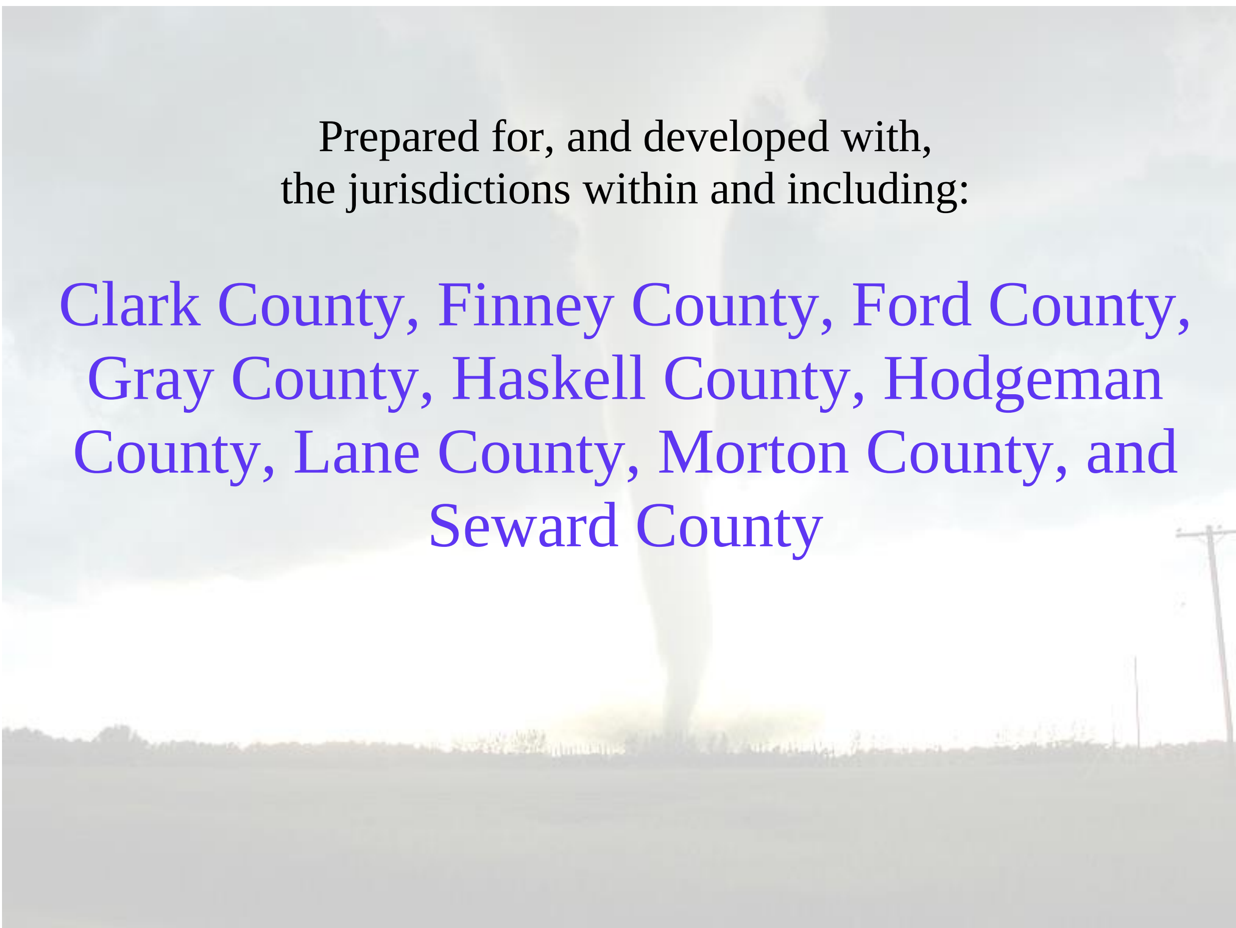
Kansas Homeland Security Region D Hazard Mitigation Plan



Prepared for, and developed with,
the jurisdictions within and including:

Clark County, Finney County, Ford County, Gray County, Haskell County, Hodgeman County, Lane County, Morton County, and Seward County

May 2020

Prepared By:

Blue Umbrella Solutions, LLC

Table of Contents

SECTION		PAGE

SECTION		PAGE

List of Appendices

List of Commonly Used Acronyms

Acronym	Meaning
CPRI	Calculated Priority Risk Index
CDC	Centers for Disease Control and Prevention
CWD	Chronic Wasting Disease
CFR	Code of Federal Regulations
CRS	Community Rating System
CWPP	Community Wildfire Protection Plans
EAB	Emerald Ash Borer
EAP	Emergency Action Plan
EMAP	Emergency Management Accreditation Program
EF	Enhanced Fujita
EPA	Environmental Protection Agency
ºF	Fahrenheit
FEMA	Federal Emergency Management Agency
HAZUS	FEMA Loss Estimation Software
FIRM	Flood Insurance Rate Map
GIS	Geographic Information System
GDP	Gross Domestic Product
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Planning
HazMat	Hazardous Materials
ISO	Insurance Service Office
KDA	Kansas Department of Agriculture
KDHE	Kansas Department of Health and Environment
KDOT	Kansas Department of Transportation
KDEM	Kansas Division of Emergency Management
KFS	Kansas Fire Service
KGS	Kansas Geological Survey
KSFM	Kansas State Fire Marshall
K.S.A	Kansas Statutes Annotated
KWO	Kansas Water Office
LEPC	Local Emergency Planning Committee
MPC	Mitigation Planning Committee
NCEI	National Centers for Environmental Information
NFIP	National Flood Insurance Program
NLCD	National Land Cover Database
NLD	National Levee Database
NLIR	National Levee Inventory Report
NLSP	National Levee Safety Program
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resource Conservation Service
NWS	National Weather Service
NSFHA	No Special Flood Hazard Area
NGO	Non-Governmental Organization

Acronym	Meaning
NRC	Nuclear Regulatory Commission
OHMS	Office of Hazardous Materials Safety
PDSI	Palmer Drought Severity Index
PHMSA	Pipeline and Hazardous Materials Safety Administration
PDM	Pre-Disaster Mitigation
PAL	Provisionally Accredited Levee
RL	Repetitive Loss
Risk MAP	Risk Mapping, Assessment and Planning
REC	Rural Electric Cooperative
SRL	Severe Repetitive Loss
SFHA	Special Flood Hazard Area
USD	Unified School District
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WUI	Wildland Urban Interface

1.0 Introduction, Assurances and Adoption

1.1 – Introduction

Mitigation is commonly defined as sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects. Hazard mitigation planning provides communities with a roadmap to aid in the creation and revision of policies and procedures, and the use of available resources, to provide long-term, tangible benefits to the community. A well-designed hazard mitigation plan provides communities with realistic actions that can be taken to reduce potential vulnerability and exposure to identified hazards.

This Hazard Mitigation Plan (HMP) was prepared to provide sustained actions to eliminate or reduce risk to people and property from the effects of natural and man-made hazards. This plan documents the State of Kansas Homeland Security Region D (hereafter referred to as Kansas Region D) and its participating jurisdictions planning process and identifies applicable hazards, vulnerabilities, and hazard mitigation strategies. This plan will serve to direct available community and regional resources towards creating policies and actions that provide long-term benefits to the community. Local and regional officials can refer to the plan when making decisions regarding regulations and ordinances, granting permits, and in funding capital improvements and other community initiatives.

Specifically, this hazard mitigation plan was developed to:

- Update the Kansas Region D 2015 Hazard Mitigation Plan
- Build for a safer future for all citizens
- Foster cooperation for planning and resiliency
- Identify, prioritize and mitigate against hazards
- Asist with sensible and effective planning and budgeting
- Educate citizens about hazards, mitigation and preparedness
- Comply with federal requirements

As stipulated in the Disaster Mitigation Act of 2000 (DMA 2000) Section 322, federally approved mitigation plans are a prerequisite for mitigation project grants. Development and Federal Emergency Management Agency (FEMA) approval of this plan will ensure future eligibility for federal disaster mitigation funds through the Hazard Mitigation Grant Program (HMPG), Pre-Disaster Mitigation Grant Program (PDM), Repetitive Flood Claims, and a variety of other state and federal programs. This Plan was prepared to meet the requirements of the DMA 2000, as defined in regulations set forth by the Interim Final Rule (44 CFR Part 201.6).

This plan has been designed to be a living document, a document that will evolve to reflect changes, correct any omissions, and constantly strive to ensure the safety of Kansas Region D.

1.2 – Participating Jurisdictions

44 CFR 201.6(a)(4): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

All eligible jurisdictions were invited to participate in the organization, drafting, completion and adoption of this plan. Invited jurisdictions included, but were not limited to, elected officials, relevant State of Kansas agencies, counties, cities, school districts, non-profit agencies, and businesses.

In order to have an approved hazard mitigation plan, DMA 2000 requires that each jurisdiction participate in the planning process. Each jurisdiction choosing to participate in the development of the plan were required to meet detailed participation requirements, which included the following:

- When practical and affordable, participation in planning meetings
- Provision of information to support the plan development
- Identification of relevant mitigation actions
- Review and comment on plan drafts
- Formal adoption of the plan

Based on the above criteria, the following jurisdictions participated in the planning process, and will individually as a jurisdiction adopt the approved hazard mitigation plan:

Table 1.1: Clark County Participating Jurisdictions

Jurisdiction	2015 HMP Participant	2020 HMP Participant
Clark County	x	x
City of Ashland	x	x
City of Englewood	x	x
City of Minneola	x	x
USD #129 - Minneola	x	x
USD #220 - Ashland	x	x
Ashland Health Center	x	x
CMS REC	x	x
Minneola District Hospital	x	x
Southern Pioneer Electric COOP	x	x

Table 1.2: Finney County Participating Jurisdictions

Jurisdiction	2015 HMP Participant	2020 HMP Participant
Finney County	x	x
City of Garden City	x	x
City of Holcomb	x	x
Garden City Community College	x	x
USD #363 – Holcomb	x	x
USD #457 – Garden City	x	x
Lane Scott Electric COOP	x	x
Pawnee Watershed Joint District #81	x	x
Pioneer Electrical COOP	x	x
Sunflower Electric COOP	x	x
Victory Electrical COOP	x	x
Wheatland Electric COOP	x	x

Table 1.3: Ford County Participating Jurisdictions

Jurisdiction	2015 HMP Participant	2020 HMP Participant
Ford County	x	x
City of Bucklin	x	x
City of Dodge City	x	x
City of Ford	x	x
City of Spearville	x	x
Dodge City Community College	x	x
USD #381 - Spearville	x	x
UDS #443 – Dodge City	x	x
USD #459 - Bucklin	x	x
Bucklin Hospital District	x	x
Pawnee Watershed Joint District #81	x	x
Sunflower Electric COOP	x	x
Victory Electric COOP	x	x

Table 1.4: Gray County Participating Jurisdictions

Jurisdiction	2015 HMP Participant	2020 HMP Participant
Gray County	x	x
City of Cimarron	x	x
City of Copeland	x	x
City of Ensign	x	x
City of Ingalls	x	x
City of Montezuma	x	x
USD #102 - Cimarron	x	x
USD #371 - Montezuma	x	x
USD #476 – Copeland / South Gray	x	x
USD #477 - Ingalls	x	x
CMS Electric COOP	x	x
Pioneer Electric COOP	x	x
Pawnee Watershed Joint District #81	x	x
Victory Electric COOP	x	x
Wheatland Electric COOP	x	x

Table 1.5: Haskell County Participating Jurisdictions

Jurisdiction	2015 HMP Participant	2020 HMP Participant
Haskell County	x	x
City of Satanta	x	x
City of Sublette	x	x
USD #374 - Sublette	x	x
USD #507 - Satanta	x	x
Pioneer Electric COOP	x	x
Southern Pioneer Electric COOP	x	x
Sunflower Electric COOP	x	x

Table 1.6: Hodgeman County Participating Jurisdictions

Jurisdiction	2015 HMP Participant	2020 HMP Participant
Hodgeman County	x	x
City of Hanston	x	x
City of Jetmore	x	x
USD #227 – Hodgeman County	x	x
Hodgeman Hospital		x
Horse Thief Reservoir District	x	x
Lane Scott Electric COOP	x	x
Midwest Energy	x	x
Pawnee Watershed Joint District #81	x	x
Victory Electric COOP	x	x

Table 1.7: Lane County Participating Jurisdictions

Jurisdiction	2015 HMP Participant	2020 HMP Participant
Lane County	x	x
City of Dighton	x	x
USD #468 – Healy Public Schools	x	x
USD #482- Dighton	x	x
Lane Scott Electric COOP	x	x
Midwest Energy	x	x
Pawnee Watershed Joint District #81	x	x
S&T Telephone COOP	x	x

Table 1.8: Meade County Participating Jurisdictions

Jurisdiction	2015 HMP Participant	2020 HMP Participant
Meade County	x	x
City of Fowler	x	x
City of Meade	x	x
City of Plains	x	x
USD #225 - Fowler	x	x
USD #226 - Meade	x	x
USD #483 – Kismet / Plains	x	x
Artesian Valley Health System	x	x
CMS Electric COOP	x	x
Southern Pioneer Electric COOP	x	x

Table 1.9: Seward County Participating Jurisdictions

Jurisdiction	2015 HMP Participant	2020 HMP Participant
Seward County	x	x
City of Kismet	x	x
City of Liberal	x	x
Seward County Community College	x	x
USD #480 - Liberal	x	x
USD #483 – Kismet / Plains	x	x

Table 1.9: Seward County Participating Jurisdictions

Jurisdiction	2015 HMP Participant	2020 HMP Participant
CMS Electric COOP	x	x
Pioneer Electric COOP	x	x
Southern Pioneer Electric COOP	x	x

Any Kansas Region D jurisdiction not covered in this HMP is either covered under another plan or declined to participate.

1.3 – Assurances

Kansas Region D and all participating jurisdictions certify that they will comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d).

This hazard mitigation plan was prepared to comply with all relevant the requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, as amended by the DMA 2000. This plan complies with all the relevant requirements of:

- Code of Federal Regulation (44 CFR) pertaining to hazard mitigation planning
- FEMA planning directives and guidelines
- Interim final, and final rules pertaining to hazard mitigation planning and grant funding
- Relevant presidential directives
- Office of Management and Budget circulars
- Any additional and relevant federal government documents, guidelines, and rules.

1.4 – Authorities

For all jurisdictions within Kansas Region D all authority is subject to prescribed constraints, as all of Kansas political subdivisions must not act without proper delegation from the State. However, cities and counties in Kansas have broad home rule powers. Local governments in Kansas have a wide range of tools available to them for implementing mitigation programs, policies, and actions. A local jurisdiction may utilize any or all of the following broad authorities granted by the State of Kansas:

- Regulation
- Acquisition
- Taxation
- Spending

In addition, Kansas local governments have been granted broad regulatory authority in their jurisdictions. Kansas Administrative Regulations bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances. Since hazard mitigation can be included under the police power (as protection of public health, safety, and welfare), towns, cities, and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance-making power to abate "nuisances", which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard.

