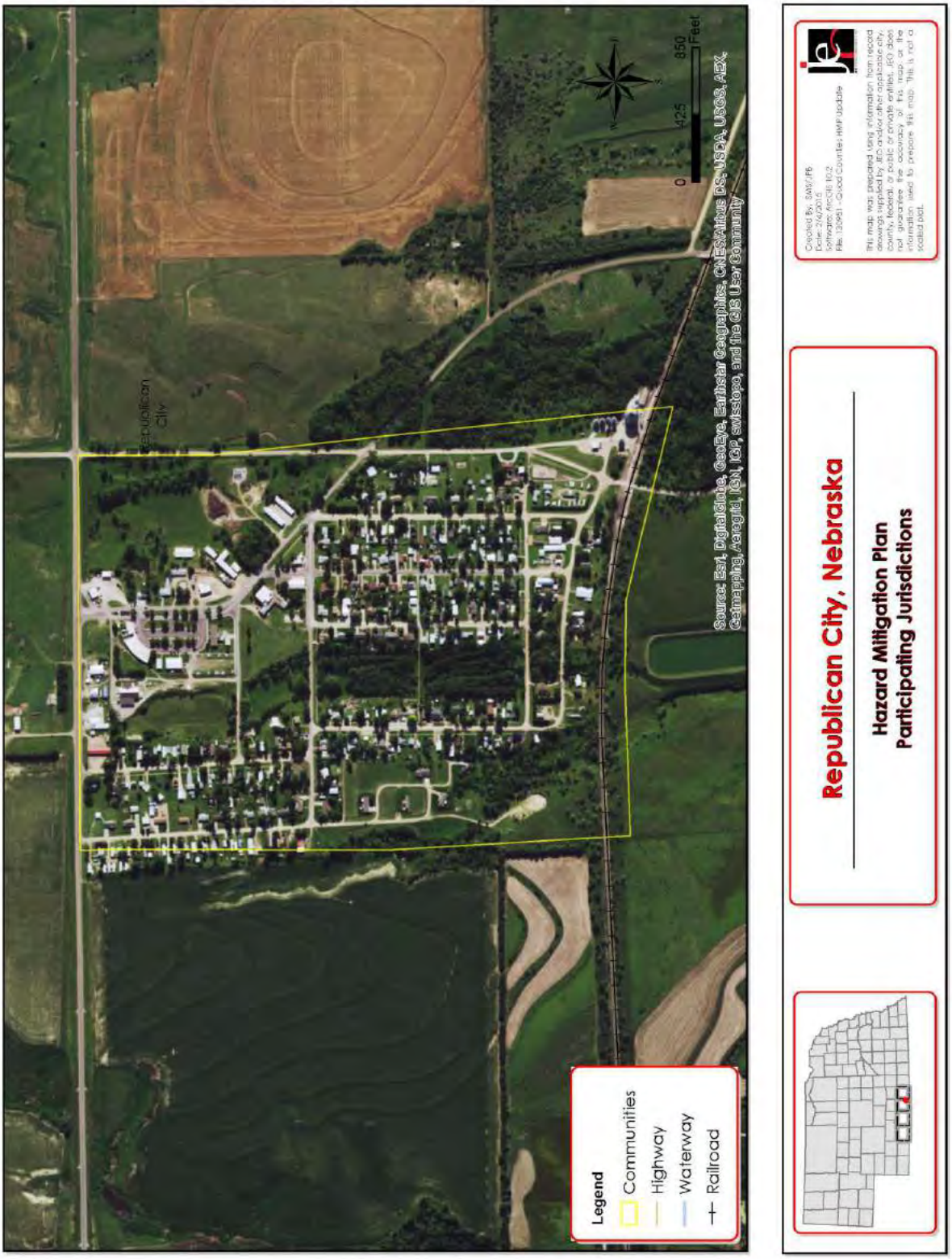
Location/Geography

Republican City is a village located in the southeast portion of Harlan County. The Village of Republican City covers an area of 192 acres and has an elevation of 2,028 feet above sea level. Republican City is approximately 40 miles south of Kearney. The topographic region Republican City lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. The Harlan County Reservoir is just to the south of the village.

Transportation

Figure REP 1 shows major transportation routes for the village. There is one major highway in Republican City US HWY 136. According to the Nebraska Department of Roads the average daily traffic count for US HWAY 136 is 675 vehicles with 75 of those being heavy trucks passing to the east of the village and 930 vehicles with 90 of those being heavy trucks passing to the west of the village. There is one railroad that runs through the south portion of the village.

Figure REP 1: Republican City



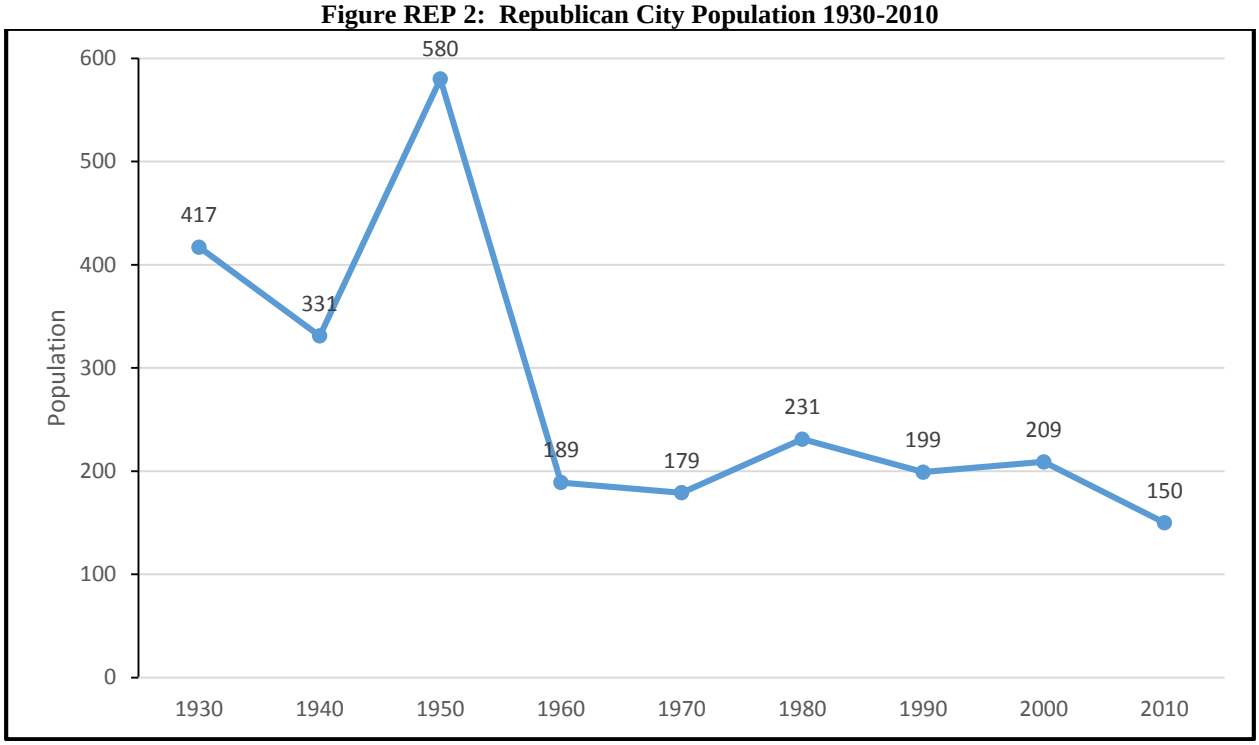
Climate

All the climate data for the county has been taken from a station located at the Harlan County Lake (253595). Please refer to the *Harlan County Section* for a climate summary for the village.

Demographics

Figure REP 2 displays the population for Republican City from 1930 to 2010. Since 1950 the population has declined. From 2000 to 2010 the village lost approximately 28 percent of its population. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure REP 2: Republican City Population 1930-2010



Source: US Census

Table REP 2 illustrates the age distribution and median age for Harlan County compared to the Village of Republican City. The village has a higher percentage of population over the age of 64 than that of the county by about 15 percent. The village has a higher median age than that of the county by 11 years.

Table REP 2: Republican City Age Distribution

Age	Harlan County	Republican City
<5	5.3%	4%
5-64	71.2%	57.3%
>64	23.5%	38.7%
Median	49.2	59.8

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Republican City in Table REP 3. The median home values for the village is $8,500 less than the county, and rent values are about $70 less. The population has decreased in the last decade as noted in the demographic section, the lower cost of living compared with the rest of the county

may be due to the aging housing stock. If these structures are not cared for as they age, they may continue to increase the vulnerabilities to hazards.

Table REP 3: Republican City Housing Value and Income

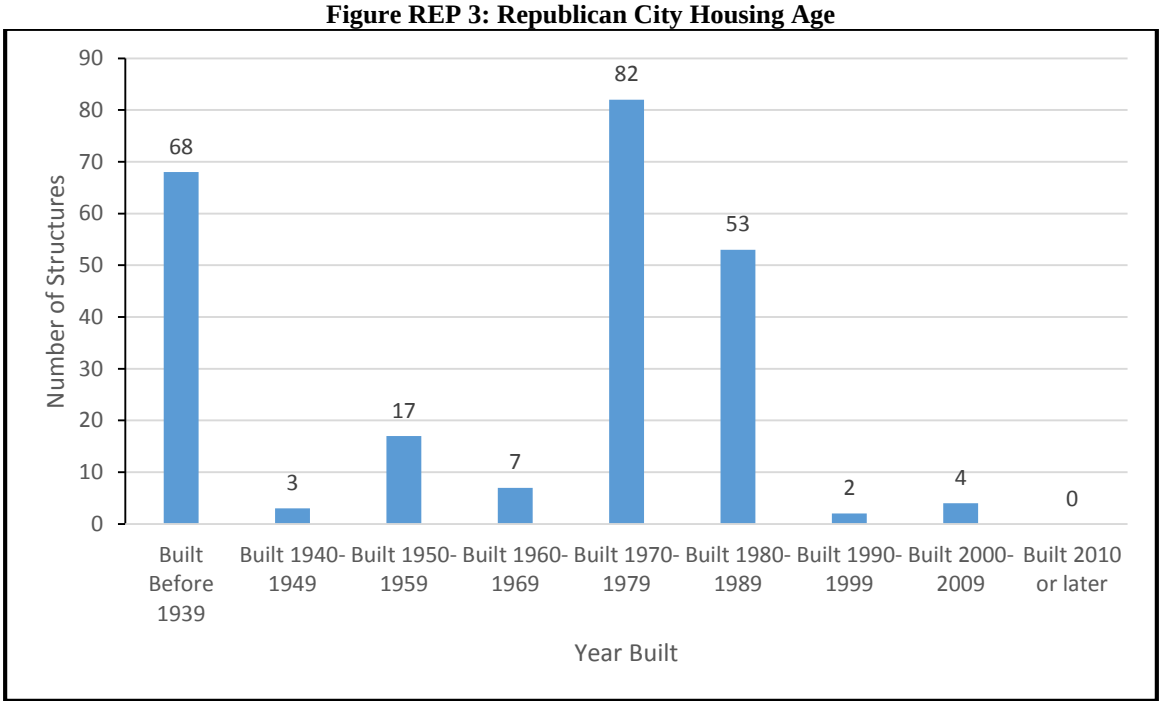
	Harlan County	Republican City
Median Household Income[1]	$54,862	$38,750
Per Capita Income[1]	$25,322	$24,997
Median Home Value[2]	$75,100	$66,600
Median Rent[2]	$546	$475

1Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Figure REP **3**) the village has 236 housing units with 46 percent of those units occupied (

Table **REP 4**). The high vacancy rate may be affected by the declining population. However, the local planning team indicates that this is due to the highly seasonal nature of the village. It is estimated that 60% of town is seasonal. Approximately 36 percent of the village's housing stock is classified as mobile homes and 37 percent of the village's housing stock was built before 1960. There is one mobile home park in the village. The mobile home park is between Anchor Court Lane and West Avenue on the western end of town. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados. About 100 percent of the village's homes were built prior to the first FIRM for the village in 2009. Houses built prior to this year may not be constructed above the base flood elevation.

Figure REP 3: Republican City Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table REP 4: Republican City Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Harlan County	1,573	64.8%	853	35.2%		1,226	77.9%	347	22.1%
Republican City	109	46.2%	127	53.8%		93	85.3%	16	14.7%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Republican City are educational services and health care (46.2%), construction (15.4%), and retail trade (10.8%).

There are no major employers in the Village of Republican City. Employment within the village is predominately located in small businesses. Many residents commute to other communities for employment.

Structural Inventory

The planning team requested GIS parcel data from the Assessor for each county. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. Results from the structural inventory completed for the Village of Republican City in **Table REP 5**

Table REP 5: Republican City Structural Inventory and Valuation

Jurisdiction	Number of Parcels with Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Value of Improvements in Floodplain
Republican City	248	$10,929,225	$44,069	$0

Source: Nebraska Department of Revenue, Property Assessment Division

Republican City has no structures in the 1% annual floodplain.

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Republican City planning team as a part of the plan update. Table REP 6 and Figure REP 4 is a summary of the type and location of critical facilities for the jurisdiction. The village does not have any critical facilities in the 1% annual floodplain.

Table REP 6: Critical Facilities List

Critical Facility Number	Critical Facility
1	Water Storage Tank
2	Fire Hall
3	Post Office
4	Village Office
5	Well # 1
6	Well # 2

Figure REP 4: Republican City Critical Facilities Map

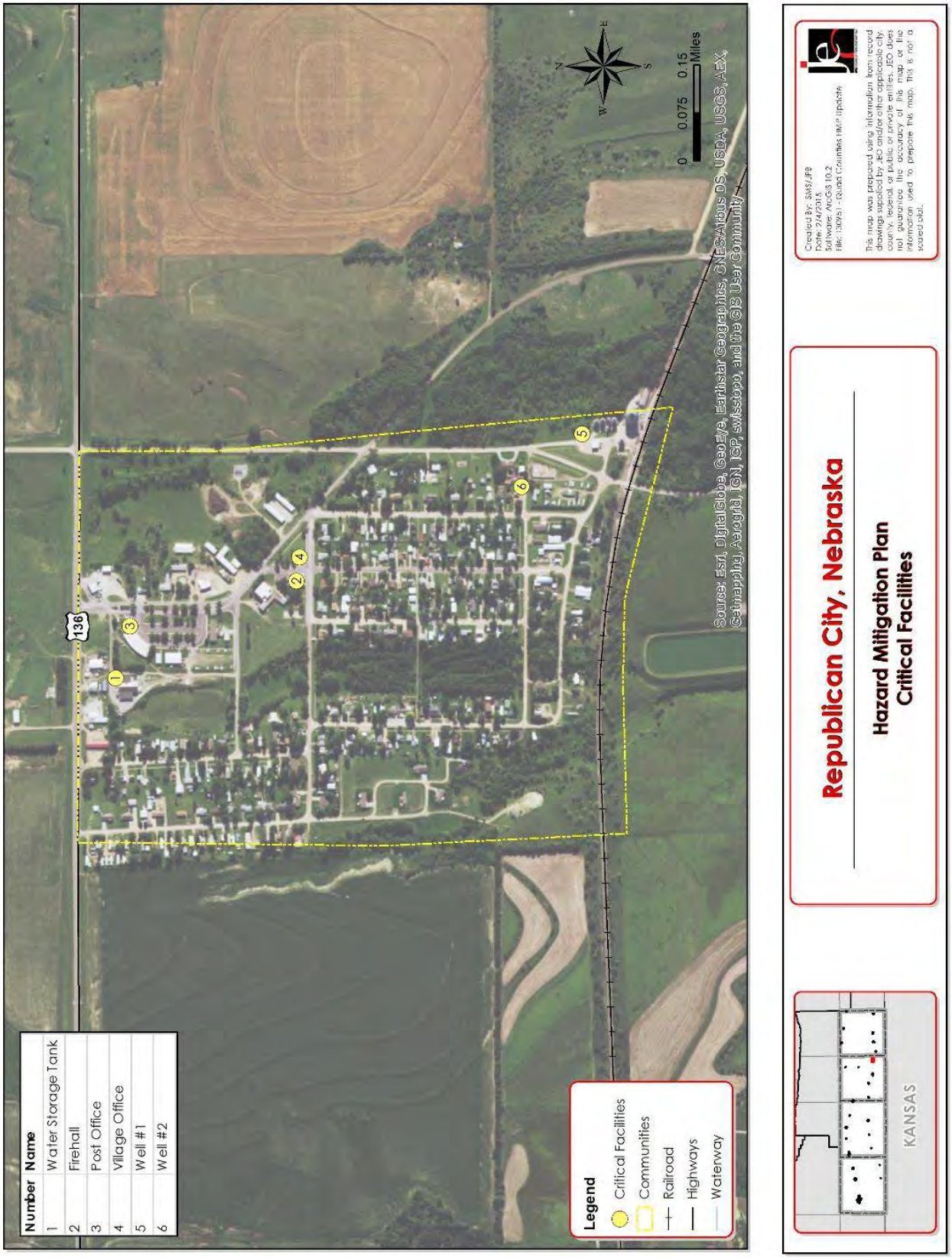
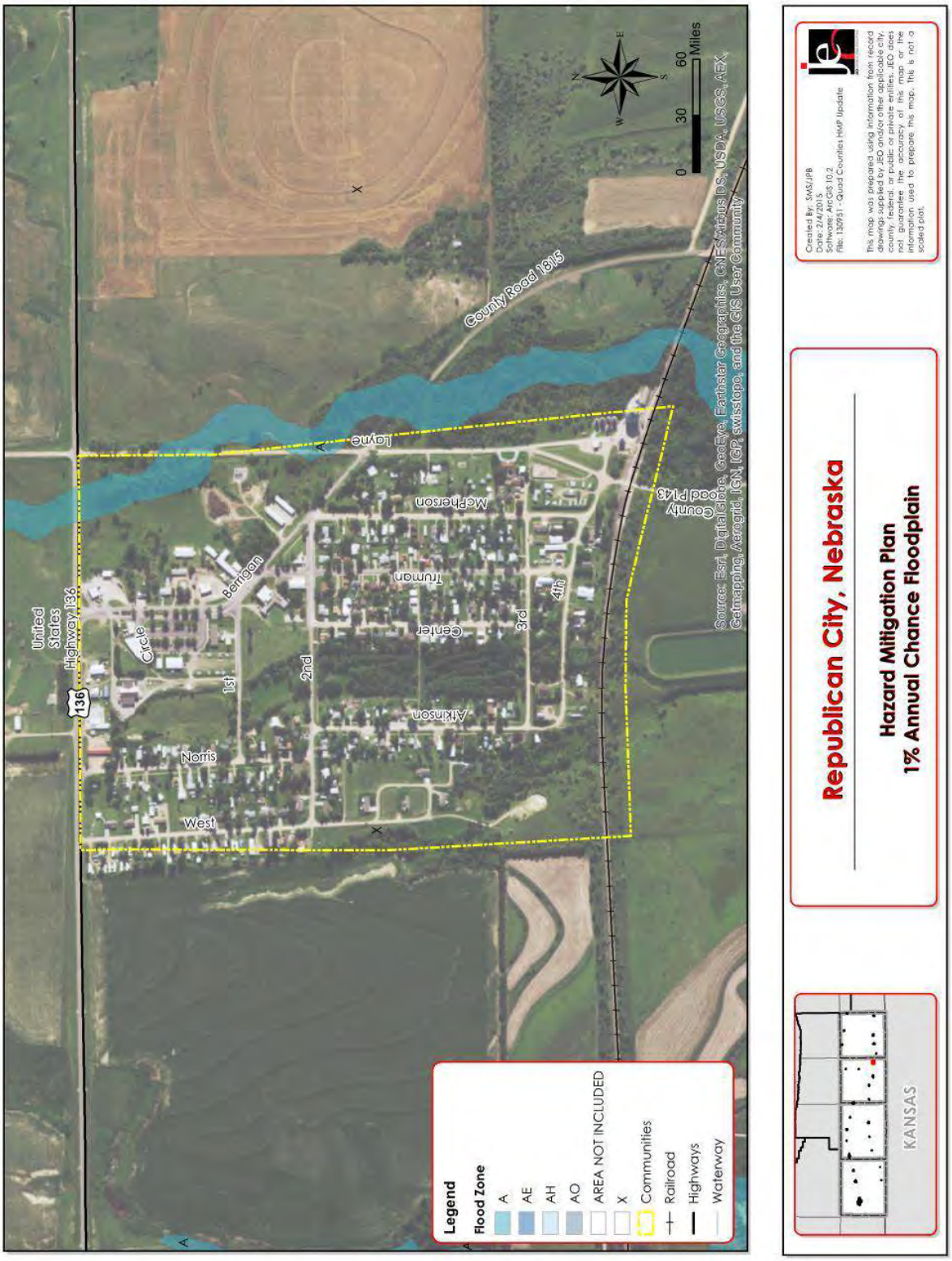


Figure REP 5 shows the 1% annual floodplain for the Village of Republican City. The village has no structures or critical facilities in the floodplain. There are no repetitive loss properties in the village. The initial FIRM for Republican City of was developed in February of 2009. Republican City does participate in the NFIP, but there are no policies in effect as of February 28, 2015.

Figure REP 5: Republican City 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of two chemical storage sites in the Village of Republican City, and none of these house materials that are categorized as hazardous.

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sited located in Republican City.

Future Development Trends

There have been approximately three houses built in the last five years. No development is planned for the next five years. Future development is discouraged from hazard areas, such as a floodplain.

Risk Assessment

Hazard Identification.

Table REP 7 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table REP 7: Republican City Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Sites)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought*	Yes	Economic impacts
Earthquake	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfire	No	None
Hail	Yes	None
High Winds*	Yes	Property damages, power outages
Landslide	No	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damages, power outages, injuries
Severe Winter Storm*	Yes	Property damages, power outages, injuries
Terrorism	No	None
Tornados*	Yes	Significant property damages, loss of life, lack of shelter

** Identified as a top concern by the local planning team*

The top five hazards in Republican City are severe winter storms, tornados, high winds, severe thunderstorms, and drought. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 22 severe weather events from 1996 to 2014 in the Village of Republican City. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table REP 8 provides a summary of the events that caused damage in the village.

Table REP 8: Republican City Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
7/15/1996	Thunderstorm Wind	60 kts./ 69 mph	0	0	$5,000
8/11/2002	Thunderstorm Wind	56 kts./ 64 mph	0	0	$75,000
5/22/2004	Hail	2 in.	0	0	$25,000
5/29/2004	Thunderstorm Wind	69 kts./ 79 mph	0	0	$150,000
5/17/2005	Hail	1.75 in.	0	0	$25,000
5/22/2007	Thunderstorm Wind	52 kts./ 60 mph	0	0	$1,000
5/22/2008	Hail	1.75 in.	0	0	$10,000
5/3/2012	Hail	1.75 in.	0	0	$25,000
5/3/2012	Hail	2.75 in.	0	0	$250,000
5/3/2012	Hail	1.25 in.	0	0	$15,000
5/27/2013	Hail	1.75 in.	0	0	$75,000

Source: NCDC

Drought

The economy of Republican City is significantly influenced by the proximity of the Harlan County Reservoir. Drought can reduce the water level in the reservoir, reducing the amount of visitors. Previous droughts have not had a significant effect on the community, as they have not had to use mandatory water restrictions in the past. Republican City drilled a new well in 2010, and their water supply is sufficient for municipal needs.

High Winds

In June 2014, there was a high wind event that caused significant damage across Republican City. The local planning team reported there were winds in excess of 100 mph, structural damages across the community, the roof was blown off of the schoolhouse, power was outage, and tree limbs were blown off. Warning sirens were installed in 2011 using FEMA grant funding.

Severe Thunderstorms

Severe thunderstorms are part of the regular climate in Republican City as well as the rest of the planning area. NCDC reports that there have been four severe thunderstorms that have caused $231,000 in damages since 1996. Severe thunderstorms also typically lead to other hazards such as hail, high winds, and power outages. In the event of a severe thunderstorm, critical municipal records have electronic backup systems. Harlan County uses Code Red warning system.

Severe Winter Storms

Severe winter storms are a part of the regular climate in Republican City as well the planning area. Winter storms are recorded as zonal events by NCDC, thus there are no recorded occurrences in local areas. However, severe winter storms occur multiple times a year in Republican City. These storms frequently cause power outages. One ice storm in 2006 knocked out power for nearly three days. The village has

limited resources in terms of personnel and equipment to adequately respond to severe winter weather. Republican City does have a portable generator that can be used at the water wells or Fire Hall.

Tornados
Although there are no historical occurrences, tornados have the potential to cause catastrophic damages and loss of life. Republican City has a large number of trailer homes that are more vulnerable to tornadic and high wind events. The community does not have a safe room; however, the church is able to house a number of people in the event of a tornado. If a tornado was heading toward Republican City, the village would be warned by warning sirens that were installed in 2011, and Code Red from Harlan County Emergency Management.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance
The Village of Republican City is governed by a five member board of trustees with a chairman. In addition to the board of trustees the village has two other employees a village clerk/treasurer and a utility supervisor.

Table REP 9: Republican City Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes

Survey Components/Subcomponents		Comments
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	Yes
	Building Codes	No
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	Yes
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	Yes
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	No
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table REP **9**9 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Republican City has an annex to the Harlan County Local Emergency Operations Plan, which was last updated in 2013. This plan discusses a number of hazards that can affect the county. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

Republican City has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from relationships with the county and the LRNRD. Republican City will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Projects

Description	**Participate in the NFIP**
Analysis	Participate in the National Flood Insurance Program
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Funding	Village funds
Priority	High
Lead Agency	Floodplain Administrator.
Action since 2010	Completed. Village joined NFIP in 2009.

Description	**Alert/Warning Sirens**
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or upgraded. Install new sirens and remote activation where lacking.
Goal/Objective	Goal 4/ Objective 4.3
Hazard(s) Addressed	All
Estimated Cost	$15,000+
Funding	Village funds
Priority	High
Lead Agency	County Emergency Manger, Village Board
Action since 2010	Completed. Village installed warning sirens in 2012.

Description	**Warning Systems**
Analysis	Improve city cable TV interrupt warning system and implement telephone interrupts system such as Reverse 911.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All
Estimated Cost	$5,000+

Description	Warning Systems
Funding	Village funds, County funds
Priority	High
Lead Agency	County Emergency Manger, Village Board
Action since 2010	Completed. County Emergency Management uses Code Red system.

New/Ongoing Mitigation Projects

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/ Objective 2.1
Hazard(s) Addressed	Tornados, Severe Thunderstorms, High Winds
Estimated Cost	$5,000+
Potential Funding	Village funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Clerk
Action since 2010	Not yet started

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Tornados, Severe Thunderstorms, High Winds, Severe Winter Storms
Estimated Cost	$500
Potential Funding	Village funds
Timeline	1 Year
Priority	Low
Lead Agency	Clerk
Action since 2010	Not yet started

Description	Public Awareness/Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. Also, educate citizens on water conservation methods, evacuation plans, etc. In addition, purchasing equipment such as overhead projectors and laptops.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All
Estimated Cost	$500+
Potential Funding	Village funds
Timeline	Ongoing
Priority	Medium
Lead Agency	Clerk
Action since 2010	Not yet started

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All
Estimated Cost	$50 per radio
Potential Funding	Village funds
Timeline	1 Year
Priority	Medium

Description	**Weather Radios**
Lead Agency	Clerk, County Emergency Manager
Action since 2010	Not yet started

Description	**Civil Service Improvements**
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's, water tanks/trucks, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles and identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	All hazards
Estimated Cost	Varies by equipment needed
Potential Funding	HMGP, PDM, Village Funds
Timeline	1 Year
Priority	High
Lead Agency	Village Board, Fire Department
Action since 2010 plan	This is a new action. Identified need for new grader due to vandalism of old one.

Description	**Develop a Drought Management Plan**
Analysis	Work with relevant stakeholders to develop a drought management plan. The drought management plan would identify water monitoring protocols, outline drought responses, identify opportunities to reduce water consumption, and establish the jurisdictional management procedures.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Drought
Estimated Cost	$5,000+
Potential Funding	Village Funds
Timeline	2-5 Years
Priority	Low
Lead Agency	Village Board
Action since 2010 plan	This is a new action. Not yet started.

Action	**Hazardous Tree Removal**
Description	Identify and remove hazardous limbs and/or trees.
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Severe Thunderstorms, Hail, High Winds, Tornados, Severe Winter Storms
Estimated Cost	$50+ per tree
Potential Funding	Village funds
Timeline	1 Year
Priority	High
Lead Agency	Village Board
Action since 2010	Identifying and removing hazardous limbs and/or trees is a regular part of the Village's maintenance program.

Action	**Power, Service, Electrical, and Water Distribution Lines**
Description	Work with local Public Power Districts or electric department to identify vulnerable transmission and distribution lines and plan to bury lines underground or retrofit existing structures to be less vulnerable to storm events. Electrical utilities should be required to use underground construction methods where possible for future installation of power lines.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados, Severe Thunderstorms, High Winds, Severe Winter Storms
Estimated Cost	$2,000,000 per mile
Potential Funding	HMGP, PDM, Village funds
Timeline	5+ Years
Priority	Low
Lead Agency	Village Board
Action since 2010	Not yet started

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Village funds
Timeline	Ongoing
Priority	Medium
Lead Agency	Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Removed Mitigation Projects

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to ensure redundant power supplies, municipal wells, lift stations, and other critical facilities.
Hazard(s) Addressed	All hazards
Reason for removal	Village has backup generator. No other site has been identified as needing a generator.

Description	Stabilize/Anchor Fertilizer, Fuel, and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement. If left unanchored tanks could present major threat to property and safety in a tornado, high wind, or flooding event.
Hazard(s) Addressed	Tornado, High Winds, Flooding
Reason for removal	No fuel tanks were identified as needing anchoring. Local planning team determined there is no need for this mitigation action.

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Hazard(s) Addressed	Flooding
Reason for removal	Local planning team determined there was no need for stormwater system or drainage improvements.

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for removal	No bank degradation has been identified in the area.

Description	Drainage Study/Storm Water Master Plan
Analysis	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.
Hazard(s) Addressed	Flooding
Reason for removal	Community does not have problems with drainage or storm water.

Description	Flood Prone Property Acquisition
Analysis	Voluntary acquisition and demolition of properties prone to flooding will reduce the general threat of flooding for communities. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.
Hazard(s) Addressed	Flooding

Description	Flood Prone Property Acquisition
Reason for removal	No flood prone properties within community.

Description	Groundwater/Irrigation/Water Conservation Management Plan and Practices
Analysis	Develop and implement a plan/ best management practices to conserve water use and reduce total use (high water use to low water use) and consumption of groundwater resources by citizens and irrigators of agricultural land during elongated periods of drought.
Hazard(s) Addressed	Flooding
Reason for removal	Determined to be no longer needed by the local planning team

Village of Stamford

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Stamford participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Stamford attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Stamford, the top concerns that were identified through this planning process include grass/wildfire, high winds, severe thunderstorms, severe winter storms, and tornados. The following local representatives were involved in the development of Stamford Participant Section:

Table SFD 1: Village of Stamford Plan Contributors

Name	Title	Department / Organization
Donn Williamson	Board Chairperson	Village of Stamford
Tresadi Preitnauer	Village Clerk	Village of Stamford
Chris Becker	Harlan County Sheriff	Harlan County

This section contains important information about the Village of Stamford relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

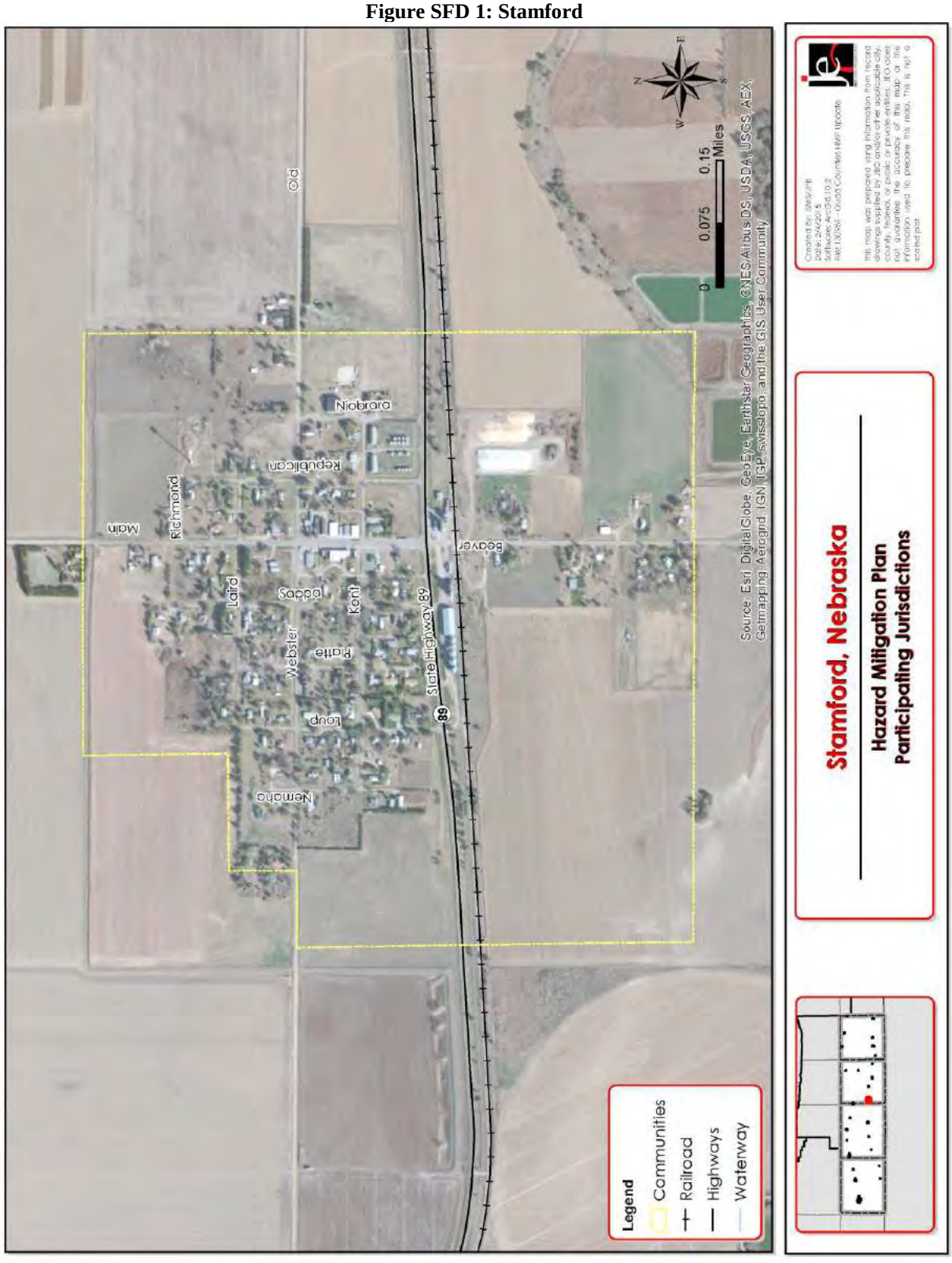
Location/Geography

Stamford is a village located in the western portion of Harlan County. The village of Stamford covers an area of 320 acres and has an elevation of 2,047 feet above sea level. Stamford is approximately 47 miles southwest of Kearney. The topographic region Stamford lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind.

Transportation

Figure SFD 1 shows major transportation routes through the village. There is one major highway through the village NE HWY 89. According to the Nebraska Department of Roads the average daily traffic count for NE HWY 89 is 490 vehicles with 55 of those being heavy trucks passing to the east of the village and 435 vehicles with 60 of those being heavy trucks passing to the west of the village. There is one railroad that runs through center of the village from east to west.

Figure SFD 1: Stamford



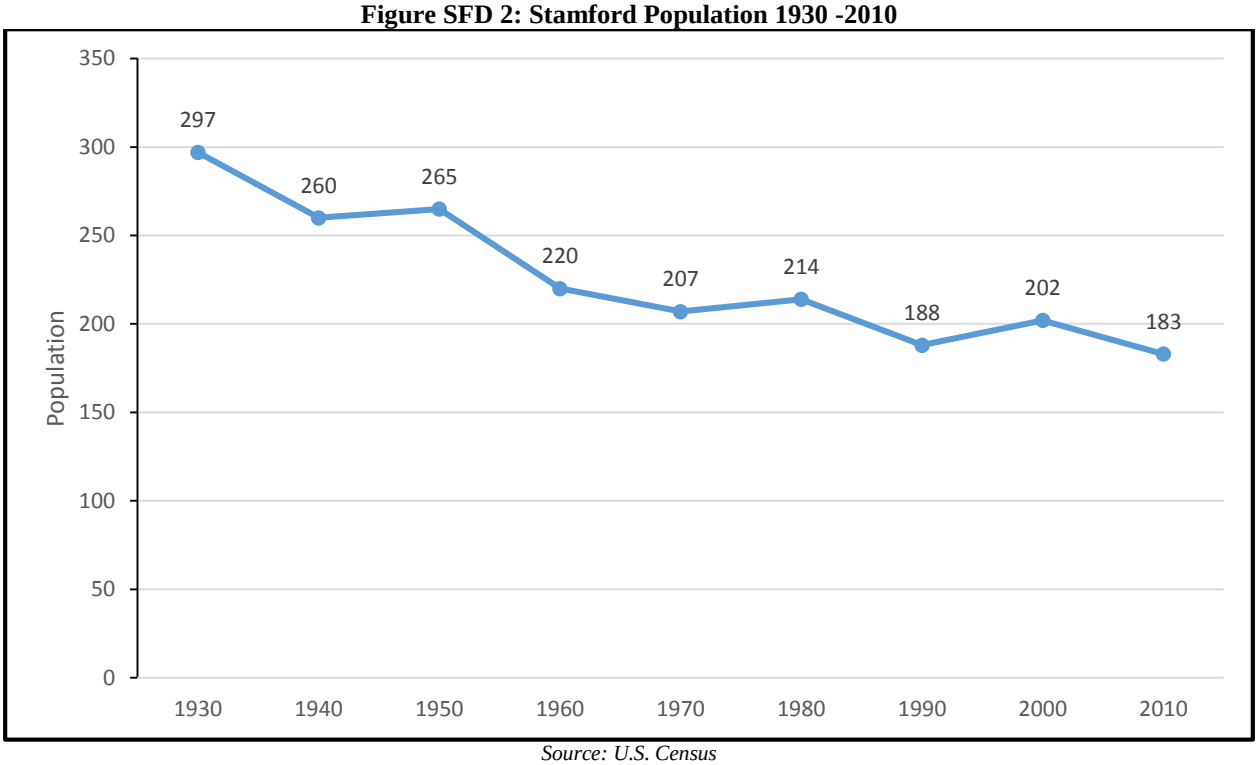
Climate

All the climate data for the county has been taken from a station located at the Harlan County Lake (253595). Please refer to the *Harlan County Section* for a climate summary for the village.

Demographics

Figure SFD 2 displays the population for Stamford from 1930 to 2010. The population of Stamford has been declining since 1930. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure SFD 2: Stamford Population 1930 -2010



Source: U.S. Census

Table SFD 22 illustrates the age distribution and median age for Harland County compared to the Village of Stamford. The village has a higher percentage of population over the age of 64 than that of the county by about three percent. The median age for the village is younger than that of the county by about four percent.

Table SFD 2: Stamford Age Distribution

Age	Harlan County	Stamford
<5	5.3%	4.9%
5-64	71.2%	68.3%
>64	23.5%	26.8%
Median	49.2	45.5

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Stamford in Table SFD 33. The median home value for the village is $30,700 less than that of the county, and rent values are almost $100 less than the county. The population has decreased in the last decade as noted in the demographic section, the lower cost of living compared with

the rest of the county may be due to the aging housing stock. If these structures are not cared for as they age, they may continue to increase the vulnerabilities to hazards.

Table SFD 3: Stamford Housing Value and Income

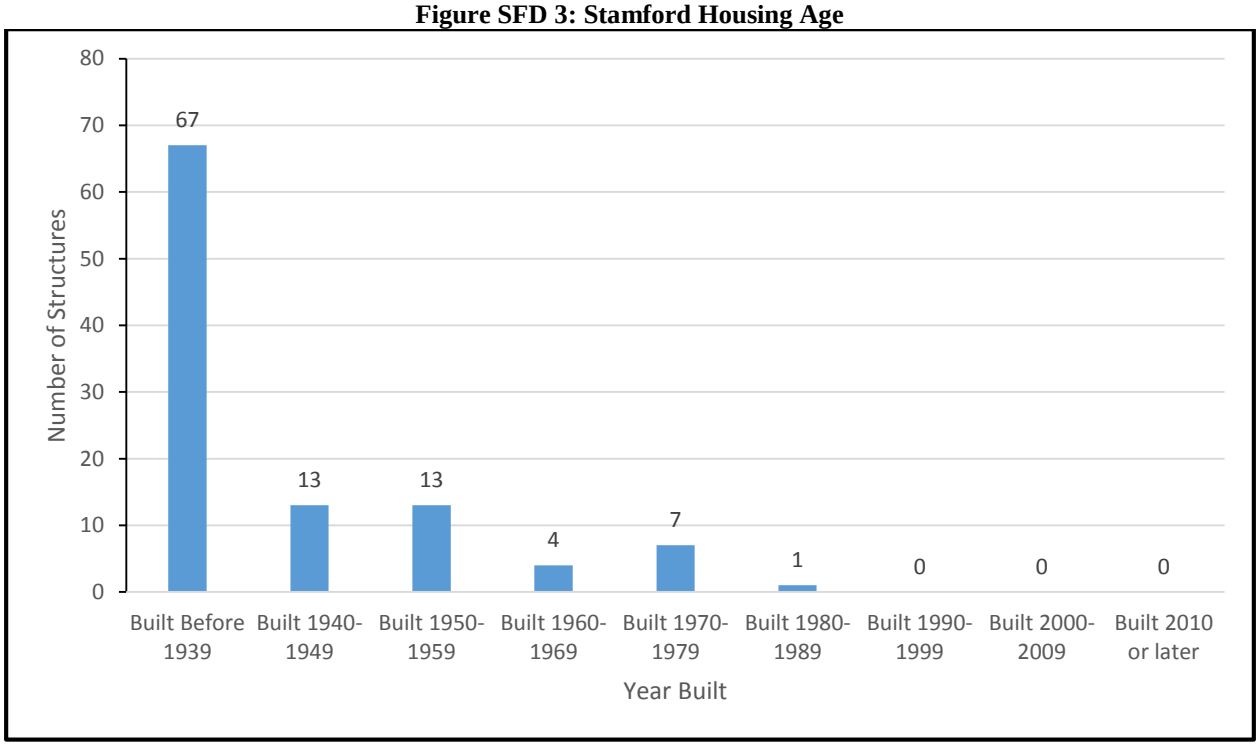
	Harlan County	Stamford
Median Household Income[1]	$54,862	$36,406
Per Capita Income[1]	$25,322	$19,419
Median Home Value[2]	$75,100	$44,400
Median Rent[2]	$546	$444

1Selected Economic Characteristics and: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics and: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Figure SFD **3**) the village has 105 housing units with 83 percent of those units occupied (

Table **SFD 4**4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. There is one mobile home in the village, and 89 percent of the village's housing stock was built before 1960. Residents living within the aging structures will be especially vulnerable to high winds, severe thunderstorms, and tornados.

Figure SFD 3: Stamford Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table SFD 4: Stamford Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Harlan County	1,573	64.8%	853	35.2%		1,226	77.9%	347	22.1%
Stamford	87	82.9%	18	17.1%		80	92%	7	8%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Stamford are manufacturing (29.2%), educational services and health care (36.4%), and agricultural and forestry (13.8%).

The Village is a major employer within the community. A large percentage of residents also commute to Furnas and Philips Counties for work.

Structural Inventory

The planning team requested GIS parcel data from the Assessor for each county. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. Results from the structural inventory completed for the Village of Stamford in Table SFD 5.

Table SFD 5: Stamford Structural Inventory and Valuation

Jurisdiction	Number of Parcels with Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Value of Improvements in Floodplain
Stamford	127	$3,216,915	$25,330	$0

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/ Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Stamford planning team as a part of the plan update. Table SFD **6**6 and Figure SFD 4 is a summary of the type and location of critical facilities for the jurisdiction.

Table SFD 6: Critical Facilities List

Critical Facility Number	Critical Facility
1	Fire House
2	Post Office
3	Water Tower
4	Church
5	Community Building
6	Sub Station
7	Church

Figure SFD 4: Stamford Critical Facilities Map

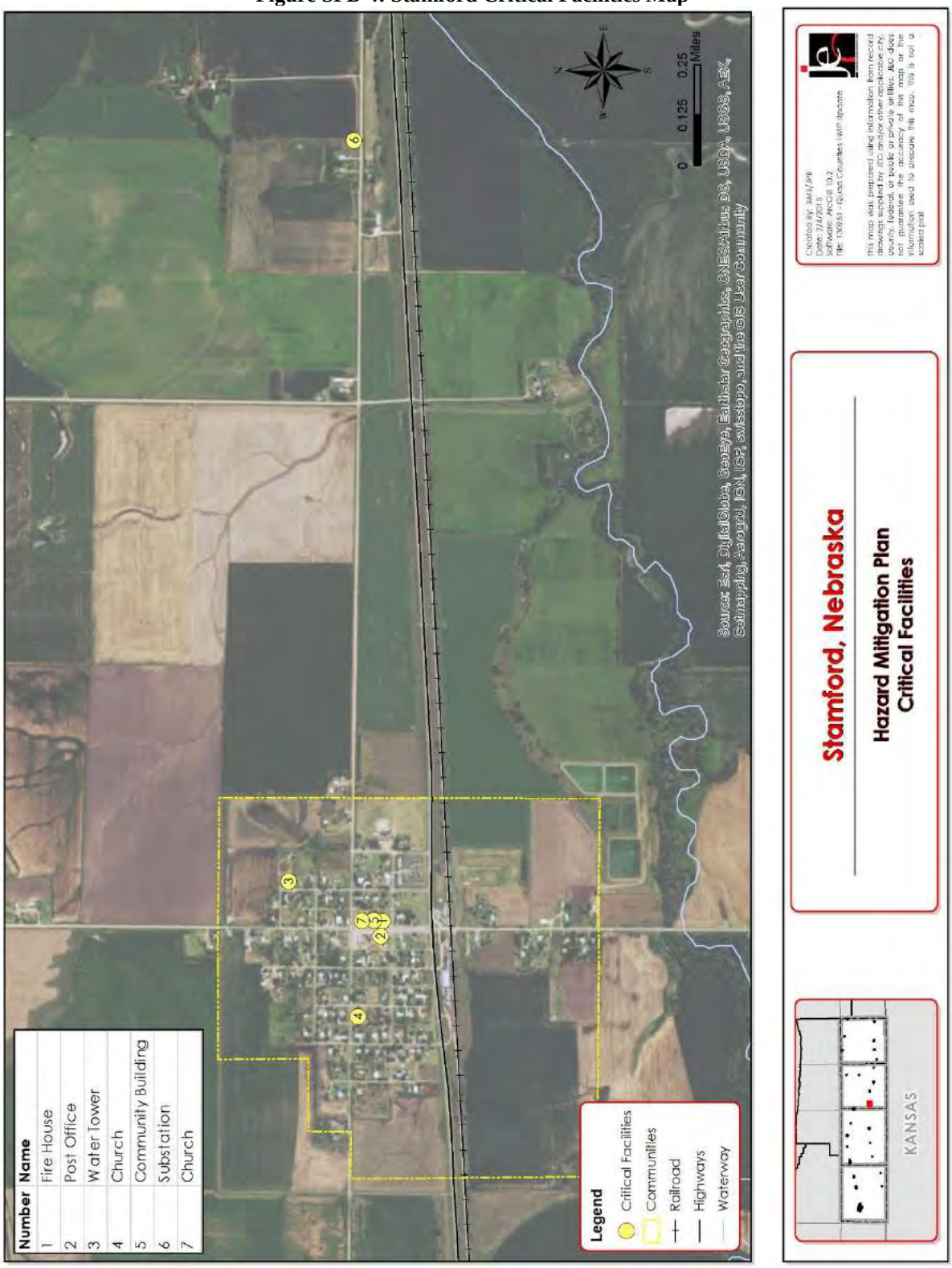
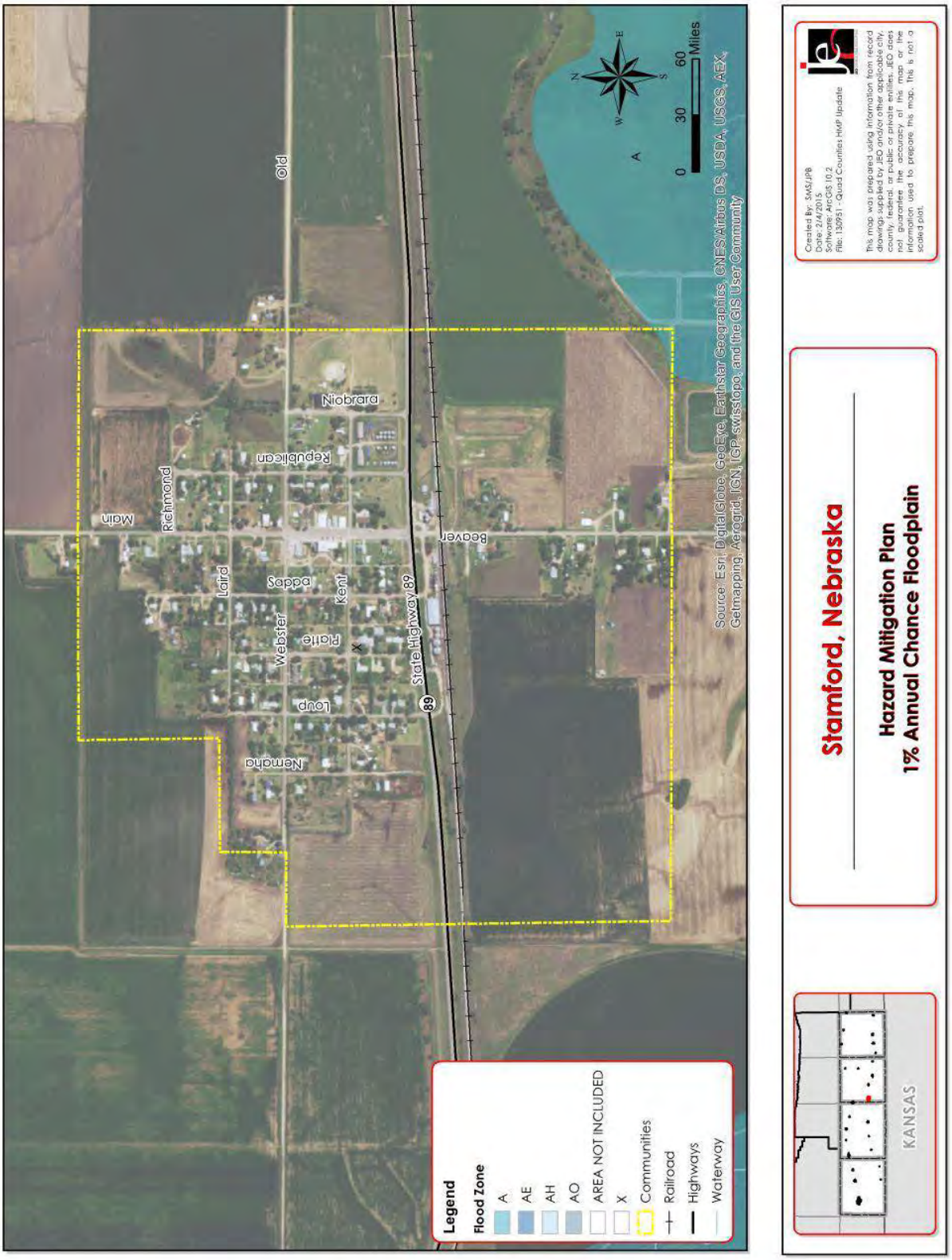


Figure SFD 5 shows the 1% annual floodplain for the Village of Stamford. The village has no structures or critical facilities in the floodplain. There are no repetitive loss properties in the village. The initial FIRM for Stamford of was developed in February of 2009. Stamford does participate in the NFIP, but there were no policies in effect as of February 28, 2015.

Figure SFD 5: Stamford 1% Annual Chance Floodplain



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are no chemical storage sites in the Village of Stamford.

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sites located in Stamford.

Future Development Trends

In the past five years, a few buildings have been demolished. According to the census data, Stamford's population is declining. The local planning team indicated that the lack of employment opportunities is a contributing factor to the declining population. No new housing or commercial developments are planning in the next five years. Any development that does occur should avoid site specific hazardous areas, such as the floodplain.

Risk Assessment

Hazard Identification

Table SFD 7 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table SFD 7: Stamford Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Sites)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfire*	Yes	Property damages and potential injuries
Hail	Yes	None
High Winds*	Yes	Property damages and power outages
Levee Failure	No	None
Severe Thunderstorm*	Yes	Property damages and power outages
Severe Winter Storm*	Yes	Property damages and power outages
Terrorism	No	None
Tornados*	Yes	Significant property damages, potential loss of life, and lack of shelter for residents

** Identified as a top concern by the local planning team*

The top five hazards of concern Stamford are grass/wildfires, high winds, severe thunderstorms, severe winter storms, and tornados. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 19 severe weather events from 1996 to 2014 in the Village of Stamford. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table SFD **8**8 provides summary of the events that caused damage in the village.

Table SFD 8: Stamford Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
8/2/1996	Thunderstorm Wind	65 kts./ 75 mph	0	0	$10,000
6/17/1998	Hail	1.75 in.	0	0	$5,000
6/29/2000	Thunderstorm Wind	61 kts./ 70 mph	0	0	$250,000
6/13/2001	Hail	1.75 in.	0	0	$10,000
5/22/2004	Tornado	F0	0	0	$150,000
7/1/2005	Hail	1.75 in.	0	0	$250,000
5/22/2008	Hail	1 in.	0	0	$2,000
5/23/2008	Flash Flood	4 in.	0	0	$50,000

Source: NCDC

Grass/Wildfires

According to the Nebraska Forest Service, there have been 40 wildfires near Stamford from 2000 to 2014 that have burned a total of approximately 242 acres. The local water supply is sufficient for firefighting. In the event of a disaster, Stamford has mutual aid agreements with Orleans, Beaver City, and Oxford.

High Winds

According to the local planning team, there have been a number of storms in recent years that have produced high winds within Stamford. Although critical facilities have not been damaged by past high wind events, these events have the ability to damage trees and knock down power lines. Stamford has data backup systems for municipal records.

Severe Thunderstorms

Severe thunderstorms occur several times annually within Stamford and the rest of the planning area. The NCDC reports there have been two severe thunderstorm events in Stamford from 1996 to 2014 that have caused $260,000 in property damages.

Severe Winter Storms

Severe winter storms occur regularly in Stamford and the rest of the planning area. Although there have not been structural damages to critical facilities due to severe winter weather in the past, winter weather has the potential to cause significant potential damages. Streets are cleared by municipal staff but snow removal resources are sufficient for local events.

Tornados

According to the NCDC, there has been one tornado in Stamford from 1996 to 2014 that caused $150,000 in property damages. This tornado set down briefly near Stamford, damaged a mobile home and upset several irrigation systems. Stamford has data backup systems for municipal records. The village does not have a safe room for residents. If a tornadic event were to occur, residents could reach out to neighbors or go to the church for shelter.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

The Village of Stamford is governed by a village board led by a chairman. In addition to the board the village has three other employees the village clerk, the village treasurer, and the water commissioner.

Table SFD 9: Stamford Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	No
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	No
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	No
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County

Survey Components/Subcomponents		Comments
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table SFD **9**9 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

Stamford has an annex to the Harlan County Local Emergency Operations Plan, which was last updated in 2013. This plan discusses a number of hazards that can affect the county. The plan also provides a clear assignment of responsibility during an emergency. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

Stamford has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from relationships with the county and the LRNDRD. Stamford will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Projects

Description	Participate in the NFIP
Analysis	Participate in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Funding	Village Budget
Timeline	Completed/ Ongoing to maintain status in NFIP
Lead Agency	Clerk, Floodplain Administrator
Action Since 2010	Have participated since March 2013.

New/Ongoing Mitigation Projects

Description	Backup Generators
Analysis	Provide a source of back-up power to ensure redundant power supplies.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$30,000+
Potential Funding	Village Budget
Priority	Low
Timeline	2-5 Years
Lead Agency	County Emergency Manager, Clerk
Action since 2010 plan	In the process of identifying locations in most need of generator.

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$200,000+
Potential Funding	HMGP, PDM, CDBG, Village Budget
Timeline	2-5 years
Priority	High
Lead Agency	Maintenance Supervisor
Action since 2010 plan	Not yet started.

Description	Stream Bank Stabilization/Grade Control Structure/Channel Improvement
Analysis	Stream bed/grade stabilization improvements can serve to more effectively protect structures, increase conveyance, prevent down cutting, and provide flooding benefits.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding

Description	Stream Bank Stabilization/Grade Control Structure/Channel Improvement
Estimated Cost	$10,000-$100,000
Potential Funding	HMGP, PDM, CDBG
Timeline	5 + years
Priority	Medium
Lead Agency	Maintenance Supervisor
Action since 2010 plan	Not yet started

Description	Drainage Study/Stormwater Master Plan
Analysis	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Flooding
Estimated Cost	10,000 to 100,000+
Potential Funding	HMGP, PDM, CDBG, Village Budget
Timeline	2-5 years
Priority	High
Lead Agency	Village Board, Maintenance Supervisor
Action since 2010 plan	Not yet started

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities. Acquire weather radios in needed areas.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	Village Budget, HMGP, PDM
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Clerk, County Emergency Manager
Action since 2010 plan	In process of identifying facilities in need of weather radios.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1, Goal1/Objective 1.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	Village Budget
Timeline	2 – 5 years
Priority	Medium
Lead Agency	County Emergency Manager, Village Board
Action since 2010 plan	Gathering information to develop educational materials

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Village Budget
Timeline	Ongoing
Priority	Medium
Lead Agency	Floodplain Administrator

Description	Maintain Good Standing in the NFIP
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Removed Mitigation Projects

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Reason for removal	Planning team identified that community has sufficient shelter at this time. No local interest.

Description	Stabilize/Anchor Fertilizer, Fuel, and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement. If left unanchored, tanks could present a major threat to property and safety in a tornado or high wind event.
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Reason for removal	Lack of fuel tanks within the village.

Description	Flood Prone Property Acquisition
Analysis	Voluntary acquisition and demolition of properties prone to flooding will reduce the general threat of flooding for communities. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.
Hazard(s) Addressed	Flooding
Reason for Removal	No local interest at this time, and lack of flood prone properties.

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Hazard(s) Addressed	Severe winter storms, severe thunderstorms, tornados, high winds
Reason for removal	No local interest at this time.

Red Willow County

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

Red Willow County participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Red Willow County's participation was extensive; a representative from Red Willow County attended every public meeting, met individually with members from the planning team, completed all hazard identification and project identification worksheets, engaged the general public in the planning process, and assisted in interdepartmental coordination and data analysis.

For Red Willow County, the top concerns that were identified through this planning process include animal disease, chemical spills during transportation, extreme heat, hail, high winds, severe winter storms, and tornados.

The following local representatives were involved in the development of Red Willow County's Participant Section:

Table RWC 1: Red Willow County Plan Contributors

Name	Title	Department / Organization
Alan Kotschwar	Red Willow County Sheriff	Red Willow County
Diana Wilkinson	Red Willow Deputy Emergency Manager	Red Willow County

This section contains important information about Red Willow County relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
    - Business Profile
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

County Profile

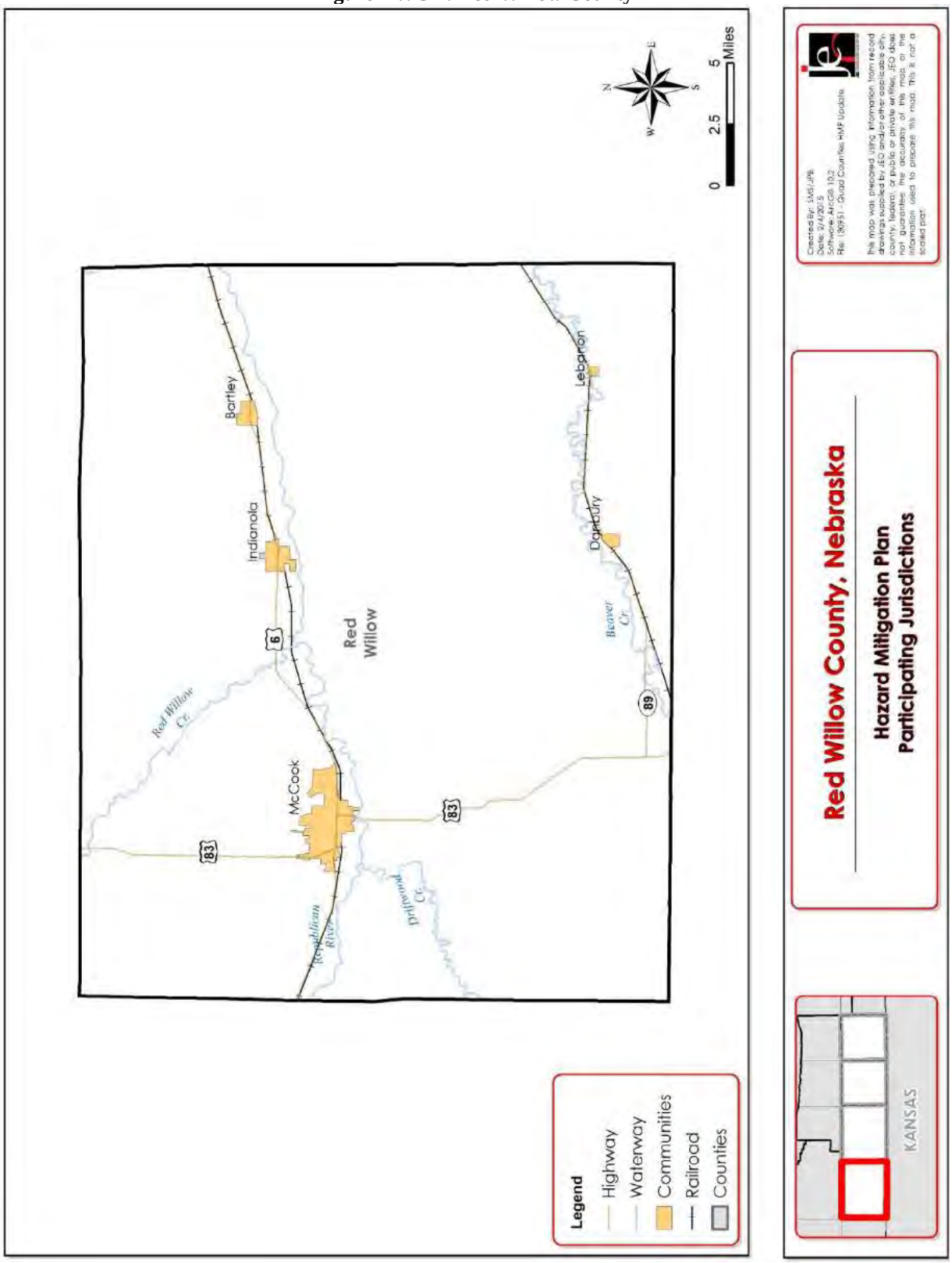
Location/Geography

Red Willow County is one of the 93 counties in the state of Nebraska. It is located in the southwest region of the state. Red Willow County is adjacent to Furnas, Frontier, and Hitchcock counties in Nebraska, and Rawlins and Decatur counties in Kansas. Red Willow County is approximately 2,461 feet above sea level and covers an area of 718 square miles. Red Willow County is in the topographic region of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests which are remnants of the old plain eroded by water and wind. The Republican River flows through the county from west to east.

Transportation

Figure RWC 1 shows the major transportation routes through the county. There are three main highways in the county US Highway 6, US Highway 83, and NE Highway 89. According the Nebraska Department of Roads the average daily traffic count for US Highway 6 is 3,050 vehicles with 390 of those being heavy trucks on the eastern border of the county and 4,525 vehicles with 400 of those being heavy trucks on the western border of the county. The traffic count for US Highway 83 is 1,895 vehicles with 275 of those being heavy trucks on the northern border of the county and 1,440 vehicles with 175 of those being heavy trucks on the southern border of the county. The traffic count for NE Highway 89 is 280 vehicles with 35 of those being heavy trucks on the eastern border of the county and 475 vehicles with 55 of those being heavy trucks at the junction with US Highway 83. There are two railroad lines that go through the county. One passes through the southeast corner and the other passes through about the center of the county.

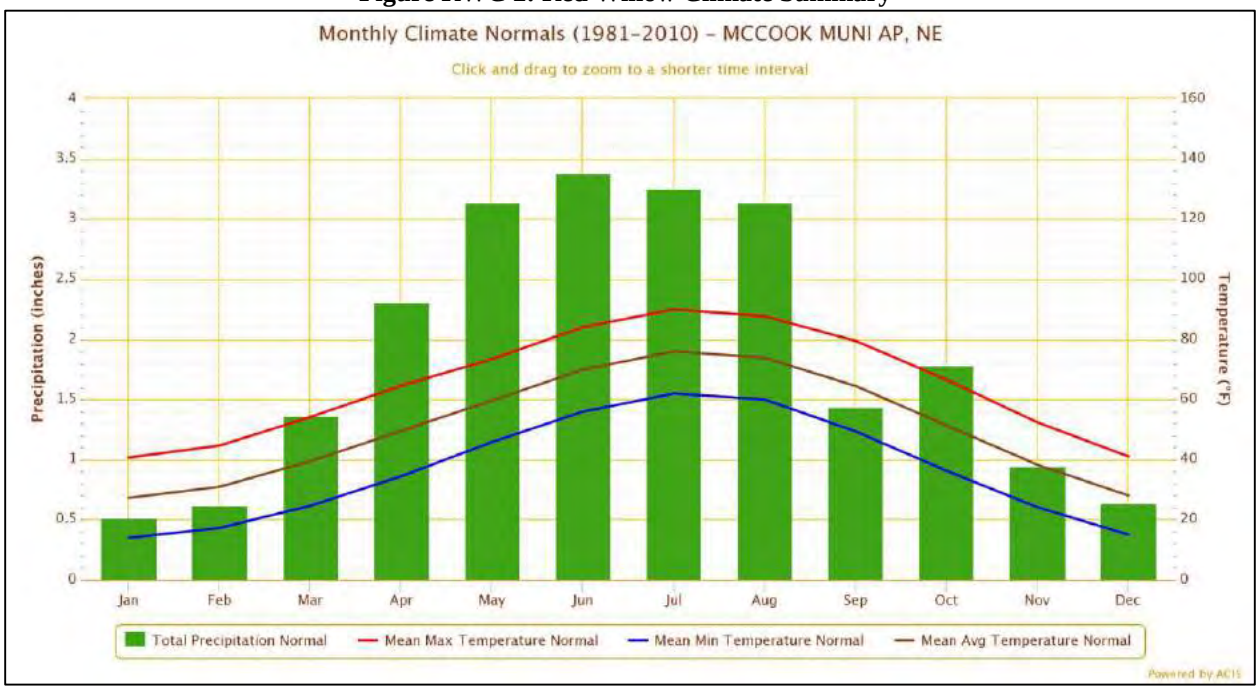
Figure RWC 1: Red Willow County



Climate

Weather data for Red Willow County is taken from a station at the McCook Airport (255310), a representative location for the county. The normal high for the month July is 89.6ºF, and the normal low for the month of January is 14.4ºF. The record high of 114ºF for the county was set in June 1932, the record low of 30 ºF below zero for the county was set in January 1912. On average the county receives 21.69 inches of rain and 30 inches of snow. Figure RWC 2 provides a summary of the climate normal for Red Willow County.

Figure RWC 2: Red Willow Climate Summary

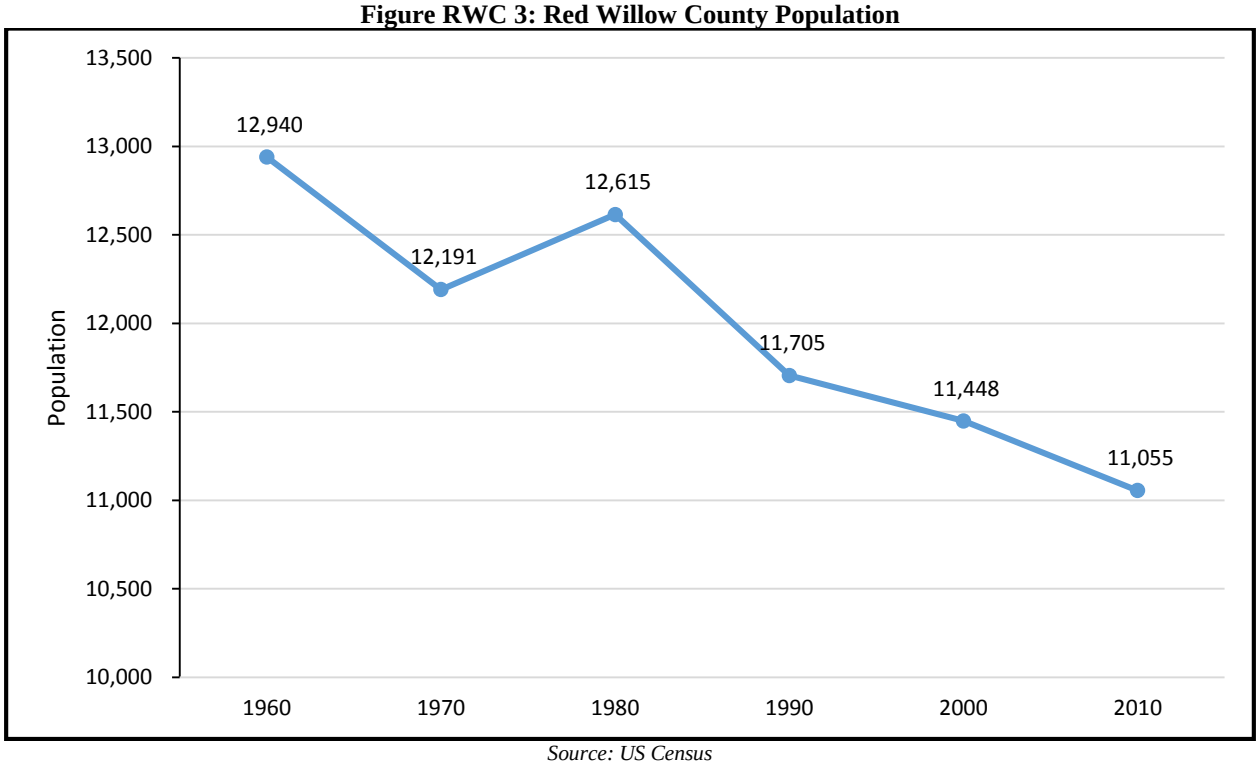


Source: Northeast Regional Climate Center

Demographics

Figure RWC *3* shows the population for Red Willow County from 1960 to 2010. The population has been declining since 1980. This is notable for hazard mitigation because communities with declining population may have a higher level of unoccupied housing that is not being maintained. Furthermore, areas with declining population will be less prone to pursuing residential/commercial development in their areas, which may reduce the number of structures vulnerable to hazards in the future. Decreasing populations can also represent decreasing tax revenue for the county which could make implementation of mitigation actions more fiscally challenging.

Figure RWC 3: Red Willow County Population



Source: US Census

Table RWC 2 shows the population for the county compared to each community in the county from 2000 to 2010. The county saw population decrease by about three percent since 2000. The villages of Bartley and Danbury both lost over 20 percent of their populations between 2000 and 2010. As communities experience population decline, they become more vulnerable to the impacts from hazards. Declining populations often result in higher rates of empty or vacant properties, declining or poorly maintained infrastructure, and reduced response and recovery capabilities. The village of Lebanon saw an increase of 14 percent in its population since 2000. Communities that are growing may also become more vulnerable to hazards. If a community grows quickly, it may lack resources to provide services for all members of the community in a reasonable timeframe, which may include issues such as snow removal, emergency storm shelters, repairs to damaged infrastructure, or even tracking the location of vulnerable populations.

Table RWC 2: Red Willow County Population Trends

Jurisdiction	2000 Population	2010 Population	% Change	2020 Projected Population
Red Willow County (Total)	11,448	11,055	-3.4%	10,679
Red Willow County (Unincorporated)	2,260	2,309	2.2%	2,360
Bartley	355	283	-20.2%	226
Danbury	127	101	-20.5%	80
Indianola	642	584	-9%	531
Lebanon	70	80	14.3%	91
McCook	7,994	7,698	-3.7%	7,413

Source: US Census Bureau – 2000, 2010

Table RWC 3 illustrates the age distribution and median age for Red Willow County in comparison to the villages of Bartley, Danbury, and Lebanon and the cities of Indianola and McCook. Three communities have a higher percentage of population over the age of 64 than that of the county. Two communities and

the state have a lower percentage of population over the age of 64. Two communities shave a higher median age than that of the county. One community has the same median age as the county, and two communities and the state have a lower median age than the county.

Table RWC 3: Red Willow County Age Distribution

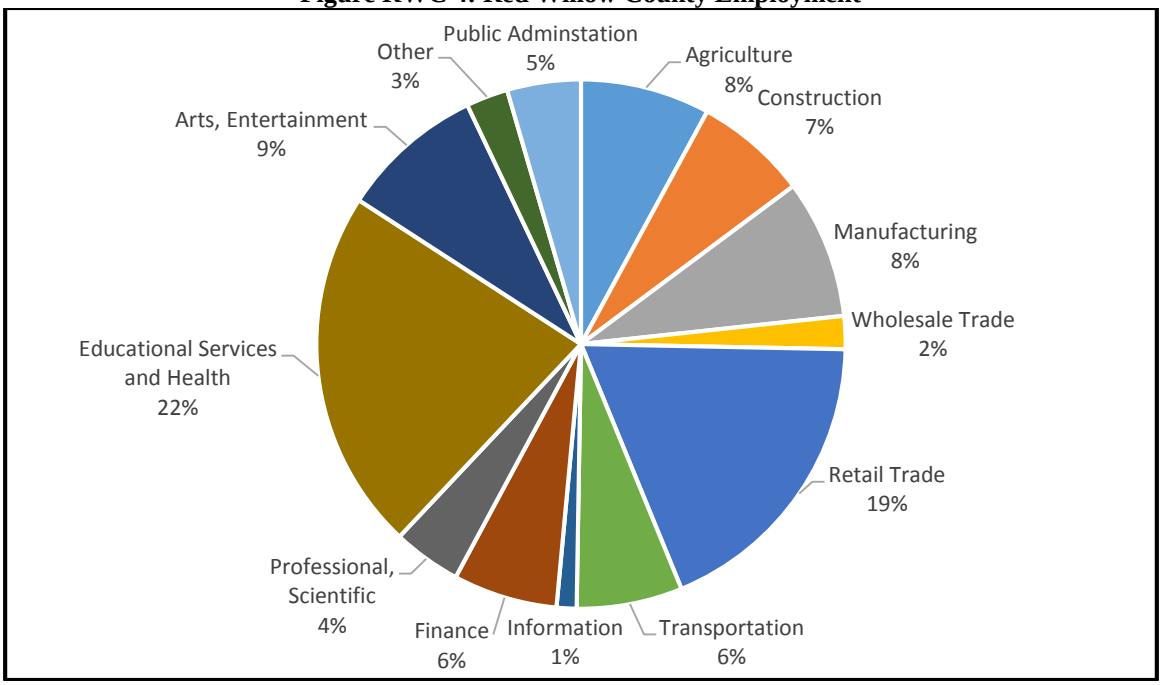
Age	Nebraska	Red Willow County	Bartley	Danbury	Indianola	Lebanon	McCook
<5	7.2%	6.1%	5.3%	5%	4.5%	3.8%	6.8%
5-64	79.2$	75.2%	69%	71.2%	79.6%	85.2%	73.8%
>64	13.6%	18.7%	25.5%	23.8%	15.9%	11.4%	19.7%
Median	36.2	41.8	47.4	41.8	42.8	36.5	40.7

Source: U.S. Census Bureau, 2010

Employment

Figure RWC ***4*** shows the employment by industry for Red Willow County. Red Willow County had 425 businesses with 3,911 paid employees according to the 2012 U.S. Economic Census.

Figure RWC 4: Red Willow County Employment



Source: Selected Economic Characteristics 2009 – 2013 ACS 5-year estimate

The largest industry with employment in Red Willow County is educational services and health employing approximately 22 percent of the population. Retail trade is the sector with the second highest employment with about 19 percent of the population.

Agriculture

Although the agricultural and forestry industry accounts for eight percent of employment in the county, ranking it fourth of all industries, it is an integral part of the economy and local communities. For example, other industries such as transportation are related to the agricultural industry as some of their transports include crops, feed, and animals for farmers. Red Willow County's farms 405 (Table RWC 4) covers 419,608 acres of land, which accounts for 91 percent of the surface land in the county. Crops and livestock are the visible parts of the agricultural economy, but many related businesses contribute as well by

producing, processing and marketing farm and food products. These businesses generate income, employment and economic activity throughout the region.