The Kansas Region D HMP relies on the authorities given to it by the State of Kansas and its citizens as encoded in state law. This plan is intended to be consistent with all policies and procedures that govern activities related to the mitigation programing and planning. In all cases of primacy, State of Kansas laws, statutes, and policies will supersede the provisions of the plan. This HMP attempts to be consistent following:

- Kansas Constitution, Article 12 Section 5: Home rule powers
- Kansas Administrative Regulation 56-2: Standards for local disaster agencies
- 2016 Kansas Statutes, Chapter 12, Article 7: Allows cities and municipalities to designate flood zones and restrict the use of land within these zones
- 2016 Kansas Statutes Chapter 24, Article 12: Establishes watershed districts
- 2016 Kansas Statutes, Chapter 48, Article 9: Promulgating the Kansas Emergency Management Act, requiring counties to establish and maintain a disaster agency responsible for emergency management and to prepare a county emergency response plan
- 2016 Kansas Statutes, Chapter 65, Article 57: Promulgating the Kansas Emergency Planning and Community Right to-Know Act
- The Robert T. Stafford Disaster Relief and Emergency Assistance Act as amended by the Disaster Mitigation Act of 2000 (Public Law 106-390 – October 30, 2000)
- 44 CFR Part 201.6: Local mitigation plans

In addition, this plan will be consistent with all relevant federal authorities as well as Emergency Management Accreditation Program (EMAP) mitigation standards.

1.5 – Adoption Resolutions

44 CFR Requirement 201.6(c)(5): Documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

Upon review and approved pending adoption status by FEMA Region VII adoption resolutions will be signed by the participating jurisdictions and tracked by the Regional Mitigation Plan Project Manager with KDEM.

While not required, private, non-profit and charitable organizations that independently participated in this planning effort are encouraged to adopt the plan.

Adoption resolutions may be found in Appendix A.

2.0 Planning Process

2.1 – Documentation of the Planning Process

44 CFR 201.6(c)(1): Documentation of 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.

In November 2019, Kansas Region D and its participating jurisdictions began the process to update the Kansas Region D 2015 HMP. It was determined that Jeanne Bunting, the Kansas State Hazard Mitigation Officer would serve as the project manager, directing this plan update, and would act as the primary point-of-contact throughout the project.

The State of Kansas contracted with Blue Umbrella Solutions to assist in updating the 2015 Kansas Region D HMP. Blue Umbrella's roles included:

- Ensure that the hazard mitigation plan meets all regulatory requirements
- Assist with the determination and ranking of hazards
- Assist with the assessment of vulnerabilities to identified hazards
- Assist with capability assessments
- Identify and determine all data needs and solicit the information from relevant sources
- Assist with the revision and development of the mitigation actions
- Development of draft and final planning documents

Kansas Region D and its participating jurisdiction undertook the following steps to update and create a robust HMP:

- Review of the 2015 Kansas Region D HMP
- Review of current related planning documents
- Delivery of organizational and planning meetings
- Solicitation of public input as to plan development
- Assessment of potential risks
- Assessment of vulnerabilities and assets
- Development of the mitigation actions
- Development of a draft multi-hazard mitigation plan
- Implementation, adoption, and maintenance of the plan

The process established for this planning effort is based on DMA 2000 planning and update requirements and the FEMA associated guidance for hazard mitigation plans. The FEMA four step recommended mitigation planning process, as detailed below, was followed:

1. Organize resources
2. Assess risks
3. Develop a mitigation plan
4. Implement plan and monitor progress

To accomplish this, the following planning process methodology was followed:

- Inform, invite, and involve other mitigation plan stakeholders throughout the state, including federal agencies, state agencies, regional groups, businesses, non-profits, and local emergency management organizations.
- Conduct a thorough review of all relevant current and historic planning efforts
- Collect data on all related state and local plans and initiatives. Additionally, all related and relevant local plans were reviewed for integration and incorporation.
- Develop the planning and project management process, including methodology, review procedures, details about plan development changes, interagency coordination, planning integration, and the organization and contribution of stakeholders.
- Develop the profile of the county and participating jurisdictions.
- Complete a risk and vulnerability assessment using a Geographic Information System (GIS) driven approach using data from various local, state and federal agency resources.
- Develop a comprehensive mitigation strategy effectively addressing their hazards and mitigation program objectives. This included identifying capabilities, reviewing pre and post disaster policies and programs, identifying objectives and goals, identifying mitigation actions and projects, and assessing mitigation actions and projects.
- Determination and implementation of a plan maintenance cycle, including a timeline for plan upgrades and improvements.
- Submission of the plan to FEMA Region VII for review and approval and the petition all participating jurisdictional governments for a letter of formal plan adoption.

2.2 – 2020 Plan Changes

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

The Kansas Region D HMP has undergone significant revision and upgrading since its last edition. Not only has the region made significant efforts to improve the functionality and effectiveness of the plan itself but is has significantly improved its hazard mitigation program. This grants the region's improved and robust hazard mitigation program a better base to further mold and improve its mitigation strategy over the next five years.

As part of this planning effort, each section of the previous mitigation plan was reviewed and completely revised. The sections were reviewed and revised against the following elements:

- Compliance with the current regulatory environment
- Completeness of data
- Correctness of data
- Capability differentials
- Current state environment

In addition to data revisions, the format and sequencing of the previous plan was updated for ease of use and plan clarity.

During this process, and after a thorough review and discussion with all participating jurisdictions and stakeholders, it was determined that the priorities of the overall community in relation to hazard mitigation planning have not changed during the five years of the previous planning cycle.

2.3 – Mitigation Planning Committee

Upon project initiation a mitigation planning committee (MPC), generally consisting of participating county emergency managers, was formed. From project inception to completion, the MPC was involved in each major plan development milestone, and fully informed through on-site meetings and electronic communication. Prior to the plan's submission to FEMA, the MPC was invited to review the plan and provide input.

In general, all MPC members were asked to participate in the following ways:

- Provide local engagement with all participating jurisdictions
- Attend and participate in meetings
- Assist with the collection of data and information
- Review planning elements and drafts
- Integrate hazard mitigation planning elements with other planning mechanisms
- Facilitate jurisdictional coordination and cooperation
- Assist with the revision and development of mitigation actions

MPC members who were unable to attend meetings due to budgetary or personnel constraints were contacted via email or phone to discuss hazard mitigation planning, including the process, goals, mitigation actions, local planning concerns and plan review.

Each MPC member was thoroughly interviewed regarding their jurisdiction's and sub-jurisdiction's mitigation related activities. These interviews were invaluable in fully integrating the resources necessary to produce this plan, document mitigation activities, and document the mitigation resources available to better increase resiliency.

Additionally, the MPC was used as a conduit to solicit input from all participating jurisdictions under the county. Where appropriate, the MPC solicited the assistance of technical experts from various agencies and groups. When the MPC updated and improved the plan's mitigation strategy, personnel from strategically selected agencies were interviewed to provide input on their mitigation capabilities.

The following participants were selected for the MPC.

Table 2.1: Kansas Region D Mitigation Planning Committee

Participant	Title	Organization
Millie Fudge	Emergency Manager	Clark County
Steve Green	Emergency Manager	Finney County
Rex Beemer	Emergency Manager	Ford County
Troy Blevins	Emergency Manager	Gray County
Debbie Brown	Emergency Manager	Haskell County
Mike Burke	Emergency Manager	Hodgeman County
Bill Barnett Jr.	Emergency Manager	Lane County
Bryan Burgess	Emergency Manager	Meade County
Greg Standard	Emergency Manager	Seward County
Jennifer Ellerman	Mitigation Planner	State of Kansas
Jeanne Bunting	State Hazard Mitigation Officer	State of Kansas
Matt Eyer	Plan Author	Blue Umbrella Solutions

2.4 – Jurisdictional Representation

Each participating jurisdiction delegated a point of contact to represent that jurisdiction during the planning process. From project inception to completion these representatives were kept fully informed concerning the planning process, milestones, and participation requirements. In general, jurisdictional representatives were asked to participate in the following ways:

- If possible, attend and participate in meetings
- Provide jurisdiction specific data and information
- Review planning elements and drafts
- Integrate hazard mitigation planning elements with jurisdictional planning mechanisms
- Assist with the revision and development of mitigation actions

The following details jurisdictional representation.

Table 2.2: Clark County Jurisdictional Representatives

Jurisdiction	Title
City of Ashland	City Clerk
City of Englewood	City Clerk
City of Minneola	City Clerk
USD #129 - Minneola	Superintendent
USD #220 - Ashland	Superintendent
Ashland Health Center	Manager
CMS REC	Director
Minneola District Hospital	President
Southern Pioneer Electric COOP	Director

Table 2.3: Finney County Jurisdictional Representatives

Jurisdiction	Title
City of Garden City	City Clerk
City of Holcomb	City Clerk
Garden City Community College	President
USD #363 – Holcomb	Superintendent
USD #457 – Garden City	Superintendent
Lane Scott Electric COOP	Director
Pawnee Watershed Joint District #81	Director
Pioneer Electrical COOP	Director
Sunflower Electric COOP	Director
Victory Electrical COOP	Director
Wheatland Electric COOP	Director

Table 2.4: Ford County Jurisdictional Representatives

Jurisdiction	Title
City of Bucklin	City Clerk
City of Dodge City	City Clerk
City of Ford	City Clerk
City of Spearville	City Clerk
Dodge City Community College	President
USD #381 - Spearville	Superintendent
UDS #443 – Dodge City	Superintendent
USD #459 - Bucklin	Superintendent
Bucklin Hospital District	President
Pawnee Watershed Joint District #81	Director
Sunflower Electric COOP	Director
Victory Electric COOP	Director

Table 2.5: Gray County Jurisdictional Representatives

Jurisdiction	Title
City of Cimarron	City Clerk
City of Copeland	City Clerk
City of Ensign	City Clerk
City of Ingalls	City Clerk
City of Montezuma	City Clerk
USD #102 - Cimarron	Superintendent
USD #371 - Montezuma	Superintendent
USD #476 – Copeland / South Gray	Superintendent
USD #477 - Ingalls	Superintendent
CMS Electric COOP	Director
Pawnee Watershed Joint District #81	Director
Pioneer Electric COOP	Director
Victory Electric COOP	Director
Wheatland Electric COOP	Director

Table 2.6: Haskell County Jurisdictional Representatives

Jurisdiction	Title
City of Satanta	City Clerk
City of Sublette	City Clerk
USD #374 - Sublette	Superintendent
USD #507 - Satanta	Superintendent
Pioneer Electric COOP	Director
Southern Pioneer Electric COOP	Director
Sunflower Electric COOP	Director

Table 2.7: Hodgeman County Jurisdictional Representatives

Jurisdiction	Title
City of Hanston	City Clerk
City of Jetmore	City Clerk
USD #227 – Hodgeman County	Superintendent
Hodgeman Hospital	President
Horse Thief Reservoir District	Director
Lane Scott Electric COOP	Director
Midwest Energy	Director
Pawnee Watershed Joint District #81	Director
Victory Electric COOP	Director

Table 2.8: Lane County Jurisdictional Representatives

Jurisdiction	Title
City of Dighton	City Clerk
USD #468 – Healy Public Schools	Superintendent
USD #482- Dighton	Superintendent
Lane Scott Electric COOP	Director
Midwest Energy	Director
Pawnee Watershed Joint District #81	Director
S&T Telephone COOP	Director

Table 2.9: Meade County Jurisdictional Representatives

Jurisdiction	Title
City of Fowler	City Clerk
City of Meade	City Clerk
City of Plains	City Clerk
USD #225 - Fowler	Superintendent
USD #226 - Meade	Superintendent
USD #483 – Kismet / Plains	Superintendent
Artesian Valley Health System	Operations Manager
CMS Electric COOP	Director
Southern Pioneer Electric COOP	Director

Table 2.10: Seward County Jurisdictional Representatives

Jurisdiction	Title
City of Kismet	City Clerk
City of Liberal	City Clerk
Seward County Community College	President
USD #480 - Liberal	Superintendent
USD #483 – Kismet / Plains	Superintendent
CMS Electric COOP	Director
Pioneer Electric COOP	Director
Southern Pioneer Electric COOP	Director

2.5 – Local and Regional Stakeholder Participation

44 CFR Requirement 201.6(b)(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

Within Kansas Region D there are many jurisdictions and organizations who have a vested interest in participating in the creation and adoption of the hazard mitigation plan. An integral part of the planning process included the identification, development, and coordination of these entities. The Kansas Region D MPC provided the opportunity for neighboring communities, counties, and local and regional development agencies to be involved in the planning process. Where applicable, these entities were kept informed of the hazard mitigation process during state, regional and local emergency management meetings, gatherings and conferences, in person by MPC members, or were solicited for planning information.

It is worth noting that all neighboring Kansas counties are undergoing a similar mitigation planning effort, and as part of this statewide process all county and state planners are working together toward common mitigation goals. During the creation and adoption of this plan communication channels were opened to facilitate the cross pollination of ideas, to incorporate neighboring regions concerns, and to ensure the overall preparedness of the State of Kansas.

In addition, relevant federal, regional, state, local governmental, and private and non-profit entities were also invited to provide input and utilized for information and technical expertise, including, but not limited to:

- American Red Cross
- Center for Disease Control
- FEMA
- Kansas Adjutant General’s Office
- Kansas Department of Agriculture, the Kansas Department of Health and Environment
- Kansas Department of Transportation
- Kansas Fire Service, Kansas Water Office

- Kansas Geological Survey
- Kansas State Fire Marshall
- Local and county planning and zoning offices (where available).
- Local business and non-profit entities
- National Oceanic and Atmospheric Administration
- National Weather Service
- Nuclear Regulatory Commission
- Pipeline and Hazardous Materials Safety Administration
- Salvation Army
- United States Army Corp of Engineers, National Resource Conservation Service
- United States Department of Agriculture
- United States Geological Survey

2.6 – Public Participation

44 CFR Requirement 201.6(b): 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

As part of the overall planning process, the public were provided with numerous opportunities to contribute and comment on the creation and adoption of the plan. These opportunities included:

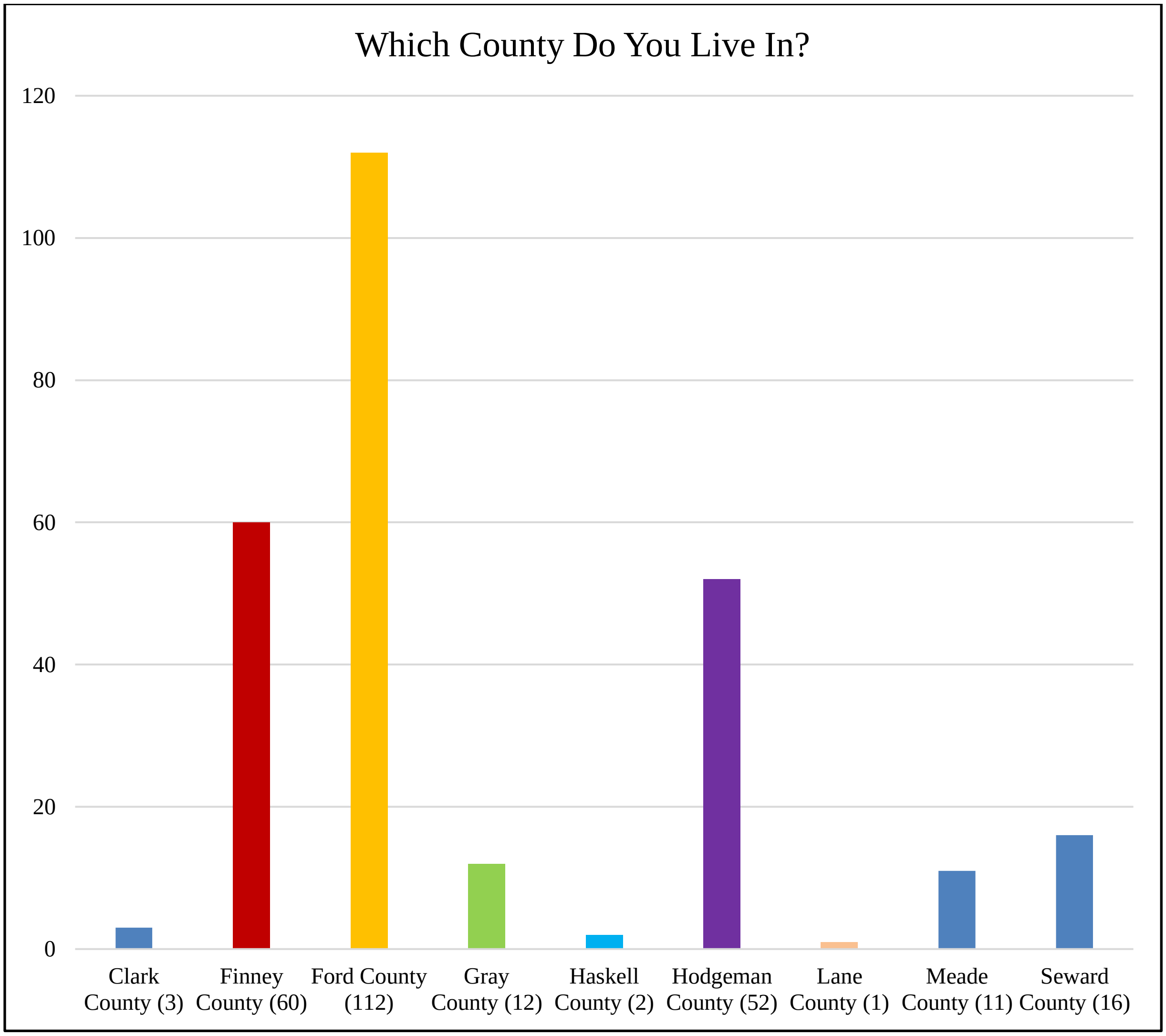
- Advertised meeting invitations on participating jurisdictional websites
- Open meeting opportunities with Kansas Region D MPC members
- Access to an online survey document to provide feedback
- Comment period upon completion of draft plan

Input from the general public provided the MPC with a clearer understanding of local concerns, increased the likelihood of citizen buy-in concerning proposed mitigation actions, and provided elected officials with a guide and tool to set regional ordinances and regulations. This public outreach effort was also an opportunity for adjacent jurisdictions and entities to be involved in the planning process.

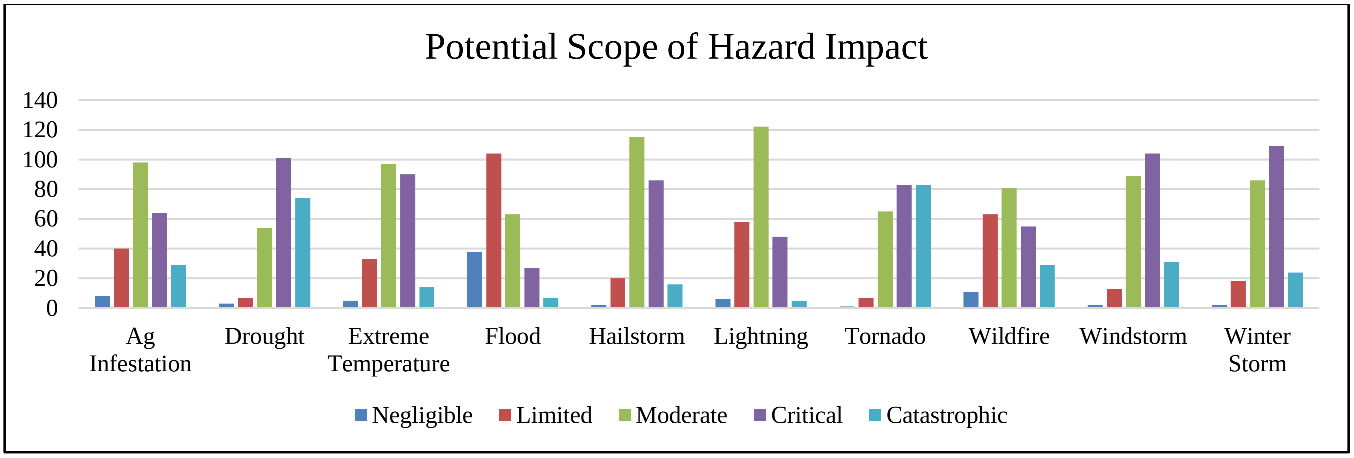
Additionally, as citizens were made more aware of potential hazards and the local process to mitigation against their impacts, it was believed that they would take a stronger role in making their homes, neighborhoods, schools, and businesses safer from the potential effects of natural hazards.

The following graphics represents the feedback received from the public from the online survey document (269 participants).

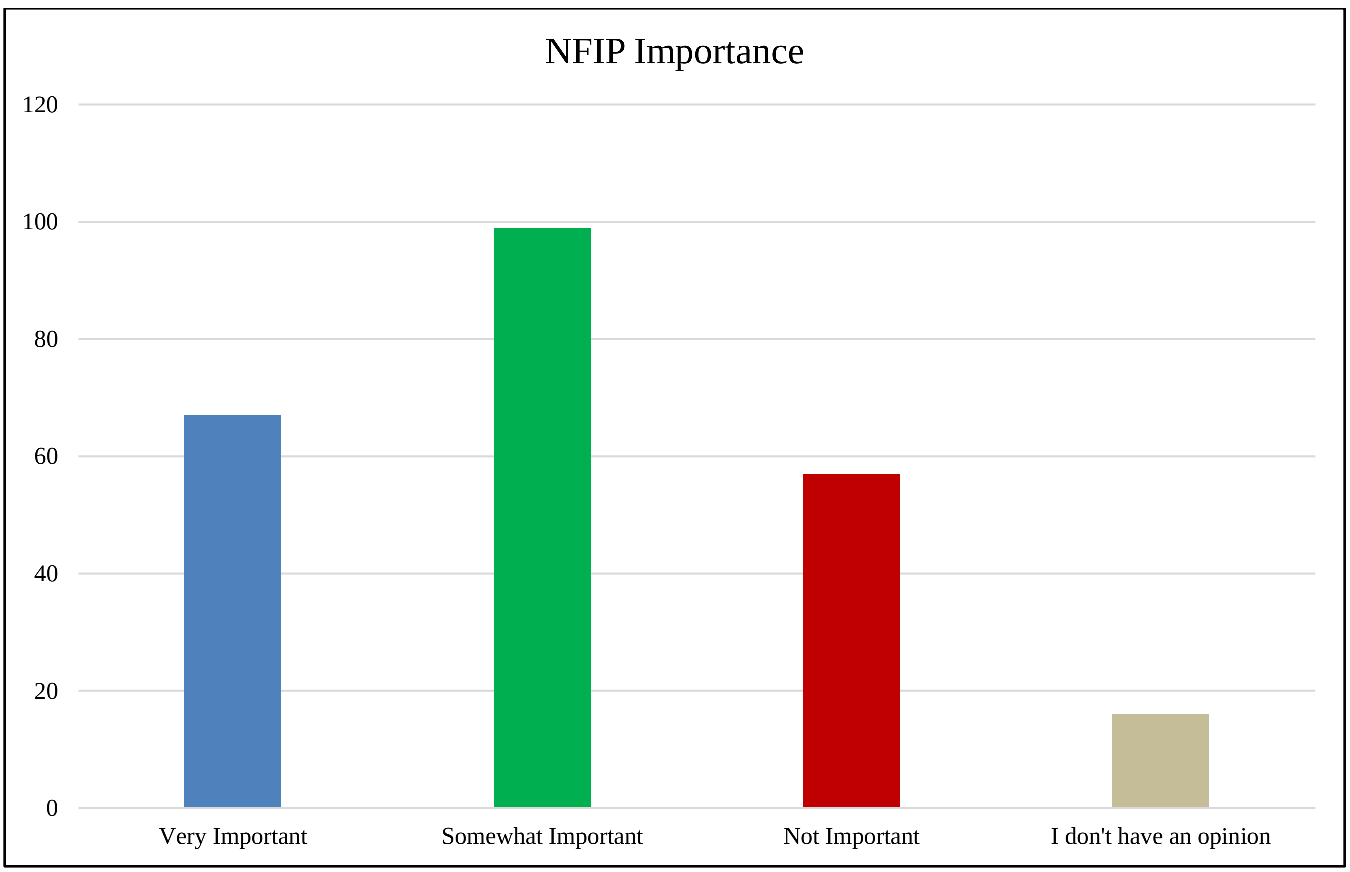
Question 1: In which county or jurisdiction do you live?



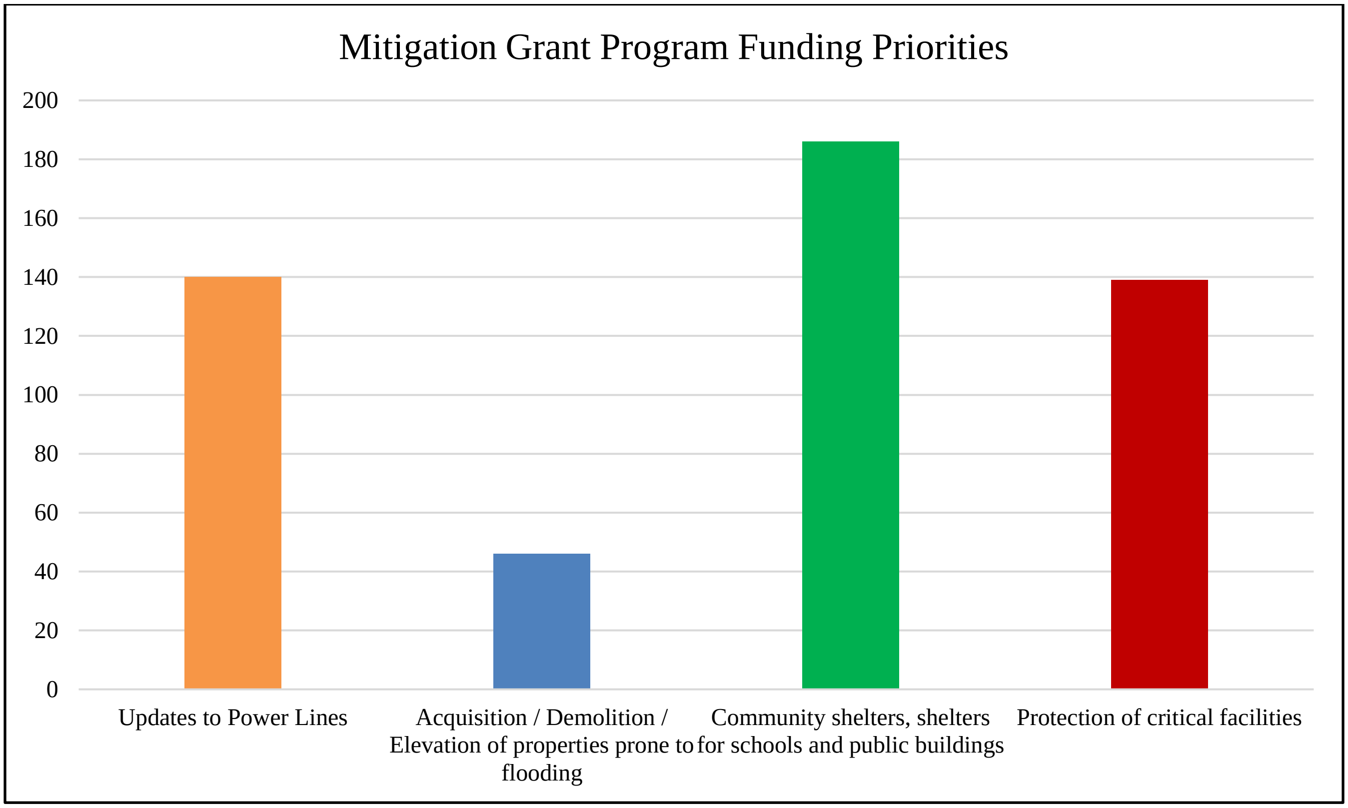
Question 2: In 2014, the Region consisting of Grant, Greeley, Hamilton, Kearny, Morton, Scott, Stanton, Stevens and Wichita Counties, the planning committee determined that the hazards listed below are important to the area. Indicate the level of risk, or the scope of potential impacts, in the Region, that you perceive for each hazard:



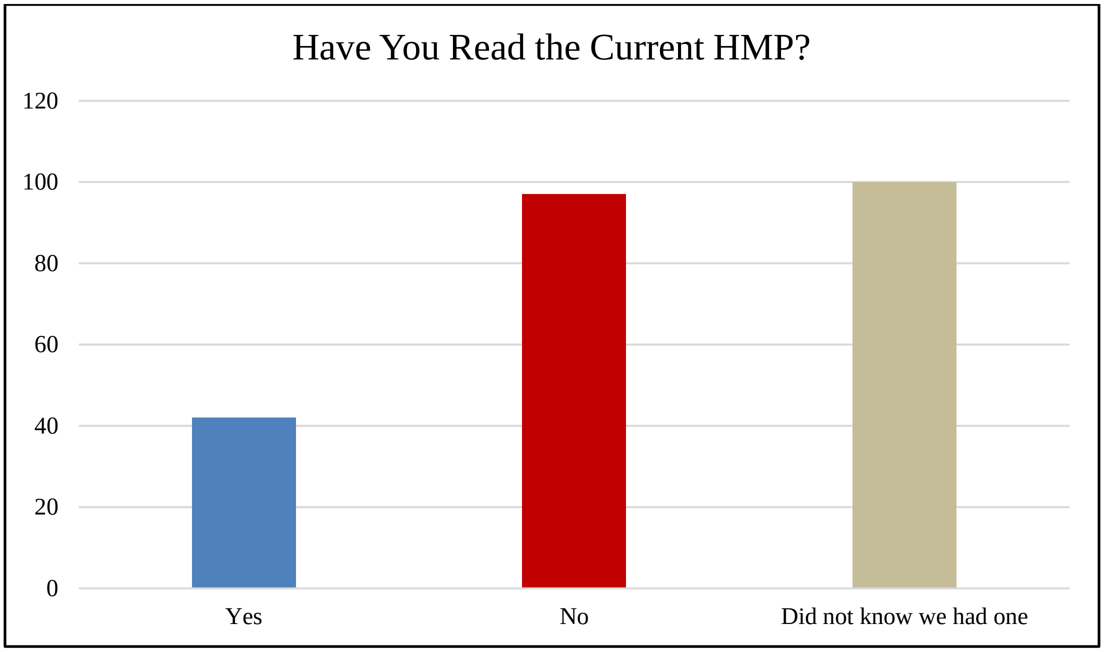
Question 3: In the Region, the planning committee has determined that a flood event is the third most critical hazard. How important is it for you to have your community participate in or continue to participate in the National Flood Insurance Program?