Table RWC 4: Agricultural Inventory

Agricultural Assets	Inventory
Number of Farms	405
Land in Farms	419,608 acres
Estimated market values of land & buildings (per farm)	$1,651,696
Crop Lands	241,601 acres
Cattle Inventory	63,124 head

Source: USDA Census of Agriculture, 2012

Housing and Income

The median household income, per capita income, home value, and rent for the county compared to the state and villages of Bartley, Danbury, and Lebanon and the cities of Indianola and McCook in Table RWC 5. The median household income for the county is $45,345 with a median home value of $84,200. The median household income is over $6,400 less than that of the state and the median home value is over $43,800 less than that of the state. The lower cost of living compared to that of the state may make contribute to any future population growth in the county.

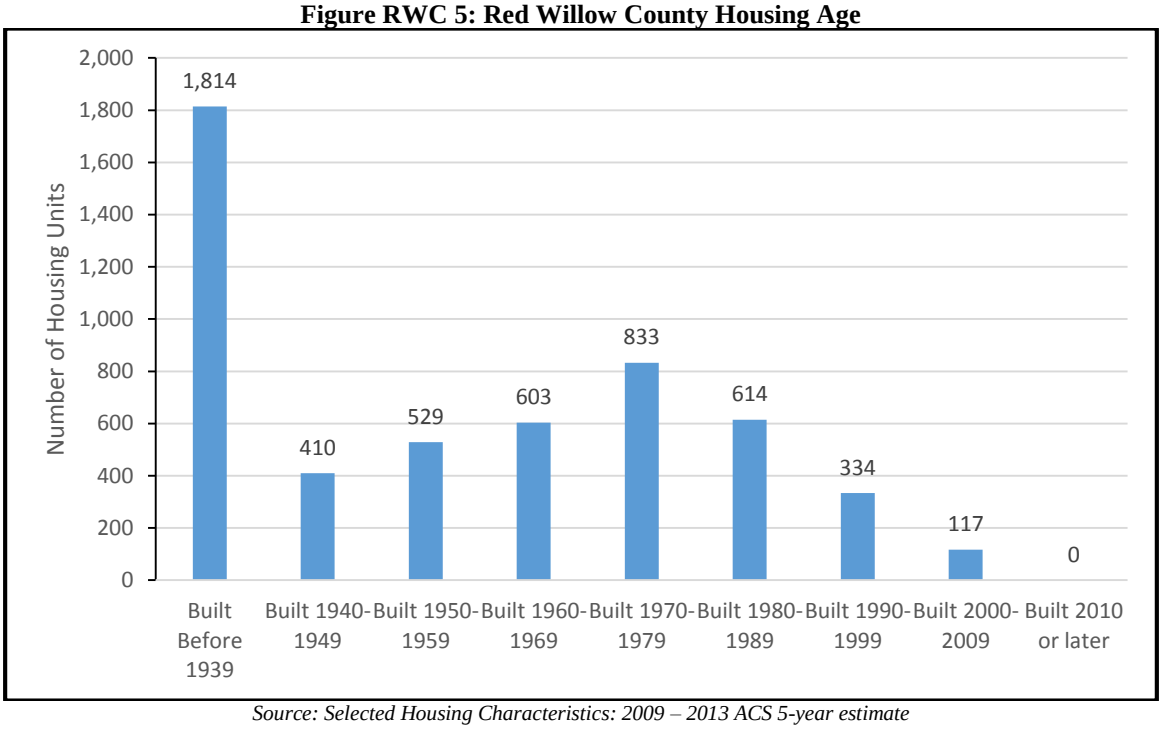
Table RWC 5: Red Willow County Housing Value and Income

	Nebraska	Red Willow County	Bartley	Danbury	Indianola	Lebanon	McCook
Median Household Income[1]	$51,672	$45,345	$37,000	$25,208	$57,578	$26,875	$41,055
Per Capita Income[1]	$26,899	$23,320	$23,468	$16,458	$23,761	$31,683	$22,979
Median Home Value[2]	$128,000	$84,200	$56,400	$16,000	$65,000	$31,600	$83,600
Median Rent[2]	$706	$589	$683	-	$500	-	$595

1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Table RWC) Red Willow County has 5,254 housing units with 90.1 percent of those units occupied. Three communities Bartley, Danbury, and Lebanon have vacancy rates that are over 15 percent. These vacant buildings are more susceptible to damage from high winds, severe thunderstorms, and tornados. Over 52 percent of the county's housing units were built before 1939 (Figure RWC 5). Vacant buildings, mobile homes, and aging housing stock are susceptible to high winds, severe thunderstorms and tornados. Approximately six percent of the county's homes are classified as mobile homes. Residents living near or in these types of structures will be vulnerable to severe weather hazards. A mobile home park is located a mile south of McCook along Highway 83.Over 80 percent of the county's homes were built prior to the first FIRM for the county in 1988. Houses built prior to this year may not be constructed above the base flood elevation.

Figure RWC 5: Red Willow County Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table RWC 6: Red Willow County Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Red Willow County	4,732	90.1%	522	9.9%		3,377	71.4%	1,355	28.6%
Red Willow County (Unincorporated)	878	85.6%	148	14.4%		691	78.7%	187	21.3%
Bartley	124	74.3%	43	25.7%		101	81.5%	23	18.5%
Danbury	47	83.9%	9	16.1%		44	93.6%	3	6.4%
Indianola	309	85.6%	52	14.4%		241	78%	68	22%
Lebanon	29	56.9%	22	43.1%		21	72.4%	8	27.6%
McCook	3,345	93.1%	248	6.9%		2,279	68.1%	1,066	31.9%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in the following table.

Table RWC 7: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
4,964	$395,185,392	$79,610	713	$48,269,644

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Red Willow County planning team as a part of the plan update. Table RWC 8 provides a summary of the type and location of critical facilities for the County.

Table RWC 8: List of Critical Facilities

Critical Facility Number	Critical Facility	Location
1	Red Willow Court House	McCook

There are no critical facilities located within the 1% annual floodplain in Red Willow County.

Levees

There are two levees in the county. One levee is located in the Village of Bartley and the other is located in the City of Indianola. Both levees were built by the USACE, but only the Indianola levee provides 1% annual flood protection.

Dams

There are 34 dams in Red Willow County. Of these, one dam has been identified as a high hazard dam

Table RWC 9: Dams in Red Willow County

	Number of Dams	Minimal	Low	Significant	High
Red Willow County	34	4	28	0	1
Planning Area	175	33	125	3	2

Source: NDNR

Table RWC 10 shows the high hazard dams that could affect jurisdictions within Red Willow County. One of the dams is located in Red Willow County just north of McCook. The other dam is located in Frontier County at the Red Willow State Recreation area.

Table RWC 10: High Hazard Dams that could affect Red Willow County

NIDID	Dam Name	County	Down Stream Jurisdictions
NE01672	Kelly Creek West Dam	Red Willow	McCook
NE01076	Red Willow Dam	Frontier	Indianola

Source: NDNR

Chemical Storage Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of 40 chemical storage sites in Red Willow County, and 15 of these sites house materials categorized as hazardous. Table RWC 11 lists facilities that house hazardous materials only. Vulnerable populations have been identified near chemical fixed sites in McCook. Residents near chemical storage facilities are educated about the threat and appropriate response in the event of a spill.

Table RWC 11: Chemical Storage Sites

Facility	Address	Hazardous Material
Ag Valley Co-op Non Stock	Jct. 5th & C Sts, Indianola	Paraquat Dichloride
Cambridge Telephone Co	410 Commercial St, Bartley	Sulfuric Acid
Century Link	402 W 1st St, McCook	Sulfuric Acid
Crop Production Services	101 Burlington Dr, McCook	Anhydrous Ammonia, Paraquat Dichloride
Frenchman Valley Farmers Co-op	203 Karrer St, McCook	Anhydrous Ammonia
NALCO Company	100 S. Center Ave, Lebanon	Aniline
Parker Hannifin Corporation	400 South St, McCook	Sulfuric Acid
Plain Equipment Group	1207 W B St, McCook	Sulfuric Acid
Red Willow Chemical & Fertilizer	308 Airport Rd, McCook	Terbufos
RAS INC	Not Listed	Paraquat Dichloride
Suess Field Unit	Road 382, McCook	Hydrogen Sulfide
United Suppliers Inc.	402 Airport Rd, McCook	Dimethoate, Paraquat Dichloride, Terbufos, Zinc Phosphide
Valley Aerial Spray Inc.	71296 Road 384, McCook	Dimethoate
Valmont Industries Inc.	75 US Highway 83, McCook	Sulfuric acid
Van Diest Supply CO Warehouse	71703 Highway 83, McCook	Paraquat Dichloride

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there are eight historic sites located in Red Willow County. There is one site in the 1% annual floodplain.

Table RWC 12: National Historic Registry

Site Name	Date Listed	Classification	In Floodplain?
Doyle Archeological Site	12/4/1974	Site	Yes
Norden Bombsight Vault	6/17/1993	Structure	No
H.P. Sutton House	5/22/1978	Building	No
Keystone Hotel	7/5/2001	Building	No
McCook Y.M.C.A.	3/9/2000	Building	No
Red Willow County Courthouse	7/5/1990	Building	No
Senator George W. Norris House	5/28/1967	Building	No
McCook Carnegie Library	9/12/1985	Building	No

Source: Nebraska State Historical Society

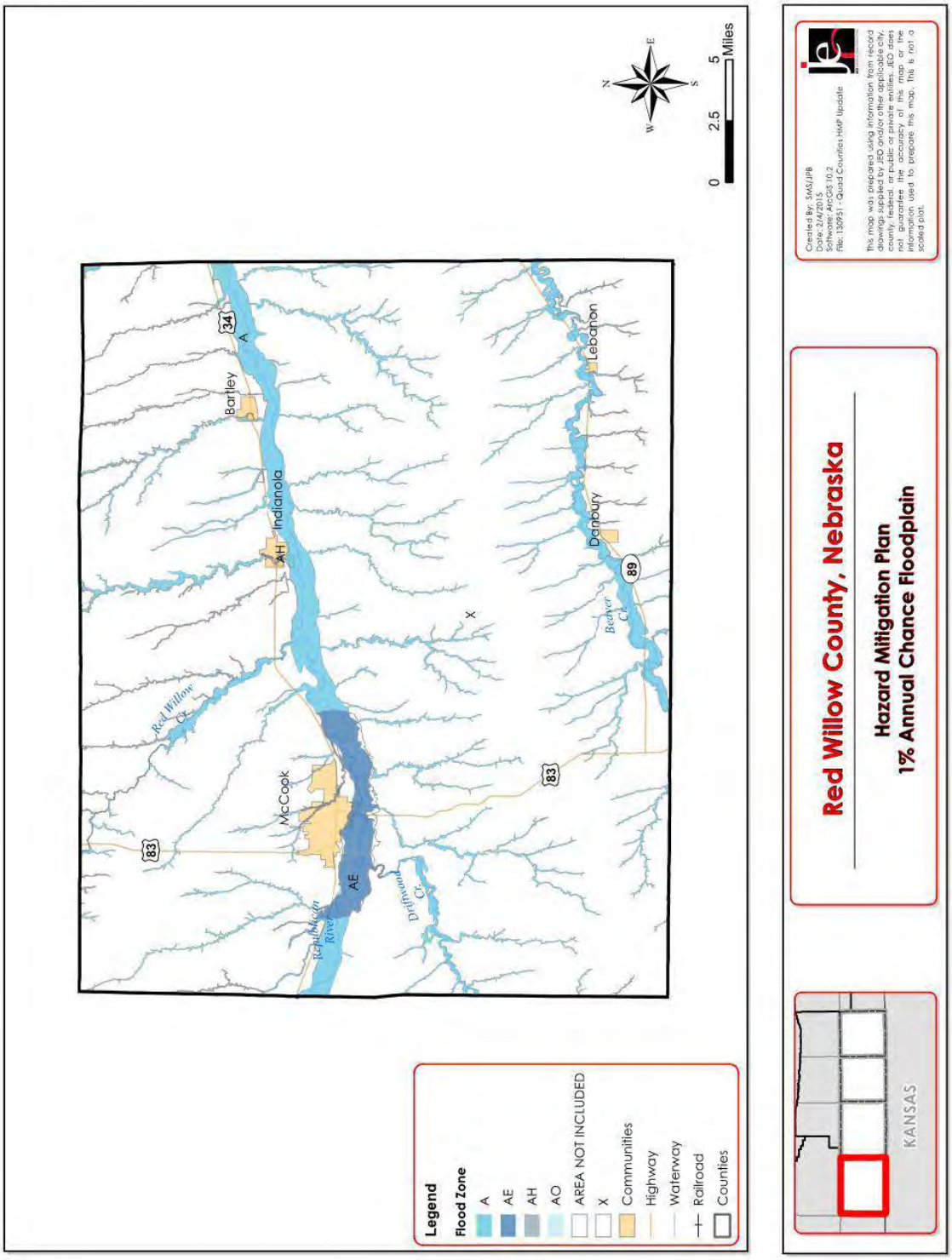
Future Development Trends

In the past five years, Red Willow County has experienced new housing for the elderly, new commercial development, and had buildings demolished due to fire. New housing developments are planned along the north edge of McCook. The county's population is currently declining and many properties are staying vacant.

Figure RWC 6 shows the 1% annual floodplain for Red Willow County. There are no repetitive loss properties in the county. The initial FIRM for Red Willow County was developed in May of 1988. Red

Willow County does participate in the NFIP, with 11 policies in effect worth $1,232,700 as of November 30, 2015.

Figure RWC 6: Red Willow County 1% Annual Chance Floodplain



Risk Assessment

Hazard Identification

Table RWC 2 is a risk assessment identified specifically for the county. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table RWC 2: Red Willow County Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	2014 HIRA	Specific Concerns Identified
Agricultural Animal Disease	Yes	Medium	None
Agricultural Plant Disease	Yes	Low	None
Chemical Spills (Fixed Sites)	No	N/A	None
Chemical Spills (Transportation)*	Yes	Medium	Property damages, injuries
Dam Failure	No	Medium	None
Drought*	Yes	High	Economic impacts, leads to secondary hazards
Earthquake	No	Medium	None
Extreme Heat	Yes	N/A	None
Flooding	Yes	Medium	None
Grass/Wildfire	Yes	Medium	None
Hail	Yes	N/A	None
High Winds	Yes	N/A	None
Levee Failure	No	Medium	None
Severe Thunderstorm*	Yes	High	Property damages, injuries, power outages
Severe Winter Storm*	Yes	High	Property damages, injuries, power outages
Terrorism	No	Medium	None
Tornados*	Yes	High	Significant property damages, injuries, loss of life

** Identified as a top concern by the local planning team*

The top five hazards in Red Willow County are severe winter storms, tornados, severe thunderstorms, drought, and chemical transportation. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The events recorded by NCDC are broken down by two types: county-based and zone-based events. The county-based records are events that affect the jurisdictions within the county while the zone-based records are those affecting the zone that include the county as part of the affected zone. Please refer to specific villages or cities within the county for the previous county-based severe weather events retrieved from NCDC. For zone-based events, there are 100 recorded events from 1996 to 2014. Of those 100 events three resulted in damages. Two events resulted in three injuries. One injury occurred in December 2006 when a woman skidded her vehicle on ice and rolled the vehicle. The other injuries occurred in January 2011 when a two-vehicle accident resulted in minor injuries to two separate people.

Table RWC 3: NCDC Severe Weather Events

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
2/25/1998	High Wind	51 kts./ 59 mph	0	0	$100,000
11/14/2006	High Wind	61 kts./ 70 mph	0	0	$15,000
12/29/2006	Winter Storm		0	1	$0

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
1/19/2011	Winter Weather		0	2	$30,000

Source: NCDC

Since NCDC data provides limited information on crop losses, additional crop loss information from 2000-2014 was gathered from the Risk Management Agency (RMA) located within the United States Department of Agriculture (USDA). RMA information is only available at the county level so additional data is not provided for the individual jurisdictions. The RMA data shows greater impacts to crops than all of the NCDC data. This discrepancy occurs because all the crop losses for every event may not be reported to NCDC like it is to RMA. In Table RWC 4, the total crop loss is provided for each hazard type along with the number of events or records over the 15 year period. Annual crop loss was calculated by diving the total crop loss by the number of years, which is 15 years.

Table RWC 4: Red Willow County RMA Loss Data

Hazard Type	Number of Records	Total Crop Loss	Annual Crop Loss
Extreme Cold	87	$656,841	$46,917
Drought	216	$83,834,325	$5,988,166
Flooding	9	$41,430	$2,959
Hail Events	131	$16,719,640	$1,194,260
Heat	115	$10,991,011	$785,072
Severe Thunderstorms	0	$1,472,743	$105,196
Tornados	0	$0	$0
High Wind	104	$7,085,536	$506,110
Plant Disease	13	$110,222	$7,873
Other	12	$57,107	$4,079

Source: USDA, RMA Cause of Loss 2000-2014
** Amounts rounded to the nearest dollar*

Chemical Spills during Transportation

According to the PHMSA there have been 13 chemical spills in McCook during transportation. There has been one injury reported and $8,077 in property damage.

Drought

The local planning team indicated that the county has been in drought conditions for several years. Drought can lead to increased wildfire risk as well as significant economic losses. According to RMA data, drought has caused $83,834,325 in crop losses from 2000 to 2014.

The county water supply has been determined sufficient.

Severe Thunderstorm

NCDC reported 87 severe thunderstorm (wind, rain, and lightning) and 156 hail events between January 1996 and December 2014 that resulted in $2,100,400 in property damage. RMA reported $18,192,383 in crop damage. There were two injuries reported from a storm in July 2002 when a tarp blew down at a local rodeo that was still in progress during the storm. There were three injuries that occurred in August of 2011 during a hail storm. Two people were hurt from broken glass due to hail and a third person broke her thumb when it was struck by a hail stone.

County records are protected with surge protectors on electronic devices. Some critical facilities have identified as needing backup power generators. Critical facilities are equipped with weather radios.

Severe Winter Storms
NCDC reported 38 severe winter storm events for the county. There was one storm that reported in $30,000 in property losses. RMA reported $656,841 in crop damage. There was on person injured in December 2006 when her vehicle skidded on icy roads just south of McCook and her vehicle rolled. There were also two injuries in January 2011 accident that resulted in two minor injuries in McCook during a freezing rain event.

Snow removal resources have been deemed sufficient for local events.

Tornados
The NCDC reported 16 tornados and two funnel clouds for the county between January 1996 and December 2014. An F2 tornado that occurred in August 1996 caused $750,000 in property damage. An F1 tornado in June 1999 caused $6,500 in damage. An EF 1 tornado in May 2008 caused $350,000 in property damage. In total the NCDC reported one EF/F2 tornado, three EF/F 1 tornados, and 12 EF/F 0 tornados.

Churches and some office buildings serve as storm shelters but most of the county shelters in place. Educational outreach is done in schools and retirement homes.

Capability Assessment
Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Unincorporated County Governance
The jurisdiction of Red Willow County includes all unincorporated areas within the county boundaries. The Red Willow County government structure is a three member Board of Commissioners. The Red Willow County government includes the following departments and offices:

- Assessor
- Attorney
- Clerk
- Health Director
- Clerk of District Court
- Emergency Manger/Sheriff
- Extension

- Highway Superintendent/Floodplain Administrator
- Planning & Zoning
- Tourism
- Treasurer
- Veterans Services
- Weed Superintendent

Table RWC 53: Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	Yes
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	No
	Development Impact Fees	No

Survey Components/Subcomponents		Comments
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in Table RWC 53 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraphs present a summary of the findings of this analysis.

Red Willow County has a Local Emergency Operations Plan that was last updated in 2011. This plan provides clear assignment of responsibility during an emergency.

The Red Willow County zoning regulations prohibit development in hazardous areas such as the floodplain. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

Red Willow County has the administrative staff and technical and fiscal capabilities to implement some mitigation projects without assistance. Larger projects such as safe rooms or drainage improvements may require that the county look to partner with the MRNRD, and other regional and state agencies. Through this update process, the planning team reviewed previously identified mitigation projects and added new projects as well.

Mitigation Strategy

Completed Mitigation Projects

Description	Backup Power Generators
Analysis	Provide a source of back-up power supply to ensure redundant power supply.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$30,000
Funding	General County Funds
Timeline	Completed
Lead Agency	Sheriff's Department, County Emergency Management
Action since 2010 plan	Installed backup generator at Sheriff's Department in 2014. The county funded this mitigation action.

New/Ongoing Mitigation Projects

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	General County Funds
Timeline	2-5 Years
Priority	High
Lead Agency	County Commissioners
Action since 2010 plan	Identified the need of a structure at the fairgrounds with the capacity of approximately 200-250 people.

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 to $100,000+
Potential Funding	General County Funds
Timeline	5+ Years
Priority	Medium
Lead Agency	County Commissioners
Action since 2010 plan	Identified southwest corner of the county as needing improvements; working with drainage group to complete drainage projects.

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 – 100,000+
Potential Funding	HMGP, PDM, DNR, MRNRD, General County Funds
Timeline	5+ Years
Priority	Medium
Lead Agency	County Commissioners
Action since 2010 plan	Identified need of improvements along Republican River, between Perry Grain and Red Willow Crossing.

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Existing Staff
Timeline	Ongoing
Priority	Medium
Lead Agency	Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	General County Funds
Timeline	5+ Years
Priority	Medium
Lead Agency	Floodplain Administrator, County Commissioners
Action since 2010 plan	Will continue to work with the state to ensure proper management of floodplain. Commissioners have been discussing the potential of floodplain enforcers restricting landowners from grading private land and taking out flood control structures.

Description	Warning Systems
Analysis	Improve city cable TV interrupt warning system and implement telephone interrupts system such as Reverse 911.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All
Estimated Cost	$5,000
Potential Funding	General County Funds
Timeline	5+ Years
Priority	Medium
Lead Agency	County Commissioners
Action since 2010 plan	Discussing the best course of action. Used to have Code Red system but ran out of funds.

Removed Mitigation Projects

Description	Flood Prone Property Acquisition
Analysis	Voluntary acquisition and demolition of properties prone to flooding will reduce general threat of flooding for communities within the NFIP. Additionally, this can provide flood insurance benefits to those communities within the NFIP. Repetitive loss structures are typically highest priority.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer feasible.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Hazard(s) Addressed	All hazards
Reason for Removal	Determined to be not a priority at this time.

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's, water tanks/trucks, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles and identifying and training additional personnel for emergency response.
Hazard(s) Addressed	All hazards
Reason for Removal	Determined to be not a priority at this time.

Description	Alert/Warning Sirens
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or the placement of new sirens.
Hazard(s) Addressed	All hazards
Reason for Removal	Determined to be the responsibility of individual communities.

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Hazard(s) Addressed	All hazards
Reason for Removal	Determined to be no longer needed.

Village of Bartley

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Bartley participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Bartley attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Bartley, the top concerns that were identified through this planning process include extreme heat, levee failure, severe thunderstorms, severe winter storms, and tornados. The following people were involved in the development of Bartley's Participant Section:

Table BTL 1: Village of Bartley Plan Contributors

Name	Title	Department / Organization
Ronni Harding	Village Clerk	Village of Bartley
Alan Kotschwar	Red Willow County Sheriff	Red Willow County

This section contains important information about the Village of Bartley relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

Location/Geography

Bartley is a village in the northeast portion of Red Willow County. The Village of Bartley covers an area of 448 acres and has an elevation of 2,346 feet above sea level. Bartley is 65 miles southeast of North Platte. The topographic region Bartley lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests which are remnants of the old plain eroded by water and wind.

Transportation

Figure BTL 1 shows the major transportation routes for the village. There is one major highway in the village, US HWY 6. According to the Nebraska Department of Roads average daily traffic counts US HWY 6 is 2,770 vehicles with 415 of those being heavy trucks passing to the east of the village and 2,980 vehicles with 455 of those being heavy trucks passing to the west of the village. There is one railroad in the south portion of the village.

Figure BTL 1: Bartley

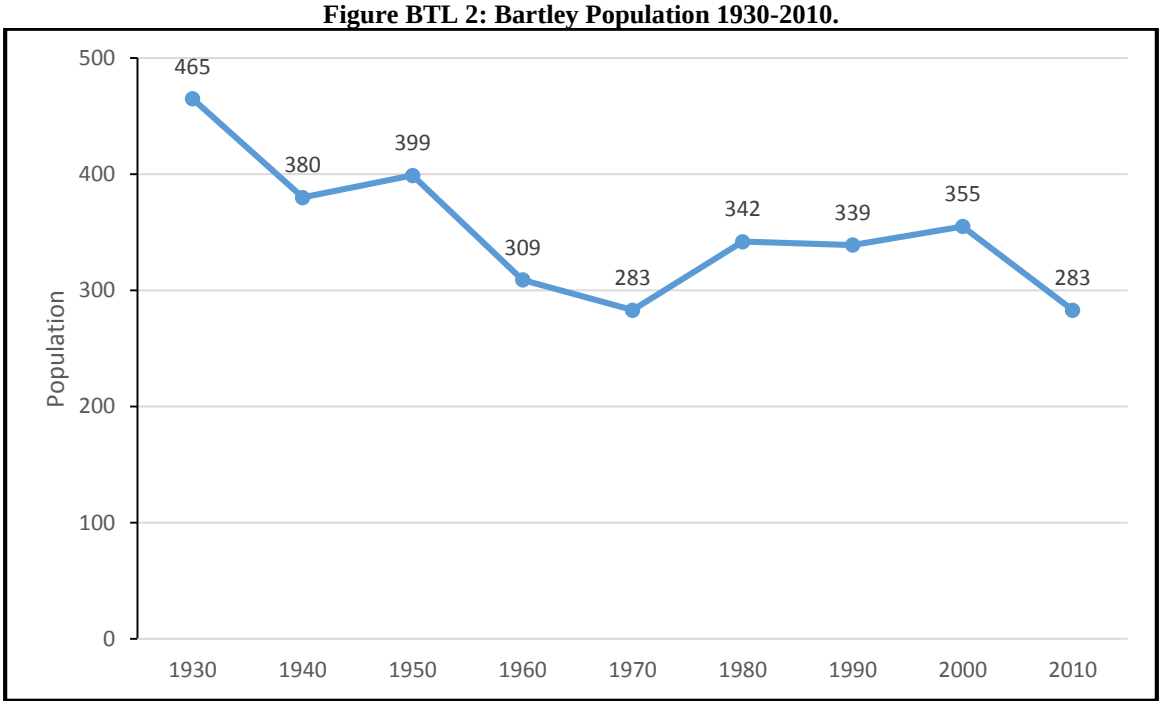
Climate

All the climate data for the county has been taken from a station located at the McCook Airport (255310). Please refer to the *Red Willow County Section* for a climate summary for the village.

Demographics

Figure BTL 2 displays the population for Bartley from 1930 to 2010. This figure shows that Bartley's population has been fluctuating since 1940. A fluctuating population goes through periods of growth and decline. When there is a decrease in population it results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects. When there is a growing population that results in more tax revenue for the community to implement hazard mitigation projects.

Figure BTL 2: Bartley Population 1930-2010.



Source: US Census

Table BTL 2 illustrates the age distribution and median age for Red Willow County in comparison to the Village of Bartley. The village has a higher population over the age of 64 than that of the county by about seven percent. The village has a higher median age than that of the county by about five years.

Table BTL 2: Bartley Age Distribution

Age	Red Willow County	Bartley
<5	6.1%	5.3%
5-64	75.2%	69%
>64	18.7%	25.5%
Median	41.8	47.4

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Bartley in Table BTL 3. Home values for the village are $2,780 dollars lower than the county, and rent values are $94 higher than the county. The population has decreased in the last decade as noted in the demographic section, the lower cost of living compared with the rest of the county may be beneficial to the future of the community's population stability.

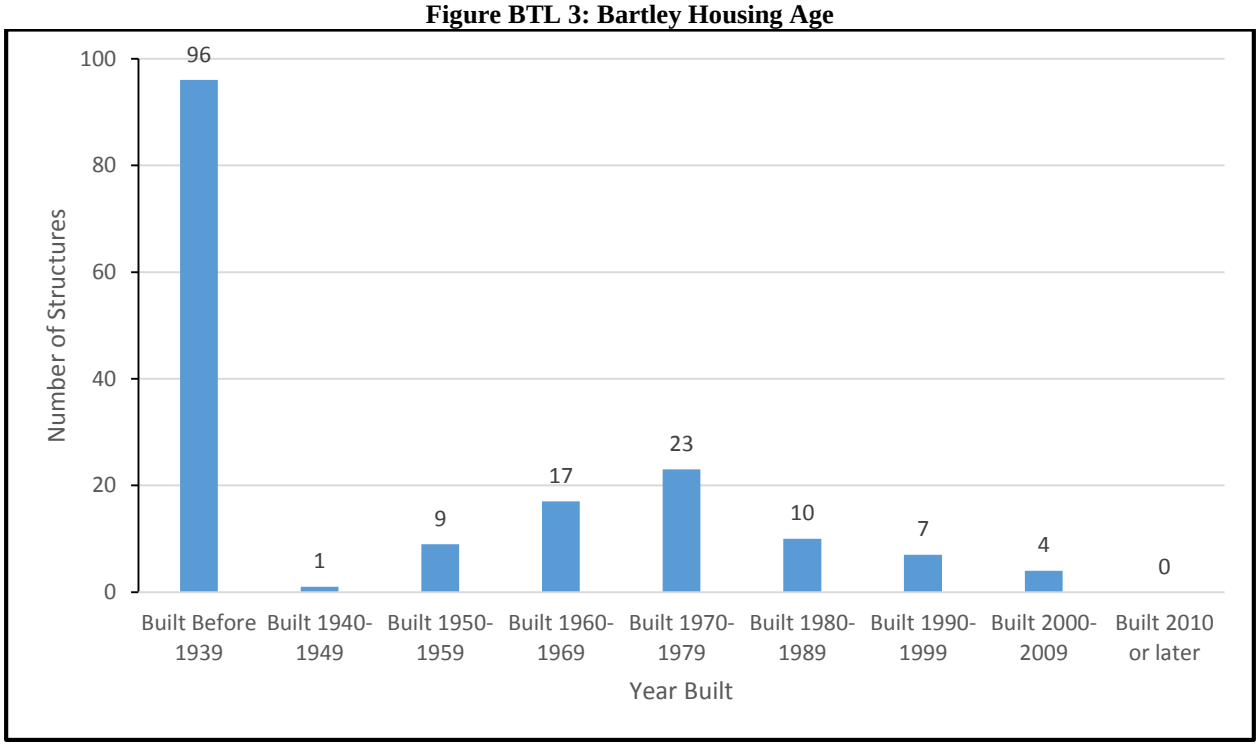
Table BTL 3: Bartley Housing Value and Income

	Red Willow County	Bartley
Median Household Income[1]	$45,345	$37,000
Per Capita Income[1]	$23,320	$23,468
Median Home Value[2]	$84,200	$56,400
Median Rent[2]	$589	$683

1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (Figure BTL 3) the village has 167 housing units with 74 percent of those units occupied (Table BTL 4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. There are 10 mobile homes located in the village. Although there are mobile homes in the community, they are not located in a single identified mobile home park in the village, but are spread throughout the village. Over 63 percent of the village's housing stock was built before 1960. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados. The local planning team identified that most homes built before 1939 are dilapidated. Nearly all of the village's homes were built prior to the first FIRM for the village in 2009. Houses built prior to this year may not be constructed above the base flood elevation. There are six parcel improvements in the floodplain.

Figure BTL 3: Bartley Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table BTL 4: Bartley Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Red Willow County	4,732	90.1%	522	9.9%		3,377	71.4%	1,355	28.6%
Bartley	124	74.3%	43	25.7%		101	81.5%	23	18.5%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Bartley are educational services and health care (25.4%), agriculture and forestry, (19.8%), and construction (15.9%).

The major employers for the Village of Bartley include Ag Valley Co-op, and Southwest Public Schools. A large percentage of residents also commute to Cambridge and McCook.

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table BTL 5.

Table BTL 5: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
199	$13,409,180	$67,383	6	$6,203,263

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Bartley planning team as a part of the plan update. Figure BTL 4 is a summary of the type and location of critical facilities for the jurisdiction.

Figure BTL 4: Bartley Critical Facilities Map

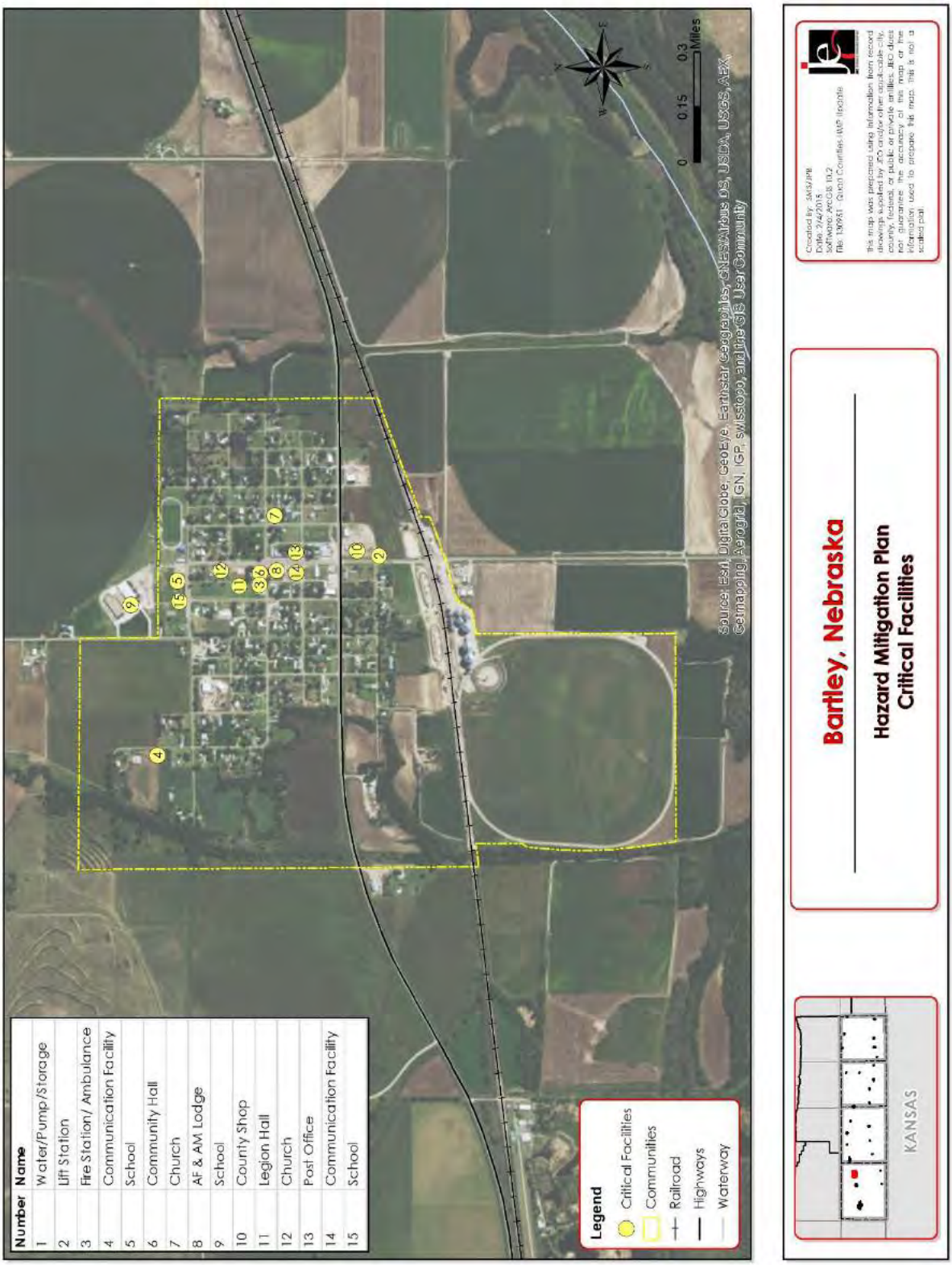


Figure BTL 5 shows the 1% annual floodplain for the Village of Bartley. Bartley has six parcels with structures in the 1% annual floodplain. These structures have a value of $6,203,263. There are no critical facilities in the 1% annual floodplain. There are no repetitive loss properties in the village. The initial FIRM for Bartley was developed in February of 2009. Bartley does participate in the NFIP, with one policy in effect worth $45,000 as of February 28, 2015.

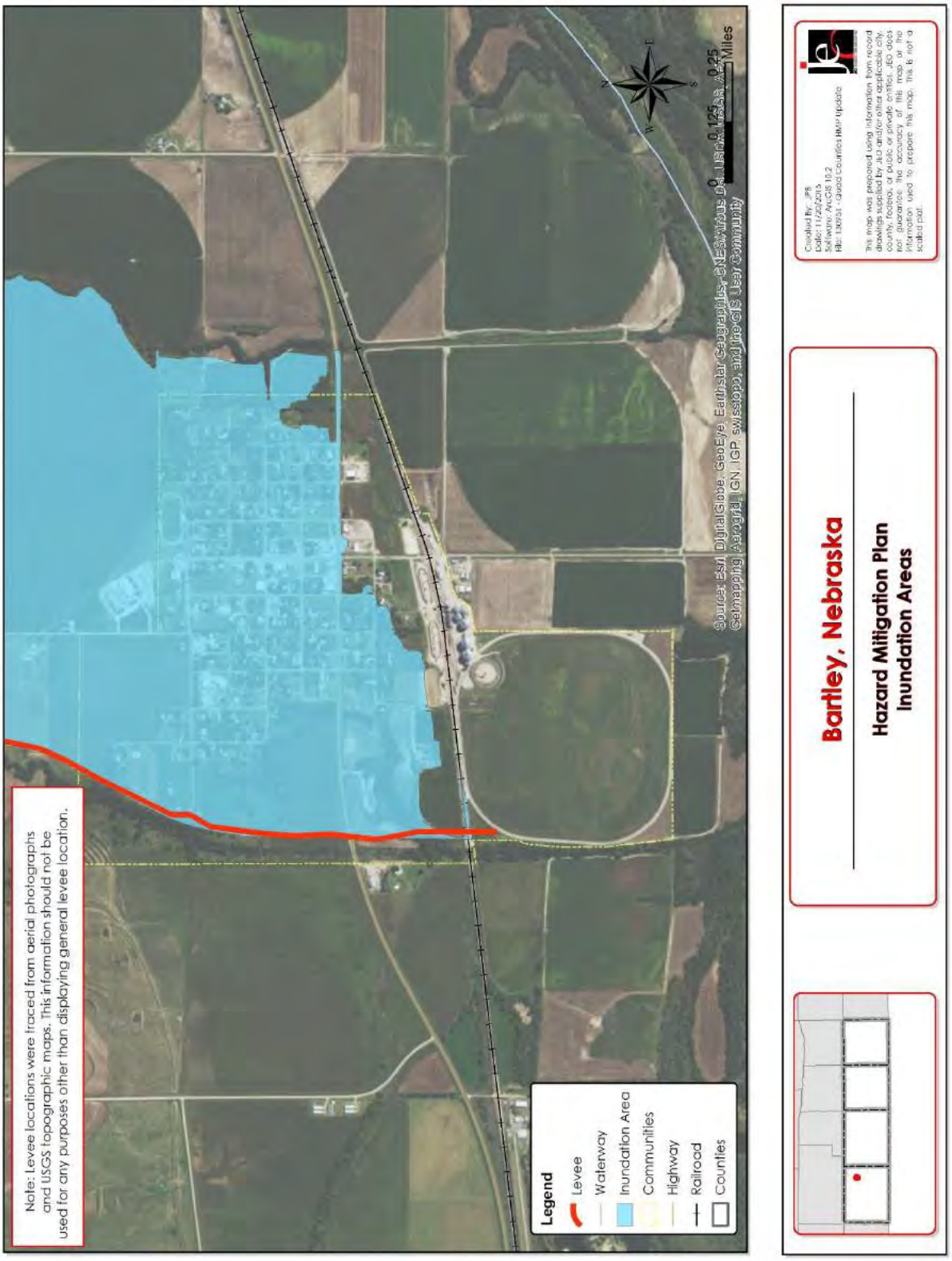
Figure BTL 5: Bartley 1% Annual Chance Floodplain

Levees

There is one levee located in the village.