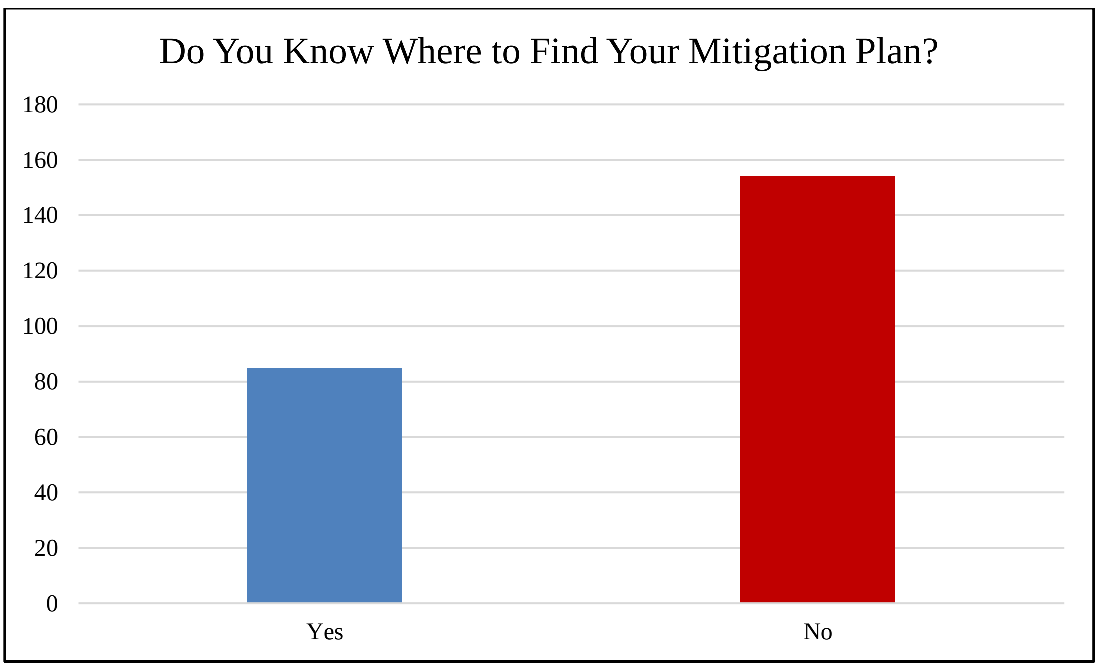
Question 4: The Kansas Division of Emergency Management currently reviews the application for funds for the FEMA Risk Mitigation Grant Program. Your current funding priorities are listed below. Please check those that could benefit your community.



Question 5: Have you had the opportunity to read your current Risk Mitigation Plan?



Question 6: Do you know where you can find the mitigation plan for your county if you would like to see it?



In addition, respondents were given the opportunity to address any local concerns or issues of concern to them.

Question 7: Your opinion is valuable to this planning process. Discuss any other problems that the planning committee should consider when developing a strategy to reduce future losses caused by natural hazard events.

Table 2.14: Kansas Region D Survey Comments, Areas of Concern

Jurisdiction	Comments
Finney	Clean river of debris in case of flood.
Finney	Stop watering the street!!!!!
Finney	a better notification system to community members of possible hazardous weather. Sirens are great if outside or live in towns but not for many. A phone alert system is ideal sending to cell phones and home phones. Ford counties is a great model
Finney	Develop underground power lines so power will not be lost in high wind events and freezing temperatures.
Finney County	Public education of a diverse population.
Finney County, Terry Township	Finney county is a large area and one section of the county may be affected very differently than other.
Ford	where we could go and do
Ford	No river, flood plain regulations should be reviewed and consideration of flood insurance verse costs
Ford	Question #2 list hazards but fails to provide further context. Context could have been provided by simple categorization (e.g., Hazard to life, health, property, environment, commerce, etc.). Analysis of the responses will yield unintelligible crap. Furthermore, since risk = impact x probability and the question asks the respondent to report perceived risk or perceived impact, then analysis of the responses will yield unintelligible crap. Question #3 presumes the respondent understands the statement/ terminology 'high hazard event' and the methodology used to arrive at the classification. The statement is a priming device for the question which follows. Analysis of the responses will yield unintelligible crap. Question #4 oversimplifies the priorities to a point where the selections are unintelligible without benefit of first reviewing the funding request. Analysis of the responses will yield unintelligible crap.
Ford	There is no active emergency management in the county. I think that a county our size should have a dedicated emergency management department with a staff of two to three. Our size and industry more than warrant the time and attention. We are so far behind the times it is embarrassing. If something major was to happen we are not prepared and are doing a very poor job of preparing the community. There is no proactive approach. Get a legit Emergency Management Department.
Ford	Better alert systems
Ford	Send out education on these topics
ford	Drought is of much bigger concern than flood. The management of local agriculture and their plowing of topsoil on some of the windiest days is ridiculous. More CRP or WIHA would benefit the community that doesn't farm for a living.
Ford	Planning to protect our historic documents in case of emergency. Also surveying area to locate where historically significant properties are located in case of emergency that would lead to destruction of this property.

Table 2.14: Kansas Region D Survey Comments, Areas of Concern

Jurisdiction	Comments
Ford	Ford county needs an actual emergency manager not some that does nothing and knows nothing just holding title for money. The current has continually failed this county
Ford Co.,City of Dodge City	This is very important when it comes to planning.
Ford County	The committee should stress self-reliance, both on an individual, and a community level. Personal disaster preparedness is invaluable.
Ford County	Fixing the drainage on 3rd Avenue and Avenue D in Dodge City, Ford County, Kansas. These areas seem to really flood when it rains heavily. There are problems with cars floating down the street at these times.
Ford County	While I think the flood hazard is minimal, it is my understanding that NOT participating in the National Flood Insurance program could be very costly in terms of rising insurance costs for property owners. That might be reason enough to continue to participate in the National Flood insurance program.
Ford County, Dodge City	Provide back-up power to community facilities.
Ford, Dodge City	This is not eastern Kansas and I feel that we are not represented well in Topeka when it comes to issues like this.
Gray	Contact information in emergency.
Gray County, Cimarron	mandated that all schools have safe room, not be spending money on new activity buses but a safe room for the kids.
Gray County, City of Ensign	Community togetherness is a major concern/necessity in Ensign. Bringing the community together to make them aware of hazards, the mitigation in place to decrease tragedy, and how each individual can help/be involved would be a huge benefit to the community and a way that the hazard mitigation plan could be much more effective.
Hodgeman	Roads and the town generator
Hodgeman	Continue proactively planning.
Hodgeman	Upgrade county roads, especially the 210 from Hwy 156 south to the feed lot. It is highly traveled and when wet it is almost impassible by car making for a very long trip to get to another highway.
Hodgeman County	Fires related to land use such as crp growth, heavy plant materials that are difficult to extinguish, oil field fires, etc.
Hodgeman, Jetmore	Keep the power plant running Tornado shelters Nuclear Radiation/chemical/terrorism
Meade	Need a better AND Louder Tornado warning sirens throughout the entire community that WORK!!
Meade	Emergency preparedness in case of disaster
Seward	No matter the cause of a natural disaster maintaining power is a critical issue.
Seward	Rural cell phone service! Higher speed Internet in rural areas
Seward County	I think they should very seriously consider wildfires and have a strategy in place. What happened in Comanche and Clark counties a couple years ago could easily happen in Seward County.
Seward County	Shelters for homeowners, would be an excellent choice.

Question 8: Do you have any mitigation project that you would like to see implemented and what are they?

Table 2.15: Kansas Region D Survey Comments, Requested Projects

Jurisdiction	Comments
Clark	Safe rooms and generators for critical facilities
Clark	Public safe rooms an infrastructure generators
Finney	technology
Finney	Education for low income property owners or renters. Many times, their awareness or preparation for disaster is little to none!
Finney	Safe rooms for all school districts. More tornado sirens in higher populated subdivisions.
Finney County	An expanded "Hazard Notification System".
Ford	Lead agency should be those that are immediate first responders.
Ford	An independent audit of Ford County's Emergency Management Plan, including a comprehensive analysis of the scope and quality of 'The Plan's' execution to date.
Ford	1) An independent audit of Ford County's Hazard Mitigation Plan, including a comprehensive analysis of the scope and quality of 'The Plan's' execution to date.
Ford	Community shelters should be available. There are many houses in Dodge City which do not have basements. We have a large immigrant population that does not understand sheltering. Look at earthquake risk.
Ford	An actual emergency manager
Ford County	Nothing that would involve the expenditure of taxpayer dollars.
Ford County	Levy improvements
Ford, Dodge City	More funding for the fire/ems departments and urban search and rescue team in dodge city. This county also needs more ambulances.
Gray County, Cimarron	safe rooms in all government buildings.
Gray County, City of Ensign	The Ensign community is extremely lacking in storm shelters and in severe need of another warning siren. I would personally like to see another siren added to the North side of town and shelters open to the public in multiple locations throughout town as most properties in town are lacking basements.
Hodgeman	Repair Highway 156
Hodgeman	Storm shelters. We need one that will be open in each community and one at Horse Thief Reservoir.
Hodgeman	Jetmore is in Hodgeman County and has generators for backup power supply that are in poor to unusable condition. Water conditions in this area are not good, reports were sent out but from testing that had been done several years previously, water treatment needed.
Hodgeman County	The schools are listed as shelters in case of an emergency. I would like to see generators for the school so that uninterrupted power could be provided during a crisis.
Lane	An independent audit of Ford County's Emergency Management Plan, including a comprehensive analysis of the scope and quality of 'The Plan's' execution to date.
Meade	Need more and better severe storm shelter at the schools and community for residents who don't have basements.
Meade County	Community Shelter for Plains and Meade
Seward	This is not a mitigation project but ties in... See County and city governments work together

Table 2.15: Kansas Region D Survey Comments, Requested Projects

Jurisdiction	Comments
Seward County	Community Tornado shelter for Kismet
Seward County	Yes. The Kismet Public Library is raising funds to build a new library building, which will contain a community storm shelter. Since the railroad tracks divide Kismet, and the only public shelter is on the north end of town, this project should receive major consideration and help to see it to fruition. The trains park for hours on the crossing in Kismet, which means a 6-mile trip out into the country and back just to cross from one end of town to the other. Six miles won't work when a tornado is bearing down on the town. They have over half the funds raised and they did apply for a FEMA mitigation grant through KS but were not granted the money. The grant would have paid for that part of the project to build the shelter. No one at the state level seems to understand the seriousness of this issue. In November of 2015 we had an EF 3 tornado that came within a half mile of going right through Kismet...which would have been catastrophic.
Seward County	Buy flood prone properties. Establish program to assist with home shelters.

2.7 – Planning Meetings

Within Kansas Region D there are many jurisdictions and organizations who have a vested interest in participating in the creation and adoption of the hazard mitigation plan. An integral part of the planning process included the identification, development, and coordination of all of these entities. As such, a series of three organizational and planning meetings were scheduled and all past and potential future participants were notified by the State of Kansas as to the dates and locations of the meetings. In addition, communities neighboring the region were invited to participate in the planning process.

It is worth noting that all neighboring Kansas counties are undergoing a similar mitigation planning effort, and as part of this statewide process all county and state planners are working together toward common mitigation goals. During the creation and adoption of this plan communication channels were opened to facilitate the cross pollination of ideas, to incorporate neighboring regions concerns, and to ensure the overall preparedness of the State of Kansas.

A series of kick-off meetings were held with MPC members, available representatives from jurisdictions within the planning region, local and regional stakeholders, and the public invited. At the kickoff meeting, the planning process, project coordination, scope, participation requirements, strategies for public involvement, and schedule were discussed in detail. During the meeting, participants were led through a guided discussion concerning hazard data sourced from their previous hazard mitigation plans. Additionally, research was conducted prior to the meeting on recent regional hazard events to further inform the discussion. Participants were encouraged to discuss past hazard events, past impacts, and the future probability for all identified hazards. At the conclusion of the meeting, all participants were provided with a data collection forms to solicit information needed to properly complete the HMP. The forms asked for information concerning data on historic hazard events, at risk populations and properties, and available capabilities. Additionally, participating jurisdictions were provided with their mitigation actions from the previous plans for review and comment and asked to identify any additional mitigation actions.

A mid-term planning meeting was held with MPC members. Based upon the initial research, discussions held during the kickoff meetings, information obtained from the data collection forms, additional research, and subsequent discussion with MPC members, the results of the hazard identification, classification, and delineation were discussed in detail. In addition, sections of the HMP were made available for review and comment. Based on the supplied hazard information, participants were asked to assist in the development and review of mitigation goals and actions.

A final planning meeting was held with MPC members, available representatives from jurisdictions within the planning region, local and regional stakeholders, and the public invited. The completed draft HMP was made available for review and comment.

The following table presents the date and location of each planning meeting.

Table 2.16: Kansas Region D Planning Meetings

Meeting Number	Date	Location
1 (Kickoff)	12/05/2019	Finney County
	12/05/2019	Ford County
2 (Mid-Term)	02/12/2020	Finney County
3 (Final)	04/07/2020	Online

Both the minutes and sign-in sheets from all meetings may be found in Appendix C.

2.8 – Existing Plan Incorporation

44 CFR 201.6(b)(3): Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

The hazard mitigation plan is an overarching document that is both comprised of, and contributes to, various other jurisdictional plans. In creating this plan, all the planning documents identified below were consulted and reviewed, often extensively. In turn, when each of these other plans is updated, they will be measured against the contents of the hazard mitigation plan.

Below is a list of the various planning efforts, sole or jointly administered programs, and documents reviewed and included in this hazard mitigation plan. While each plan can stand alone, their review and functional understanding was pivotal in the development of this plan and further strengthens and improves Kansas Region D's resilience to disasters.

- All participating jurisdictions Codes and Ordinances
- All participating jurisdictions Comprehensive Plans
- All participating jurisdictions Critical Facilities Plans
- All participating jurisdictions Economic Development Strategic Plans
- All participating jurisdictions Emergency Operations Plans
- All participating jurisdictions Flood Mitigation Assistance Plan
- All participating jurisdiction Land-Use Plans

- Community Wildfire Protection Plans
- Any other newly created or relevant jurisdictional plan

Information from each of these plans and programs is utilized within the applicable hazard sections to provide data and fully inform decision making and prioritization.

State and Federal Level Plan Integration

The following list illustrates local, state and federal programs integrated, where applicable, and referenced in Kansas Region D's mitigation efforts.

- State of Kansas Hazard Mitigation Plan
- Hazard Mitigation Grant Program
- Flood Mitigation Assistance Program
- National Flood Insurance Program
- Pre-Disaster Mitigation Program
- Repetitive Loss & Severe Repetitive Loss Program
- FireWise Communities Program
- Relevant Dam Emergency Action Plans (if document not secured)
- Community Rating System

Integration Challenges

The 2015 plan update successfully integrated approved Kansas Region D local hazard mitigation plans into one regional HMP. This represents a success of our streamlined program of allowing jurisdictions to participate in multi-jurisdictional regional-level plans. This program not only reduces the cost and the burden to local jurisdictions, it also allows for closer collaboration and integration of local communities in all areas or planning and response. However, and as always, challenges exist due to the day to day demands of the working environment, including scheduling conflicts, budget restrictions, and staffing changes and shortages related to both the utilization and incorporation of the HMP and completion of identified hazard mitigation projects.

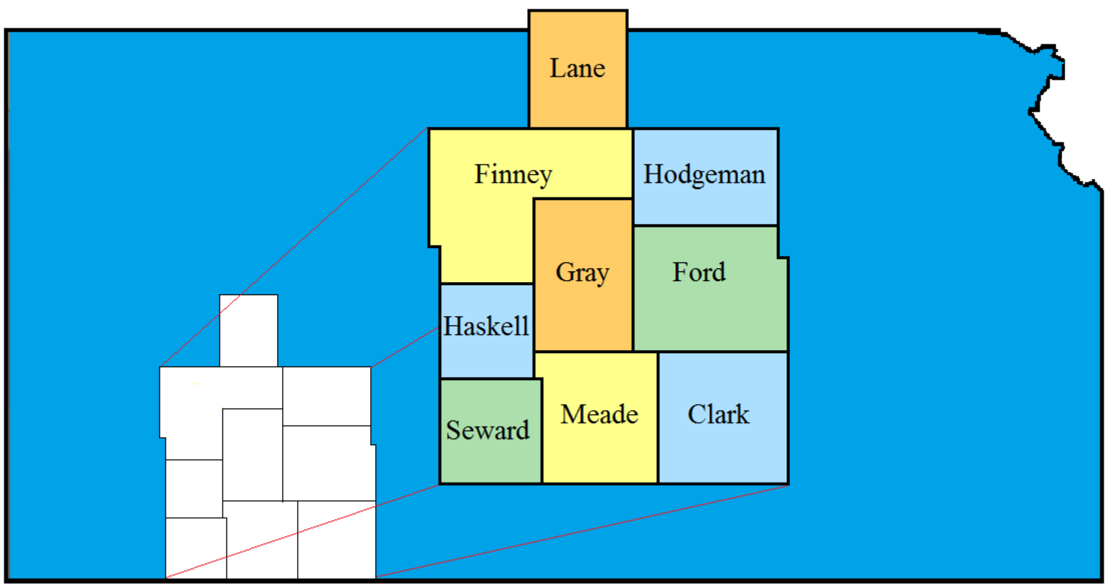
3.0 Planning Area

3.1 – Introduction

Kansas Region C consists of the following twelve participating counties and their participating jurisdictions:

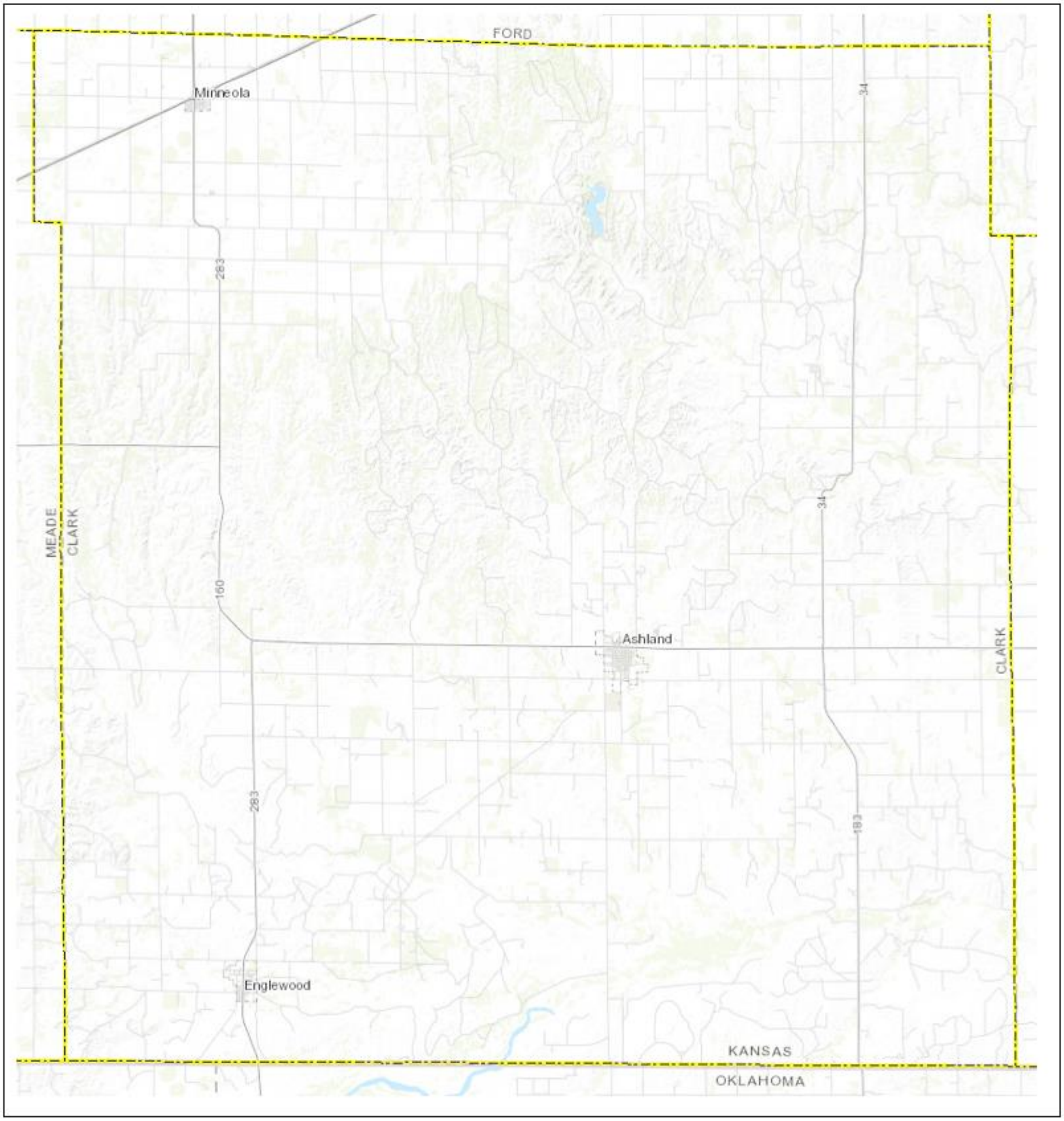
- Clark County
- Finney County
- Ford County
- Gray County
- Haskell County
- Hodgeman County
- Lane County
- Meade County
- Seward County

The following map details the locations of these counties.



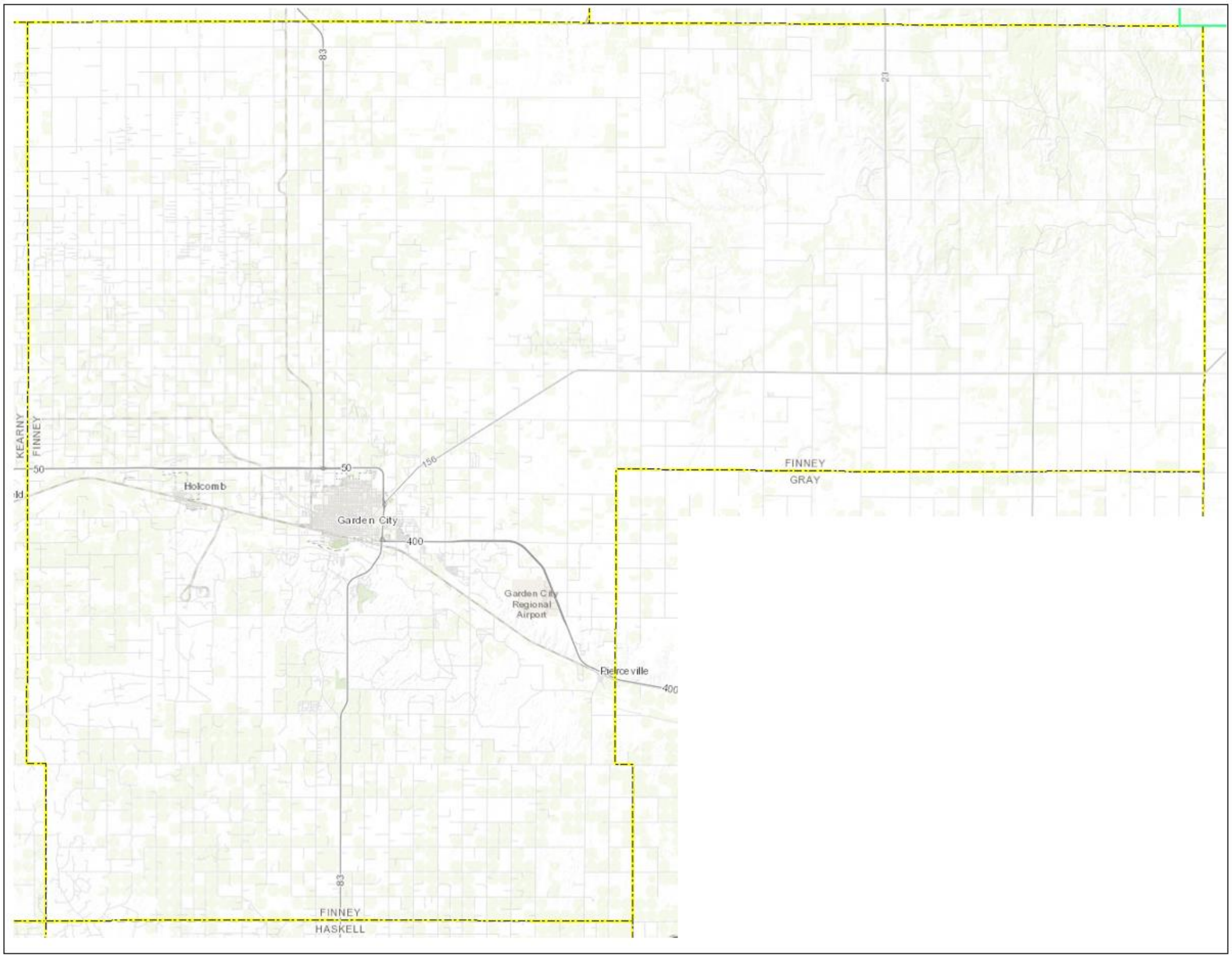
The following is a map of **Clark County,** provided by the Kansas Department of Transportation (KDOT).

Map of Clark County



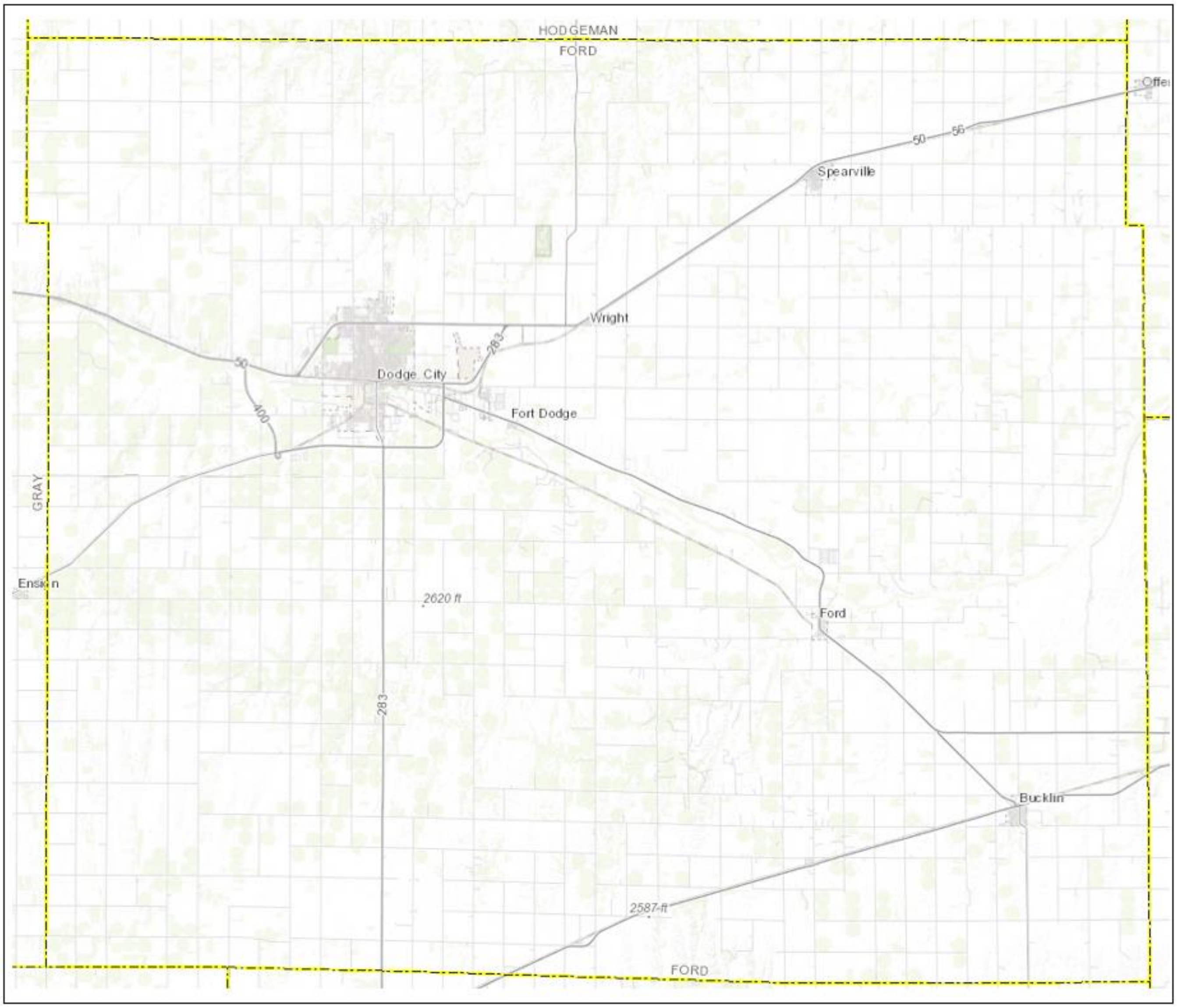
The following is a map of **Finney County,** provided by KDOT.