Figure BTL **6** shows the location of the levee. The levee is 1.31 miles in length and protects 576.84 acres. The levee was constructed in 1951 by the USACE and then turned over to the Village of Bartley for operations and maintenance. The levee does not provide 1% annual flood protection.

Figure BTL 6: Bartley Levee Location



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of four chemical storage sites in the Village of Bartley, and one of these house materials that are categorized as hazardous. Table BTL 2 list facilities that house hazardous materials only.

Table BTL 2: Chemical Storage Fixed Sites

Facility	Address	Hazardous Material
Cambridge Telephone Company	410 Commercial St, Bartley	Sulfuric Acid

Source: Nebraska Department of Environmental Quality

Historic Sites

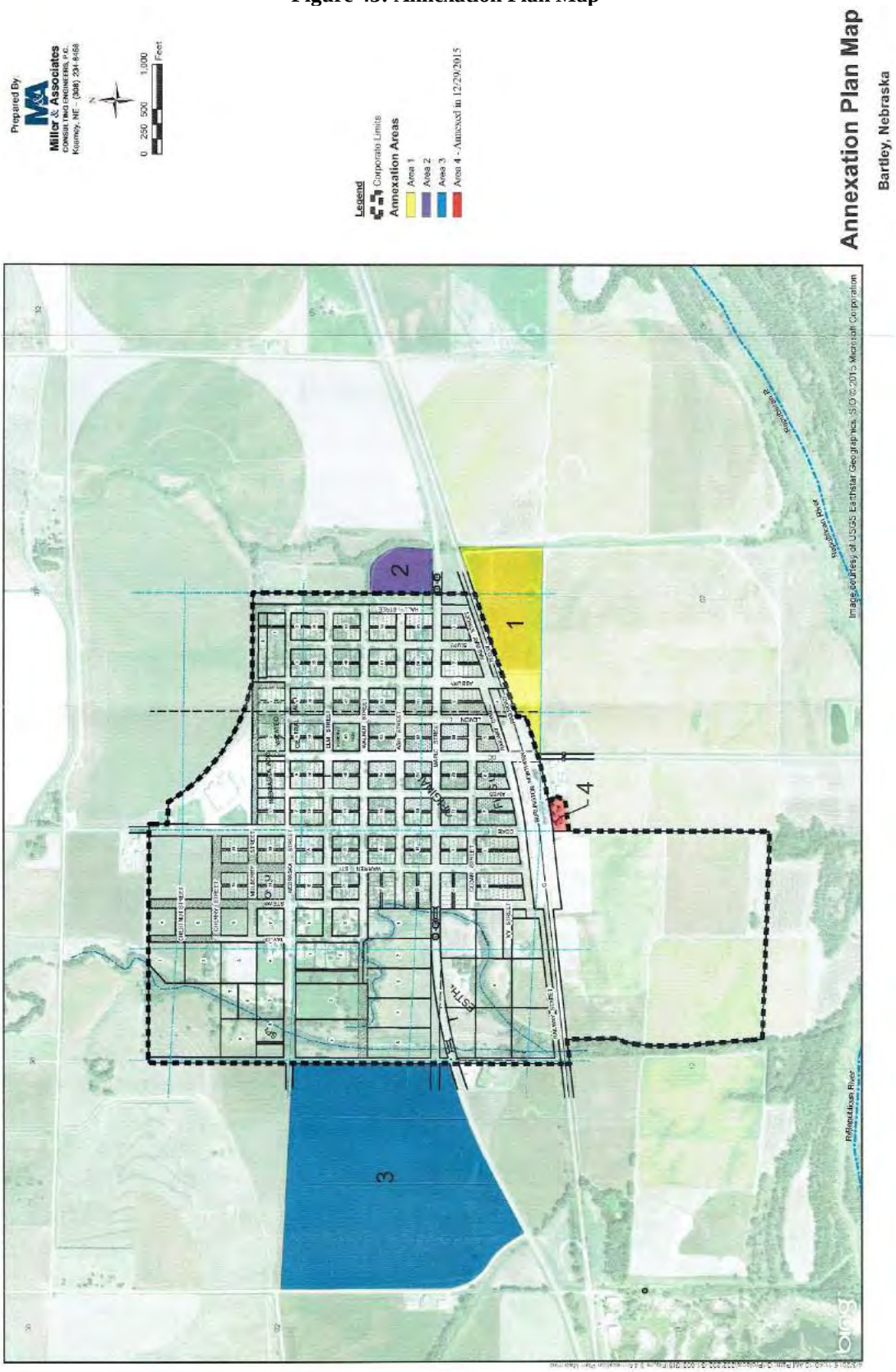
According to the National Register of Historic Places for Nebraska, there are no historic sites located in Bartley.

Future Development Trends

Below are the Future Land Use and Annexation Plan maps for the Village of Bartley. As seen in the Future Land Use Map, Bartley is discouraging development in the floodplain by assigning an agricultural or vacant use for the surrounding parcels.

Figure 42: Future Land Use Map

Figure 43: Annexation Plan Map



Risk Assessment

Hazard Identification

Table BTL 3 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table BTL 3: Bartley Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Sites)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat*	Yes	Power outages, injuries to vulnerable populations
Flooding	No	None
Grass/Wildfire	Yes	None
Hail	Yes	None
High Winds	Yes	None
Landslide	No	None
Levee Failure*	No	Total loss of property, loss of life
Severe Thunderstorm*	Yes	Power outages, property damages
Severe Winter Storm*	Yes	Power outages, property damages
Terrorism	No	None
Tornados*	Yes	Lack of shelter, significant property damages, loss of life

** Identified as a top concern by the local planning team*

The top five hazards in Bartley are extreme heat, levee failure, severe thunderstorms, severe winter storms, and tornados. These five hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 31 severe weather events from 1996 to 2014 in the Village of Bartley. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds. Table BTL 4 provides a summary of events within the village.

Table BTL 4: Bartley Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/29/2000	Hail	2.75 in	0	0	$250,000
8/8/2002	Thunderstorm Wind	60 kts./ 69 mph	0	0	$100
8/3/2010	Thunderstorm Wind	65 kts./ 75 mph	0	0	$500

Source: NCDC

Extreme Heat

The closest weather station to the village is located in Cambridge. The station reports an average of 49 days a year over 90°F. In the event of extreme heat, the library, Legion Hall, AF & AM Lodge, Methodist Church, and the Fire and Rescue squads are available to assist vulnerable populations. The local planning team identified that the community has experienced several power outages in the past. Power outages during extreme heat events have the potential to cause injury or death to vulnerable populations without shelter from the heat. Although not specifically designated, in the event of a power outage during an extreme heat event, facilities with backup generators would be used as cooling centers for residents.

Levee Failure

There has been no historic levee failure in the village. However, levee failure is being included in this plan due to the potentially catastrophic nature that a levee failure would have on the Village of Bartley. According to the local planning team, if the levee was to fail, it would cause total loss of property and possible loss of life. **Figure BTL 6** shows the location of the levee that protects Bartley.

Severe Thunderstorm

NCDC reported six severe thunderstorms (wind, rain and lightning) between January 1996 and December 2014 that resulted in $600 in property damage. Although they are not reported to NCDC, severe thunderstorms occur several time annually in Bartley and the rest of the planning area.

Critical municipal records are protected with surge protectors on electronic devices. There are a number of critical facilities that need backup power generators including: fire and ambulance station, village office, Southwest Schools, community hall, church, legion hall, and the library. Approximately five percent of primary power lines have been buried. Weather radios are located in the fire station and village office.

Severe Winter Storms

Severe winter weather occurs annually in Bartley and the rest of the planning area. NCDC reports severe winter storms at the county level. According to the NCDC, Red Willow County had 38 severe winter storm events from 1996 to 2014. One of these storms resulted in $30,000 in property damage.

In 2007, a major ice storm knocked down power lines and took out power for days. Designated snow routes include: Nebraska, Commercial, Walnut, and Coke Streets. Streets are cleared by the village maintenance man. Snow removal resources are sufficient for local events.

Tornados

NCDC reported 5 tornados for the village. Three of the storms were rated as F/EF0 and the other two storms were not rated on the Fujita Scale. NCDC did not report any damages; however, the local planning team indicated a tornado in 2000 caused damages to windows and siding. The community does not have a safe room. The only underground shelter is in the Methodist Church; and it is not handicap accessible. In the event of a disaster, all the communities within Red Willow County have Mutual Aid Agreements.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

A community's governance indicates the number of boards or offices that may be available to help implement hazard mitigation actions. The Village of Bartley is governed by a five member village board and chairman. In addition to the village board, the village has the following positions: clerk/treasurer, utility superintendent, volunteer fire department, volunteer ambulance squad, librarian, sewer and water commissioner, and street commissioner.

Table BTL 9: Bartley Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	Yes
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	Yes
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	No

Survey Components/Subcomponents		Comments
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	Yes
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	Yes
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the

Table **BTL**9 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraphs present a summary of the findings of this analysis.

The Village of Bartley has a comprehensive plan that was last updated in 2012. This comprehensive plan discusses the absence of public storm safety shelter, storm water drainage, and flooding concerns. At this time, Bartley does not have zoning. Future zoning maps will discourage development in hazardous areas.

The Village of Bartley has an annex to the county's Local Emergency Operations Plan, which was last updated in 2001. This plan addresses the following hazards: flood, fire, hazardous materials, terrorism, outbreak or medical needs, agricultural disease, severe weather, tornados, and windstorms. The plan provides a clear assignment of responsibility during an emergency. The Clerk's office, Fire Department

and Ambulance, and Board of Trustees are all familiar with the Red Willow Local Emergency Operations Plan.

Bartley has a floodplain ordinance that was last updated in 2009. The floodplain ordinance meets minimum federal and state requirements. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The Village of Bartley has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from strong partnerships, such as with the county and MRNRD, and will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Projects

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's water tanks/trucks, snow removal equipment, etc. This would include developing backup systems for emergency vehicles and identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	All
Estimated Cost	Unknown
Funding	Village funds, Rural Fire Department funds
Timeline	Completed
Lead Agency	Rural Fire Department
Action since 2010	New fire and rescue building was built in 2001

Description	Warning Systems
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or upgraded. Install new sirens and remote activation where lacking.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All Hazards
Estimated Cost	$15,000
Funding	Village funds, HMGP
Timeline	Completed
Lead Agency	Board of Trustees
Action since 2010	New siren system was put in 2010

New/Ongoing Mitigation Projects

Description	Maintain Good Standing in NFIP
Analysis	Maintain good standing in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Village funds
Timeline	Ongoing
Lead Agency	Village Board, Floodplain administrator
Action since 2010	Currently meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	Backup Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities.
Goal/Objective	Goal 2/ Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Winter Storms, Severe Thunderstorms, Flooding
Estimated Cost	$20,000 to $50,000 per generator
Potential Funding	HMGP, PDM, Village Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Board of Trustees
Action since 2010	Facilities in need of a generator have been identified: Fire & Rescue, Village Office, Schools, Community Hall, Church, Legion Hall, Library

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	Village Funds
Timeline	5+ Years
Priority	High
Lead Agency	Emergency Manager, Board of Trustees
Action since 2010	Identified a possible location and necessary capacity for safe room.

Description	Stormwater System and Drainage Improvements
Analysis	Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 to $100,000+
Potential Funding	HMGP, PDM, Village Funds
Timeline	1 Year
Priority	Low
Lead Agency	Board of Trustees
Status	Areas with drainage issues have been identified

Description	Drainage Study/Stormwater Master Plan
Analysis	Drainage studies can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community-wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each.
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 to $100,000+
Potential Funding	HMGP, PDM, Village Funds
Timeline	2-5 Years
Priority	Low
Lead Agency	Board of Trustees
Action since 2010	Not yet started

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Timeline	2 – 5 years
Priority	Medium
Lead Agency	Board of Trustees
Action since 2010	Not yet started

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Timeline	2 – 5 years
Priority	Low
Lead Agency	Board of Trustees, Fire Department
Action since 2010	Not yet started

Removed Mitigation Projects

Description	Stabilize/Anchor Fertilizer, Fuel and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement. If left unanchored tanks could present major threat to property and safety in a tornado or high wind event.
Hazard(s) Addressed	Tornados and High Winds
Reason for Removal	No fuel tanks present at this time.

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvements
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	Determined to be no longer needed.

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Hazard(s) Addressed	Flooding
Reason for Removal	This action is redundant with 'maintain good standing in NFIP' mitigation action

Action	Tree City USA
Description	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Reason for Removal	No local support for this project.

Village of Danbury

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The Village of Danbury participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Danbury attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Danbury, the top concerns that were identified through this planning process include are drought, severe thunderstorms, severe winter storms, and tornados.

The following local representatives were involved in the development of Danbury's Participant Section:

Table DNB 1: Village of Danbury Plan Contributors

Name	Title	Department / Organization
Shirley Axtell	Village Clerk	Village of Danbury
Eugene Axtell	Board Chairperson	Village of Danbury
Dave Schultz	Board member	Village of Danbury
Carl Rae	Board member	Village of Danbury
Roy Jordan	Board member	Village of Danbury
Ardie Berry	Board member	Village of Danbury
Gary Schultz	Water Superintendent	Village of Danbury
Brett Wegher	Village Resident	Village of Danbury
Alan Kotschwar	Red Willow County Sheriff	Red Willow County

This section contains important information about the Village of Danbury relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

Location/Geography

Danbury is a village in the south central portion of Red Willow County. The Village of Danbury covers an area of 192 acres and has an elevation of 2,477 feet above sea level. Danbury is 76 miles southeast of North Platte. The topographic region Danbury lies in is that of the dissected plains. This hilly land has moderate

to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. There is one waterway, Beaver Creek that passes north of the village.

Transportation

Figure DNB **1** shows the land-use and major transportation routes for the village. There is one major highway in the village, NE HWY 89. According to the Nebraska Department of Roads average daily traffic county for NE HWY 89 is 305 vehicles with 30 of those being heavy trucks passing to the east of the village and 320 vehicles with 30 of those being heavy trucks passing to the west of the village. The other major transportation corridor identified by the village is County Road 397 which connects Danbury and Indianola. The village reported that there have been some automobile accidents that occurred at the intersection of Road 397 and Highway 89 including one accidents that involved two deaths. There is one railroad that passes through the north portion of the village. Chemicals are normally transported along the highways through the city. These chemicals include fertilizer, agricultural chemicals and fuel/oil products.

Figure DNB 1: Danbury

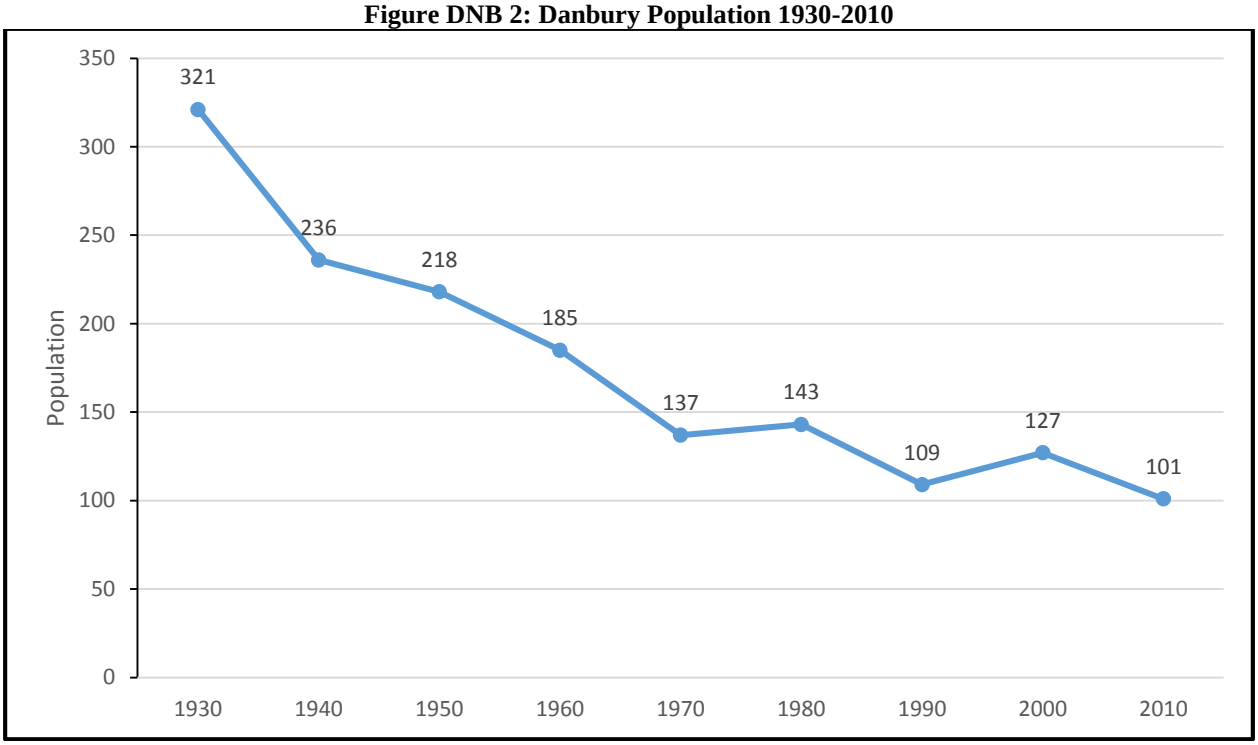
Climate

All the climate data for the county has been taken from a station located at the McCook Airport (255310). Please refer to the *Red Willow County Section* for a climate summary for the village.

Demographics

Figure DNB 2 displays the population for Danbury from 1930-2010. This figure shows that Danbury's population has been declining since 1930. From 2000 to 2010 the village lost approximately 21 percent of its population. A decrease in population results in a decrease in tax revenue for the village, which can make it more difficult to fiscally implement mitigation projects.

Figure DNB 2: Danbury Population 1930-2010



Source: U.S. Census Bureau

Table DNB 2 illustrates the age distribution and median age for Red Willow County in comparison to the Village of Danbury. The village has a higher percentage of the population over the age of 64 than that of the county by about five percent. The village also has a higher median age than that of the county by about six years.

Table DNB 2: Danbury Age Distribution

Age	Red Willow County	Danbury
<5	6.1%	5%
5-64	75.2%	71.2%
>64	18.7%	23.8%
Median	41.8	48.3

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value, and rent for the county as a whole are compared with the Village of Danbury in Table DNB 3. Home values for the village are $68,200 lower than that of the county, and rent values are $51 less than that of the county. Median home values are calculated from estimates from the census bureau, and may be inaccurate as the margin of error is nearly $10,000.

The population has decreased in the last decade as noted in the demographic section. The lower cost of living compared with the rest of the county may be due to the aging housing stock. Older structures that are not maintained may be more vulnerable to hazards.

Table DNB 3: Danbury Housing Value and Income

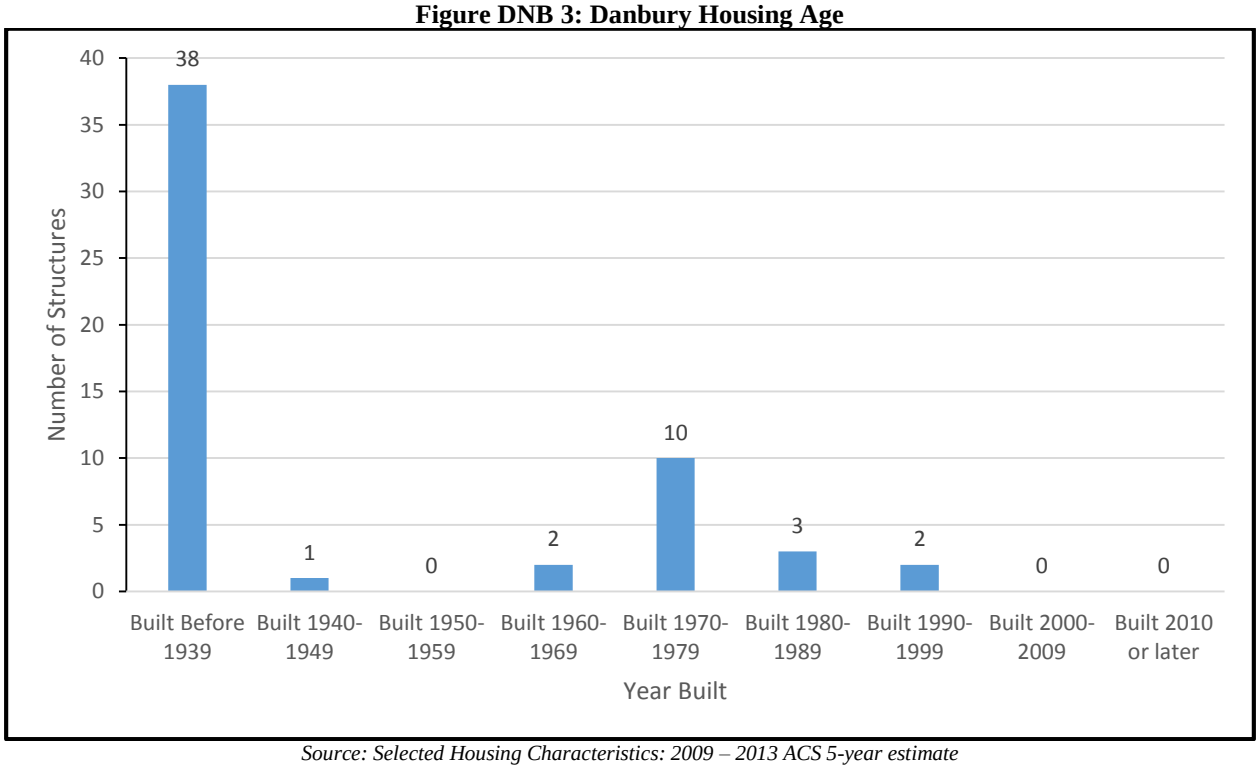
	Red Willow County	Danbury
Median Household Income[1]	$45,345	$25,208
Per Capita Income[1]	$23,320	$16,458
Median Home Value[2]	$84,200	$16,000
Median Rent[2]	$589	$538

1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (Figure DNB 3) the village has 56 housing units with 84 percent of those units occupied (

Table **DNB** 4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados. 17.9 percent of the village's housing stock are classified as mobile homes located throughout the village. The village has one property that is considered blighted. Over 69 percent of the village's housing stock was built before 1960. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados.

Figure DNB 3: Danbury Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table DNB 4: Danbury Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Red Willow County	4,732	90.1%	522	9.9%		3,377	71.4%	1,355	28.6%
Danbury	47	83.9%	9	16.1%		44	93.6%	3	6.4%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the Village of Danbury are retail trade (17.6%), educational services and health care, (14.7%), arts, entertainment and recreation, public administration and manufacturing all tied (11.8%).

The major employers in Danbury are the Decatur Co-op, the U.S. Postal service and Red Willow County Roads Department. Some residents commute to McCook or Indianola for work as well. There are also a large percentage of residents who are retired and do not have to work.

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table DNB 5.

Table DNB 5: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
80	$1,752,227	$21,903	0	$0

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/ Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Danbury planning team as a part of the plan update. Table DNB 6 and Figure DNB 4 provide a summary of the type and location of critical facilities for the jurisdiction. The village does not have any critical facilities in the 1% annual floodplain. Only the community wells have backup generators. None of the critical facilities are currently able to function as a shelter.

Table DNB 6: Critical Facilities List

Critical Facility Number	Critical Facility
1	Anhydrous Fertilizer
2	Post Office
3	Telephone BW Tel
4	County Roads Building
5	Fire and Rescues Building
6	Fueling Station
7	Wells
8	Community Center

Figure DNB 4: Danbury Critical Facilities Map

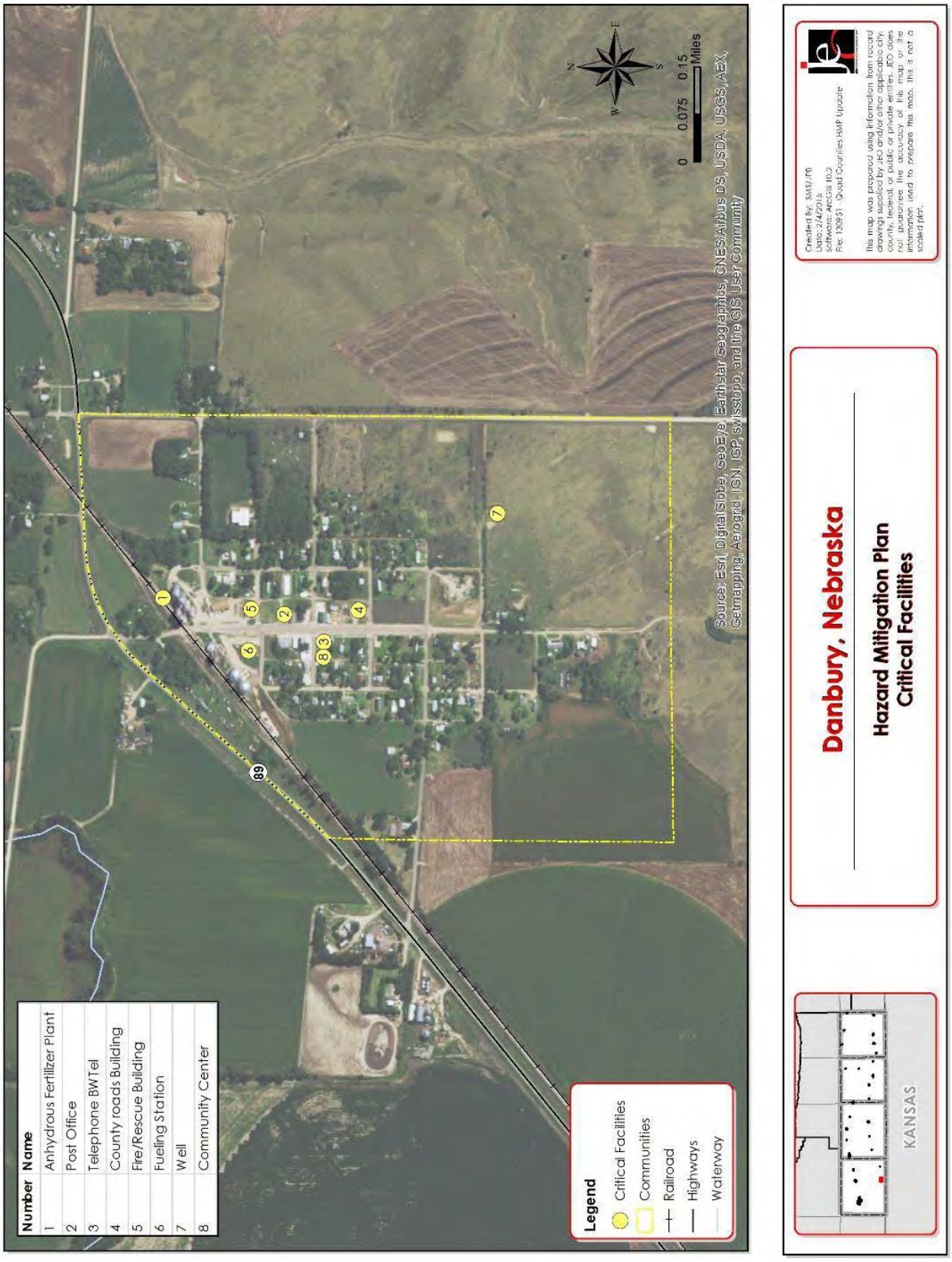
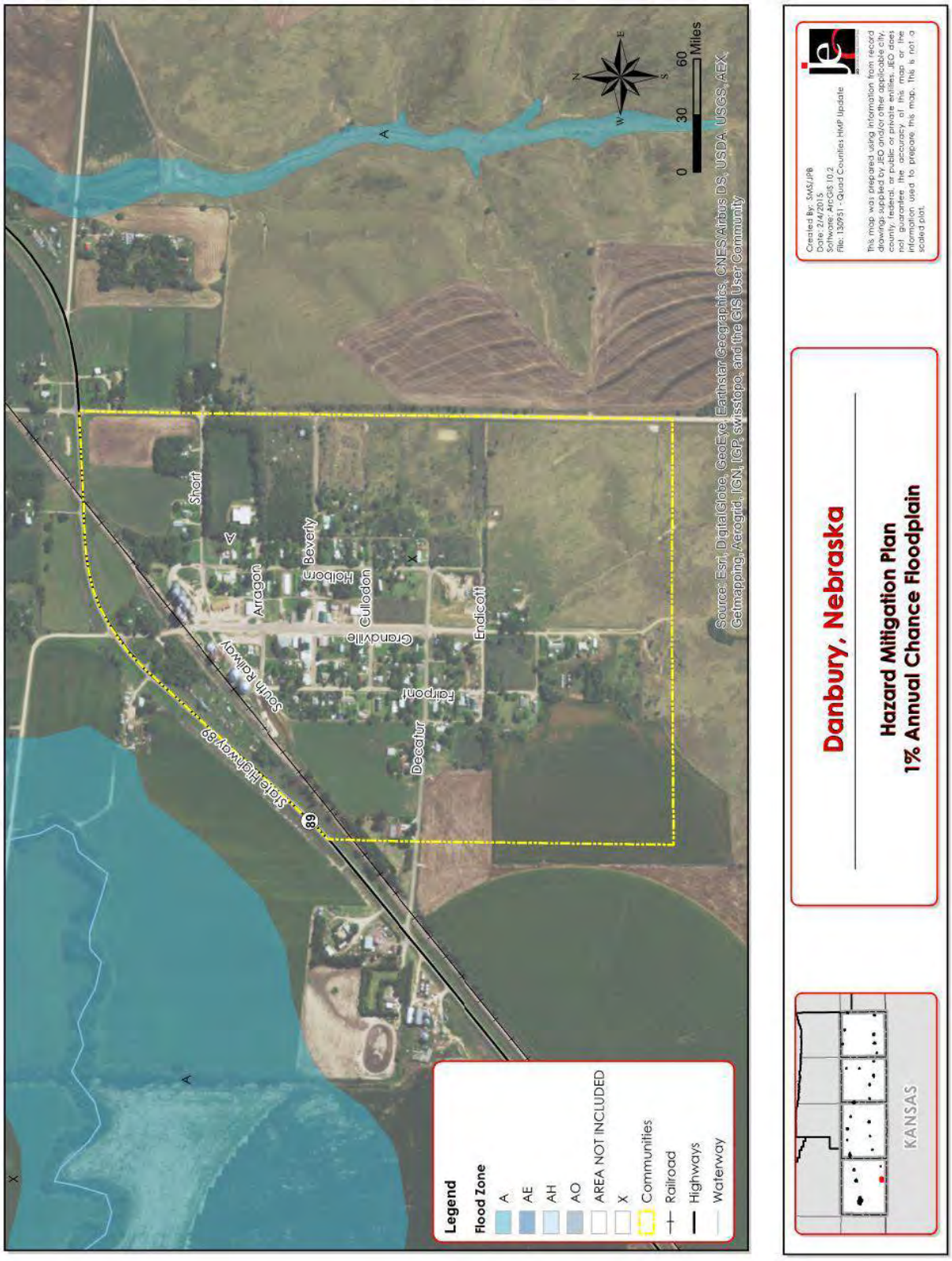


Figure DNB 5 shows the 1% annual floodplain for the Village of Danbury. There are no parcels or critical facilities in the floodplain. There are no repetitive loss properties in the village. The initial FIRM for Danbury was developed in February of 2009. Danbury does not participate in the NFIP due to the lack of parcels in the floodplain. Danbury will reevaluate participation in NFIP as conditions change and local interest grows.

Figure DNB 5: Danbury 1% Annual Chance Floodplain



Levees
There are no levees located in Danbury.

Chemical Storage Fixed Sites
According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of eight chemical storage sites in the Village of Danbury, and none of these house materials that are categorized as hazardous. The village is concerned that the junkyard in the community could be an area where chemicals are not property disposed of and could pose a threat to the village. If any spills were to occur the local fire department would respond.

Historic Sites
According to the National Register of Historic Places for Nebraska, there are no historic sites in Danbury.

Future Development Trends
The village has not had any changes in the past five years. There are no new housing developments or businesses planned for the community in the next five years. This is due to the community aging and a lack of jobs available to young families to encourage them to move to the community.

Risk Assessment

Hazard Identification
Table DNB 7 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table DNB 7: Danbury Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Sites)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought*	Yes	Forced to reduce water usage
Earthquake	No	None
Extreme Heat	Yes	None
Flooding	Yes	None
Grass/Wildfire	Yes	None
Hail	Yes	None
High Winds	Yes	None
Landslide	No	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Injuries or loss of life possible, property damage
Severe Winter Storm*	Yes	Injuries or loss of life possible, property damage
Terrorism	No	None
Tornados*	Yes	Injuries or loss of life possible, property damage

** Identified as a top concern by the local planning team*

The top hazards in Danbury are drought, severe thunderstorms, severe winter storms, and tornados. These hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 19 severe weather events from 1996 to 2014 in the Village of Danbury. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds Table DNB 8 provides a summary of events that caused damage in the village.

Table DNB 8: Danbury Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
8/9/2011	Hail	1.50 in.	0	0	$1,000
8/8/2002	Thunderstorm Wind	74 kts./85 mph	0	0	$79,000
6/26/1999	Tornado	F1	0	0	$6,500

Source: NCDC

Drought

The NDMC reported that Danbury experienced 144 months in at least D2 drought. The longest drought of at least D2 began in June 1954 and ended in July of 1959. The village did not report any monetary losses from drought. The village did report not allowing outdoor watering from 9 Am to 9 PM during the 2012 drought.

The village does not have a drought monitoring board or drought plan. The village will monitor water supply during drought and does have a plan that will allow lawn watering to occur every other day. The village does not require native plantings of irrigation limits on residents. The village has sufficient water supply and is not looking for additional sources.

Severe Thunderstorms

In 2011 the village reported two thunderstorms with hail one occurred in June and the other occurred in August. Due to the hail damage several home owner's replaced their roofs with metal roofs which are more hail resistant that traditional roofing materials. The village owned properties do have insurance that the village pays. The village does have surge protectors to protect devices that contain municipal records and the community wells have backup generators. None of the village's critical facilities have a weather radios.

Severe Winter Storms

Severe winter storms occur regularly in Danbury and the rest of the planning area. The village does not have designated snow routes and does not use snow fences. The streets in the village are cleared by a combination of county road crews and village maintenance crews. This is sufficient for the village after snow storms.

Tornados

The NCDC reported three tornados for the village between January 1996 and December 2014. An F1 tornado in June 1999 caused $6,500 in damage. The other tornados that occurred were both rated as an F0 and they occurred in June 1999 and October 2000. The Storm Prediction Center also reported an F1 tornado that passed just to the north of Danbury in June 1964.

The village has taken steps to increase the community's resilience to tornados. The village uses discs and flash drives to backup municipal records and has hand written backup records for four years. The county offers text alerts to residents and pager alerts are available for fire department volunteers. Most residents

can take shelter in their homes during tornados; the county emergency manager has designated the community center and First Presbyterian Church as other locations where shelter can be taken. There are no safe rooms that would meet the standards set forth by FEMA in the community.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

The Village of Danbury is governed by a five member village board with a chairman. The Village also has the following officials:

- Village Clerk
- Utility Superintendent/ Water Commissioner
- Volunteer Fire Department
- Street Superintendent
- Park and Recreation
- Maintenance (part-time)

Table DNB 9: Danbury Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes, 2010
	Capital Improvements Plan	No
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes, 2011
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes

Survey Components/Subcomponents		Comments
	Subdivision Regulation/Ordinance	No
	Floodplain Ordinance	No
	Building Codes	No
	National Flood Insurance Program	No
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	No
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	No
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use,

transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table DNB 9 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraphs present a summary of the findings of this analysis.

The Comprehensive Plan, updated in 2010, outlines long term goals for Danbury. The plan contains a number of action items that could be coordinated with action items listed in the mitigation plan.

Danbury also has a Local Emergency Operations Plan that is an annex to the county's plan. This plan was last updated in 2011, and provides a clear assignment of responsibility during an emergency. This plan addresses water outages, electricity outages, and storm damages. The Village Board, Fire Department, and EMS are all familiar with the emergency operations plan. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The Village of Danbury has limited fiscal capabilities and administrative support available for implementing mitigation projects. The village will continue to benefit from strong partnerships, such as with the county and MRNRD, and will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Projects

The village has not completed any mitigation actions from the 2010 plan.

New/Ongoing Mitigation Projects

Description	**Safe Rooms**
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, Village funds
Timeline	5 + Years
Priority	Medium
Lead Agency	Village board
Action since 2010	If a community safe room is installed it will be placed at the town hall.

Description	**Stormwater System and Drainage Improvements**
Analysis	Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 - $100,000+
Potential Funding	HMGP, PDM, Street funding
Timeline	5+ Years
Priority	Low
Lead Agency	Village Board
Action since 2010	Culverts in the village need to be repaired.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	HMGP, PDM, General Funds
Timeline	2 – 5 Years
Priority	Medium
Lead Agency	Village Board, County Emergency Management
Action since 2010	No actions have been taken on this project.

Removed Mitigation Projects

Description	Stream Bank Stabilization/Grad Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Reason for Removal	No streams flow through the village.

Description	Participate in the NFIP
Analysis	Participate in the NFIP
Hazard(s) Addressed	Flooding
Reason for Removal	The village is not located in the 1% annual floodplain. No local interest due to the lack of local impacts.

Description	Tree City USA
Analysis	Work to become a Tree City USA through the National Arbor Day Foundation in order to receive direction, technical assistance, and public education on how to establish a hazardous tree identification and removal program in order to limit potential tree damage and damages caused by trees in a community when a storm event occurs. The four main requirements include: 1) establishing a tree board; 2) enacting a tree care ordinance; 3) establishing a forestry care program; 4) enacting an Arbor Day observance and proclamation.
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, Severe Winter Storms
Reason for Removal	Village does not have the resources to meet the program requirements

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Hazard(s) Addressed	All Hazards
Reason for Removal	Residents alerted by village siren. No local interest at this time.

City of Indianola

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The City of Indianola participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from Indianola attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For Indianola, the top concerns that were identified through this planning process include drought, severe thunderstorms, severe winter storms, tornados, and wildfires. The following people were involved in the development of Indianola's Participant Section:

Table IND 1: City of Indianola Plan Contributors

Name	Title	Department / Organization
Stephanie Quador	City Clerk	City of Indianola
DeAnna Brown	Deputy Clerk	City of Indianola

This section contains important information about the City of Indianola relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

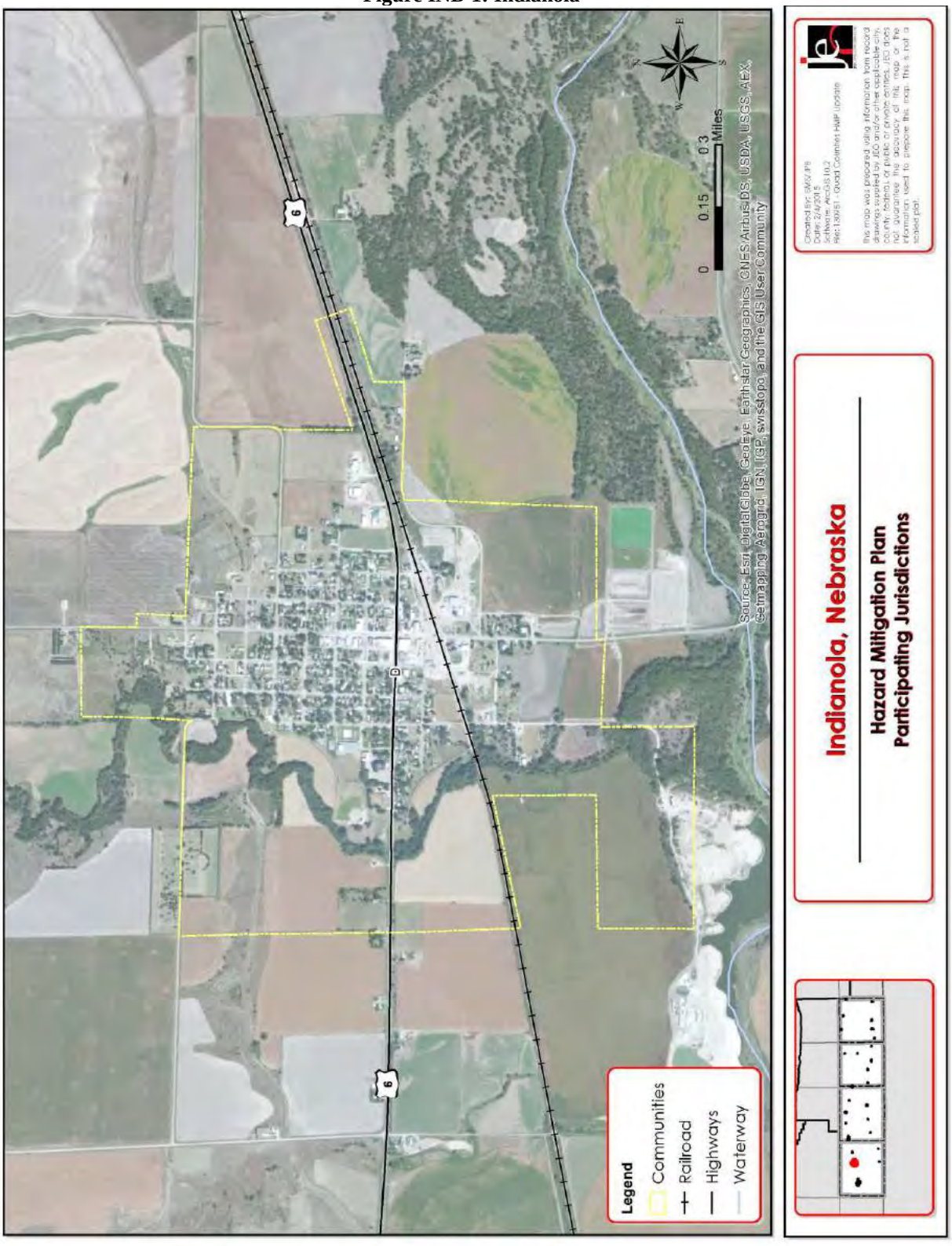
Location/Geography

Indianola is a city located in the north-central portion of Red Willow County. The City of Indianola covers an area of 768 acres and has an elevation of 2,382 feet above sea level. Indianola is approximately 64 miles southeast of North Platte. The topographic region Indianola lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. The Republican River flows to the south of the city.

Transportation

Figure IND 1 shows the land-use and major transportation routes for the city. There is one major highway in the city, US HWY 6. According to the Nebraska Department of Roads the average daily traffic count for US HWY 6 is 2,980 vehicles with 455 of those being heavy trucks passing to the east of the city and 3,585 vehicles with 440 of those being heavy trucks passing to the west of the city. There is one railroad that goes through the center of the city.

Figure IND 1: Indianola



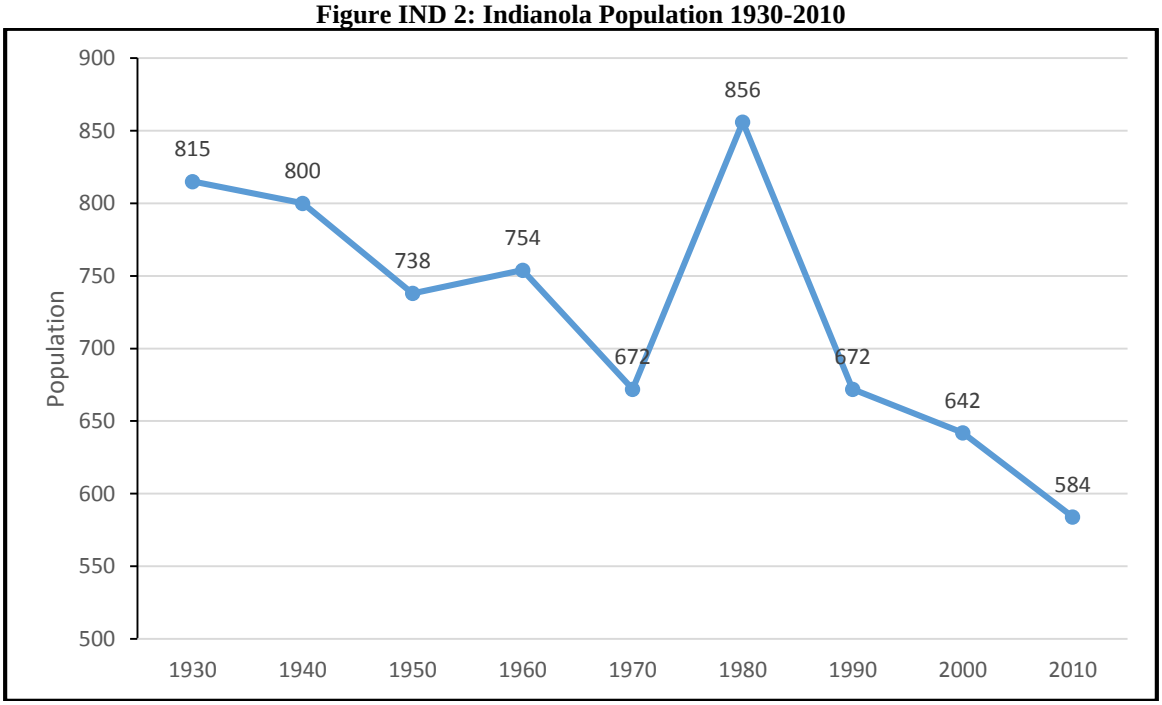
Climate

All the climate data for the county has been taken from a station located at the McCook Airport (255310). Please refer to the *Red Willow County Participant Section* for a climate summary for the city.

Demographics

Figure IND **2** displays the population for Indianola from 1930 to 2010. In the 1980s, Indianola experienced a spike in population due to oil workers. However, the overall population trend in Indianola is that of decline. The local planning team indicated that lack of housing and jobs are contributing to the decline in population. A decrease in population results in a decrease in tax revenue for the city, which can make it more difficult to fiscally implement mitigation projects.

Figure IND 2: Indianola Population 1930-2010



Source: US Census

Table IND 2 illustrates the age distribution and median age for Red Willow County in comparison to the City of Indianola. The city has a lower percentage of population over the age of 64 by about 3 percent. The city has a higher median age than the county by about one year.

Table IND 2: Indianola Age Distribution

Age	Red Willow County	Indianola
<5	6.1%	4.5%
5-64	75.2%	79.6%
>64	18.7%	15.9%
Median	41.8	42.8

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value and rent for the county as a whole are compared with the City of Indianola in Table IND 3. Home values for the city are about $19,200 less than that of the county, and rent values are about $89 less than the county. The population has decreased in the last decade as noted in the demographic section. The lower cost of living compared with the rest of the county may be beneficial to the future of the community's population stability.

Table IND 3: Indianola Housing Value and Income

	Red Willow County	Indianola
Median Household Income[1]	$45,345	$57,578
Per Capita Income[1]	$23,320	$23,761
Median Home Value[2]	$84,200	$65,000
Median Rent[2]	$589	$500

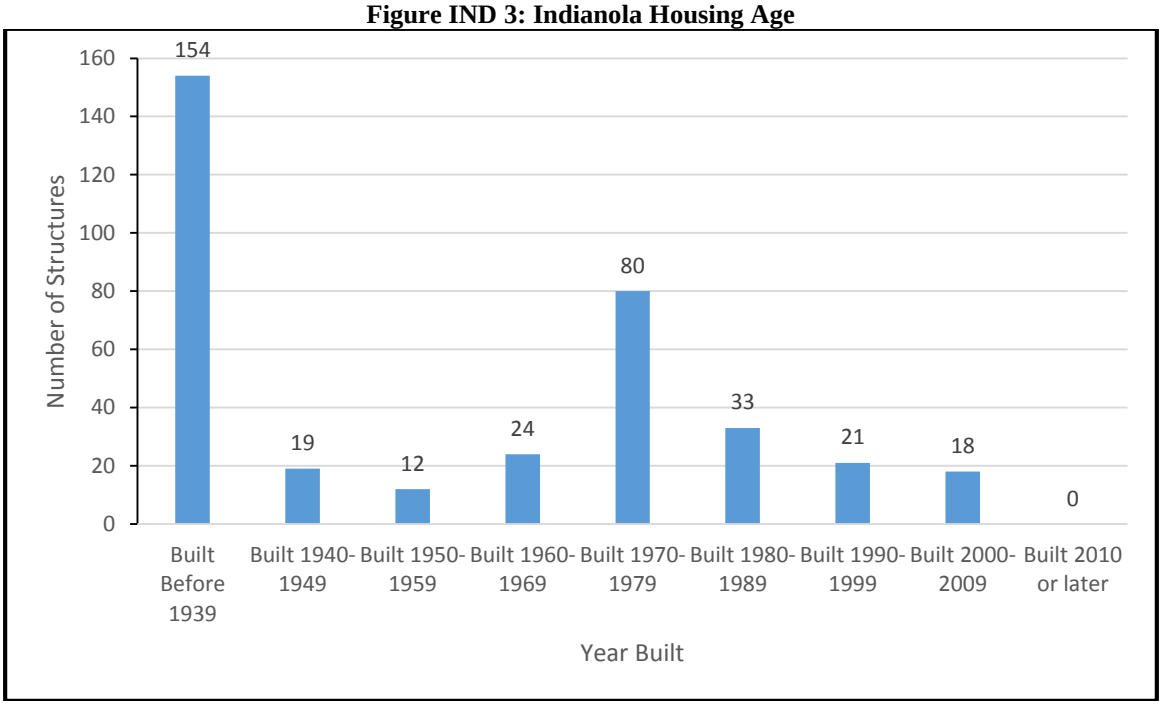
1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (Figure IND 3) the city has 361 housing units with 86 percent of those units occupied (

Table IND 4). The vacant structures in the community may fall into disrepair which could create increase the community's vulnerability to high winds, severe thunderstorms, and tornados.

Approximately eight percent of the city's housing stock is classified as mobile homes. Many of these mobile homes are located southwest of the railroad tracks. Over 51 percent of the city's housing stock was built before 1960. Residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados. Approximately 89 percent of the city's homes were built prior to the first FIRM for the city in 1990. Houses built prior to this year may not be constructed above the base flood elevation. There are 239 parcel improvements in the floodplain.

Figure IND 3: Indianola Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table IND 4: Indianola Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Red Willow County	4,732	90.1%	522	9.9%		3,377	71.4%	1,355	28.6%
Indianola	309	85.6%	52	14.4%		241	78%	68	22%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the City of Indianola are retail trade (20.7%), educational services and health care (18.8%), and manufacturing (13.9%). The major employers for the City of Indianola include Ag Valley Co-op, Adams Bank & Trust, Lords Inc, Rocket Inn, Schaffer Manufacturing, Southwest Elementary School, and Tri Valley Medical Clinic. A large percentage of residents also commute to McCook for employment.

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table IND 5.

Table IND 5: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
317	$13,809,199	$43,562	13	$576,157

Source: Red Willow County Assessor

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the Indianola planning team as a part of the plan update. Figure IND 4 provide a summary of the type and location of critical facilities for the jurisdiction. The city does not have any critical facilities in the 1% annual floodplain.

Figure IND 4: Indianola Critical Facilities Map

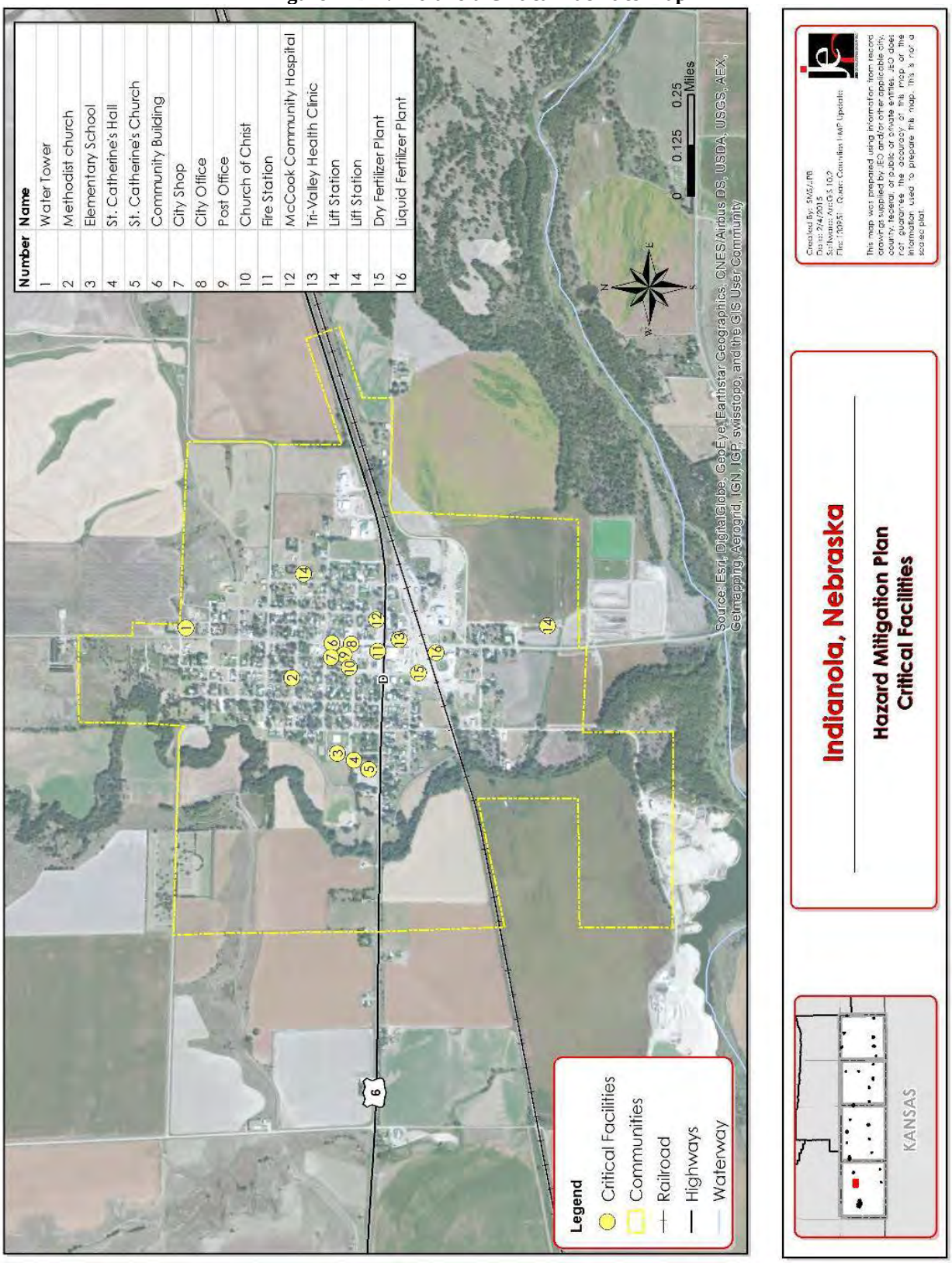
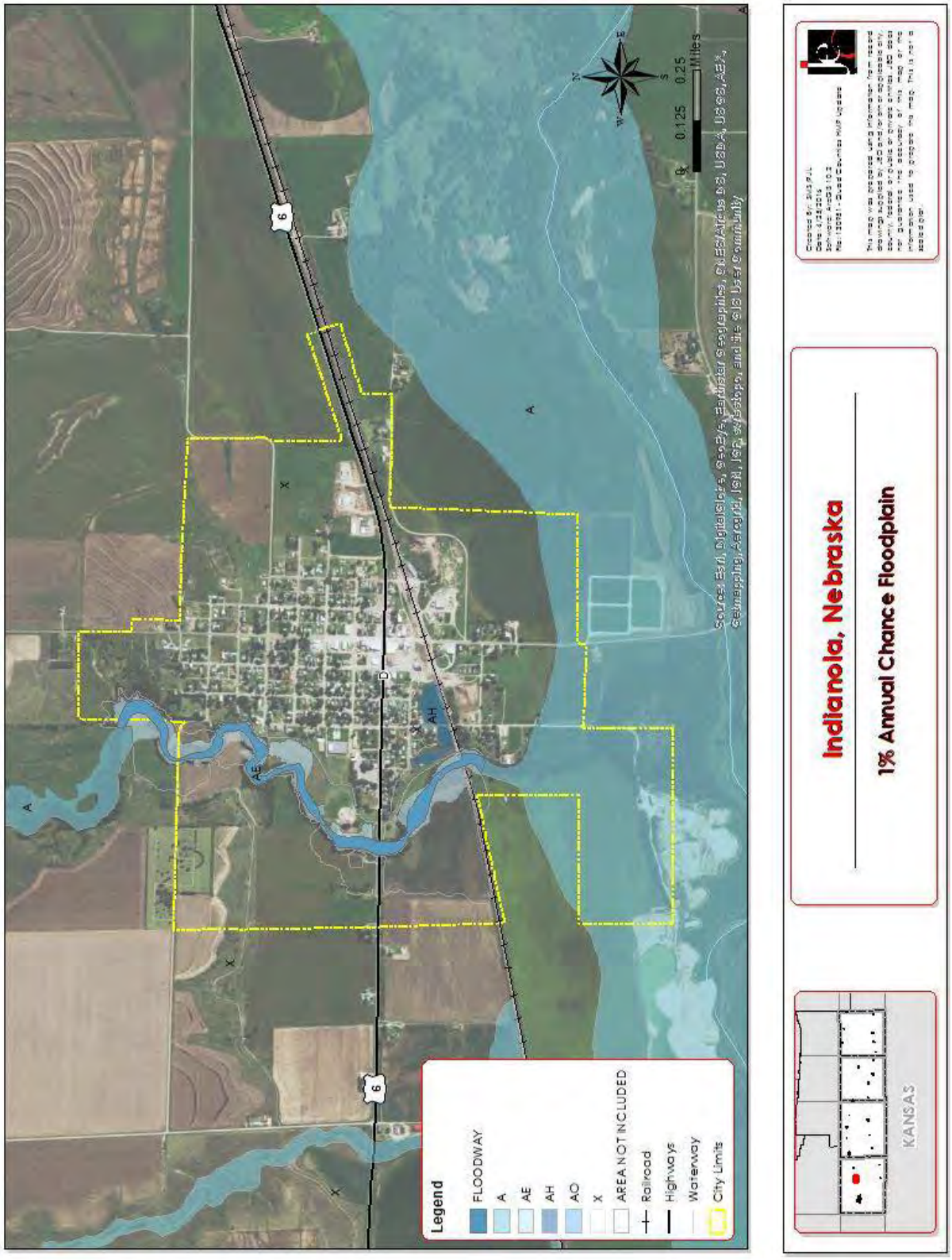


Figure IND 5 shows the 1% annual floodplain map for the City of Indianola. The city has 13 parcels worth $576,157 in the floodplain. There are no critical facilities in the floodplain. The initial FIRM for Indianola was developed in November of 1990. Indianola does participate in the NFIP, but there are no policies in effect as of February 28, 2015.

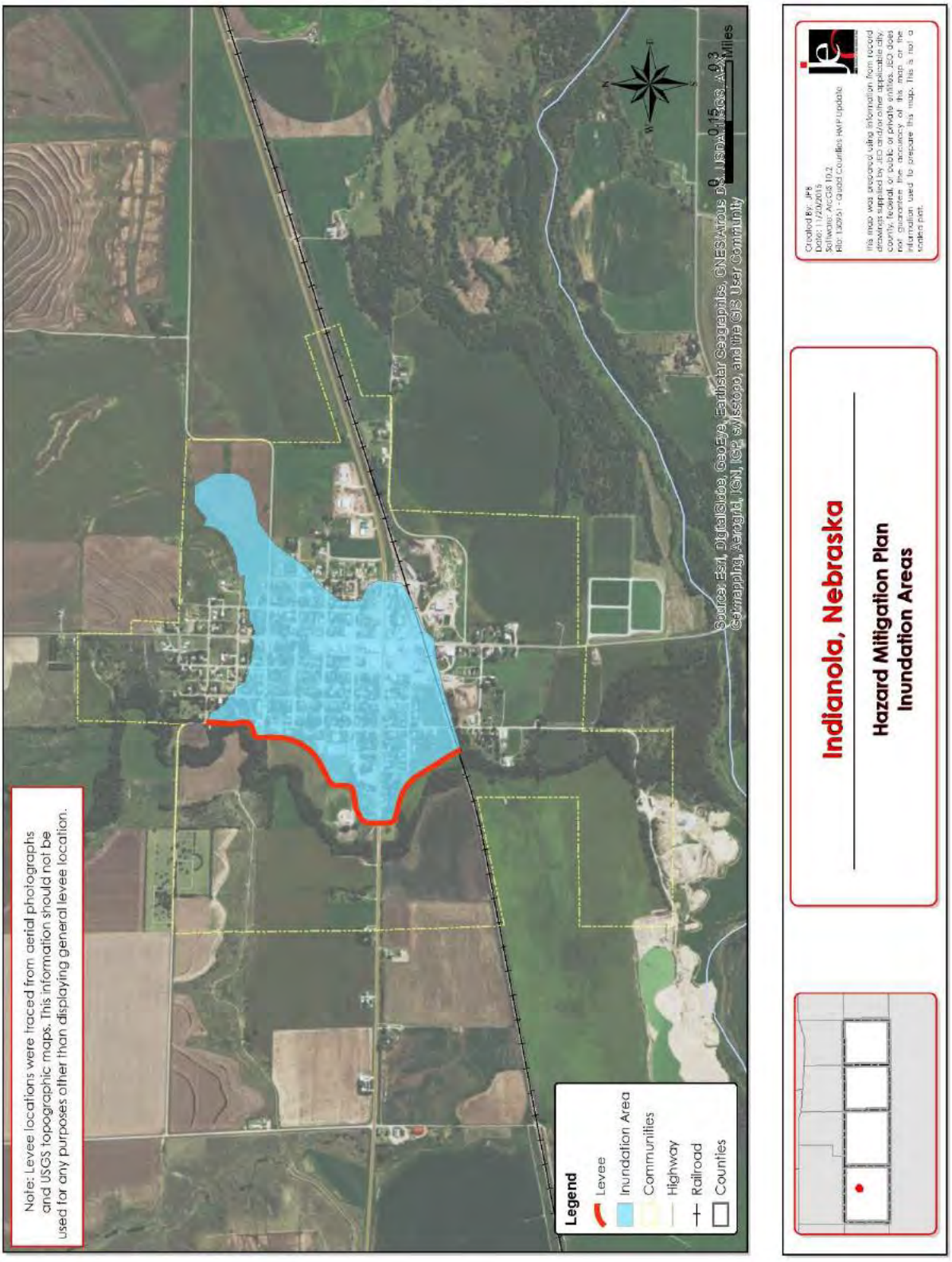
Figure IND 5: Indianola 1% Annual Chance Floodplain



Levees

There is one levee located in the city. Figure IND 6 shows the location of the levee. The levee is 0.86 mile in length and protects 166.59 acres. The levee was constructed in 1949 by the USACE and then turned over to the City of Indianola for operations and maintenance. The levee was last inspected in July of 2014 and was rated as "Minimally Acceptable." The levee is certified by FEMA to provide 1% annual flood protection.

Figure IND 6: Indianola Levee Location



Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of six chemical storage sites in the City on Indianola, and only one of these sites houses materials categorized as hazardous. Table IND 2 lists facilities that house hazardous materials only.

Table IND 2: Chemical Storage Fixed Site

Facility	Address	Hazardous Material
Ag Valley Co-op Non Stock	Jct. 5th & C Sts, Indianola	Paraquat Dichloride

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there are no historic sites located in Indianola.

Future Development Trends

In the past five years, Indianola has demolished a number of buildings. No housing or commercial development is planned in the next five years.

Risk Assessment

Hazard Identification

Table IND 3 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table IND 3: Indianola Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Sites)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought*	Yes	Significant economic impacts
Earthquake	No	None
Extreme Heat	Yes	None
Flooding*	Yes	Property damages
Grass/Wildfire*	Yes	None
Hail	Yes	None
High Winds	Yes	None
Landslide	No	None
Levee Failure*	No	Significant property damages
Severe Thunderstorm*	Yes	Property damages, injuries and loss of life
Severe Winter Storm*	Yes	Property damages, injuries and loss of life
Terrorism	No	None
Tornados*	Yes	Significant property damages, injuries and loss of life

** Identified as a top concern by the local planning team*

The top hazards in Indianola are identified in the table above. These hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 19 severe weather events from 1996 to 2014 in the City of Indianola. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds.

Table IND **4** provides a summary of events that caused damage within the city.

Table IND 4: Indianola Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
8/10/1996	Tornado	F2	0	0	$750,000
6/18/1997	Thunderstorm Wind	Unknown	0	0	$2,000
8/8/2002	Thunderstorm Wind	52 kts./ 60 mph	0	0	$100
8/3/2010	Thunderstorm Wind	70 kts./ 81 mph	0	0	$10,000

Source: NCDC

Drought

Drought was identified as a significant concern by the local planning team. The Indianola economy is based on the surrounding agricultural producers. A drought affecting these agricultural producers would have significant economic impacts on Indianola.

Water supply has been identified as sufficient for municipal needs.

Flooding

There have been no reported flooding events in the City of Indianola. However, there are 13 improvements located in the floodplain. There are no repetitive loss properties as of March 2015. Indianola is a member of the NFIP, but there were no policies in force as of February 2015.

Table IND 9: Structures in the Floodplain

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
317	$13,809,199	$43,562	13	$576,157

Source: Red Willow County Assessor

Grass/Wildfire

Wildfires and pasture fires regularly occur in the area surrounding Indianola. Indianola has a volunteer fire department. The department has a sufficient water supply, and sufficient equipment for firefighting. In the event of a wildfire, Indianola has Mutual Aid Agreements with: Bartley, Red Willow Western, Beaver Valley, and McCook.

Levee Failure
Indianola is protected with a 0.86 mile levee on the west side of the community. According to the local planning team, the levee is FEMA certified and provides 100 year flood protection. The levee is owned by the Army Corp of Engineers.

The levee was last inspected in July of 2014 and was rated as "Minimally Acceptable". As seen in Figure IND 6, the levee protected area contains the majority of structures within the community. If the levee were to fail, structures such as homes, and infrastructure such as streets and sewer would be damaged from flooding.

Severe Thunderstorms
Indianola has had three thunderstorms reported by NCDC that have caused $12,100 in damages. Severe thunderstorms are a regular part of the climate in Indianola and the rest of the planning area. Thunderstorms occur several times a year, even if they have not been reported. Critical municipal records are protected with surge protectors on electronic devices.

Severe Winter Storms
There are no designated snow routes but an emphasis is made to keep Main Street clear. The streets are cleared by the city. Snow removal resources have been determined sufficient by the local planning team.

Tornados
Tornados have the ability to cause significant damages and loss of life. In 1996, an F2 tornado in Indianola caused $750,000 in property damages. There is a data backup system for municipal records. Storm shelter is located at 120 N. 4th Street. Mutual Aid Agreements with neighboring communities.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capability, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

The City of Indianola is governed by a mayor and a five member city council. The City of Indianola government includes the following departments and offices:

- Clerk
- Utilities
- Library
- Fire Department
- Ambulance

Table IND 5: Indianola Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes
	Capital Improvements Plan	Yes
	Hazard Mitigation Plan	Yes
	Economic Development Plan	No
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	No
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes
	Building Codes	Yes
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	No
	Civil Engineering	Yes, Contract
	Staff Who Can Assess Community's Vulnerability to Hazards	No
	Grant Manager	No
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	No
	Community Development Block Grant	No
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	No
	Storm Water Service Fees	No

Survey Components/Subcomponents		Comments
	Water/Sewer Service Fees	No
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	No
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No
	Natural Disaster or Safety related school programs	No
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	No
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in the Table IND 5 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraphs present a summary of the findings of this analysis.

Indianola has a comprehensive plan but it was last updated in 1969 and does not discuss natural hazards. Indianola is in the process of updating their comprehensive plan. The updated comprehensive plan will address hazards facing the community and discourage development in hazardous areas such as the floodplain.

Indianola has an annex to the Red Willow County Local Emergency Operations Plan. This plan was last updated in 2011 and provides clear assignment of responsibility during an emergency. The City of Indianola and the Fire Department are familiar with the Red Willow County Local Emergency Operations Plan.

Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The City of Indianola has limited fiscal capabilities and administrative support available for implementing mitigation projects. The city will continue to benefit from strong partnerships, such as with the county and MRNRD, and will need to explore outside funding assistance for project implementation. Through this update process, the planning team reviewed previously identified mitigation projects and removed projects that were deemed unrealistic or no longer necessary.

Mitigation Strategy

Completed Mitigation Projects

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$20,000
Funding	Village funds
Timeline	Completed
Lead Agency	Utilities Supervisor, Village Board
Action since 2010 plan	Constructed storm shelter with sufficient capacity to serve the village needs.

New/Ongoing Mitigation Projects

Description	Backup Power Generators
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$30,000
Potential Funding	HMGP, PDM, Village funds
Timeline	5+ Years
Priority	Medium
Lead Agency	Utilities Supervisor
Action since 2010 plan	Installed generator at lift station. Currently identifying critical facilities in need of backup power supply.

Description	Stormwater System and Drainage Improvements
Analysis	Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 - $100,000+
Potential Funding	HMGP, PDM, Village funds
Timeline	5+
Priority	Medium
Lead Agency	Utilities Supervisor, Village Board
Action since 2010 plan	Not yet started. Identified area near Main Street as in need of improvements.

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 – 100,000+
Potential Funding	HMGP, PDM, DNR, MRNRD, Village funds
Timeline	Ongoing
Priority	High
Lead Agency	Utilities Supervisor
Action since 2010 plan	Stream banks and levee are constantly maintained. Village installed rip rap in 2015.

Description	Drainage Study/Stormwater Master Plan
Analysis	Drainage Studies Can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each
Goal/Objective	Goal 2/Objective 2.2

Description	Drainage Study/Stormwater Master Plan
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 - $100,000+
Potential Funding	HMGP, PDM, CDBG, Village funds
Timeline	5+ Years
Priority	Low
Lead Agency	Utilities Supervisor, Village Board
Action since 2010 plan	Not yet started. Identified downtown area as potential future study area.

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	Village funds
Timeline	Ongoing
Priority	Medium
Lead Agency	Floodplain Administrator
Action since 2010 plan	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	Village funds
Timeline	Ongoing
Priority	Medium
Lead Agency	Village Board, Utilities Supervisor, Red Willow County Emergency Manager, Fire Department
Action since 2010 plan	Village and fire department has ongoing effort to educate residents regarding hazards.

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's, water tanks/trucks, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles and identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	All hazards
Estimated Cost	Varies by need
Potential Funding	HMGP, PDM, Village funds, Rural Fire
Timeline	2-5 Years
Priority	Medium
Lead Agency	Utilities Supervisor, Village Board, Fire Department
Action since 2010 plan	Purchased new ambulance since 2011 update.

Description	Alert/Warning Sirens
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or the placement of new sirens.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$15,000+
Potential Funding	HMGP, PDM, Village funds
Timeline	2-5 Years

Description	Alert/Warning Sirens
Priority	Medium
Lead Agency	Fire Department, Utilities Supervisor
Action since 2010 plan	Installed new siren in 2008. Identified need to modify sirens to remote activated.

Removed Mitigation Projects

Description	Power Service, Electrical, and Water Distribution lines
Analysis	Indianola can work with their Public Power Provider and the city utilities department to identify vulnerable transmission and distribution lines and plan to bury lines underground or retrofits existing structures to be less vulnerable to storm events. Electrical Utilities shall be required to use underground construction methods where possible for future installation of power lines.
Hazard(s) Addressed	All Hazards
Reason for Removal	Determined to be unfeasible at this time.

Description	Stabilize/Anchor Fertilizer, Fuel, and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement. If left unanchored tanks could present major threat to property and safety in a tornado or high wind event.
Hazard(s) Addressed	Tornados and High Winds
Reason for Removal	No longer needed. Lack of unanchored tanks.

Description	Floodplain Regulation Enforcements and Updates
Analysis	Continue to enforce local floodplain regulations for structures located in the 1% annual chance floodplain. Strict enforcement of the type of development and elevations of structures should be considered through issuance of building permits by any Nebraska city. Continue education of building inspectors or Certified Floodplain Managers.
Hazard(s) Addressed	Flooding
Reason for Removal	No longer needed as a mitigation action. Regulations are constantly regulated and enforced. This action is redundant with "maintain good standing in NFIP' mitigation action.

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Hazard(s) Addressed	All hazards
Reason for Removal	No longer needed

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Hazard(s) Addressed	Flooding
Reason for Removal	This action is redundant with the 'maintain good standing in NFIP' mitigation action

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City of McCook

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

The City of McCook participated in this hazard mitigation plan in order to reduce the risk to human life and property from hazards. Their participation was extensive; a representative from McCook attended every public meeting; met with members from the planning team; completed all hazard identification and project identification worksheets; engaged the general public in the planning process; and, assisted in plan development coordination and data analysis.

For McCook, the top concerns that were identified through this planning process include chemical spills during transportation, extreme heat, severe thunderstorms, and tornados.

The following people were involved in the development of McCook's Participant Section:

Table MCC 1: City of McCook Plan Contributors

Name	Title	Department / Organization
Lori Schmidt	Deputy City Clerk	City of McCook
Marc Harpham	Fire Chief	City of McCook
Nate Schneider	City Manager	City of McCook
Alan Kotschwar	Red Willow County Sheriff	Red Willow County

This section contains important information about the City of McCook relevant to hazard mitigation, including the following elements:

- Location /Geography/Climate
- Demographics
    - Population Trends
    - Population by Age
    - Housing and Income Data
    - Age of Housing
- Governance
- Transportation
- Future Development Trends
- Parcel Improvements and Valuations
- Critical Infrastructure and Key Resources
- Historical Hazard Events
- Local Hazard of Concern / Risk Assessment
- Capability Assessment
- Plan Integration
- Mitigation Actions

Community Profile

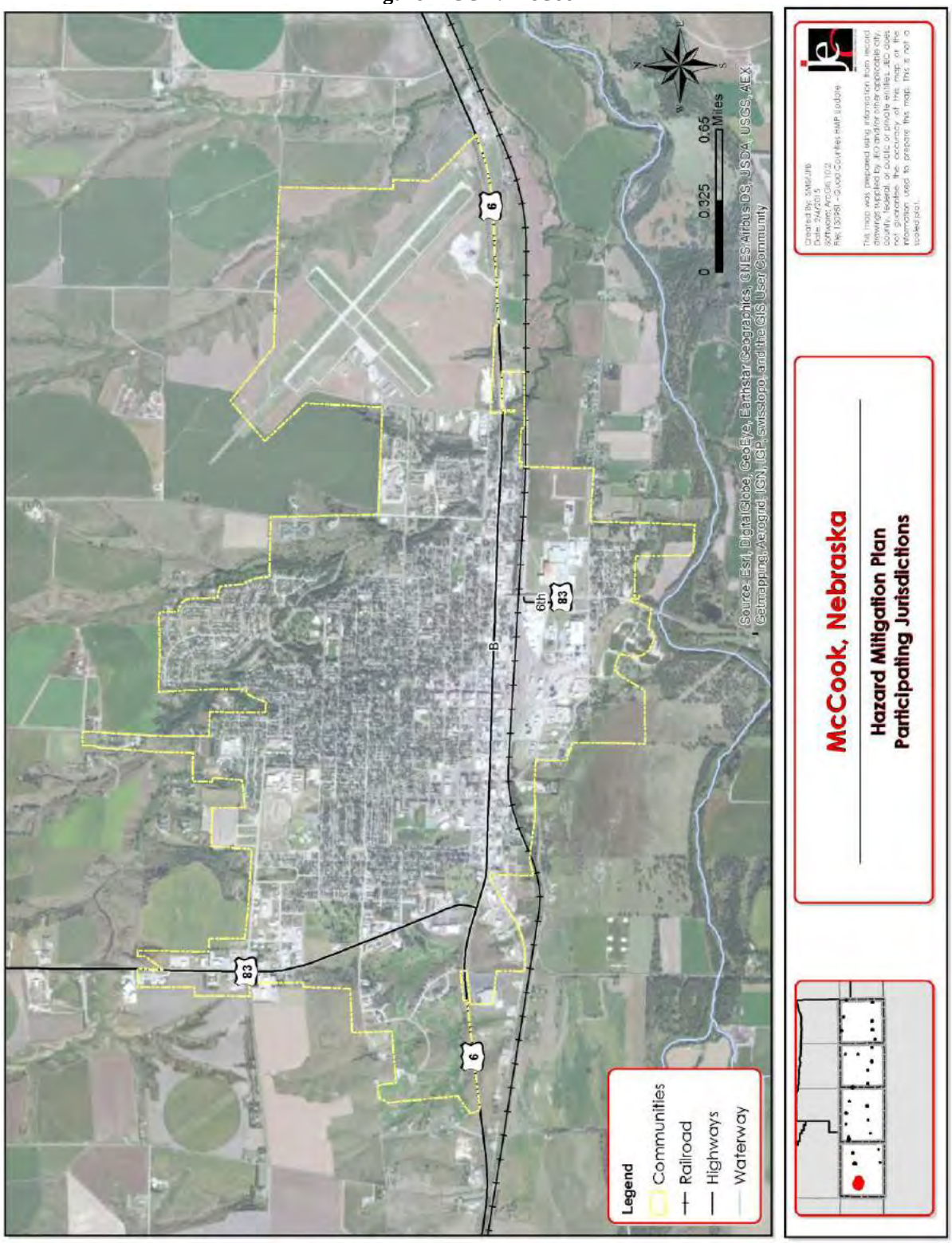
Location/Geography

McCook is a city located in the western portion of Red Willow County. The City of McCook covers an area of 3,456 acres and have an elevation of 2,572 feet above sea level. McCook is approximately 65 miles south of North Platte. The topographic region McCook lies in is that of the dissected plains. This hilly land has moderate to steep slopes and sharp ridge crests. They are remnants of the old plain eroded by water and wind. The Republican River flows to the south of the city.