Map of Finney County



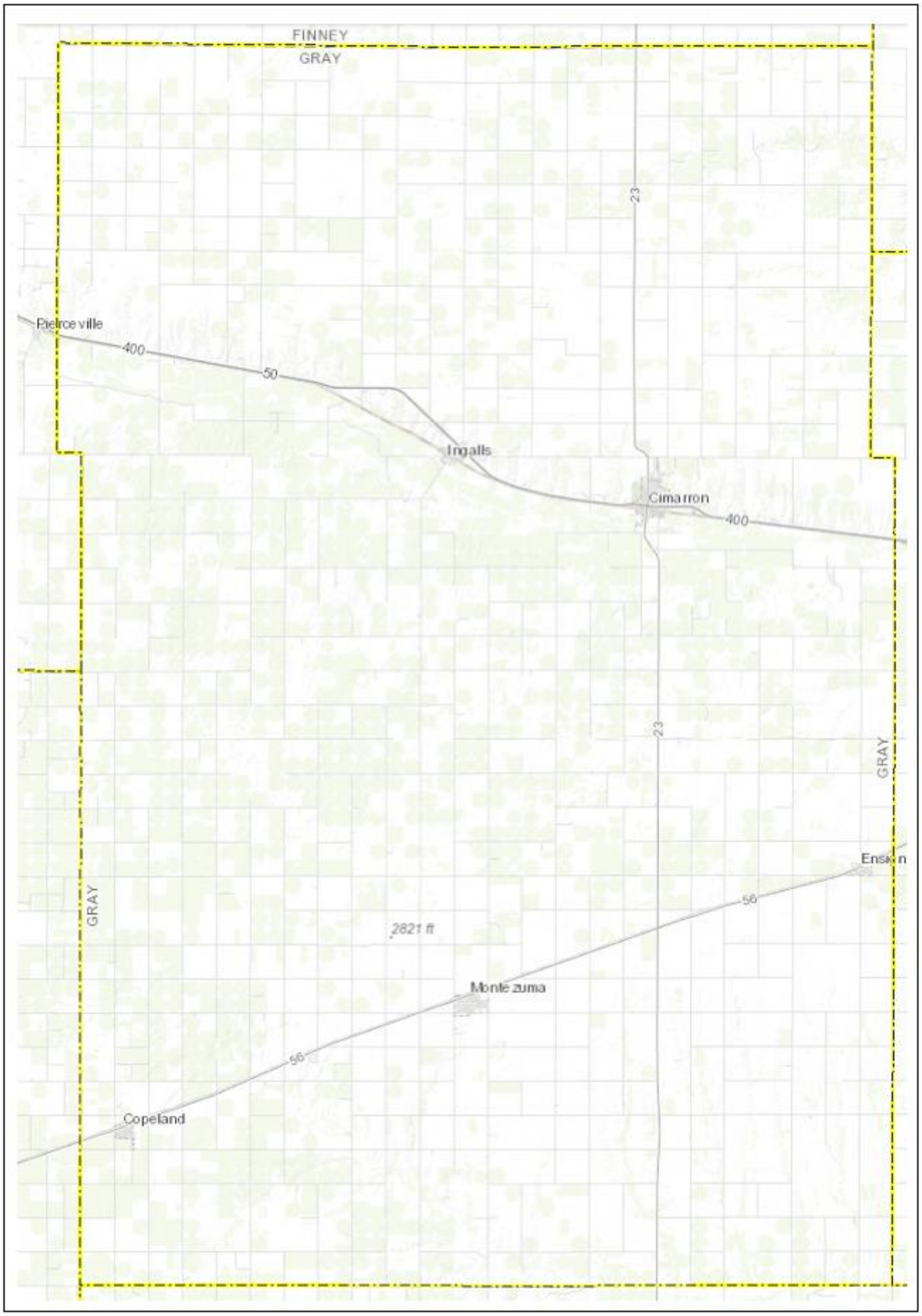
The following is a map of **Ford County,** provided by KDOT.

Map of Ford County



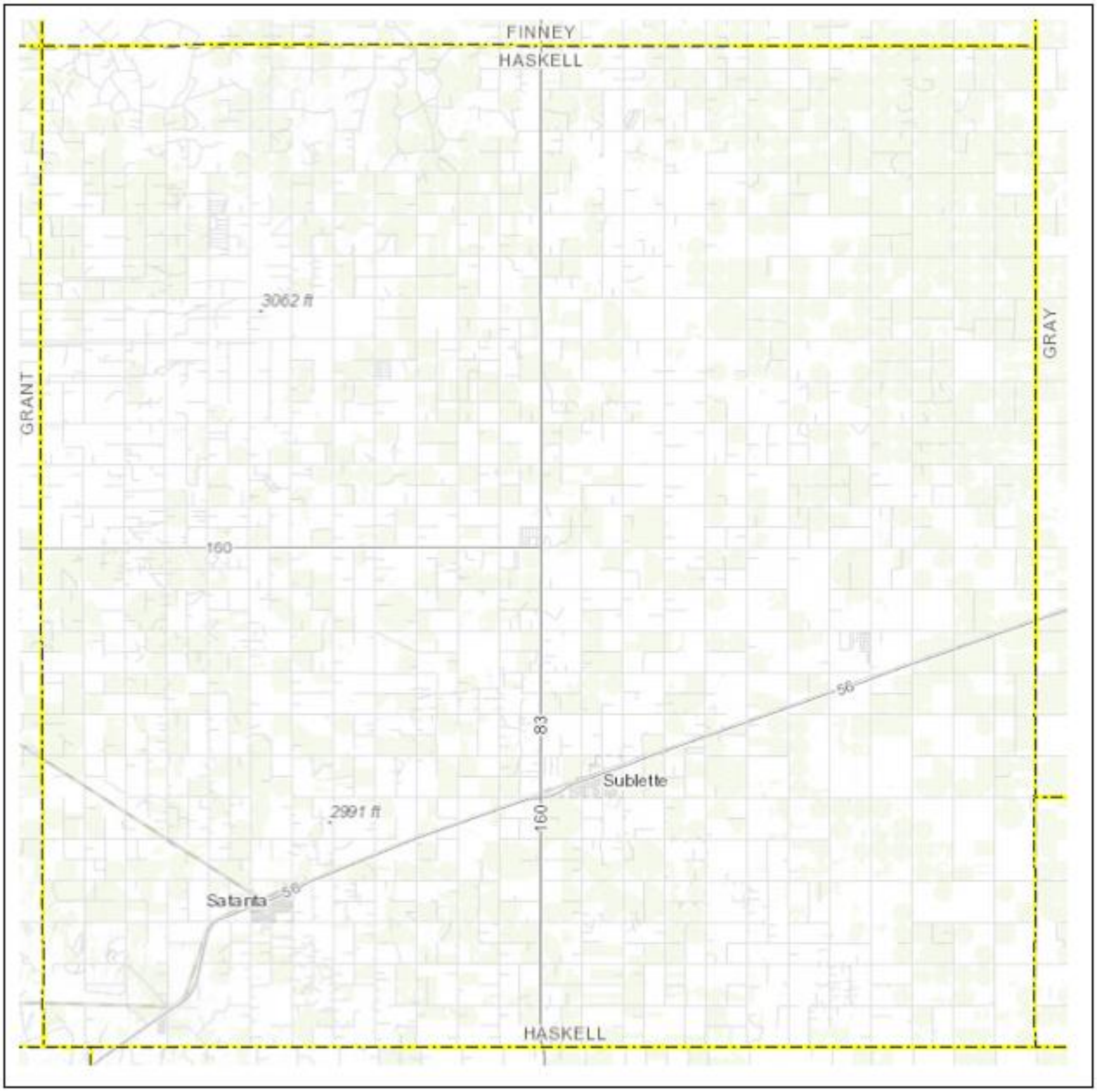
The following is a map of **Gray County,** provided by KDOT.

Map of Gray County



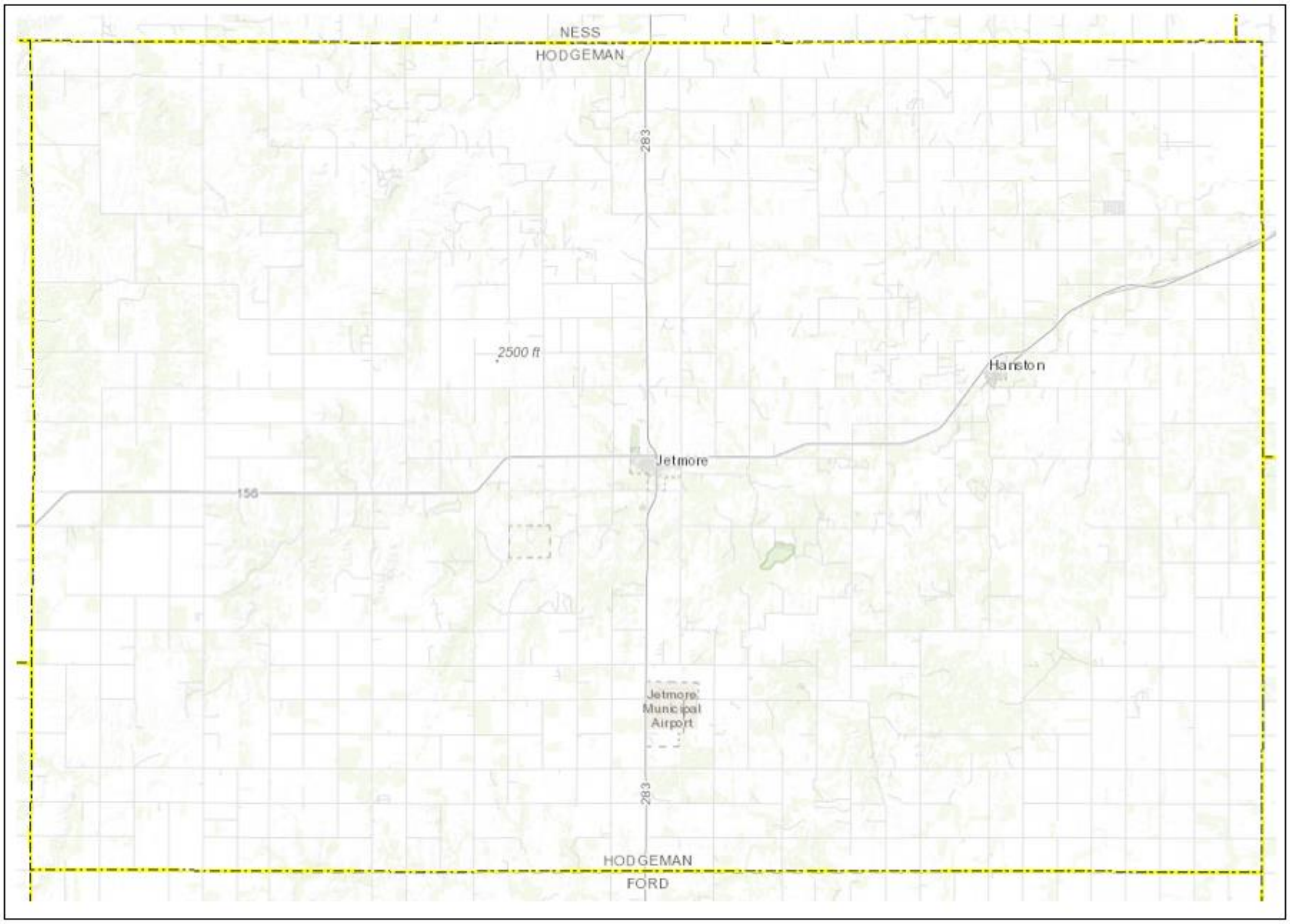
The following is a map of **Haskell County,** provided by KDOT.

Map of Haskell County



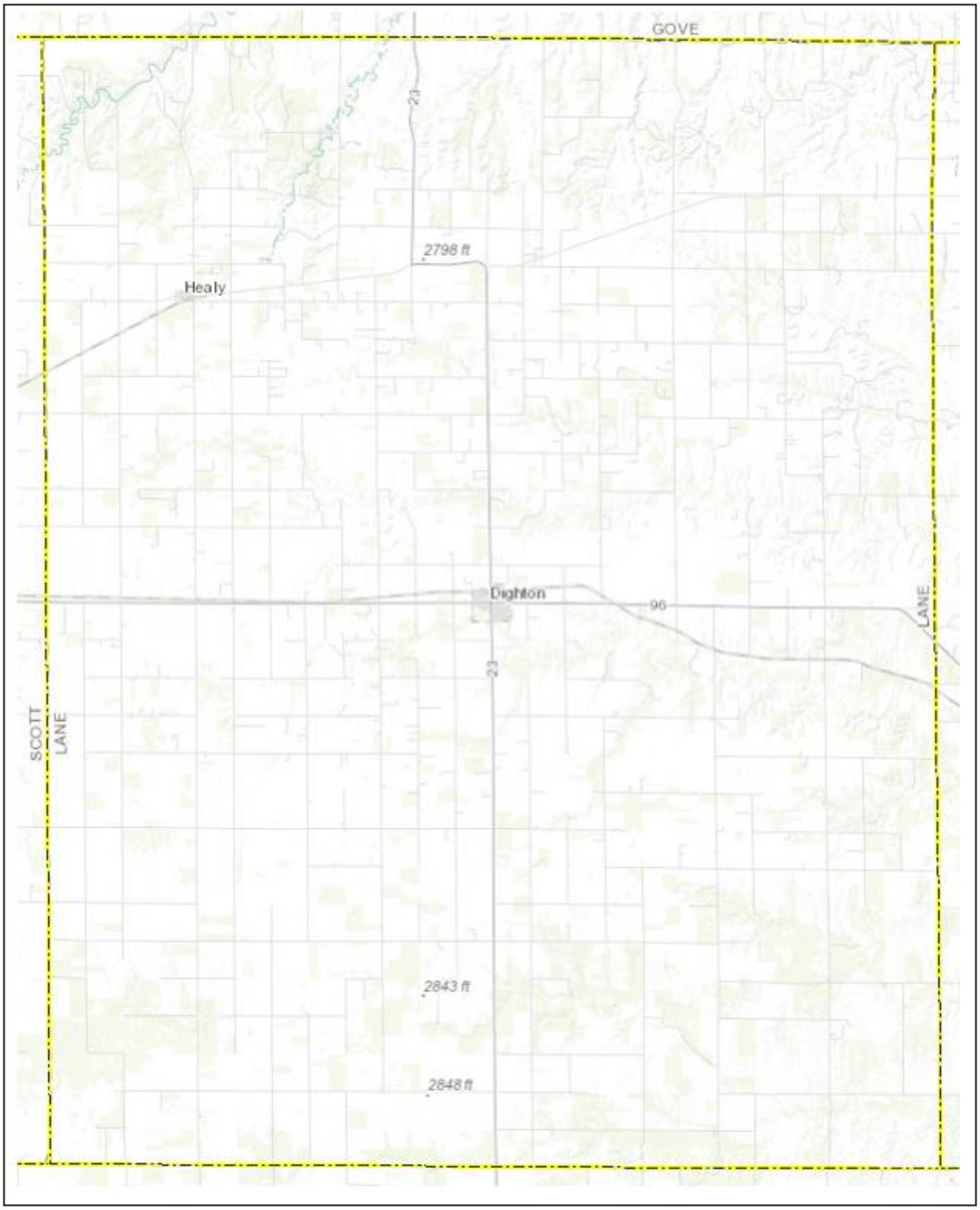
The following is a map of **Hodgeman County,** provided by KDOT.