Transportation

Figure MCC 1 shows the major transportation routes for the city. There are two major highways that pass through the city, US HWY 6 and US HWY 83. According to the Nebraska Department of Roads the average daily traffic count for US HWY 6 is 4,105 vehicles with 455 of those being heavy trucks passing to the east of the city and 4,920 vehicles with 395 of those being heavy trucks passing to the west of the city. The traffic count for US HWY 83 is 2,055 vehicles with 265 of those being heavy trucks passing to the north of the city and 3,095 vehicles with 370 of those being heavy trucks passing to the south of the city. There is one railroad that passes through the southern portion of the city. There are numerous chemicals that pass through the city on the highways and railroad. Some of the chemicals include sulfuric acid, ammonium nitrates, ethanol, anhydrous ammonia, diesel, gasoline, and other combustible and corrosive material. The McCook Municipal Center is located within 500 feet of the railroad and 400 feet of USHWY6. The city also has a regional airport.

Figure MCC 1: McCook



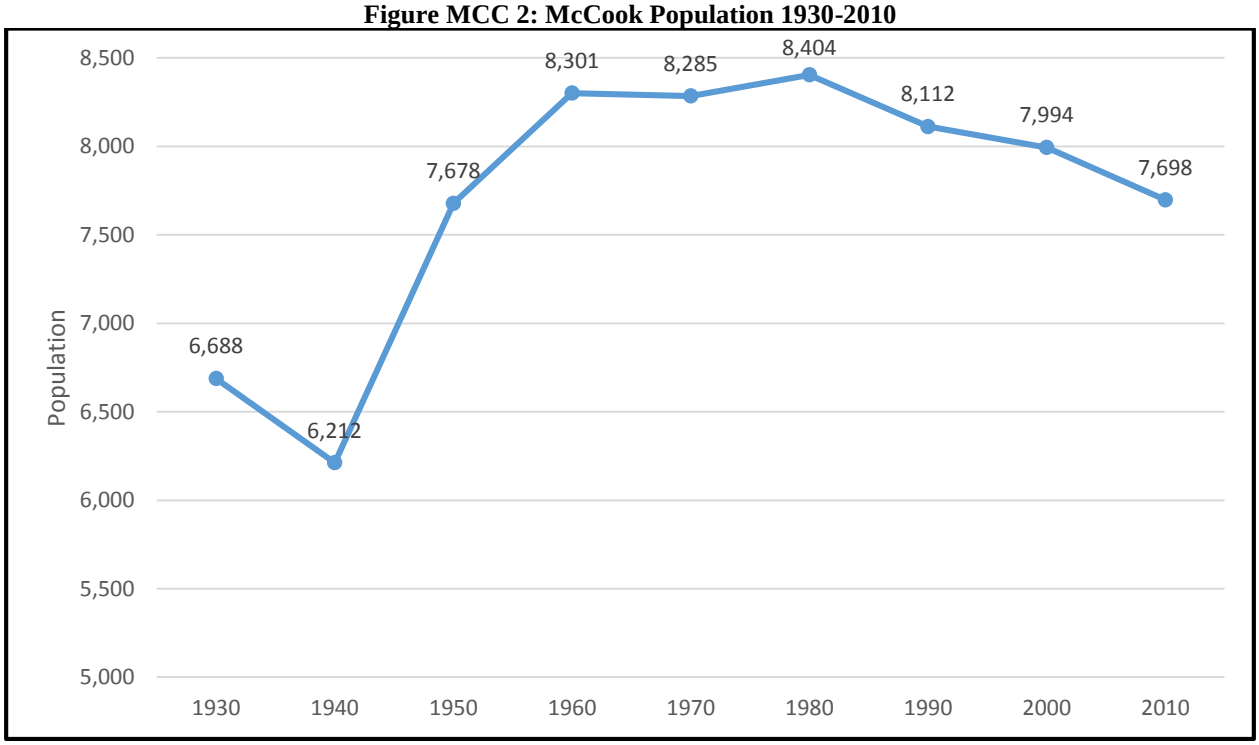
Climate

All the climate data for the county has been taken from a station located at the McCook Airport (255310). Please refer to the *Red Willow County Section* for a climate summary for the city.

Demographics

Figure MCC 2 displays the population for McCook from 1930 to 2010. The city had a period of growth from about 1940 to 1960. The population was relatively stable from 1960 to 1980. There has been some decline since 1980 but the population sees to becoming stabilized. A stable in population results in a reliable tax revenue for the city, which can make it easier implement mitigation projects.

Figure MCC 2: McCook Population 1930-2010



Source: US Census

Table MCC 2 illustrates the age distribution and median age for Red Willow County in comparison to the City of McCook. The city has a higher percentage of population over the age of 64 than that of the county by one percent. The city has a lower median age than that of the county by about one year.

Table MCC 2: McCook Age Distribution

Age	Red Willow County	McCook
<5	6.1%	6.8%
5-64	75.2%	73.8%
>64	18.7%	19.7%
Median	41.8	40.7

Source: U.S. Census Bureau, 2010

Housing and Economics

The median household income, per capita income, home value and rent for the county as a whole are compared with the City of McCook in Table MCC 3. Home values for the city are about $600 more than that of the county, and rent values are roughly the same as the county. The median income for the city is

about $4,300 less than the county. The lower income and higher cost of living could explain the decline in population discussed in the demographic section.

Table MCC 3: McCook Housing Value and Income

	Red Willow County	McCook
Median Household Income[1]	$45,345	$41,055
Per Capita Income[1]	$23,320	$22,979
Median Home Value[2]	$84,200	$83,600
Median Rent[2]	$589	$595

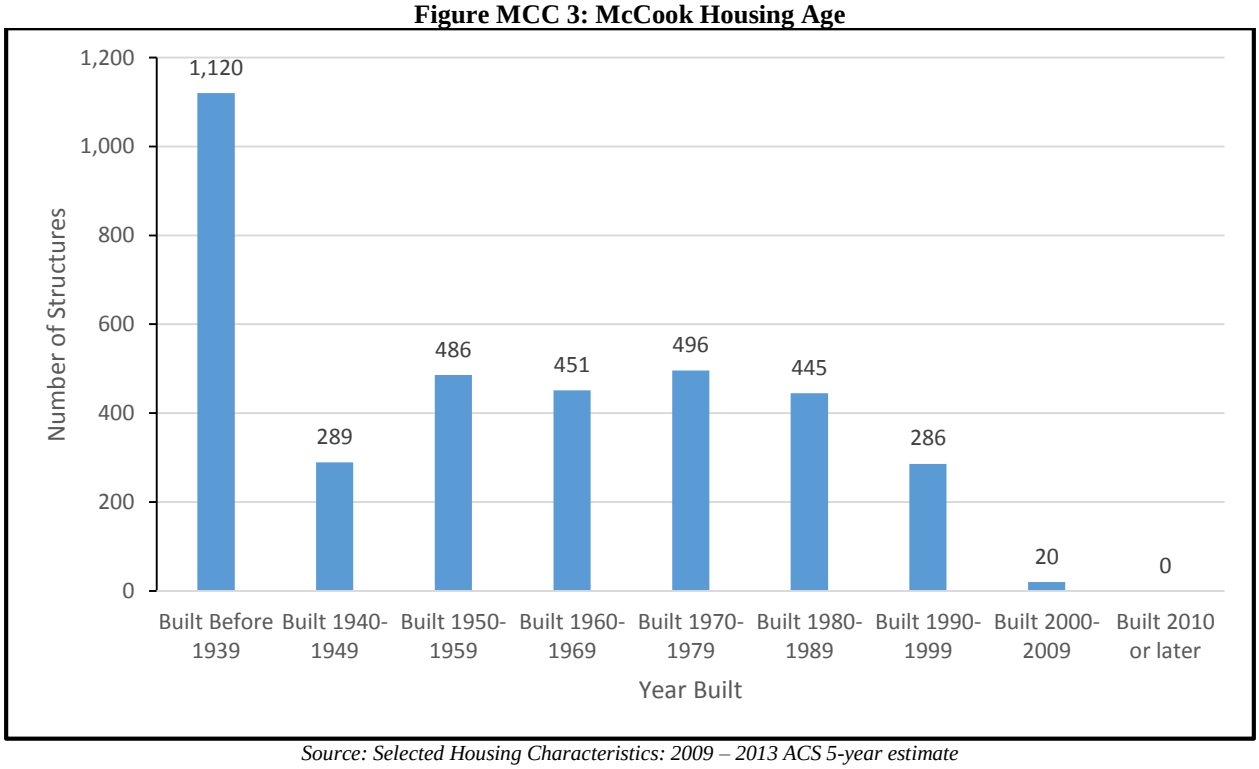
1Selected Economic Characteristics: 2009 – 2013 ACS 5-year estimate, 2Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

According to the U.S. Census Bureau data (
Figure MCC **3**) the city has 3,593 housing units with 93 percent of those units occupied (

***Table* MCC** 4). Approximately five percent of the city's housing stock is classified as mobile homes. The city has two mobile home parks located at West 10th and West B Streets, and West Q and West 4th Streets. In addition to the mobile home parks the city has identified multiple blighted properties throughout the city. Over 52 percent of the city's housing stock was built before 1960. In conjunction with the aging housing stock, residents living within these types of structures will be especially vulnerable to high winds, severe thunderstorms, and tornados. Over 80 percent of the city's homes were built prior to the first FIRM for the city in 1983. Houses built prior to this year may not be constructed above the base flood elevation. There are 106 parcel improvements in the floodplain.

The housing stock in the city is not sufficient for the population. There are few vacant properties but they are not considered livable as residential structures. There are also a few houses available for purchase or rent. The city does try to address nuisance property and older vacant structures through the city's Property Resolution Team and through the Health Board Process.

Figure MCC 3: McCook Housing Age



Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Table MCC 4: McCook Housing Units and Occupied Housing

Jurisdiction	Total Housing Units					Occupied Housing Units			
	Occupied		Vacant			Owner		Renter	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
Red Willow County	4,732	90.1%	522	9.9%		3,377	71.4%	1,355	28.6%
McCook	3,345	93.1%	248	6.9%		2,279	68.1%	1,066	31.9%

Source: Selected Housing Characteristics: 2009 – 2013 ACS 5-year estimate

Major Employers

The major industries for the City of McCook are educational services and health care (21.9%), retail trade (20.6%), and arts, entertainment, and recreation (10.1%).

The major employers for the City of McCook include Valmont Industries, Parker Hannifan, and McCook Community Schools. There are some members of the community that do commute to other nearby communities for work, but it is more likely that residents from other communities commute to the city for work.

Parcel Improvements and Valuation

The planning team requested GIS parcel data from the County Assessor. This data allowed the planning team to analyze the location, number, and value of property improvements at the parcel level. The data did not contain the number of structures on each parcel. A summary of the results of this analysis is provided in Table MCC 5.

Table MCC 5: Parcel Improvements

Number of Improvements	Total Improvement Value	Mean Value of Improvements Per Parcel	Number of Improvements in Floodplain	Value of Improvements in Floodplain
3,349	$282,705,852	$84,415	106	$7,342,441

Source: Nebraska Department of Revenue, Property Assessment Division

Critical Infrastructure/Key Resources

Critical facilities were identified during the 2010 planning process and updated by the McCook planning team as a part of the plan update.

Table **MCC** 6 and Figure MCC 4 provide a summary of the type and location of critical facilities for the jurisdiction. There are 19 critical facilities that have a backup generators. There are four critical facilities that have areas designated as storm shelters, but they are not classified as safe rooms. The city does not have any critical facilities in the 1% annual floodplain.

Table MCC 6: Critical Facilities List

Critical Facility Number	Critical Facility
1	McCook Waste Water Treatment
2	Water Booster Pump Station
3	Sewer Lift Station
4	Water Tower West
5	McCook Elementary School
6	McCook Jr. High School
7	McCook Sr. High School
8	Water Tower East
9	McCook Community College Brooks Hall Dorm
10	McCook Community College Campus
11	Van Diest North
12	NPPD Sub Station
13	NPPD Sub Station
14	Kelly Creek Flood Control Dam
15	Sewer Lift Station
16	Community Hospital
17	St. Patrick School
18	McCook Ben Nelson Regional Airport
19	Crop Production Services
20	Red Willow Aviation/Fertilizer
21	NPPD Sub Station
22	Source Gas Sub Station
23	Sewer Lift Station
24	Public Safety Center
25	Valmont Industries
26	Van Diest South
27	Frenchman Valley Fertilizer
28	Crop Production Services
29	City Maintenance Complex
30	Frenchman Valley Grain Elevator
31	Frenchman Valley Feedmill
32	Mallock Oil/Propane Storage
33	Grain Elevator
34	BNSF Depot
35	NPPD Sub Station
36	Source Gas Sub Station
37	Household Hazardous Waste Facility
38	Sewer Lift Station
39	Sewer Lift Station
40	Solid Waste Transfer Station

Figure MCC 4: McCook Critical Facilities Map

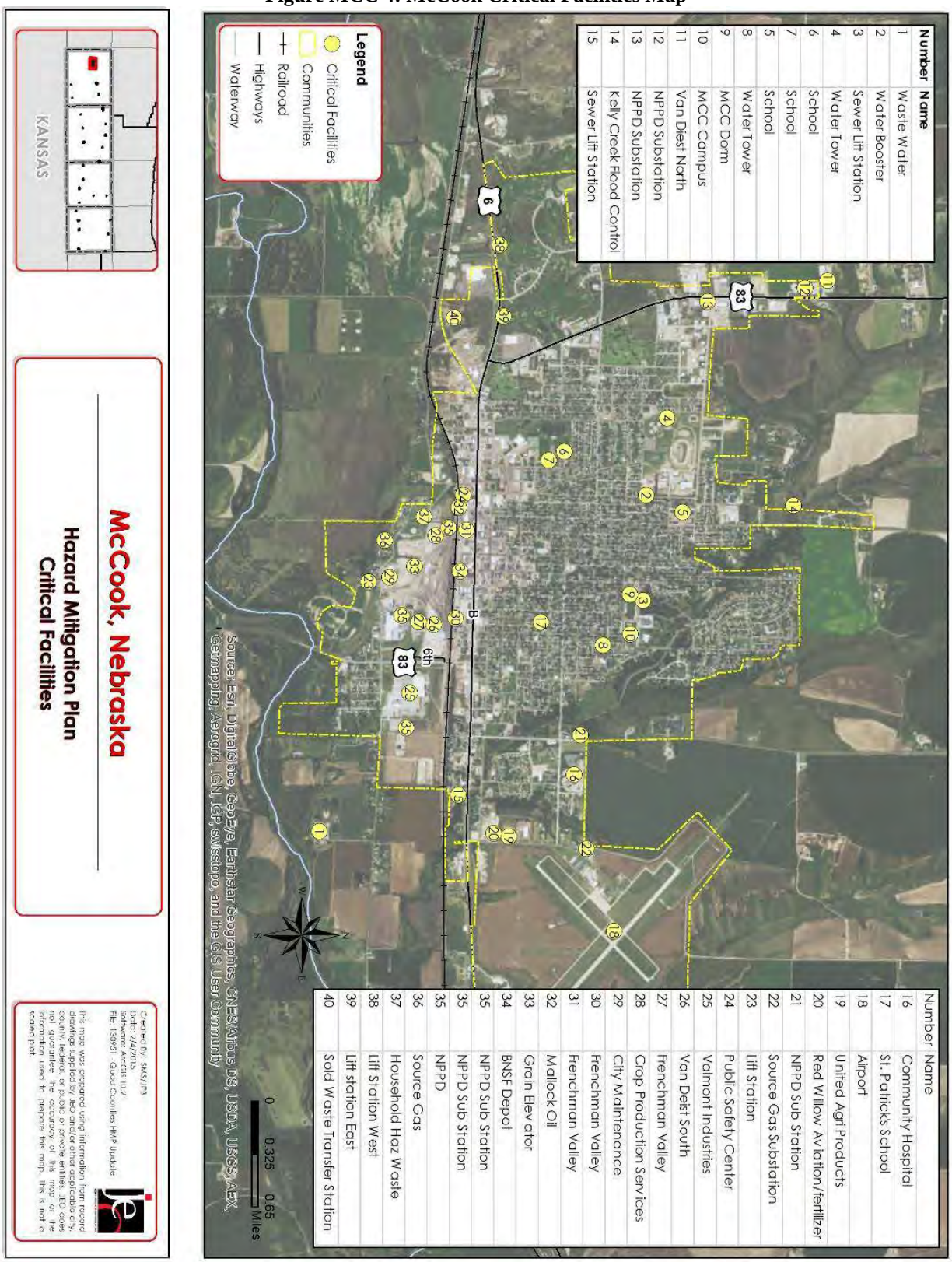


Figure MCC 5 shows the 1% annual floodplain for the City of McCook. McCook has 106 parcel improvements in the annual 1% floodplain. Those improvements are valued at $7,342,441. There are no critical facilities in the floodplain. There are no repetitive loss properties in the city. The initial FIRM for McCook was developed in May of 1983. McCook does participate in the NFIP, with 10 policies in effect worth $2,011,500 as of February 28, 2015.

Figure MCC 5: McCook 1% Annual Chance Floodplain

Levees

There are no levees located in the city.

Chemical Storage Fixed Sites

According to the Tier II System reports submitted to the Nebraska Department of Environmental Quality, there are a total of 36 chemical storage sites in the City of McCook, and 11 of these sites house materials categorized as hazardous. American Ag Lab is planning on expanding their services in McCook and may start reporting under the Tier II System in the state. There is also a fertilizer plant 10 miles west of McCook that the city is aware of. There are four critical facilities that are located near chemical fixed sites and could be affected in the event of a spill. The facilities include the hospital, the airport, the work ethic camp, and the municipal building. Residents near chemical storage sites get information from Southwest Nebraska Public Health and they city will put out notices as needed. If there were to be a spill the McCook Police and Fire Departments would respond along with the Red Willow County Sheriff's Office/Emergency Manager, the Nebraska State Patrol, and the rural fire department. Table MCC 7 lists facilities that house hazardous materials only.

Table MCC 7: Chemical Storage Fixed Sites

Facility	Address	Hazardous Material
Century Link	402 W 1st St, McCook	Sulfuric Acid
Crop Production Services	101 Burlington Dr, McCook	Anhydrous Ammonia, Paraquat Dichloride
Frenchman Valley Farmers Co-op	203 Karrer St, McCook	Anhydrous Ammonia
Parker Hannifin Corporation	400 South St, McCook	Sulfuric Acid
Plain Equipment Group	1207 W B St, McCook	Sulfuric Acid
Red Willow Chemical & Fertilizer	308 Airport Rd, McCook	Terbufos
Suess Field Unit	Road 382, McCook	Hydrogen Sulfide
United Suppliers Inc.	402 Airport Rd, McCook	Dimethoate, Paraquat Dichloride, Terbufos, Zinc Phosphide
Valley Aerial Spray Inc.	71296 Road 384, McCook	Dimethoate
Valmont Industries Inc.	75 US Highway 83, McCook	Sulfuric acid
Van Diest Supply CO Warehouse	71703 Highway 83, McCook	Paraquat Dichloride

Source: Nebraska Department of Environmental Quality

Historic Sites

According to the National Register of Historic Places for Nebraska, there are eight historic sites located in the City of McCook. There is one site in the 1% annual floodplain.

Table MCC 8: National Historic Registry

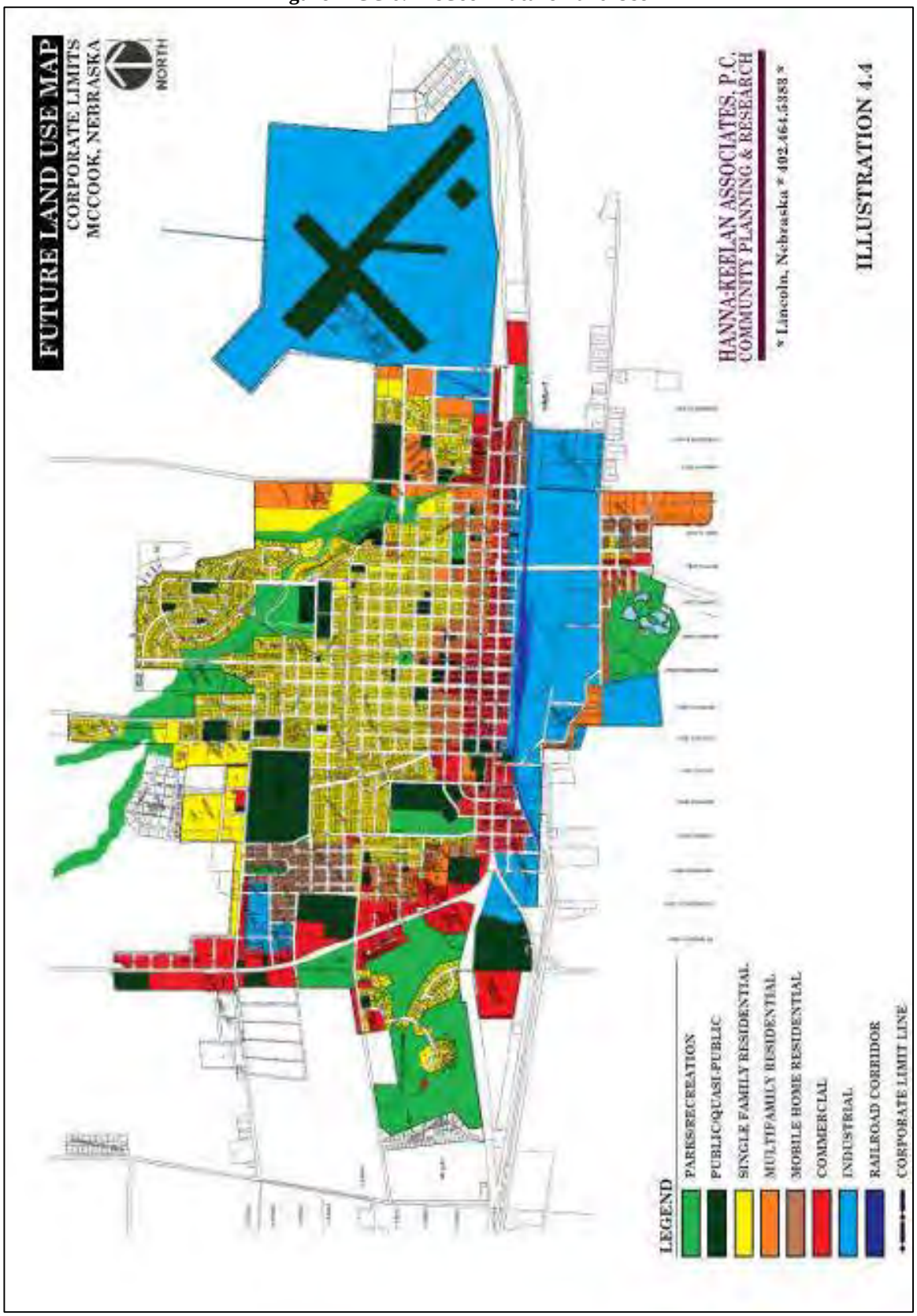
Site Name	Date Listed	Classification	In Floodplain?
Doyle Archeological Site	12/4/1974	Site	Yes
Norden Bombsight Vault	6/17/1993	Structure	No
H.P. Sutton House	5/22/1978	Building	No
Keystone Hotel	7/5/2001	Building	No
McCook Y.M.C.A.	3/9/2000	Building	No
Red Willow County Courthouse	7/5/1990	Building	No
Senator George W. Norris House	5/28/1967	Building	No
McCook Carnegie Library	9/12/1985	Building	No

Source: Nebraska State Historical Society

Future Development Trends

According to the city's comprehensive plan, the city would like to achieve a stabilized population base by 2023. In order to do this the city will need housing and availability of new subdivisions to support the required development. The city would like to see development of single family housing within the city's corporate limits. There are a few tracts of land that remain in a couple of subdivisions within the city. McCook will also look at expanding its multifamily housing development over by 2023 to expand affordable housing options within the city. The city plans to keep most of the future development out of the floodplain, through making those areas parks of greenspaces. There will be some areas of the floodplain that have already developed that the city will allow to stay, but most new development will be done outside of the floodplain.

Figure MCC 6: McCook Future Land Use



In addition to what has been identified in the comprehensive plan the city identified some changes that have occurred since the last plan update. There has been a new subdivision that was created and new housing is being developed. Some of the new buildings include a municipal building, a jail, an event center for McCook Community College, and United Agri Products moved locations. Red Willow Aviation and the hospital both expanded in the last five years. There are some new businesses that will be in McCook the largest of which is American Ag Labs. The other new buildings will be smaller retail shops.

Risk Assessment

Hazard Identification

Table MCC **9**9 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table MCC 9: McCook Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Sites)	No	None
Chemical Spills (Transportation)*	Yes	Property damages, injuries and loss of life
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat*	Yes	Injuries to vulnerable populations
Flooding	Yes	None
Grass/Wildfire	Yes	None
Hail*	Yes	Significant property damages
High Winds	Yes	None
Levee Failure	No	None
Severe Thunderstorm*	Yes	Significant property damages
Severe Winter Storm*	Yes	Power outages, property damages and injuries
Terrorism	No	None
Tornados*	Yes	Significant damages, injuries and loss of life

** Identified as a top concern by the local planning team*

The top hazards in McCook are chemical spills during transportation, extreme heat, hail, severe thunderstorms, and tornados. These hazards that raise the greatest concerns for the community are discussed in detail.

Historical Occurrence

The NCDC reported 160 severe weather events from 1996 to 2014 in the City of McCook. The events listed below do not include any information about hazards that the NCDC classifies as zonal, such as blizzards, winter storms, and high winds.

Table MCC 10 provides a summary of the events that caused damage in the city.

Table MCC 10: McCook Historical Occurrences

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
7/21/2002	Thunderstorm Wind	70 kts./ 81 mph	0	2	$100,000
8/8/2002	Thunderstorm Wind	65 kts./ 75 mph	0	0	$10,000
8/8/2002	Thunderstorm Wind	60 kts./69 mph	0	0	$1,000
4/24/2007	Flash Flood	-	0	0	$25,000
5/23/2008	Flood	-	0	0	$200,000
4/16/2009	Lightning	-	0	0	$1,000
8/30/2010	Thunderstorm Wind	70 kts./ 81 mph	0	0	$41,000
5/23/2011	Lightning	-	0	0	$6,000
7/10/2011	Thunderstorm Wind	52 kts./ 60 mph	0	0	$200
7/11/2011	Thunderstorm Wind	59 kts./	0	0	$1,500
8/9/2011	Hail	1.75 in.	0	0	$1,000
7/8/2013	Thunderstorm Wind	70 kts./ 81 mph	0	0	$50,000
8/7/2013	Thunderstorm Wind	52 kts./ 60 mph	0	0	$47,500

Source: NCDC

Chemical Spills during Transportation

The PHMSA reported 16 chemical spills in McCook. The spills caused $4,309 in damages. The largest spill was 3,980 LGA of crude oil in 1985. After a rollover accident. The routes of most concern for the city are highway 6/34, highway 83, and the rail line that passes through McCook. There are numerous chemicals that pass through the city on the highways and railroad. Some of the chemicals include sulfuric acid, ammonium nitrates, ethanol, anhydrous ammonia, diesel, gasoline, and other combustible and corrosive material.

The McCook Municipal Center is located within 500 feet of the railroad and 400 feet of USHWY6. The WEC is located just off highway 83 on the north of the city. If a spill where to occur the McCook Fire Department, Police Department, Red Willow County Sheriff/Emergency Manager would respond to the incident.

Extreme Heat

The weather station located at the McCook Municipal Airport reports an average of 52 days a year over 90^{o}F. During 2013 the city reported that the city reached temperature over 100^{o}F on several occasions as well. They city has not reported any damages that have occurred due to heat.

The city does not have any concerns with power supply during extreme heat events. Almost half of the critical facilities in the city have backup generators if the city were to lose power due to heat the critical facilities would still be able to function. The city will set up cooling centers as necessary. The last time the city used cooling centers was in 2013. There are numerous organization that will help to assist vulnerable populations during these events including the hospital, Southwest Nebraska Public Health, Mid-Nebraska Community Services, and the senior center can be opened as a cooling center when necessary.

Hail
NCDC reported 85 hail events in McCook between January 1996 and December 2014. Only $1,000 in property damage was reported by NCDC for these events. However, the local planning team indicated that these storms caused significant damages to roofs, windows, and crops. Past hail events have caused damages to critical facilities.

McCook has a tree board that can evaluate hail damage to trees. Residents receive information regarding hail resistant building materials with building permits. Some critical facilities are fitted with hail resistant building materials. Municipal facilities are insured for hail.

Severe Thunderstorms
NCDC reported X severe thunderstorms (wind, rain and lightning) and XX hail events between January 1996 and December 2014 that resulted in $X in property damage. The city dealt with significant thunderstorms in 2011 and 2014 with the majority of the damage from those storms occurring due to hail.

The city does protect electronic devices with surge protectors. Most of the critical facilities have backup generators and all of the critical facilitates have weather radios. Some of the critical facilities have been retrofitted with hail resistant building material. And the municipal buildings are insured through the city. The city will remove hazardous trees as necessary and has a tree board to help with the replacement of trees.

Severe Winter Storms
NCDC reported 38 severe winter storm events for the city. There was one storm that reported in $30,000 in property losses. There was on person injured in December 2006 when her vehicle skidded on icy roads just south of McCook and her vehicle rolled. There were also two injuries in January 2011 accident that resulted in two minor injuries in McCook during a freezing rain event. The city also reported power lines were damaged in a 2006 winter storm.

To help with snow removal the city has designated snow routes that get cleared before other streets. The city has multiple snow routes that cover the entire city. The city will also use snow fences when needed along the major transportation routes in the city that are open air such as highway 6/34 and highway 83. The city is responsible for clearing its streets and is able to handle typical events however, the city's resources may be stretched during a blizzard.

Tornados
NCDC reported 5 tornados for the city that did not cause any damage. Three of the storms were rated as F/EF0 and the other two storms were not rated on the Fujita Scale.

The city does have a backup system for municipal records. The city does not have any community safe rooms they do have eight buildings that have been designated by the city and the county sheriff as protective shelters. These location include the three public schools, the First Baptist Church, St. Patrick's Catholic Church, the United Methodist Church, the YMCA, and the Southwest Public Health Department. The city does offer emergency alerts to residents.

Capability Assessment

Thus far the planning process has identified the major hazards for the communities and described and quantified the vulnerability of the community to these risks by acquiring updated information from FEMA, local jurisdiction, and other sources. The following step shall be assessing what loss prevention or preparedness mechanisms are already in place, which is referred to as capability assessment. Combining the risk assessment with the local capability assessment results in a stronger mechanism in understanding locality's "net vulnerability" and to what extent they could be able to implement the goals, objectives, and actions.

A two-step approach was applied to conduct this assessment for each participant. First, an inventory of common mitigation activities was developed through the Capability Assessment Survey completed by the participants' representatives. There are four major local capabilities considered by this assessment and they are planning & regulatory capabilities, administrative & technical capability, fiscal capability, and education & outreach capability. Please refer to *Capability Assessment* in *Section Three: Community Profile & Capability Assessment* for the overall picture of the whole county. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, local existing policies, regulation, plans, and the programs were reviewed and evaluated to determine their contributions to reducing hazard-related losses or if they inadvertently increased such losses.

Governance

The City of McCook is governed by a mayor and a five member city council. The City of McCook government includes the following departments and offices:

- Airport
- Building and Zoning
- City Attorney
- City Clerk/Treasurer
- City Manager
- Fire Department
- Library
- Parks
- Police Department
- Streets
- Utilities
- Senior Center

Table MCC 2: McCook Capability Assessment

Survey Components/Subcomponents		Comments
Planning & Regulatory Capability	Comprehensive Plan	Yes, 2013
	Capital Improvements Plan	Yes
	Hazard Mitigation Plan	Yes
	Economic Development Plan	Yes
	Emergency Operational Plan	Yes
	Natural Resources Protection Plan	No
	Open Space Preservation plan	No
	Floodplain Management Plan	Yes

Survey Components/Subcomponents		Comments
	Storm Water Management Plan	No
	Zoning Ordinance	Yes
	Subdivision Regulation/Ordinance	Yes
	Floodplain Ordinance	Yes
	Building Codes	Yes, IBC 2003
	National Flood Insurance Program	Yes
	Community Rating System	No
	Other (if any)	Wellhead Protection Plan
Administrative & Technical Capability	Planning Commission	Yes
	Hazard Mitigation Planning Commission	No
	Floodplain Administration	Yes
	Emergency Manager	Yes, County
	GIS Coordinator	No
	Chief Building Official	Yes
	Civil Engineering	Yes, Consultants
	Staff Who Can Assess Community's Vulnerability to Hazards	Yes
	Grant Manager	Yes, Committee
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	Yes
	Community Development Block Grant	Yes
	Authority to Levy Taxes for Specific Purposes	Yes
	Gas/Electric Service Fees	Yes, franchise fee
	Storm Water Service Fees	No
	Water/Sewer Service Fees	Yes
	Development Impact Fees	No
	General Obligation Revenue or Special Tax Bonds	Yes
	Other (if any)	
Education & Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes
	Natural Disaster or Safety related school programs	Yes
	StormReady Certification	No
	Firewise Communities Certification	No
	Public-private partnership initiatives addressing disaster-related issues	Yes
	Other (if any)	

Plan Integration

Building safe and smart communities can be accomplished through effective Plan integration. Integrating hazard mitigation principles into other local planning mechanisms, such as plans addressing land use, transportation, climate change, sustainability, natural and cultural resource protection, watershed management, economic development and others can greatly increase an area's level of resiliency. While this HMP planning process involved interdepartmental coordination at the local level, this planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. The plans listed in Table MCC 2 were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraphs present a summary of the findings of this analysis.

McCook's Comprehensive Plan was last updated in 2013. The comprehensive plan addresses the following hazards: flooding, tornados, winter storms, chemical spills, explosions, plane crashes, and severe weather. The comprehensive plan promotes growth away from hazardous areas, such as the floodplain.

McCook has an annex to the Red Willow County Local Emergency Operations Plan, which was last updated in 2011. This plan discusses debris management, evacuation, flooding, dam failure, hazardous materials, disease, terrorism, and other major emergencies. The plan provides clear assignment of responsibility during an emergency.

The City of McCook's zoning ordinance contains natural hazard layers and discourages development in those areas. The floodplain regulations were updated in 2013 and meet all minimum Federal and State requirements. The City's ordinances prohibit development within wetlands, floodways, and floodplains. McCook has also adopted more stringent ordinances to further reduce the risk of flooding.

McCook's subdivision regulations were also updated in 2013. These subdivision regulations restrict subdivision of land within or adjacent to natural hazard areas. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Summary

The City of McCook has the administrative staff and technical and fiscal capabilities to implement some mitigation projects without assistance. Larger projects such as safe rooms or drainage improvements may require that the city look to partner with the county emergency management, Red Willow County, MRNRD, and other regional and state agencies. Through this update process, the planning team reviewed previously identified mitigation projects and added new projects as well.

Mitigation Strategy

Completed Mitigation Projects

Description	**Backup Power Generators**
Analysis	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$30,000
Funding	City General Funds
Timeline	Completed
Lead Agency	Utilities
Action since 2010	Installed generator at the McCook Municipal Center

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$25,000
Funding	City General Funds
Timeline	Completed
Lead Agency	City Police Department, County Sheriff/Emergency Manager
Action since 2010	Built a stormproof dispatch center as part of the Municipal Center.

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$100,000+
Funding	City General Funds
Timeline	Completed
Lead Agency	Public Works
Action since 2010	Completed a drainage project on M Street in 2011, and East G Street in 2013.

New/Ongoing Mitigation Projects

Description	Hazardous Tree Removal
Analysis	Identify and remove hazardous trees and limbs
Goal/Objective	Goal 1/Objective 1.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms, severe winter storms
Estimated Cost	$20,000
Potential Funding	HMGP, PDM, City General funds
Timeline	Ongoing
Priority	High
Lead Agency	Public Works Department
Action since 2010	Trees are removed as they become a problem.

Description	Power Service, Electrical, and Water Distribution lines
Analysis	McCook can work with McCook Public Power and the city utilities department to identify vulnerable transmission and distribution lines and plan to bury lines underground or retrofits existing structures to be less vulnerable to storm events. Electrical Utilities shall be required to use underground construction methods where possible for future installation of power lines.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All Hazard
Estimated Cost	$50,000 - 70,000 per mile (electrical)
Potential Funding	HMGP, PDM, water and sewer funds, private investments
Timeline	5+ Years
Priority	High
Lead Agency	Utilities Department, McCook Public Power
Action since 2010	There have been some power lines buried in the city, but more work is needed.

Description	Safe Rooms
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, City Sales Tax Fund
Timeline	5 + Years
Priority	High
Lead Agency	Public Works, Parks Department
Action since 2010	Karrer Park has been identified as an area in need. The city would like the safe room to hold 20 to 30.

Description	Stabilize/ Anchor Fertilizer, Fuel, and Propane Tanks
Analysis	Anchor fuel tanks to prevent movement if left unanchored tanks could present major threat to property and safety in a tornado or high wind event
Goal/Objective	Goal 1 /Objective 1.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$1,000+
Potential Funding	HMGP, PDM, City General funds
Timeline	5 + Years
Priority	Low
Lead Agency	Public Works, Utilities
Action since 2010	The city would lie to see this occur at the transfer station (1801 W Old Hwy 6)

Description	Stormwater System and Drainage Improvements
Analysis	Larger communities generally utilize underground stormwater systems comprising of pipes and inlets to convey runoff. Undersized systems can contribute to localized flooding. Stormwater system improvements may include pipe upsizing and additional inlets. Retention and detention facilities may also be implemented to decrease runoff rates while also decreasing the need for other stormwater system improvements.
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 - $100,000+
Potential Funding	HMGP, PDM, sales tax, assessments, private funds
Timeline	5+ Years
Priority	High
Lead Agency	Public Works
Action since 2010	Looking at west Q street in (2- 5 years); A Street Ditch and N Hwy 83 (North of NPPD) (5+ years)

Description	Drainage Study/Stormwater Master Plan
Analysis	Drainage Studies Can be conducted to identify and prioritize improvements to address site specific localized flooding/drainage problems. Stormwater master plans can be conducted to perform a community wide stormwater evaluation, identifying multiple problem areas, and potentially multiple drainage improvements for each
Goal/Objective	Goal 2/Objective 2.2
Hazard(s) Addressed	Flooding
Estimated Cost	$10,000 - $100,000+
Potential Funding	HMGP, PDM, CDBG, General funds
Timeline	5+ Years
Priority	Medium
Lead Agency	Public Works
Action since 2010	There are various areas that need a study in the future.

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Analysis	Bank degradation is occurring along many rivers and creeks. Stabilization improvements including rock rip rap, vegetative cover, j-hooks, boulder vanes, etc. can be implemented to reestablish the channel banks.
Hazard(s) Addressed	Flooding

Description	Stream Bank Stabilization/Grade Control Structure/ Channel Improvement
Estimated Cost	$10,000 – 100,000+
Potential Funding	HMGP, PDM, DNR, MRNRD
Timeline	5+ Years
Priority	Low
Lead Agency	Public Works
Action since 2010	Not yet started.

Description	Flood Prone Property Acquisition
Analysis	Voluntary acquisition and demolition f properties prone to flooding will reduce general threat of flooding for communities within the NFIP. Properties are located at the intersection of East 11th and East H Streets
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	Flooding
Estimated Cost	Varies
Potential Funding	HMGP, PDM, State of Nebraska
Timeline	5+ Years
Priority	Low
Lead Agency	City Council, Floodplain Administrator
Action since 2010	Not yet started (No appraisal of the property has been conducted).

Description	Maintain Good Standing in the NFIP
Analysis	Maintain good standing in the NFIP
Goal/Objective	Goal 2/Objective 2.3
Hazard(s) Addressed	Flooding
Estimated Cost	N/A
Potential Funding	City General Funds
Timeline	Ongoing
Priority	Medium
Lead Agency	City Council, Floodplain Administrator
Action since 2010	Meeting all the requirements to maintain NFIP status. Continuing to enforce floodplain regulations, floodplain identification and remapping (as needed), and engaging in community assistance and monitoring activities.

Description	Public Awareness / Education
Analysis	Through activities such as outreach projects, distribution of maps and environmental education increase public awareness of natural hazards to both public and private property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. In addition, educate citizens on erosion control and water conservation methods. Educate residents on response and rescue plans for all hazard types.
Goal/Objective	Goal 3/Objective 3.1
Hazard(s) Addressed	All hazards
Estimated Cost	$500+
Potential Funding	HMGP, City General Funds
Timeline	Ongoing
Priority	Medium
Lead Agency	Fire Department, County Sheriff/Emergency Manager
Action since 2010	Provide information on hail resistant building material and provide other information through city wide mailings

Description	Weather Radios
Analysis	Conduct an inventory of weather radios at schools and other critical facilities
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$50/radio
Potential Funding	HMGP, PDM, Private funds
Timeline	Ongoing
Priority	High
Lead Agency	Fire Department, County Sheriff/Emergency Manager

Description	Weather Radios
Action since 2010	Various entities must acquire their own radio.

Description	Alert/Warning Sirens
Analysis	Perform an evaluation of existing alert sirens in order to determine sirens which should be replaced or the placement of new sirens.
Goal/Objective	Goal 4/Objective 4.3
Hazard(s) Addressed	All hazards
Estimated Cost	$15,000+
Potential Funding	HMGP, PDM, Sales Tax, City General Funds
Timeline	2-5 Years
Priority	High
Lead Agency	Emergency Manager
Action since 2010 plan	Identified need to modify sirens to remote activated. The need to update outdoor warning sirens was included in the 2013 Comprehensive Plan.

Description	Civil Service Improvements
Analysis	Improve emergency rescue and response equipment and facilities by providing additional, or updating existing emergency response equipment. This can include fire trucks, ATV's, water tanks/trucks, snow removal equipment, etc. This would also include developing backup systems for emergency vehicles and identifying and training additional personnel for emergency response.
Goal/Objective	Goal 4/Objective 4.1
Hazard(s) Addressed	All hazards
Estimated Cost	Varies by need
Potential Funding	HMGP, PDM, Sales Tax, City General Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Fire Department, Police Department, Public Works
Action since 2010 plan	Need to continuously update fleet of emergency vehicles and other emergency equipment

Description	Backup Municipal Records
Analysis	Develop system to backup critical municipal records
Goal/Objective	Goal 2/Objective 2.1
Hazard(s) Addressed	All hazards
Estimated Cost	$100 for external hard drive; $15,000+ for GIS mapping system
Potential Funding	HMGP, PDM, General Funds
Timeline	2-5 Years
Priority	Medium
Lead Agency	Fire Department, Police Department, Public Works
Action since 2010 plan	Identified need to backup municipal records as well as develop GIS mapping system

Removed Mitigation Projects

Description	Floodplain Management
Analysis	Continue or improve floodplain management practices such as adoption and enforcement of flood plain management requirements (Regulation of construction in SFHAs), floodplain identification and mapping (local request for map updates), description of community assistance and monitoring activities.
Hazard(s) Addressed	Flooding
Reason for Removal	This action is redundant with 'maintain good standing in NFIP' mitigation action.

Description	Floodplain Regulation Enforcements and Updates
Analysis	Continue to enforce local floodplain regulations for structures located in the 1% annual floodplain. Strict enforcement of the type of development and elevations of structures should be considered through issuance of building permits by any Nebraska city. Continue education of building inspectors or Certified Floodplain Managers
Hazard(s) Addressed	Flooding
Reason for Removal	This action is redundant with 'maintain good standing in NFIP' mitigation action.

Southwest Public Schools

Quad Counties
Multi-Jurisdictional Hazard Mitigation Plan
2016

Overview

Southwest Public Schools participated in this hazard mitigation plan in order to reduce the risk to life for its faculty, staff, and students, as well and to its property from hazards. Their participation was extensive; a representative from Southwest Public Schools attended every public meeting, met individually with members from the planning team, completed all hazard identification and project identification worksheets, engaged the general public in the planning process, and assisted in interdepartmental coordination and data analysis.

For Southwest Public Schools, the issues of top concern that were identified through this planning process include extreme heat, severe thunderstorms, severe winter storms, and tornados.

The following people were heavily involved in the development of Southwest Public Schools' Participant Section:

Southwest Public Schools Plan Contributors

Name	Title	Department / Organization
Todd Porter	Superintendent	Southwest Public Schools
Alan Kotschwar	Red Willow County Sheriff	Red Willow County

This section contains important localized information about the school district relevant to hazard mitigation, including the following elements:

- Location / Services
- Demographics
- Critical Facilities
- Plan Integration
- Risk Assessment
- Administration / Capability Assessment
- Mitigation Actions

Location/Services

Southwest Public Schools operates two schools an elementary school in Indianola and a high school in Bartley. The school district provides services to students in the communities of Bartley, Danbury, Indianola, Lebanon, Marion, and Wilsonville.

Demographics

There are 300 students enrolled in Southwest Public Schools. During the 2015 -2016 school year there were 155 students in the elementary school and 145 students in the high school. The school district also employs 30 faculty and staff in the elementary school and 35 faculty and staff in the high school.

In the 2013-2014 school year the district had about 53 percent of students in the school on free or reduced lunch. The school had a mobility rate of 15 percent during the 2013-2014 school year. About 16 percent of students are reported as being in Special Education. Table 1 shows the number of students by race and ethnicity for the 2013-2014 school year. The Department of Education did not report the number of students who are classified as English Learners.

SWS 80: Number of Students by Race

Year	American Indian/Alaskan Native	Asian	Black/African American	Hispanic	Native Hawaiian or Other Pacific Islander	White	Two or More Races
2013-2014	1	0	1	7	0	285	7

Source: Nebraska Department of Education

Critical Facilities

The school district operates two facilities. These facilities are listed below, along with information indicating the school's address, the year the structure was built, previously hazard damages, it's location in a Special Flood Hazard Area, the presence of a tornado safe room, the presence of a weather radio, and the structure's value.

SWS 2: Number of Students by Race

School	Southwest Elementary School
Address	719 E St. Indianola
Damages	None
Structure in Floodplain	No
Number of Students	155
Number of Staff	30
Tornado Safe Rooms	No
Backup Generator	No
Weather Radio	Yes
Building Valuations	$9,502,010

School	Southwest Jr.-Sr. High School
Address	900 Coke St. Bartley
Damages	None
Structure in Floodplain	No
Number of Students	145
Number of Staff	35
Tornado Safe Rooms	No
Backup Generator	No

School	Southwest Jr.-Sr. High School
Weather Radio	Yes
Building Valuations	$9,502,010

In addition to the two schools the school district also identified five other critical facilities which include: a practice gym, a bus barn in Bartley and Indianola, a maintenance shop in Bartley, and a bus barn for larger vehicles on downtown Bartley.

Risk Assessment

Table SWS 3 is a risk assessment identified specifically for the community. Refer to *Section Four: Community Based Risk Assessment* for an explanation as to what this methodology is.

Table SWS 3: Southwest Public Schools Risk Assessment

HAZARD TYPE	PREVIOUS OCCURRENCE? Yes/No	Specific Concerns Identified
Agricultural Animal Disease	No	None
Agricultural Plant Disease	No	None
Chemical Spills (Fixed Site)	No	None
Chemical Spills (Transportation)	No	None
Dam Failure	No	None
Drought	Yes	None
Earthquake	No	None
Extreme Heat*	Yes	Injuries or loss of life possible
Flooding	No	None
Grass/Wildfire	No	None
Hail*	Yes	Injuries, property damage
High Winds*	Yes	Injuries or loss of life possible, property damage
Levee Failure	No	None
Severe Thunderstorm	Yes	Injuries or loss of life possible, property damage
Severe Winter Storm*	Yes	Injuries or loss of life possible, property damage
Terrorism	No	None
Tornado*	No	Injuries or loss of life possible, property damage

**Identified as a hazard of greatest concern*

For more information regarding these area wide hazards, please see *Section Four: Risk Assessment*. The following provides community specific information, reported in Southwest Public Schools' Risk Assessment Summary, that is relevant to each of the top five hazards.

Extreme Heat

The planning area experiences extreme heat several times annually. Extreme heat can put a strain on the local electrical supply, causing power outages. Exposure to extreme heat can cause injuries or death. School aged children are especially vulnerable to extreme heat events.

Hail

NCDC does not gather occurrence data by the school district. However, hail is a frequent occurrence in the school district and the rest of the planning area. Although there are no reported damages to school facilities

from hail events, the local planning team indicated there have been minor damages to school property due to hail. Hail has the potential to cause significant damages to property and minor injuries.

High Winds
High winds are a frequent occurrence in the school district and the rest of the planning area. High winds have the potential to cause damages to school property and injuries to students and staff due to flying debris.

Severe Winter Storms
Severe winter storms occur annually in the school district. Severe winter storms can cause power outages, which result in dangerous conditions for vulnerable populations. Winter storms can restrict the mobility of students and staff, often resulting in school cancellations.

Tornados
There have been no recorded tornados in the school district. However, tornados frequently occur in the planning area, and the rest of the state. Tornados have the potential to cause significant property damages, injuries, and loss of life. The school district performs two tornado drills per year.

Plan Integration

Building safe and smart communities can be accomplished through effective plan integration. Integrating hazard mitigation principles into other local planning mechanisms can greatly increase a school district's level of resiliency. This planning process also sought to analyze how existing planning mechanisms were presently integrated and make suggestions for further integration. Available plans were analyzed using guidance from FEMA's 2014 *Plan Integration Guide*. The following paragraph presents a summary of the findings of this analysis.

The school conducts an annual safety audit as a requirement of Rule 10. Rule 10 is the mandated rules and procedures for accreditation by Nebraska Department of Education. Additional plans and/or policies that have integrated hazard mitigation have not been identified.

Administration/Capability Assessment

The school district has a superintendent and two principals. The school board is made up of a six member panel. The school district also has two administrative secretaries (one for the elementary school and one for the high school) and a bookkeeper.

The school's superintendent would be main actor in overseeing the implementation of mitigation actions in school facilities. The school currently does a number of education and outreach programs These programs include natural disaster and safety related school programs (two tornado drills a year, 10 fire drills a year, and 2 intruder drills (including active shooter) a year) as well as ongoing public education and information programs (students receive evacuation and safety materials training). The schools district does partner with local departments on fire safety, driving safety, and drug/alcohol issues. In Junior High, the students learn first aid.

Mitigation Actions

Completed Mitigation Actions

The school district did not identify any specific mitigation actions in the previous plan.

New Mitigation Actions

Description	**Backup Generators**
Analysis	Provide a source of backup power to ensure redundant power supplies, municipal wells, lift stations, and other critical facilities.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	All Hazards
Estimated Cost	$35,000
Potential Funding	HMGP, PDM, School Funds
Timeline	2-5 years
Priority	High
Lead Agency	School Board, Superintendent
Action since 2010 plan	Not yet started. This is a new action

Description	**Safe Rooms**
Analysis	Design and construct storm shelters and safe rooms in highly vulnerable areas such as mobile home parks, campgrounds, school, and other areas.
Goal/Objective	Goal 2 /Objective 2.1
Hazard(s) Addressed	Tornados, High Winds, Severe Thunderstorms
Estimated Cost	$4,500+
Potential Funding	HMGP, PDM, School Funds
Timeline	2-5 years
Priority	Medium
Lead Agency	School Board, Superintendent
Action since 2010 plan	Not yet started. This is a new action

Appendix A: Resolutions

Contents:

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RESOLUTIONS OF PARTICIPATION

RESOLUTIONS OF ADOPTION

Appendix B: Documents of Public Involvement

Contents:

1. Letters
2. Postcards
3. Flyers
4. Sign-in Sheets

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ENGINEERING ■ ARCHITECTURE ■ SURVEYING ■ PLANNING

Thursday, March 26, 2015

RE: Hazard Mitigation Plan Update Project Announcement

To Previous Plan Participants,

You are receiving this letter because your community participated in the 2010 Quad Counties Hazard Mitigation Plan.

Franklin, Furnas, Harlan, and Red Willow Counties (Quad Counties) have recently secured a FEMA grant to update this Hazard Mitigation Plan.

A hazard mitigation plan is a publicly-guided document that identifies vulnerability to disasters such as flood, drought, earthquake, wildfire, winter storm, tornado, high wind storm, dam failure, etc. The plan establishes goals, outlines specific mitigation options, and prioritizes projects which may reduce or eliminate loss of life and potential damages to property when future disasters occur.

Once a city, village, county, or district is part of an approved hazard mitigation plan they become eligible for up to a 75% cost share for a wide variety of projects listed in the plan.

The 2010 Hazard Mitigation Plan included cities, school districts, and villages in Franklin, Furnas, Harlan, and Red Willow Counties. All communities, public school districts, and other taxing authorities within these counties are eligible to participate in this plan update.

In order for an entity to be included in the updated 2016 plan, active participation in this planning process is required.

Please notify other departments or offices in your jurisdiction that may be involved in this process.

In addition to working with your County Emergency Manager, JEO Consulting Group, Inc. (JEO) has been hired to assist with the plan development over the next 12 months, and will also be working closely with participating jurisdictions to develop this plan.

For more information, please visit the project website at: www.jeo.com/quad

Sincerely,

Joe Robine
Hazard Mitigation and Emergency Planner
JEO Consulting Group, Inc.

JEO CONSULTING GROUP INC ■ JEO ARCHITECTURE INC
3700 Fletcher Avenue | Lincoln, Nebraska 68504 | p: 402.435.3060 | f: 402.435.4110
www.jeo.com

March 4, 2015

Harlan County Sheriff's Office
P.O. Box 679
Alma, NE 681920

RE: Franklin, Furnas, Harlan, and Red Willow Counties Multi-jurisdictional Hazard Mitigation Plan Update Kick-off Meeting

Dear Planning Team Member:

The Franklin, Furnas, Harlan, and Red Willow Counties (Quad Counties) planning grant from the Federal Emergency Management Agency (FEMA) to develop a multi-jurisdiction hazard mitigation plan has been approved.

An organizational kickoff meeting for the Planning Team has been scheduled for:

Tuesday, March 24, 2015 at 2:00 PM at the **Harlan County Courthouse** located at 706 W 2nd St in Alma, NE.

The intent of this meeting is to meet with JEO Consulting Group and staff from each of the counties to discuss the following:

1) Intent and purpose of hazard mitigation planning
2) Roles and responsibilities
3) General project schedule
4) Schedule first three public meetings
5) Question and answer

If you have any questions please contact Chris Becker, (308) 928-2147, hclaw@megavision.com.

Sincerely,

Chris Becker
Harlan County Sheriff

CC: Jeff Henson, JEO Consulting Group, Inc.

May 12, 2015

RE: Franklin, Furnas, Harlan, and Red Willow Counties (Quad Counties) Multi-jurisdictional Hazard Mitigation Plan (HMP) Update

Dear Hazard Mitigation Planning Participant:

Franklin, Furnas, Harlan and Red Willow Counties (Quad Counties) have secured grant funding from the Federal Emergency Management Agency (FEMA) and is in the process of updating the four county-wide HMP. **You are receiving this letter because your jurisdiction is eligible and encouraged to participate in this planning effort.**

HMPs identify vulnerabilities and possible impacts and losses within participating jurisdiction to various natural and man-made hazards (e.g., flood, drought, wildfire, winter storm, terrorism, urban fire, transportation incidents, etc.). The HMP also identifies projects and strategies aimed at enhancing community resilience and preparedness to specific hazards.

Your community participated in the development of the 2010 Quad Counties Multi-Jurisdictional Hazard Mitigation Plan. As required by the Disaster Mitigation Act of 2000, HMPs must be updated and approved by FEMA every five (5) years. Generally, the update and approval process requires a 12-month to 18-month period.

This plan update will build on the 2010 plan and incorporate detailed project recommendations. Examples of projects that are potentially eligible for funding include: drainage and stormwater infrastructure improvements, warning sirens, assistance with educational activities, storm shelters, back-up power generators, and a number of other possible mitigation activities.

FEMA requires at least one 'designated representative' from your jurisdiction to be recognized as a participating jurisdiction. Please attend the upcoming meeting:

- **Thursday, June 4, 2015 at 7:00 PM at the Senior Center, 609 Ogden St, Oxford, Nebraska**

To RSVP for the meeting or for more information, please contact me at (308)928-2147 or by email at hclaw@megavision.com; or contact Joseph Robine, Project Coordinator, at (402)392-9911 or jrobine@jeo.com. For updates and information on this planning effort, please visit: http://jeo.com/quad-counties-hmp . **We are looking forward to seeing you at the meeting!**

Sincerely,

Chris Becker
Harlan County Sheriff

CC: Jeff Henson, JEO Consulting Group, Inc.

August 1, 2015

RE: Franklin, Furnas, Harlan, and Red Willow Counties (Quad Counties) Multi-jurisdictional Hazard Mitigation Plan (HMP) Update

Dear Hazard Mitigation Planning Participant:

The Quad Counties are moving forward with the second phase of developing the multi-jurisdictional Hazard Mitigation Plan with the 'Mitigation Strategies' public meetings. **Your jurisdiction's attendance is required in order to continue participation in this planning effort!** The intent of these meetings is to gather and review vital information from individual plan participants including:

1) Identification, Evaluation, and Prioritization of mitigation alternatives
2) Status reports on the development of the Hazard Mitigation Plan
3) Identification and Obtaining missing sources of information and data

Continued participation in the planning effort makes your jurisdiction eligible for pre-hazard mitigation project cost-share. Potential project examples include: drainage improvements, improved stormwater infrastructure, safe rooms, back-up power generation, emergency warning/notification equipment and a number of other possible mitigation activities. Attached is a list of potential mitigation strategies to consider for you community, this list was developed from FEMA's Publication: *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards.*

In order to continue being included as part of the plan, FEMA requires at least one 'designated representative' from your jurisdiction to be recognized as a participating jurisdiction. Please attend the upcoming meeting:

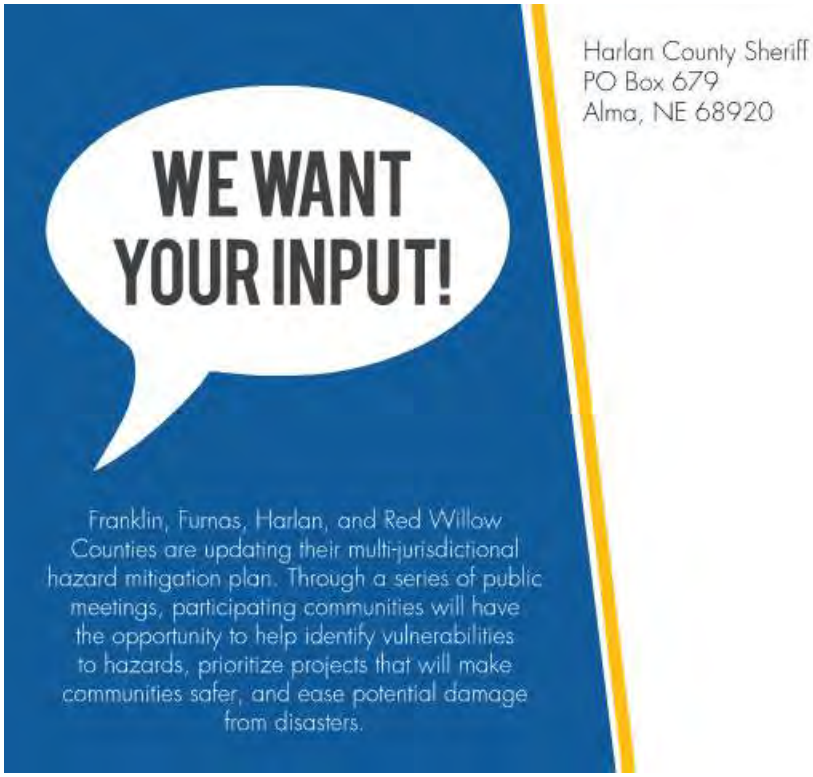
- **Thursday, September 10, 2015 at 7:00 PM at the Senior Center, 609 Central (northeast corner of Bothwell St and Central), Oxford, Nebraska**

To RSVP for the meeting or for more information, please contact me at (308)928-2147 or by email at hclaw@megavision.com; or contact Joseph Robine, Project Coordinator, at (402)392-9911 or jrobine@jeo.com. For updates and information on this planning effort, please visit: http://jeo.com/quad-counties-hmp . **We are looking forward to seeing you at the meeting!**

Sincerely,

Chris Becker
Harlan County Sheriff

CC: Jeff Henson, JEO Consulting Group, Inc.


WE WANT YOUR INPUT!
Harlan County Sheriff
PO Box 679
Alma, NE 68920
Franklin, Furnas, Harlan, and Red Willow Counties are updating their multi-jurisdictional hazard mitigation plan. Through a series of public meetings, participating communities will have the opportunity to help identify vulnerabilities to hazards, prioritize projects that will make communities safer, and ease potential damage from disasters.


Quad Counties Hazard Mitigation Plan Update
No one knows communities like those who live there.
As such, the four counties invites you to attend a meeting near you and help in its effort to update the multi-jurisdictional hazard mitigation plan.
Refreshments will be provided!
For more information, visit
http://jeo.com/quad-counties-hmp/
MARK YOUR CALENDAR!
June
Oxford, NE
June 4, 2015 - 7PM
Senior Center - Oxford

ENGINEERING ■ ARCHITECTURE ■ SURVEYING ■ PLANNING

January 29, 2016

Dear Hazard Mitigation Planning Participant,

Enclosed is the updated draft of your jurisdiction's Participant Section, as part of the 2016 update of the Quad Counties Multi-Jurisdictional Hazard Mitigation Plan. This draft includes the latest revisions that were undertaken following the second round of community meetings.

The draft will now be made available for a 30-day public comment period, which lasts from **January 30, 2015 to February 29, 2016**. At the end of this period, the complete multi-jurisdictional plan will be submitted to the Federal Emergency Management Agency (FEMA) and the Nebraska Emergency Management Agency (NEMA) for final approval.

This is the last opportunity to review your jurisdiction's section draft and submit to JEO any requested changes or corrections, prior to its submission to FEMA and NEMA.

Please carefully review this section and verify that the information therein is accurate to the best of your knowledge. Then please inform JEO as soon as possible should you desire any changes. To request changes, you can markup the section, scan it, and email it to me at pluebbert@jeo.com; fax it to the number provided below; or mail your revisions to our Lincoln office.

If we do not receive changes from you by February 29, 2016, we will assume that your jurisdiction has reviewed this section and approves of it as written. Please especially pay attention to the mitigation action tables at the end of your Participant Section. Please advise us if you would like to add, amend, or delete projects.

Thank you for helping us to provide your constituents with an accurate and comprehensive hazard mitigation plan. Should you have any questions, please contact me at 402.474.8768 or via email at pluebbert@jeo.com. Copies of your jurisdiction's Participant Section are also available for download at www. http://jeo.com/quad-counties-hmp/.

Sincerely,

PHIL LUEBBERT | Planner | Hazard Mitigation and Emergency Planning
JEO CONSULTING GROUP INC
2700 Fletcher Avenue | Lincoln, Nebraska 68504-1113
d: 402.474.8768 | m: 402.499.4154 | o: 402.435.3080 | f: 402.435.4110
pluebbert@jeo.com

Quad Counties – Hazard Mitigation Plan Update
Round 1 Public Meeting
Bartley, NE – Thursday, June 25, 2015
PLEASE PRINT CLEARLY- THANK YOU!

NAME	TITLE	JURISDICTION Represented	ADDRESS Street #, Street Name, City, Zip	PHONE	EMAIL
Ron Pankoke	Utilities Super Fire Chief	Franklin	PoBox 215 Campbell NE 68932	402-984-4730	
Roxni Harding	Village Clerk	Bartley	PO Box 99 101 W Walnut Bartley 69020	308-692-3222	
Aaron Kotschwar	Sheriff /Emergency Manager	Red Willow	516 Norris Avenue McCook NE 69001	308-345-1350	akotschwar@rwcso.org
Diana Wilkinson	Off Mgr / Dep EM	Red Willow	✓	✓	dwilkinson@rwcso.org
R Todd Porter	Superintendent	Southwest Public Schools	900 Coke St Bartley NE 69020	308-692-3223	todd.porter@swpschools.org
Donn Williamson	Chairperson STAMford	STAMford	110 N PlATTe Ave	(308) 868-2565	
Stephanie Quadhuer	City Clerk	Indianola	PO Box F Indianola, NE 69034	308-364-2413	indianola@gpcom.net
Deanna Brown	Deputy Clerk	Indianola	✓	✓	✓
Joe Robine	Planner	JEO			

Please Sign In!

Quad Counties – Hazard Mitigation Plan Update

Round 1 Planning Team Meeting

Oxford, NE – Thursday, June 4, 2015

PLEASE PRINT CLEARLY- THANK YOU!

NAME	TITLE	JURISDICTION Represented	ADDRESS Street #, Street Name, City, Zip	PHONE	EMAIL
Alan Kotschwar	Emergency Manager	Red Willow County	502 Norris Ave McCook 69001	308-345-1850	akotschwar@rwcso.org
Diana Wilkinson	Dep. Emergency Mgr	"	"	"	dwilkinson@rwcso.org
John Brennan	Planner	JEO	2700 Fletcher Ave	402-435-3090	jbrennan@jeo.com
David Snodgrass	Town Board	Orleans	309 S Harlan Orleans	308 920 0360	orleanshotelbedandbreakfast@gmail.com
Jerry Archer	Sheriff/EM Coord.	Franklin County	405 15th Ave P.O. Bx 292 Franklin	308-425-6231	jarcher950@yahoo.com
Roger Powell	Furnas County EM	Furnas County	912 R Street Po Box 405 Beaver City	308-268-5088	furnasem@atcjet.net
Ed Bruckman	Franklin PD	Franklin City	619 15th Ave Franklin, NE 68939	308-425-6096	Franklinpdne@yahoo
David Pedersen	Supervisor	Franklin County	2004 K Road Franklin 68939	308 425 3023	dpedersen@gtmc.net
Duane Hoffman	Public Works Director	Village of Oxford	326 Ogden Box 385 Oxford	308-824-3511	dhoffman@swnebr.net
Larry Hanna	Supervisor	Harlan County	412 3rd St. Box 318	308 920-1333	lhanna@megavision.com
Doug Wilson	City Adm	Alma	614 Main Po Box 468 Alma 68920	308-928-2242	cityadm@almacity.com
Chris Becker	Harlan Co	Alma	Box 699 Alma, NE	308 928 2147	hclaw@megavision.com

Please Sign In!

Quad Counties – Hazard Mitigation Plan Update
Round 1 Public Meeting
Oxford, NE – Thursday, June 4, 2015
PLEASE PRINT CLEARLY- THANK YOU!

NAME	TITLE	JURISDICTION Represented	ADDRESS Street #, Street Name, City, Zip	PHONE	EMAIL
Joe Robine	Planner	JEO	11717 Burt St. Omaha 68154	402-392-9911	jrobine@jeo.com
Ed Bruckman	Chief of Police	Franklin City	619 15th Ave Franklin	308-425-6046	FRANKLINPDNE@YAHOO
Jerry Archer	Sheriff / EM Coord	Franklin County	405 15th Ave PO Bx 292 Franklin 68939	308-425-6231	jarcher950@yahoo.com
David Pedersen	Supervisor /	Franklin County	2004 K Road Franklin Ne 68939	308-425-3022	dpedersen@gmtc.net
Duane Hoffman	Public Works Director	Village of Oxford	36326 Ogden Box 385 68967	308-824-3511	dhoffman@swnebr.net
RICHARD P BLAKE	BOARD CHAIRMAN	NAPONEE	702 WALNUT NAPONEE	308-269-2001	NONE
Larry Hanna	Supervisor	Harlan County	1112 3rd ST Alma	308-928-2604	—
Doug Wilson	City Adm	ALMA	614 MAIN PO Box 648 ALMA 68920	308-928-2242	cityadm@almacity.com
Chris Beala	[illegible] EM	Alma/Harlan County	Box 674 Alma	308-928-2[illegible]	[illegible]@[illegible].com
Charlie Cunningham	Supt. Arapahoe School	Arapahoe Public School	610 Walnut Arapahoe	308-962-5458	charlie.cunningham@arapahoe.k12.ne.us
R. Dale Fultz	Board Member	Twin Valley P.P.D.	42918 Rd 706, Beaver City	308-268-6567	—
Charles Wolfe	Environmental Services		719 N Brown Alma	308-920-1032	Cwolfe@good-sam.com

Please Sign In!

Quad Counties – Hazard Mitigation Plan Update
Round 1 Public Meeting
Oxford, NE – Thursday, June 4, 2015
PLEASE PRINT CLEARLY- THANK YOU!

NAME	TITLE	JURISDICTION Represented	ADDRESS Street #, Street Name, City, Zip	PHONE	EMAIL
John Brennan	Planner	JEO	2700 Fletcher	402-435-3080	jbrennan@jeo.com
Diana Wilkinson	Dep Emergency Mgr	Red Willow Co	516 Norris Ave McCook NE	308-345-1850	dwilkinson@rwcso.org
Alan Kotschwar	Emergency Manager	Red Willow Co	"	"	akotschwar@rwcso.org
Roger Powell	Emergency Manager	Furnas County	PO Box 408 Beaver City, NE	308-268-5088	furnasem@atcjet.net
Chris Becker	EM/Sheriff	Harlan Co	Box 679 Alma, NE	3089282147	hclaw@megavision.com
Ron Brown	Superintendent	Furnas	416 Center Ave	308-655-0595	rbrownholbrook@[illegible]
Tiffany Hock	Clerk/Treasurer	Furnas	209 Benson Ave	970-403-2202	Holbrookvil@atcjet.net
Shirley Axtell	Clerk/Treasurer	Red Willow	303 Grandville	308-895-2375	seaxtell@bwtelcom.net
[illegible]	Bd Chm. Danbury	Red Willow	303 Grandville	308-895-2375	" " "
[illegible]	Planner	Harlan	235 Atkinson	402-516-5795	—
David Custer	Director of Operations	Furnas	72181 Cross Creek Cambridge, NE	308-697-3315	—
Angie Wardwig	City Clerk	Furnas	301 10th St Beaver City	308-268-2145	beavercityco@hotmail.com
Kelly Winz		Harlan	1437 Cross Ave	308-991-9531	Kwinz80@yahoo.com
Marc Harpham	Fire/EMS Chief	City of McCook	505 West C	308-345-5710	firechief@cityofmccook.com
Charlie Wallace	Community Consultant	S.C.E.D.D.	POB 79, Holdrege, NE	308-995-3190	charliew@scedd.us
Mark Harpst	Mayor	City of Cambridge/TVHS	PO Box Q ~~814 Flannery~~ Camb NE	308-697-1129	markh@trivalleyhealth.com

Please Sign In!

Quad Counties Sign-In Sheet Hazard Mitigation Plan Update Round 2 Public Meeting						
	Name	**Title**	**Jurisdiction**	**Address**	**Phone**	**Email**
	Jeff Henson	Department Manager	JEO Consulting	2700 Fletcher Ave. Lincoln, NE 68504	402-435-3080	jhenson@jeo.com
	Phil Luebbert	Planner & Project Coordinator	JEO Consulting	2700 Fletcher Ave. Lincoln, NE 68504	402-435-3080	pluebbert@jeo.com
	Caitlin Olson	Planning Intern	JEO Consulting	2700 Fletcher Ave. Lincoln, NE 68504	402-435-3080	colson@jeo.com
1	Marc Harpham	Fire Chief	McCook FD	505 West C McCook, NE 69001	308-345-5710	firechief@cityofmccook.com
2	Alan Kotschwar	Sheriff/Emergency Manager	Red Willow S.O.	516 Norris Avenue McCook, Ne 69001	308-345-1850	akotschwar@rwcso.org
3	Diana Wilkinson	OffMgr/Dep Emergency Mgr	Red Willow S.O.	516 Norris Avenue McCook, Ne 69001	308-345-1850	dwilkinson@rwcso.org
4	Angie Woodring	City Clerk	City of Beaver City	301 10th Street, Beaver City, NE 68926	308-268-2145	beavercityco@hotmail.com
5	Roger Powell	Emergency Manager	Furnas County	912 R Street, Beaver City, NE 68926	308-268-5088	furnasem@atcjet.net
6	Missy Waldo	Clerk/Treasurer	Republican City	101 Truman Ave Republican City 68971	308-920-2243	villageofrepublicancity@yahoo.com
7	Kent Tidyman	Mayor	Edison	108 1st. St. Edison Ne 68936	308-655-0165	kenttidyman@gmail.com
8	Duane Hoffman	public works Director	Oxford	326 Ogden Box 385 68967	308-824-3511	dhoffman@swnebr.net
9	Chris Becker	Emergency Manager	Harlan County			
10	Dale Sprague		Huntley			
11	Doug Wilson	City Administrator	Alma			
12	Dale Casper	Superintendent	City of Hildreth			
13	Leighton Schmidt	Mayor	Beaver City			
14	Kandra Kinne	City Clerk	Cambridge			
15	David Houghtelling	Utility Supervisor	Cambridge			
16	Mark Harpst	Mayor	Cambridge			
17	Mike Ingram	Highway Superintendent	Franklin			
18	Lisa Howsden	treasure	Huntley	1425 Lock Road, 68971	308-991-7330	howsden@atcjet.net
19	David Snodgrass	Board Member	Orleans	101 Pine St	308 920 0360	orleanshotelbedandbreakfast@gmail.com
20	Jerry Archer	Franklin Co. Sheriff/EM	Franklin CO	PO Box 292, Franklin, NE 68939	308-425-6231	jarcher950@yahoo.com
21	Charlie Curnyn	Arapahoe Public Schools	Araphoe	610 Walnut St, Araphoe, NE	308-962-5458	charlie.crunyn@araphoewarriors.org
22	Donn Williamson	Board Member	Stamford	PO Box 43, Stamford, NE	308-920-0317	N/a
23	Richard Blake	Board Chair	Napolee			
24	Lana Dake	Board Chair	Orleans	221 S. Kansas ave, Orleans, NE 68966	308-991-2381	newwine@frontiernet.net
25	Ed Brickman	Chief PD	city of Franklin	619 15th ave, Franklin, NE 68939	308-425-6096	franklinpdne@yahoo.com
26	Nate Schneider	City Manager	McCook	505 W. C st, McCook, NE 69001	308-345-2022 (225)	nschneider@cityofmccook.com
27						
28						
29						

Appendix C: Public Meeting Materials and Worksheets

Contents:

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Hazard Identification Worksheet:

ENGINEERING ■ ARCHITECTURE ■ SURVEYING ■ PLANNING

Quad Counties – Hazard Mitigation Plan Update

Hazard Identification

Name: _____ Community Represented: Bloomington

Information regarding severe weather events was collected from the NCDC Storm Events Database. The NCDC Storm Events Database is a limited data source that only collects events that have been reported to the National Weather Service. The database reported eight events for Bloomington from January 1996 to October 2014. The table below is a selection of the five weather events that caused property damage.

Table 1: NCDC Severe Weather Events

Date	Hazard	Magnitude	Deaths	Injuries	Property Damage
6/12/1996	Hail	0.75 in.	0	0	$0
5/22/1999	Hail	0.75 in.	0	0	$0
9/10/2003	Hail	1.75 in.	0	0	$25,000
9/6/2012	Hail	1.25 in.	0	0	$5,000
4/23/2014	Hail	1.25 in.	0	0	$10,000

Source: NCDC

For this Risk Assessment Exercise, please think about the following questions in conjunction with the information provided in the table: What types of impacts did your community experience from natural and man-made hazards? Have there been any known deaths or injuries from hazards? How prepared was your community for these events? Have critical facilities been damaged? Are there resources or projects needed to be better prepared in the future for particular hazards? Have any groups (e.g. population under the age of 5, population over the age of 65, those living in care facilities, member of the community without access to transportation, etc.) experienced impacts more often that other groups? Have any groups experience impacts that are worse than other groups? Are certain weather events becoming more or less frequent?