Map of Hodgeman County



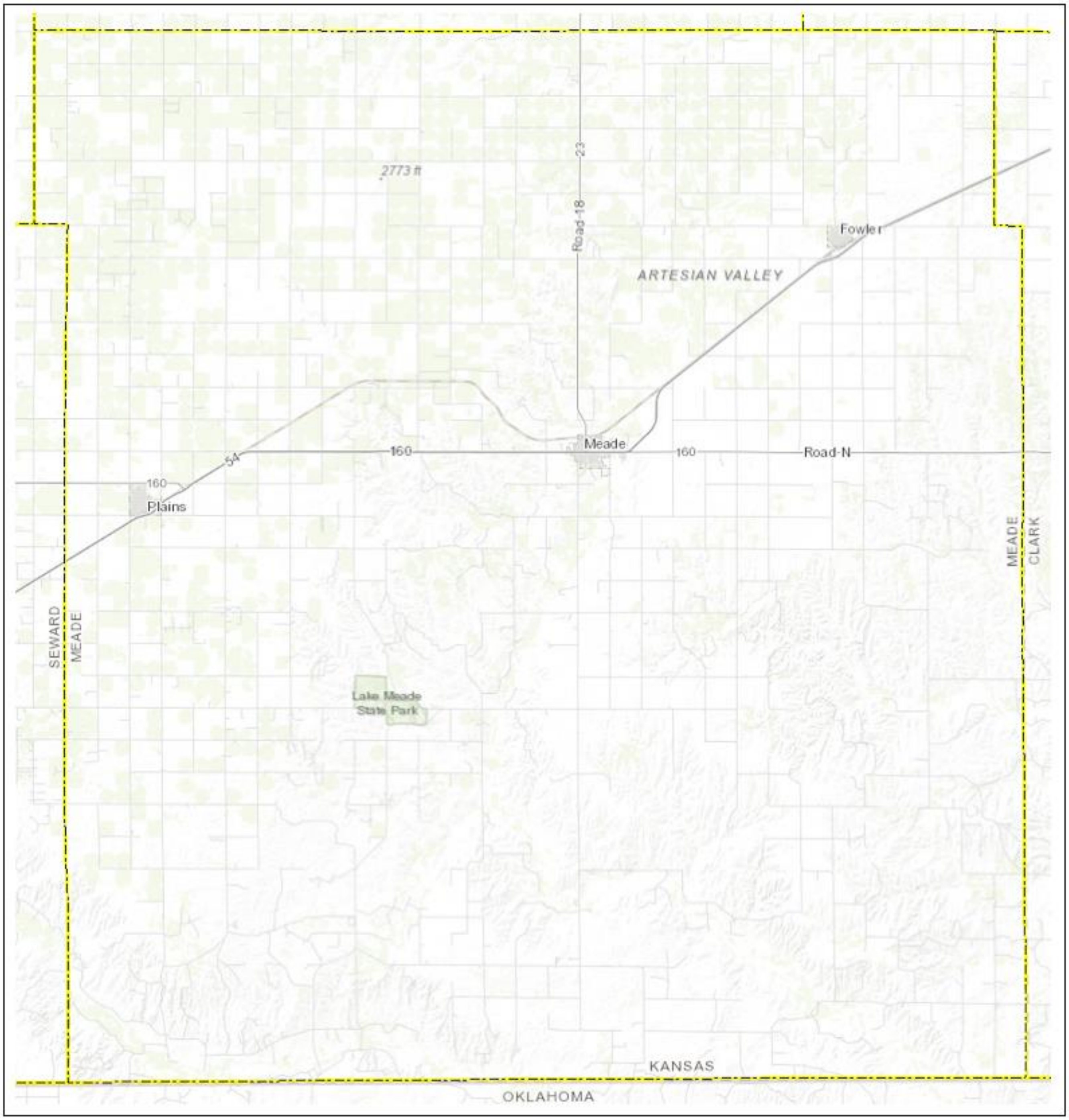
The following is a map of **Lane County,** provided by KDOT.

Map of Lane County



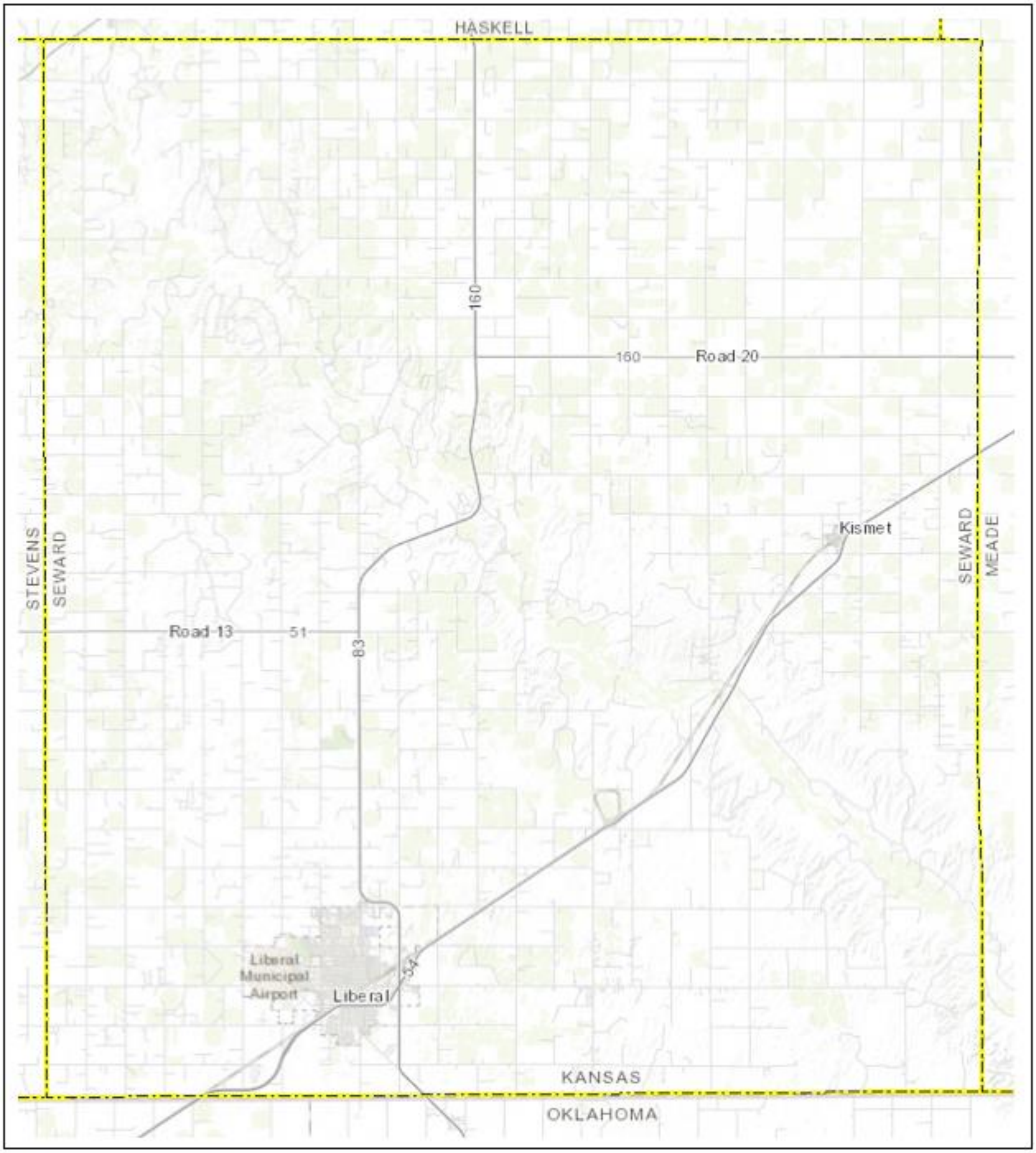
The following is a map of **Meade County,** provided by KDOT.

Map of Meade County



The following is a map of **Seward County,** provided by KDOT.

Map of Seward County



3.2 – Regional Population Data

The following tables present population data for counties and participating city jurisdictions in Kansas Region C. In general, the higher a jurisdiction's population the greater the potential vulnerability of its citizens to identified hazards.

Table 3.1: Clark County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Clark County	2,390	2,215	2,005	-385	-16.1%	2
City of Ashland	975	867	779	-196	-20.1%	464
City of Englewood	109	77	69	-40	-36.7%	68
City of Minneola	717	745	684	-33	-4.6%	1,487

Source: US Census Bureau

Of note for Clark County and its participating jurisdictions for the period 2000 to 2018:

- A population loss was noted in Clark County, -16.1% as a whole
- Population losses were noted in all participating cities

Table 3.2: Finney County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Finney County	40,523	36,776	36,611	-3,912	-9.7%	28
City of Garden City	28,451	26,996	26,546	-1,905	-6.7%	3,010
City of Holcomb	2,026	2,094	2,084	58	2.9%	1,544

Source: US Census Bureau

Of note for Finney County and its participating jurisdictions for the period 2000 to 2018:

- A population loss was noted in Finney County, -9.7% as a whole
- Population losses were noted in one of two participating cities

Table 3.3: Ford County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Ford County	32,548	33,848	33,888	1,340	4.1%	31
City of Bucklin	725	794	783	58	8.0%	1,327
City of Dodge City	25,176	28,159	27,329	2,153	8.6%	1,878
City of Ford	314	216	217	-97	-30.9%	517
City of Spearville	813	773	793	-20	-2.5%	1,322

Source: US Census Bureau

Of note for Ford County and its participating jurisdictions for the period 2000 to 2018:

- A population gain was noted in Ford County, 4.1% as a whole
- Population gains were noted in two of four participating cities

Table 3.4: Gray County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Gray County	5,904	6,006	6,033	129	2.2%	7
City of Cimarron	1,934	2,184	2,211	277	14.3%	1,939
City of Copeland	339	310	298	-41	-12.1%	1,192
City of Ensign	203	187	298	95	46.8%	1,028
City of Ingalls	328	306	291	-37	-11.3%	1,003
City of Montezuma	966	966	961	-5	-0.5%	1,264

Source: US Census Bureau
-: No data available

Of note for Gray County and its participating jurisdictions for the period 2000 to 2018:

- A static population was noted in Gray County, with a small 2.2% gain as a whole
- Population losses were noted in three of five participating cities

Table 3.5: Haskell County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Haskell County	4,295	4,256	3,997	-298	-6.9%	7
City of Satanta	1,239	1,133	1,144	-95	-7.7%	1,939
City of Sublette	1,592	1,453	1,351	-241	-15.1%	1,468

Source: US Census Bureau
-: No data available

Of note for Haskell County and its participating jurisdictions for the period 2000 to 2018:

- A population loss was noted in Haskell County, -6.9% as a whole
- Population losses were noted in all participating cities

Table 3.6: Hodgeman County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Hodgeman County	2,085	1,916	1,818	-267	-12.8%	2
City of Hanston	259	206	196	-63	-24.3%	700

Table 3.6: Hodgeman County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
City of Jetmore	903	867	822	-81	-9.0%	183

Source: US Census Bureau

Of note for Hodgeman County and its participating jurisdictions for the period 2000 to 2018:

- A population loss was noted in Hodgeman County, -12.8% as a whole
- Population losses were noted in all participating cities

Table 3.7: Lane County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Lane County	2,155	1,750	1,560	-595	-27.6%	2
City of Dighton	1,261	1,038	925	-336	-26.6%	1,051

Source: US Census Bureau

Of note for Lane County and its participating jurisdictions for the period 2000 to 2018:

- A population loss was noted in Lane County, -27.6% as a whole
- Population losses were noted in all participating cities

Table 3.8: Meade County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Meade County	4,631	4,575	4,146	-485	-10.5%	4
City of Fowler	567	590	532	-35	-6.2%	1,132
City of Meade	1,672	1,721	1,565	-107	-6.4%	1,581
City of Plains	1,163	1,146	1,042	-121	-10.4%	1,042

Source: US Census Bureau

Of note for Meade County and its participating jurisdictions for the period 2000 to 2018:

- A population loss was noted in Meade County, -10.5% as a whole
- Population losses were noted in all participating cities

Table 3.9: Seward County Population Data

Jurisdiction	Population 2000	Population 2010	Population 2018	Numeric Population Change 2000 - 2018	Percent Population Change 2000 to 2018	Population Density, per Square Mile 2018
Seward County	22,510	22,952	21,780	-730	-3.2%	34
City of Kismet	484	459	435	-49	-10.1%	1,813
City of Liberal	19,666	20,956	19,495	-171	-0.9%	1,659

Source: US Census Bureau

Of note for Seward County and its participating jurisdictions for the period 2000 to 2018:

- A population loss was noted in Seward County, -3.2% as a whole
- Population losses were noted in all participating cities

3.3 – At-Risk Population Data

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."

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
- The hazard event will, in many cases, affect at risk population in differing ways

The following tables present information on select potential at risk populations within each participating Region C jurisdiction, by county. The higher a jurisdiction's at-risk population the greater the potential vulnerability to identified hazards.

Table 3.10: Kansas Region C Potentially Vulnerable Population Data, Jurisdictions Over 5,000 Persons

Jurisdiction	Percentage of Population 5 and Under (2018)	Percentage of Population 65+ (2018)	Percentage of Population Speaking Language Other Than English (2018)	Percentage of Population Living Below Poverty Level (2018)	Persons with a Disability, Under the Age of 65 (2018)
Clark County	5.30%	21.90%	6.50%	13.10%	8.10%
Finney County	8.70%	11.00%	44.60%	13.20%	7.60%
Ford County	8.90%	11.20%	51.20%	11.60%	7.30%
Gray County	7.60%	15.10%	18.20%	7.50%	6.80%
Haskell County	7.00%	14.80%	39.90%	10.50%	3.60%
Hodgeman County	6.40%	24.00%	8.70%	11.70%	7.50%
Lane County	5.70%	23.50%	4.30%	10.30%	10.60%
Meade County	6.60%	19.30%	21.30%	9.40%	5.40%

Table 3.10: Kansas Region C Potentially Vulnerable Population Data, Jurisdictions Over 5,000 Persons

Jurisdiction	Percentage of Population 5 and Under (2018)	Percentage of Population 65+ (2018)	Percentage of Population Speaking Language Other Than English (2018)	Percentage of Population Living Below Poverty Level (2018)	Persons with a Disability, Under the Age of 65 (2018)
Seward County	9.20%	9.80%	59.60%	15.10%	4.80%

Source: US Census Bureau

Of note for Kanas Region C and its participating jurisdictions:

- Regionally, 7.3% of the total population is under the age of 5
- Regionally, 16.7% of the total population is above the age of 65
- Regionally, 28.3% of the total population speak a language other than English at home
- Regionally, 11.4% of the total population is living below the poverty line
- Regionally, 6.9% of persons under the age of 65 have an identified disability

3.4 – Regional Housing Data

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Over the period 2000 to 2018 the majority of Kansas Region C has been experiencing a yearly decrease in housing stock. In general, the higher a jurisdiction's housing stock, the higher the hazard vulnerability.