Please circle the top five (5) hazards of greatest concern for your community:

Agricultural Animal Disease
Agricultural Plant Disease
Chemical Spills (Fixed Site)
Chemical Spills (Transportation)
Civil Disorder
Dam Failure
Drought
Earthquake
Extreme Heat
Flooding
Grass/Wildfires
Hail
High Winds
Landslides
Levee Failure
Radiological Incident (Fixed Site)
Radiological Incident (Transportation)
Severe Thunderstorms
Severe Winter Storms
Terrorism
Tornados

Capability Assessment Worksheet:

CAPABILITY ASSESSMENT

The capability assessment consisted of two main components: a Capability Assessment Survey completed by the jurisdiction and a review of local existing policies, regulations, plans, and the programs. The survey is used to gather information regarding the jurisdiction's planning and regulatory capability; administrative and technical capability; fiscal capability; and educational and outreach capability.

Table JKN.14: Capability Assessment

Survey Components/Subcomponents		Existing (Yes/No)
Planning and Regulatory Capability	Comprehensive Plan	
	Capital Improvements Plan	
	Hazard Mitigation Plan	
	Economic Development Plan	
	Emergency Operational Plan	
	Natural Resources Protection Plan	
	Open Space Preservation Plan	
	Floodplain Management Plan	
	Storm Water Management Plan	
	Zoning Ordinance	
	Subdivision Regulation/Ordinance	
	Floodplain Ordinance	
	Building Codes	
	National Flood Insurance Program	
	Community Rating System	
	Other (if any)	
Administrative and Technical Capability	Planning Commission	
	Hazard Mitigation Planning Commission	
	Floodplain Administration	
	Emergency Manager	
	GIS Coordinator	
	Chief Building Official	
	Civil Engineering	
	Staff Who Can Assess Community's Vulnerability to Hazards	
	Grant Manager	
	Other (if any)	
Fiscal Capability	Capital Improvement Project Funding	
	Community Development Block Grant	
	Authority to Levy Taxes for Specific Purposes	
	Gas/Electric Service Fees	
	Storm Water Service Fees	
	Water/Sewer Service Fees	
	Development Impact Fees	
	General Obligation Revenue or Special Tax Bonds	
	Other (if any)	
Education and Outreach Capability	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	
	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	
	Natural Disaster or Safety related school programs	
	StormReady Certification	
	Firewise Communities Certification	
	Public-private partnership initiatives addressing disaster-related issues	
	Other (if any)	

Risk Assessment Survey Questions:

Risk Assessment Questions:

Agricultural Plant/Animal Disease
Please describe the local impacts of agricultural disease.
What are the populations (i.e. cows, pigs, etc) of greatest concern?
Are there current plans in place in the event of an outbreak?
Are you concerned about the possibility of an avian flu outbreak?
What educational programs are available?
Chemical Spills (Fixed Sites)
What are your concerns regarding chemical fixed sites in your community?
What chemical spills have occurred locally? Please describe the impacts.
Besides the facilities above, are there other chemical storage facilities of concern in or near your community?
Are critical facilities located near chemical fixed sites? Which facilities?
Are vulnerable populations located near chemical fixed sites? Where?
Are residents near chemical storage fixed sited educated about the threat and appropriate response?
What are the local response resources? Do they have protective gear and training?
Chemical Spills (Transportation)
What are your concerns regarding chemical fixed sites in your community?
What chemical spills have occurred locally? Please describe the impacts.
What transportation routes are of most concern?
Are chemicals regularly transported along local routes? If yes, do you know what chemicals?
Are critical facilities located along main transportation routes? Where?
Dam Failure
Is there emergency housing available for displaced residents?
If a dam was to fail, what would the impacts likely be?
What are your main concerns regarding this hazard in relation to your community?
Who owns the dams which could impact your community?
Does your community have or need a dam failure evacuation plan?
Drought
What significant events have occurred locally?
How do you define drought locally?
Does the county have a drought monitoring board?
Does the county have a drought response plan?
Is water supply sufficient?
Does the county have a water conservation program? (If yes, please provide some details.)
Are there landscape ordinances requiring native plantings or establishing irrigation limits?
Are alternative water sources needed? Where?
Earthquakes
Please describe any earthquake events have occurred locally? Please list approximate dates and describe impacts.
What are your main concerns regarding this hazard in relation to your community?
What has your community does to reduce the impact of a potential earthquake?
Extreme Heat
What significant events have occurred locally?
Does the county have cooling centers?
What are your public meeting or event cancellation procedures?
Any concerns with power supply?
What county organizations are available to assist vulnerable populations, i.e. elderly?

Flooding
What significant events have occurred locally?
Are there areas around the county that have poor stormwater drainage? If yes, please explain where.
Are any critical facilities located in the floodplain?
Have any critical facilities been damaged by flooding?
Levee Failure
Are there any levees in your community? Please provide a description of levees, particularly agricultural levees/berms, in your county.
Which levees are FEMA certified?
Which of the levees provide 100 year flood protection?
Who owns the levees?
If a levee was to fail, what would the impact likely be?
Severe Thunderstorms
What significant events have occurred locally?
Are critical county records protected with surge protectors on electronic devises?
Do critical facilities have back up power generators? Please list facilities needing generators.
What percentage (approximate) of power lines have been buried?
Are there weather radios in critical facilities? If so which facilities?
Is there a tree board?
Do residents receive information regarding hail resistant building materials with building permits?
Are critical facilities fitted with hail resistant building materials?
Have there been damages to critical facilities resulting from hail?
Are county facilities insured or self-insured?
Severe Winter Storms
What significant events have occurred locally?
Have there ever been structural damages to critical facilities from severe winter storms?
Are there designated snow routes in town? Where?
Do you use snow fences?
If no are you interested?
If yes where (please provide a location where they are used).
Who is responsible for clearing the streets?
Are snow removal resources sufficient for local events?
Tornados
What significant events have occurred locally?
Do you have data back-up systems for municipal records?
Have critical facilities been damaged by tornados or winds in the past? If yes, please provide details.
Does the community have a safe room? If so, where?
What other options are available for community members seeking safe shelter?
Do you or the County Emergency Management offer text alerts?
What educational outreach activities are done in the community?
In the event of a disaster, do you have Mutual Aide Agreements with neighboring communities and if yes, who?
Wildfire Fire
What significant events have occurred locally?
Does your community have a Wildland Urban Interface Code?
Do you have a fire department? If yes, what is the staffing?
Are property owners encouraged/required to have Defensible Space around structures?
Are there incentive programs for landowners to use Ignition-Resistant Material during construction? If yes, please explain.

Mitigation Action Status Update Worksheet:

Mitigation Actions Status Update

Village of Bloomington

Who completed this form? _____

_____

_____

_____

Below are the projects that your community identified in the 2010 Hazard Mitigation Plan.

#	Action	Hazard(s) Addressed	Estimated Cost ($)
1	Backup Generators	All	$15,000 to $30,000 per generator
2	Safe Rooms	Tornados, High winds, Severe thunderstorm	$4,500+
3	Stormwater System and Drainage Improvements	Flooding	$10,000 to $100,000+
4	Stream bank Stabilization/Grad Control Structure/ Channel Improvement	Flooding	$50,000 to $100,000+
5	Drainage Study/ Stormwater Master Plan	Flooding	$10,000 to $100,000+
6	Maintain good Standing in NFIP	Flooding	N/A
7	Floodplain Management	Flooding	N/A
8	Public Awareness/ Education	All	$500+
9	Weather Radios	All	$50 per radio

FEMA requires each community to review these actions during the plan update.

Please complete the following pages **in detail**.

Mitigation Actions Status Update

ACTION	**Backup Generators**
Description	Provide a portable or stationary source of backup power to redundant power supplies, municipal wells, lift stations, and other critical facilities.
Objective	Reduce the danger to human life/health by keeping utilities operating. Reducing economic downtime associated with utility loss.
Hazard(s)	All
Estimated Cost	$15,000 to $30,000 per generator

Is this project still needed for your community? (Circle One)

Yes (Please complete Table 3)
No (Answer the following question)
Was the project completed? Yes (Complete Table 2A) -OR- No (Complete Table 2B)

When was the project completed?	
Where was the project located?	
How was the project funded?	

Table 2A

No: Please explain why this action is no longer needed in Table 2.

Explanation for Removal

Table 2B

Table 3

What stage is this project in? (Provide a detailed description)			
What types of **local** funding will support this project?			
How long will it take to complete this project?	1 year	2 – 5 years	5+ years
Is this a high, medium, or low priority?	High	Medium	Low
What specific department or office will lead this project?			
Where will this project be located?			
What critical facility is in need of this action?			

Schools Questionnaire:

Alma Public Schools

1. What Communities do you serve?

2. What is the total enrollment?_____

	Name	Address	Number of Buildings ?	Number of Students	Number of Faculty/ Staff	Shelter ?	Generator ?	Weather Radio?	Located in Floodplain ?	Emergency Operation Plan?
1	Alma Elementary School			160						
2	Alma High School			119						
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										

3. What are your critical facilities other than the school buildings? (e.g. separate gym, Administrative building, bus barn, maintenance, etc) Please provide names and addresses if different from the list above.

1

4. What types of drills (tornado, fire, shelter in place, active shooter, etc) do you perform with your students/staff? How often?

5. What types of information materials are sent home with students on hazards and preparedness?

6. Do you partner with local Fire/Police Departments and/or Hospitals to teach preparedness to children? Please provide details.

7. Do children learn First Aid? At what age?

8. Have you partnered with the city or county to implement major mitigation projects in the past (like roof hardening, etc)? If so, what was the project and with whom?

Appendix D: Worksheets to Assist Community in Review and Updates

Contents:

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Worksheet # 1: Progress Report

Progress Report Period: _____ (Date) to _____ (Date)

Project Title: _____ Project ID#: _____

Responsible Agency: _____

Address: _____

City/County: _____

Contact Person: _____ Title: _____

Phone #(s): _____ e-mail address: _____

List Supporting Agencies and Contacts: _____

_____

Total Project Cost: $_____ Anticipated Cost Overrun/Under run: _____

Date of Project Approval: _____ Start date of the project: _____

Anticipated completion date: _____

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase).

_____
_____
_____
_____
_____

Milestones	Complete	Projected Date of Completion

_____

_____

Plan Goal(s)/Objective(s) Addressed:

Goal: _____

Objective: _____

Indicator of Success (e.g., losses avoided as a result of the acquisition program):
In most cases, you will list losses avoided as the indicator. In cases where it is difficult to quantify the benefits in dollar amounts, you will use other indicators, such as the number of people who now know about mitigation or who are taking mitigation actions to reduce their vulnerability to hazards.

_____

_____

_____

Status *(Please checks pertinent information and provide explanations for items with an asterisk. For completed or canceled projects, see Worksheet #2 — to complete a project evaluation):*

Project Status	Project Cost Status
(1) ☐ Project on schedule	(1) ☐ Cost unchanged
(2) ☐ Project completed	(2) ☐ Cost overrun* *explain: _____ _____
(3) ☐ Project delayed* *explain: _____ _____	(3) ☐ Cost under run* *explain: _____ _____
(4) ☐ Project canceled	

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

B. What obstacles, problems, or delays did you encounter, if any?

C. How was each problem resolved?

Next Steps: What is/are the next step(s) to be accomplished over the next reporting period?

Other comments:

Worksheet #2: Evaluating Your Planning Team

When gearing up for the plan evaluation, the planning team should reassess its composition and ask the following questions:

	YES	NO
Have there been local staffing changes that would warrant inviting different members to the planning team? Comments/Proposed Action:		
Are there organizations that have been invaluable to the planning process or to project implementation that should be represented on the planning team? Comments/Proposed Action:		
Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the planning team? Comments/Proposed Action:		
Are there procedures (e.g., signing of MOAs, commenting on submitted progress reports, distributing meeting minutes, etc.) that can be done more efficiently? Comments/Proposed Action:		
Are there ways to gain more diverse and widespread cooperation? Comments/Proposed Action:		
Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning? Comments/Proposed Action:		

If the planning team determines the answer to any of these questions is "yes," some changes may be necessary.

Worksheet #3: Evaluate Your Project Results

Project Name and Number: Project Budget: Project Description: Associated Goal and Objective (s): Indicator of Success (e.g., losses avoided):	*Insert location map* *include before and after photos if appropriate*

Was the action implemented?

IF YES ↓

What were the results of the implemented action?

IF NO ↓

Why not?

Was there political support for the action?	YES	NO
Were enough funds available?	YES	NO
Were workloads equitably or realistically distributed?	YES	NO
Was new information discovered about the risks or community that made implementation difficult or no longer sensible?	YES	NO
Was the estimated time of implementation reasonable?	YES	NO
Were sufficient resources (for example staff and technical assistance) available?	YES	NO

Were the outcomes as expected? **YES** **NO** Additional comments or other outcomes:
If No, please explain:

Did the results achieve the goal and objective (s)? **YES** **NO**
Explain how:

↓

Was the action cost-effective? **YES** **NO**
Explain how or how not:

What were the losses avoided after having completed the project?

If it was a structural project, how did it change the hazard profile?

Date _____

Prepared by: _____

Worksheet #4: Revisit Your Risk Assessment

Risk Assessment Steps	Questions	YES	NO	COMMENTS
Identify hazards	Are there new hazards that can affect your community?			
Profile hazard events	Are new historical records available?			
	Are additional maps or new hazard studies available?			
	Have chances of future events (along with their magnitude, extent, etc.) changed?			
	Have recent and future development in the community been checked for their effect on hazard areas?			
Inventory assets	Have inventories of existing structures in hazard areas been updated?			
	Are future developments foreseen and accounted for in the inventories?			
	Are there any new special high-risk populations?			
Estimate losses	Have loss estimates been updated to account for recent changes?			

If you answered "Yes" to any of the above questions, review your data and update your risk assessment information accordingly

Worksheet #5: Revise the Plan

Prepare to update the plan.

When preparing to update the plan:	Check the box when addressed ✓
1. Gather information, including project evaluation worksheets, progress reports, studies, related plans, etc. Comments:	☐
2. Reconvene the planning team, making changes to the team composition as necessary (see results from *Worksheet #2*). **Comments:**	☐

Consider the results of the evaluation and new strategies for the future.

When examining the community consider:	Check the box when addressed ✓
1. The results of the planning and outreach efforts. Comments:	☐
2. The results of the mitigation efforts. Comments:	☐
3. Shifts in development trends. **Comments:**	☐
4. Areas affected by recent disasters. **Comments:**	☐
5. The recent magnitude, location, and type of the most recent hazard or disaster. **Comments:**	☐
6. New studies or technologies. **Comments:**	☐
7. Changes in local, state, or federal laws, policies, plans, priorities, or funding. **Comments:**	☐

8. Changes in the socioeconomic fabric of the community. ☐

Comments:

9. Other changing conditions. ☐

Comments:

Incorporate your findings into the plan.

When examining the plan:	**Check the box when addressed ✓**
1. Revisit the risk assessment. **Comments:**	☐
2. Update your goals and strategies. **Comments:**	☐
3. Recalculate benefit-cost analyses of projects to prioritize action items. **Comments:**	☐

Use the following criteria to evaluate the plan:

Criteria	**YES**	**NO**	**Solution**
Are the goals still applicable?			
Have any changes in the state or community made the goals obsolete or irrelevant?			
Do existing actions need to be reprioritized for implementation?			
Do the plan's priorities correspond with state priorities?			
Can actions be implemented with available resources?			

Comments:

Appendix E: Hazard Mitigation Project Funding Guidebook

Contents:

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SECTION ONE: OVERVIEW

This *Hazard Mitigation Project Funding Guidebook* is provided by JEO Consulting Group, Inc.

The intent of the Guidebook is to provide initial guidance on:

- Hazard mitigation project funding opportunities
- Where to find more information

The information in this Guidebook is consistent with established processes for hazard mitigation planning. However, it is important to note the following in terms of the context for this Guidebook relative to the overall planning process:

- Project identification includes identifying all possible options (or alternatives) to address planning objectives; i.e., at this stage, there are no "bad" options. At times, the best option may be to work with other actors in the community to design solutions that are responsive to community values while reducing risk (i.e. a bike path or ball field that can double as a retention area, or the preservation of an animal habitat that also serves as a natural buffer). These types of solutions can often be funded in very innovative ways, including solutions which increase local industry and revenue (i.e. tapping into the entrepreneurial community).
- Project identification is followed by a comprehensive evaluation of possible project options to identify viable, preferred option(s) for development of specific implementation strategies. Preferred options may change as different stakeholders come to the table and additional ideas are proposed or funding sources identified. Incremental mitigation projects, in which risk is slowly bought down through a comprehensive range of actions, can be a much more realistic strategy than identifying the one best (and often costliest) solution.
- Project evaluation criteria include the need for and the availability of funding for specific project options along with technical feasibility, environmental consequences, cost effectiveness, etc.

Even though funding availability is "technically" part of project evaluation, this Guidebook offers information regarding availability of funding in addition to information about identifying projects. The purpose is to reflect the importance of linking project options with potential funding and implementation mechanisms as early as possible to eliminate options with little or no prospects for funding but more importantly, to recognize that successful implementation of the resulting hazard mitigation plan (HMP) will require creative approaches to project funding and the documentation of successful projects. Knowledge of a broader range of funding opportunities and mechanisms beyond federal hazard mitigation grant programs will enable the planning team to keep as many implementation options open as possible, as well as to ensure that some minimal projects can be completed in between plan updates.

SECTION TWO: HAZARD MITIGATION PROJECT FUNDING OPPORTUNITIES

2.1 GENERAL

When the current FEMA hazard mitigation planning program was formulated in the late 1990s as part of the Disaster Mitigation Act of 2000 (DMA 2000), there was an assumption that federal funding would be provided on an substantial, on-going basis for implementing hazard mitigation projects. While hundreds of millions of dollars have been provided by the federal government over the last decade, primarily through FEMA hazard mitigation grant programs, the level of funding has varied from year to year and future prospects are unclear. Additionally, some communities have not been successful in their pursuit of these grants and have not seen the value of their investment in mitigation planning. As a result, while it is still important to have a grasp of how these legacy federal programs can be used to fund hazard mitigation projects, it is increasingly important to look for other opportunities.

Opportunities for funding and technical assistance exist in other federal agencies or possibly state or local agencies. In addition, alternative funding opportunities can be developed at the regional or local level with private sector businesses, private foundations, and other non-governmental organizations (NGOs). In order to fully map out the range of local and state options it is necessary to undertake a detailed stakeholder analysis – something which has not been done at this time. The following contains a brief overview of federal, state, and local government programs that may include opportunities for hazard mitigation project funding as well as alternatives within the private sector and NGOs.

2.2 FEDERAL RESOURCES

Information about federal hazard mitigation project funding opportunities is organized per the following categories:

- FEMA Unified Hazard Mitigation Assistance Grant Programs
- Other FEMA Hazard Mitigation Programs
- Other Federal Agency Programs

2.2.1 FEMA UNIFIED HAZARD MITIGATION ASSISTANCE GRANT PROGRAMS

There are three (3) grant programs administered at the federal level by FEMA that are grouped under the umbrella heading of the "Unified Hazard Mitigation Assistance Grant Programs" (HMA) including:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)

These programs also have a counterpart agency at the State level. For Nebraska, HMGP and PDM are administered at the state level by the Nebraska Emergency Management Agency (NEMA). The FMA program is managed by the Nebraska Department of Natural Resources (NDNR). Periodically, FEMA issues guidance covering the administrative elements for all three (3) programs, titled the *Hazard Mitigation Assistance Unified Guidance*. The most recent guidance was released in 2013.

There are a number of similarities and differences between these programs but it is important to note three distinctions between HMGP and the other four HMA programs:

- HMGP is only available when authorized under a Presidential major disaster declaration, i.e., post-disaster. The other four HMA programs, when funding is appropriated by Congress, are available pre-disaster.
- Project eligibility under HMGP can be limited by the State as part of the HMGP Administrative Plan developed post-disaster. For example, funding may only be made available for projects that are related to the type of disaster; i.e., HMGP related to a significant flood disaster declaration may only be designated for flood mitigation projects like acquisitions of repetitively flooded properties.
- Eligible projects can include project types that are not typically funded by FEMA hazard mitigation programs if FEMA authorizes what is referred to as the "5 percent initiative". Generally reserved for very large disasters, authorizing the 5 percent initiative can make funding available for new, unproven mitigation techniques and technologies where benefits are not proven or not clearly measurable such as back-up generators, disaster warning equipment and systems, hazard identification or mapping efforts, and studies or plans to reduce disaster losses. The current State of Nebraska Administrative Plan for HMGP associated with FEMA 4014-DR-NE identifies the potential use of the 5 percent initiative for that particular disaster event.

Note: Section Three includes individual website URLs for more detailed information on these three HMA programs and the Hazard Mitigation Assistance Unified Guidance.

2.2.2 OTHER FEMA HAZARD MITIGATION PROGRAMS

Two (2) other FEMA programs include the potential for funding hazard mitigation projects that may be identified:

- Fire Management Assistance Grant Program (FMAGP) - FMAGP may be applicable to some areas of Nebraska; the NESHMP identifies Wildfires as the third highest ranked hazard on a state-wide basis. FEMA provides the following overview of the FMAGP program:

  [FMAGP] is available to States, local and tribal governments, for the mitigation, management, and control of fires on publicly or privately owned forests or grasslands, which threaten such destruction as would constitute a major disaster.

- Public Assistance (PA) Section 406 Hazard Mitigation Funding – Generally, PA funds are provided post-disaster for the restoration of public infrastructure that has sustained damaged due to a presidentially-declared disaster. The legislation authorizing PA also includes a "*provision for the consideration of funding additional measures that will enhance a facility's ability to resist similar damage in future events*." It is important to note that Section 406 funding can only be used on parts of a facility that were actually damaged by the disaster; although in some cases the damages are sufficient that the entire facility must be replaced.

  Therefore, it is often difficult to include the type of specific predictions in a HMP that would lead to identifying Section 406 as a prime option for funding but it should be noted in the HMP and referenced wherever it is potentially applicable. Areas of vulnerability for particular buildings, or building types, identified through the HMP can be a resource for the identification of PA

mitigation projects. Additionally, local and state staff should receive training in the successful use of PA.

Additional FEMA programs include: Community Assistance Program which assists states with the NFIP; various post-disaster funds and programs; and Assistance to Firefigher Grants which can assist with the enhancement of response capabilities.

Note: Section Three includes individual website URLs for more detailed information on these two FEMA programs that are also the sources of the quoted passages.

2.2.3 OTHER FEDERAL AGENCY PROGRAMS

Although FEMA programs are typically thought of as the primary sources of federal agency hazard mitigation project funding, there are a significant number of agencies with programs relevant to local HMPs and hazard mitigation project implementation. The following indicates some of the federal programs which may be of assistance in funding certain types of hazard mitigation projects – or portions of those projects.

Table 1: Federal Programs

Source	Description	Additional Notes	Website
Advisory Council on Historic Preservation	The Preserve America matching-grant program provides planning funding to designated Preserve America Communities to support preservation efforts through heritage tourism, education, and historic preservation planning.	This funding source may be considered as part of efforts to ensure that historic structures are protected from natural hazards. The City of Lincoln is a Preserve America Community.	http://www.preserveamerica.gov/
National Endowment for the Humanities	The National Endowment for the Humanities manages multiple grant programs which may be relevant.	Programs support educational initiatives and cultural institutions.	http://www.neh.gov/grants
U.S. Department of Agriculture (USDA)	USDA administers several programs that are potentially relevant including the National Institute of Food and Agriculture (NIFA), Natural Resource Conservation Service (NRCS), Rural Development, and the Farm Service Agency (FSA).	There are many different NRCS programs which can provide technical assistance and construction of improvements to relieve imminent hazards to life and property from floods and erosion. There are also various rural development programs which can support essential services such as sewer services and assist with fire and police stations. USDA programs also support renewable energy efforts. However, other USDA programs should be examined relative to identified projects	http://www.usda.gov/wps/portal/usda/usdahome?navid=GRANTS_LOANS

Source	Description	Additional Notes	Website
		to find potential matches with funding and assistance provisions.	
U.S. Department of Commerce	Economic Development Administration (EDA) – EDA primarily provides a variety of grants, loans, and technical assistance to support long-term economic recovery but also has supported grants for upgrades to critical public infrastructure and essential facilities.	There are various programs and resources available through EDA. The National Weather Service and National Oceanic and Atmospheric Administration have also had programs in the past, but are restricted by funding at the moment.	http://www.eda.gov/ffo.htm
U.S. Army Corps of Engineers (USACE)	USACE can provide a broad range of assistance under legislative authority related to flood control for floodplain management planning, stream bank and shoreline protection, and aquatic ecosystem restoration.	USACE projects generally involve watershed level activities and long project development and implementation timelines but may be applicable to regional considerations.	http://www.nwo.usace.army.mil/
U.S. Dept of Education	Grants support LEAs in the development of communitywide approaches to creating safe and drug-free schools and promoting healthy childhood development. Programs are intended to prevent violence and the illegal use of drugs and to promote safety and discipline. Coordination with other community-based organizations (CBOs) is required. This program is	This program can be used to work towards safer schools, taking various potential risks into account.	http://www2.ed.gov/programs/dvpsafeschools/index.html

Source	Description	Additional Notes	Website
	jointly funded and administered by the departments of Education, Justice, and Health and Human Services. The appropriation amounts listed above do not include funds appropriated for the departments of Justice and Health and Human Services.		
U.S Department of Energy (DOE)	DOE undertakes a range of missions related to electricity and energy including improving "*the ability of energy sector stakeholders to prevent, prepare for, and respond to threats, hazards, natural disasters, and other supply disruptions".* DOE works closely with State and local governments on energy assurance issues and develops products and tools to inform and educate State and local officials to support their energy emergency response activities. DOE also partners with State and local organizations to further assist in these efforts including the National Association of State Energy Officials, National Association of Regulatory Utility Commissioners, National Governors Association, National Conference of State Legislatures, and at the local level,	DOE programs fund weatherization efforts, support renewable energy efforts which can be a portion of an energy assurance effort, and can provide technical assistance through the Nuclear Safety and Environment Program.	http://energy.gov/public-services/funding-opportunities

Source	Description	Additional Notes	Website
	Public Technology Institute. Recently, DOE created the Local Energy Assurance Program (LEAP) which included more than $8 million in LEAP grants to 43 cities and towns across the country to develop or expand local energy assurance plans to improve electricity reliability and energy security in these communities		
US Dept of Health and Human Services	The US Dept of Health and Human Services and its various agencies provide a wide range of grants and technical assistance programs.	Grant programs include technical: assistance and training related to ensuring safe water and wastewater treatment for rural areas; program to provide AEDs; and programs to ensure that rural areas have access to health services.	http://www.hhs.gov/grants/index.html
U.S. Department of Housing and Urban Development (HUD)	HUD administers the Community Development Block Grants (CDBG). CDBG funds have been used in conjunction with other hazard mitigation funding sources, e.g., HMGP, to implement projects including acquisitions and elevation of flood prone properties. However, HUD funding for hazard mitigation projects usually comes via special Congressional appropriations related to specific disaster events.	CDBG funds can play a key role in hazard mitigation.	http://portal.hud.gov/hudportal/HUD?src=/topics/grants

Source	Description	Additional Notes	Website
US Dept of Justice	The Office of Community Oriented Policing services offers funding to assist with community policing capacity.	This program may be relevant to communities which identify crime, acts of violence and/or terrorism as a hazard.	http://www.justice.gov/business/
US Dept of Labor	National Emergency Grants (NEGs) temporarily expand the service capacity of Workforce Investment Act Dislocated Worker training and employment programs at the state and local levels by providing funding assistance in response to large, unexpected economic events which cause significant job losses. NEGs generally provide resources to states and local workforce investment boards to quickly reemploy laid-off workers by offering training to increase occupational skills.	Training and temporary jobs can focus on weatherization or possibly mitigation related activities.	http://www.doleta.gov/neg/
US Dept of the Interior	The National Parks Service has multiple grants allowing for the purchase of land for recreational facilities, the rehabilitation of recreation facilities, and protecting cultural treasures.	These programs could assist with the securing of land which can serve a dual purpose of mitigation and recreation, as well as for protecting some historic sites.	www.nps.gov
US Dept of Transportation	Funds support recreational trails, bridge replacement, safe routes to schools, road projects in rural areas, and other programs.	These funds can be incorporated into multi-objective projects aimed at hazard mitigation.	http://www.dot.gov/grants

Source	Description	Additional Notes	Website
U.S. Environmental Protection Agency (EPA	In May, 2010, EPA signed a memorandum of agreement with FEMA to "*formalize efforts to explore opportunities to incorporate sustainability and smart growth practices into communities' hazard mitigation planning and long term disaster recovery efforts, and to incorporate hazard resilience into smart growth assistance for communities.*" The intent is to coordinate parallel activities within these agencies for an array of policy initiatives that include climate change considerations. For projects that are intended to improve land use planning practices, this joint effort could provide valuable technical assistance.	EPA programs support efforts to clean up brownfields, support water quality, provide safe drinking water, promote green communities, and watershed protection.	http://www2.epa.gov/home/grants-and-other-funding-opportunities
Small Business Administration (SBA)	SBA Disaster Loan Program (DLP) is a significant source of assistance for homeowners, renters, businesses, and nonprofit organizations in the aftermath of disasters. Although this is a post-disaster funding mechanism, it is important to note that loans can be increased up to 20 percent for mitigation to protect property from future disasters of the same kind that caused the current damage.	Small businesses can use SBA loans for many purposes, before and after a disaster.	

These are by no means the only non-FEMA, federal agency programs that could have the potential to support hazard mitigation project implementation. Additionally many of these programs are dependent on yearly funding allocations. However, at this point, it is more important to be aware of the potential for other federal agencies to support a broad array of project types. As needs and potential hazard mitigation project options are identified, more information can begin to be gathered on the range of programs which might be utilized. It will be more efficient to start with project options and then follow-up with the identification of potential matches, working with the full range of available programs and agencies as part of a comprehensive project evaluation process.

2.3 STATE OF NEBRASKA RESOURCES AND PRIORITIES

The 2011 NESHMP identifies a number of agencies and programs with potential applicability to supporting funding and implementation of mitigation projects in addition to the federal hazard mitigation grant programs administered at the state level by NEMA and NDNR already mentioned above. These agencies will also likely be important in earlier stages of the hazard mitigation planning process by providing current hazard and risk assessment data, including:

- NDNR – Public outreach and education programs should be incorporated and cross-referenced as part of any corresponding programs recommended as part of HMPs

- Climate Assessment and Response Committee (CARC) – CARC is a committee comprised of other state agencies and other stakeholders including the University of Nebraska and private livestock and crop producers. A primary concern of the CARC appears to be drought mitigation and at a minimum, the CARC should be a good source of technical support for related mitigation actions at the region or local levels.

- Nebraska Forest Service (NFS) – Per the NESHMP, the NFS "administers state and federal grant monies for fuel treatment on private property…for thinning forested tracts and for applying firewise principles to properties."

One existing mechanism for agency collaboration, particularly in the area of flooding, is the Nebraska Silver Jackets Program (http://silverjackets.dnr.ne.gov/). Silver Jackets teams are active in many states and consist of various state and federal agencies working together in support of flood risk reduction.

Some state agencies which provide technical assistance and other resources include:

- Nebraska Department of Environmental Quality
- Nebraska Department of Economic Development
- Nebraska Department of Roads
- Nebraska Game and Parks Commission
- Nebraska State Historic Preservation Office

In addition to these programs, it is important to always have a sense of the priorities that are identified by other agencies in influential positions regarding future grant funding. For example, the 2012 State of Nebraska Administrative Plan for HMGP, consistent in many ways with aspects of the NESHMP, identifies eligible project types such as:

- Structural hazard control or protection projects
- Retrofitting of facilities
- Property acquisition or relocation
- Development or improvement of warning systems
- Dead-end storm structures
- Replacement of conductors to T-2 Conductors, e.g., for increased wind resistance for electrical transmission lines

2.4 ALTERNATIVE FUNDING SOURCES

In recent years, states and communities across the country have sought and developed innovative funding sources as alternatives to traditional government grant programs. This will be important for current and future hazard mitigation planning efforts for several reasons including:

- Decreases in funding for pre-disaster mitigation grant and assistance programs at the federal level and for state agencies - While technical assistance and other related support functions are still actively supported across federal and state agencies, and in some cases are increasing, allocations for "bricks and mortar" pre-disaster hazard mitigation projects will be competing with a broad range of government funding needs. These funds may not completely disappear but the need will continue to outstrip the supply for the foreseeable future.

- Opportunities to fund projects that might not qualify or align with traditional grant and assistance programs. Funding programs seek solutions that reduce risk for a particular threshold (i.e. 1-percent flood) and meet absolute cost-benefit criteria that the agencies themselves must adhere to. Therefore, these programs, by their basic nature, are not able to support efforts that may help most of the time but don't meet these thresholds, e.g., a homeowner installed flood wall in a repetitive loss area that prevents annual floods, but not larger magnitude events that come along every few years. There is a related concept that can be referred to as "cumulative risk reduction". For example, a homeowner with limited resources (and no real access to grant funds) might be willing to spend a little time and money each year getting just a little bit safer.

The following identifies general kinds of alternative funding sources and techniques that have been employed in other communities:

- Local Funding Options
- Public-Private Partnerships
- Private Foundations

2.4.1 LOCAL FUNDING OPTIONS

Local funding options are just what they sounds like, using local funds for local mitigation projects. Local funds are also needed as the non-federal share or "matching funds" for federal grant programs but can also be used independently to fund a range of project types. Local funding options include the following:

- Capital Improvement Programs – On-going civic improvements can include prioritized hazard mitigation projects or mitigation can be included as one aspect of a larger project. For example, improving the hydraulic capacity of a culvert or bridge to prevent upstream flooding while undertaking periodic replacements for end of service considerations is one example. Replacing windows in a school with shatter resistant glass as part of a overall renovation is another example. Capital improvement programs are generally funded with local tax revenues and municipal bonds.

- Permits, Fees, and Developer Contributions- Communities can establish fees, earmark a portion of existing permit and fee structures, and/or establish requirements for developer contributions for new developments in hazard prone areas that can then be used to fund local mitigation projects. The proceeds can be accumulated in what is often referred to as a "Mitigation Trust Fund" and the

uses are typically tied to specific project types and/or relationships with projects already identified in specific plans or documents such as an HMP. These types of funds can also be used to create vouchers or other incentives to individual action.

- Force Account / In-Kind Services – Although there is a "cost" associated with activities of of public employees, there are a wide range of activities that can be undertaken by local government staff and officials as well as interested parties on their behalf that would yield significant benefits. Some of the obvious examples are public outreach and education for individual property owners, business and institutions to reduce their risk through correspondingly inexpensive or essentially activities. This would include tapping into available educations resources[1], promoting individual action, etc.

- Property Owners – For a project that directly benefits one or more specific properties, the property owner can be asked to contribute. Through the HIRA process, property owners can become better aware of their risks and options. Owners that recognize they have a real flood problem may be willing to pay a portion of the cost. In recent years, property owners have voluntarily agreed to pay the non-federal share (up to 25 percent of the total project cost) for FEMA HMA grants in some states. In some cases, the owners have paid even higher percentages of the cost. In addition, after a flood, owners may have cash from insurance claims or disaster assistance that they will be using to repair their homes and properties. By including the right floodproofing and mitigation project components into the repairs, the resilience of the property to future flooding may be improved.

  Having property owners contribute to the project can help stretch available local funds and also gives the property owner an enhanced stake in the outcome of the project and incentive to make sure the property is properly maintained.

- Individual Participation – Although mitigation is ultimately intended to benefit individuals, HMPs often neglect to integrate participation of potential beneficiaries into the process. The participation by individuals, including small business owners, is important for making sure the resulting HMP reflects community needs and priorities but it also allows for the planning team to identify measures and options that individuals can take to reduce their own risk at a cost they can afford.

2.4.2 PUBLIC-PRIVATE PARTNERSHIPS

Developing a "public-private partnership" is a phrase used frequently in a wide range of government programs and for good reason, especially in the content of hazard mitigation. Similar to the point made in the preceding subsection regarding individual participation, participation of private sector organizations in solving their own hazard risk situations can be a low-cost and effective method. The phrase also encompasses finding opportunities for public and private sector partners to share costs equitably for larger projects that require substantial funds to implement. Private sector businesses and organizations have their own cost-benefit calculations to perform but joint efforts may make the balance sheets work for both sides.

2.4.3 PRIVATE FOUNDATIONS

[1] Several states and agencies have created resources for homeowners, some of which could be readily adapted for use in Nebraska.

Cultivating relationships with local, regional, or even national foundations with interests or missions consistent with hazard mitigation, community sustainability, climate change adaptation, and other related topics can yield successful results in terms of funding and other means of support.

There are many local foundations around the State of Nebraska, many of which fund programs that can be utilized for components of hazard mitigation projects. Many of these foundations only support non-profit organizations, so the applicability of these funds to projects depends upon the partners involved.

This approach is not as easy to develop as simply listing grants and funding mechanisms as it involves engaging a broad spectrum of stakeholders and employing combinations of funding sources in solving what are increasingly sticky issues related to funding for any public endeavor. However, as noted throughout this guidebook, the reality is that significant federal or state grant allocations for pre-disaster mitigation efforts are not apparent on the immediate horizon and communities will need to be creative, cooperative and proactive to realize risk reduction on a meaningful level.

SECTION THREE: REFERENCES

3.1 HAZARD MITIGATION PROJECT FUNDING

The following includes current websites with more detailed information about several of the programs and documents mentioned in this Guidebook.

- *Hazard Mitigation Assistance Unified Guidance*. The current version of this guidance document was developed in 2013 and can be found at: http://www.fema.gov/library/viewRecord.do?id=3649.

In addition, the individual grant programs each have specific websites per the following:

- Hazard Mitigation Grant Program (HMGP) http://www.fema.gov/hazard-mitigation-grant-program
- Pre-Disaster Mitigation (PDM) http://www.fema.gov/pre-disaster-mitigation-grant-program
- Flood Mitigation Assistance (FMA) http://www.fema.gov/flood-mitigation-assistance-program
- Fire Management Assistance Grant Program (FMAGP) - http://www.fema.gov/fire-management-assistance-grant-program
- Public Assistance (PA) Section 406 Hazard Mitigation Funding http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/hazard-mitigation-funding-under-section-406-0

Note: These websites and reference materials are as current as possible. However, one important aspect of grant programs that is not just applicable to hazard mitigation or to government agencies, is that the status, priorities, and administration of funding sources and programs is dynamic, i.e., subject to frequent changes in direction and emphasis. Therefore, it is useful to be familiar with the current information but it is equally, if not more important, to engage candidate federal and state agencies in a dialog as soon as possible. The intent is to determine the most current information about grant project status and priorities for inclusion in the evaluation of hazard mitigation projects and the development of implementation strategies.

On a related note, it is also recommended to include specific reference in plan maintenance procedures to the monitoring and updating of information regarding grant programs and the agencies or foundations that administer these grants.

There are also a number of documents that include a broad range of project types and how these have been implemented in communities across the country including:

Mitigation Best Practices Portfolio
http://www.fema.gov/mitigation-best-practices-portfolio