Table 3.11: Clark County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2018	Numeric Housing Change 2000 - 2018	Percentage Housing Change 2000 - 2018	Percentage Mobile Homes 2018	Housing Density, per Square Mile 2018
Clark County	**1,111**	**1,150**	**39**	**3.5%**	**6.4%**	**1**
City of Ashland	472	423	-49	-10.4%	6.4%	252
City of Englewood	62	47	-15	-24.2%	17.0%	47
City of Minneola	319	416	97	30.4%	4.8%	904

Source: US Census Bureau

Of note for Clark County and its participating jurisdictions for the period 2000 to 2018:

- Housing levels remained static in Clark County, with a small 3.5% increase
- Housing gains were noted in two of three participating cities

Table 3.12: Finney County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2018	Numeric Housing Change 2000 - 2018	Percentage Housing Change 2000 - 2018	Percentage Mobile Homes 2018	Housing Density, per Square Mile 2018
Finney County	**13,763**	**13,500**	**-263**	**-1.9%**	**13.3%**	**10**
City of Garden City	9,907	9,816	-91	-0.9%	7.2%	1,113

Table 3.12: Finney County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2018	Numeric Housing Change 2000 - 2018	Percentage Housing Change 2000 - 2018	Percentage Mobile Homes 2018	Housing Density, per Square Mile 2018
City of Holcomb	608	697	89	14.6%	4.7%	516

Source: US Census Bureau

Of note for Finney County and its participating jurisdictions for the period 2000 to 2018:

- Housing levels remained static in Finney County, with a small -1.9% decline
- Housing gains were noted in one of two participating cities

Table 3.13: Ford County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2018	Numeric Housing Change 2000 - 2018	Percentage Housing Change 2000 - 2018	Percentage Mobile Homes 2018	Housing Density, per Square Mile 2018
Ford County	**11,650**	**12,247**	**597**	**5.1%**	**12.1%**	**11**
City of Bucklin	339	395	56	16.5%	6.3%	669
City of Dodge City	8,976	9,307	331	3.7%	10.5%	640
City of Ford	121	135	14	11.6%	13.3%	321
City of Spearville	311	382	71	22.8%	3.4%	637

Source: US Census Bureau

Of note for Ford County and its participating jurisdictions for the period 2000 to 2018:

- A housing increase was noted in Ford County, 5.1% as a whole
- Housing gains were noted in all participating cities

Table 3.14: Gray County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2018	Numeric Housing Change 2000 - 2018	Percentage Housing Change 2000 - 2018	Percentage Mobile Homes 2018	Housing Density, per Square Mile 2018
Gray County	**2,181**	**2,436**	**255**	**11.7%**	**11.9%**	**3**
City of Cimarron	749	864	115	15.4%	8.2%	758
City of Copeland	133	164	31	23.3%	19.5%	656
City of Ensign	77	119	42	54.5%	29.4%	410
City of Ingalls	116	107	-9	-7.8%	24.3%	369
City of Montezuma	362	447	85	23.5%	9.4%	588

Source: US Census Bureau
-: No data available

Of note for Gray County and its participating jurisdictions for the period 2000 to 2018:

- A housing increase was noted in Gray County, 11.7% as a whole
- Housing gains were noted in four of five participating cities

Table 3.15: Haskell County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2018	Numeric Housing Change 2000 - 2018	Percentage Housing Change 2000 - 2018	Percentage Mobile Homes 2018	Housing Density, per Square Mile 2018
Haskell County	**1,639**	**1,680**	**41**	**2.5%**	**23.3%**	**3**
City of Satanta	470	436	-34	-7.2%	20.2%	739
City of Sublette	645	683	38	5.9%	15.4%	742

-: No data available

Of note for Haskell County and its participating jurisdictions for the period 2000 to 2018:

- Housing levels remained static in Haskell County, with a small 2.5% increase
- Housing losses were noted in one of two participating cities

Table 3.16: Hodgeman County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2018	Numeric Housing Change 2000 - 2018	Percentage Housing Change 2000 - 2018	Percentage Mobile Homes 2018	Housing Density, per Square Mile 2018
Hodgeman County	**945**	**1,000**	**55**	**5.8%**	**7.2%**	**1**
City of Hanston	127	113	-14	-11.0%	7.1%	404
City of Jetmore	427	480	53	12.4%	9.2%	107

Source: US Census Bureau

Of note for Hodgeman County and its participating jurisdictions for the period 2000 to 2018:

- A housing increase was noted in Hodgeman County, 5.8% as a whole
- Housing losses were noted in one of two participating cities

Table 3.17: Lane County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2018	Numeric Housing Change 2000 - 2018	Percentage Housing Change 2000 - 2018	Percentage Mobile Homes 2018	Housing Density, per Square Mile 2018
Lane County	**1,065**	**974**	**-91**	**-8.5%**	**4.3%**	**1**
City of Dighton	653	576	-77	-11.8%	2.1%	655

Source: US Census Bureau

Of note for Lane County and its participating jurisdictions for the period 2000 to 2018:

- A housing decrease was noted in Lane County, -8.7% as a whole
- Housing losses were noted in all participating cities

Table 3.18: Meade County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2018	Numeric Housing Change 2000 - 2018	Percentage Housing Change 2000 - 2018	Percentage Mobile Homes 2018	Housing Density, per Square Mile 2018
Meade County	**1,968**	**1,978**	**10**	**0.5%**	**8.2%**	**2**
City of Fowler	266	247	-19	-7.1%	3.6%	526
City of Meade	753	732	-21	-2.8%	6.0%	739
City of Plains	453	454	1	0.2%	20.3%	454

Source: US Census Bureau

Of note for Meade County and its participating jurisdictions for the period 2000 to 2018:

- Housing levels remained static in Meade County, with a small 0.5% gain
- Housing losses were noted in two of three participating cities

Table 3.19: Seward County Housing Data

Jurisdiction	Housing Units 2000	Housing Units 2018	Numeric Housing Change 2000 - 2018	Percentage Housing Change 2000 - 2018	Percentage Mobile Homes 2018	Housing Density, per Square Mile 2018
Seward County	**8,027**	**8,218**	**191**	**2.4%**	**13.9%**	**13**
City of Kismet	172	202	30	17.4%	38.6%	842
City of Liberal	7,014	7,324	310	4.4%	11.1%	623

Source: US Census Bureau

Of note for Seward County and its participating jurisdictions for the period 2000 to 2018:

- Housing levels remained static in Seward County, with a small 2.4% gain
- Housing gains were noted in all participating cities

3.5 – Regional Property Valuations

This section quantifies the built environment exposed to potential hazards in Kansas Region C. The following tables provide monetary value of structures, by category and where available, for each county in Kansas Region C. In addition to the population information presented above, this information forms the basis of the vulnerability and risk assessment presented in this plan. This information was derived from inventory data associated with FEMA's loss estimation software HAZUS.

Table 3.20: Kansas Region C Property Valuations, Residential, Commercial and Industrial

County	Residential	Commercial	Industrial
Clark	$179,303,000	$28,210,000	$11,985,000
Finney	$2,527,894,000	$574,135,000	$108,789,000

Table 3.20: Kansas Region C Property Valuations, Residential, Commercial and Industrial

County	Residential	Commercial	Industrial
Ford	$2,181,622,000	$473,364,000	$127,482,000
Gray	$488,512,000	$73,178,000	$11,722,000
Haskell	$316,477,000	$62,224,000	$9,643,000
Hodgeman	$143,584,000	$18,841,000	$1,627,000
Lane	$158,664,000	$42,666,000	$2,374,000
Meade	$420,131,000	$51,629,000	$9,842,000
Seward	$1,361,234,000	$340,765,000	$48,002,000

Source: HAZUS

Table 3.21: Kansas Region C Property Valuations, Agriculture, Government and Education

County	Agriculture	Government	Education
Clark	$8,969,000	$2,339,000	$10,473,000
Finney	$50,388,000	$19,647,000	$53,614,000
Ford	$54,313,000	$20,220,000	$40,052,000
Gray	$11,074,000	$8,748,000	$17,760,000
Haskell	$10,162,000	$6,634,000	$8,584,000
Hodgeman	$2,922,000	$2,560,000	$2,864,000
Lane	$4,560,000	$3,842,000	$6,321,000
Meade	$13,099,000	$4,364,000	$20,049,000
Seward	$38,093,000	$12,047,000	$24,223,000

Source: HAZUS

Table 3.22: Kansas Region C Property Total Valuations

County	Total
Clark	$495,884,000
Finney	$6,770,618,000
Ford	$5,874,814,000
Gray	$1,294,134,000
Haskell	$861,920,000
Hodgeman	$367,392,000
Lane	$465,306,000
Meade	$1,090,544,000
Seward	$3,662,220,000

Source: HAZUS

3.6 – Critical Facility Data

A critical facility is essential in providing utility or direction either during the response to an emergency or during the recovery operation, with facilities determined from jurisdictional feedback. The following are examples of critical facilities and assets:

- Communications facilities
- Emergency operations centers
- Fire stations

- Government buildings
- Hospitals and other medical facilities
- Police stations

Details concerning critical facilities have been deemed as sensitive information, and as such their specific information is not contained in the body of this HMP, but is included in the restricted from public view Appendix D.

3.7 – Unified School Districts

Each participating county is served by multiple Unified School Districts (USDs), with these USDs providing educational coverage for each participating jurisdiction. The following table presents participating USD enrollment information, the number of school structures, and the insured valuation of these structures and contents within (if information is available).

Table 3.23: Participating USD Information

School District	Enrollment (2013)	Enrollment (2018)	Enrollment Change (2013-2018)	School Buildings (2018)	Total Insured Valuation of Structures (2018)
Clark County					
USD #219 - Minneola	259	237	-22	6	-
USD #220 - Ashland	213	214	1	7	-
Finney County					
USD #363 – Holcomb	1,006	979	-27	8	-
USD #457 – Garden City	7,640	7,534	-106	27	-
Ford County					
USD #381 - Spearville	353	331	-22	6	-
UDS #443 – Dodge City	6,960	6,964	4	23	-
USD #459 - Bucklin	254	238	-16	6	-
Gray County					
USD #102 - Cimarron	723	674	-49	4	$71,771,850
USD #371 - Montezuma	260	198	-62	3	$15,000,000
USD #476 – Copeland / South Gray	120	131	11	1	$12,000,000
USD #477 - Ingalls	247	250	3	7	$13,000,000
Haskell County					
USD #374 - Sublette	497	459	-42	10	-
USD #507 - Satanta	314	264	-50	10	$25,000,000
Hodgeman County					
USD #227 – Hodgeman County	305	290	-15	2	$21,000,000
Lane County					
USD #468 – Healy Public Schools	86	44	-42	1	$1,270,267
USD #482- Dighton	267	265	-2	4	$20,000,000
Meade County					
USD #225 - Fowler	168	150	-18	4	$20,000,000
USD #226 - Meade	442	400	-42	2	$30,000,000
USD #483 – Kismet / Plains	178	166	-12	4	$6,455,950

Table 3.23: Participating USD Information

School District	Enrollment (2013)	Enrollment (2018)	Enrollment Change (2013-2018)	School Buildings (2018)	Total Insured Valuation of Structures (2018)
Seward County					
USD #480 - Liberal	4,995	5,400	405	9	$60,000,000
USD #483 – Kismet / Plains	178	166	-12	4	$6,455,950

Source: Kansas State Department of Education and Participating USDs
-: Information unavailable

The following table presents participating college and university enrollment information, the number of school structures, and the insured valuation of these structures and contents within (if information is available).

Table 3.24: Participating College and University Information

School District	Estimated Enrollment (2018)	Number of Offices and Schools (2018)	Total Insured Valuation of Structures (2018)
Finney County			
Garden City Community College	2,122	36	-
Ford County			
Dodge City Community College	1,773	29	-
Seward County			
Seward County Community College	1,838	27	$57,222,473

Source: Participating College or University
-: Information unavailable

3.8 – Regional Land Use

In general, land use is determined by three major types of regulation, zoning ordinances, floodplain ordinances and building code requirements.

- 2017 Kansas Statutes, KS Stat § 12-741 (2017): This act is enabling legislation for the enactment of planning and zoning laws and regulations by cities and counties for the protection of the public health, safety and welfare, and is not intended to prevent the enactment or enforcement of additional laws and regulations on the same subject which are not in conflict with the provisions of this act.
- 2012 Kansas Statutes, Chapter 19 Counties and County Officers, Article 33 Flood Control: Allows cities and counties to develop stormwater management and flood control projects and programs, provide local funding, and enter into agreements with other agencies to develop and use flood control works.
- The Kansas State Legislature has not implemented a statewide building code, nor does it require comprehensive planning by local governments.

These three types of regulations can assist in preventing the following:

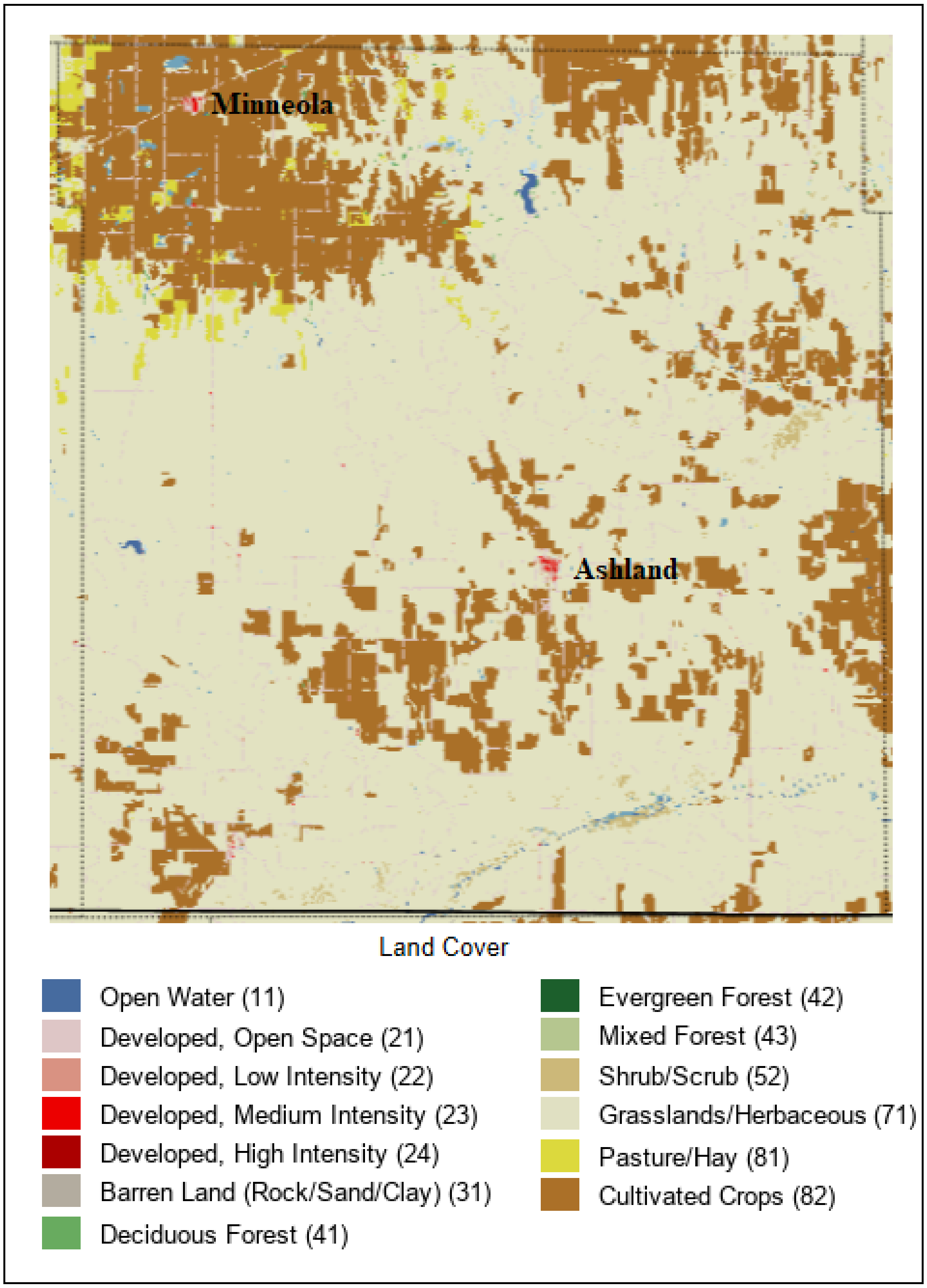
- Unrestricted residential growth which can increase a population's exposure to identified hazard prone areas
- Rapid, unchecked development that can put a strain on a community's vulnerable resources such as its energy infrastructure
- Residential development constructed quickly and inexpensively to meet consumer demand that often lacks long term mitigation measures and resiliency
- Rapid development under pressure to meet consumer demand can alter the landscape in ways affecting urban runoff, drainage, or other environmental considerations which have drastic effects on floodplains

Information on relevant codes and ordinances may be found in Section 5 of this HMP.

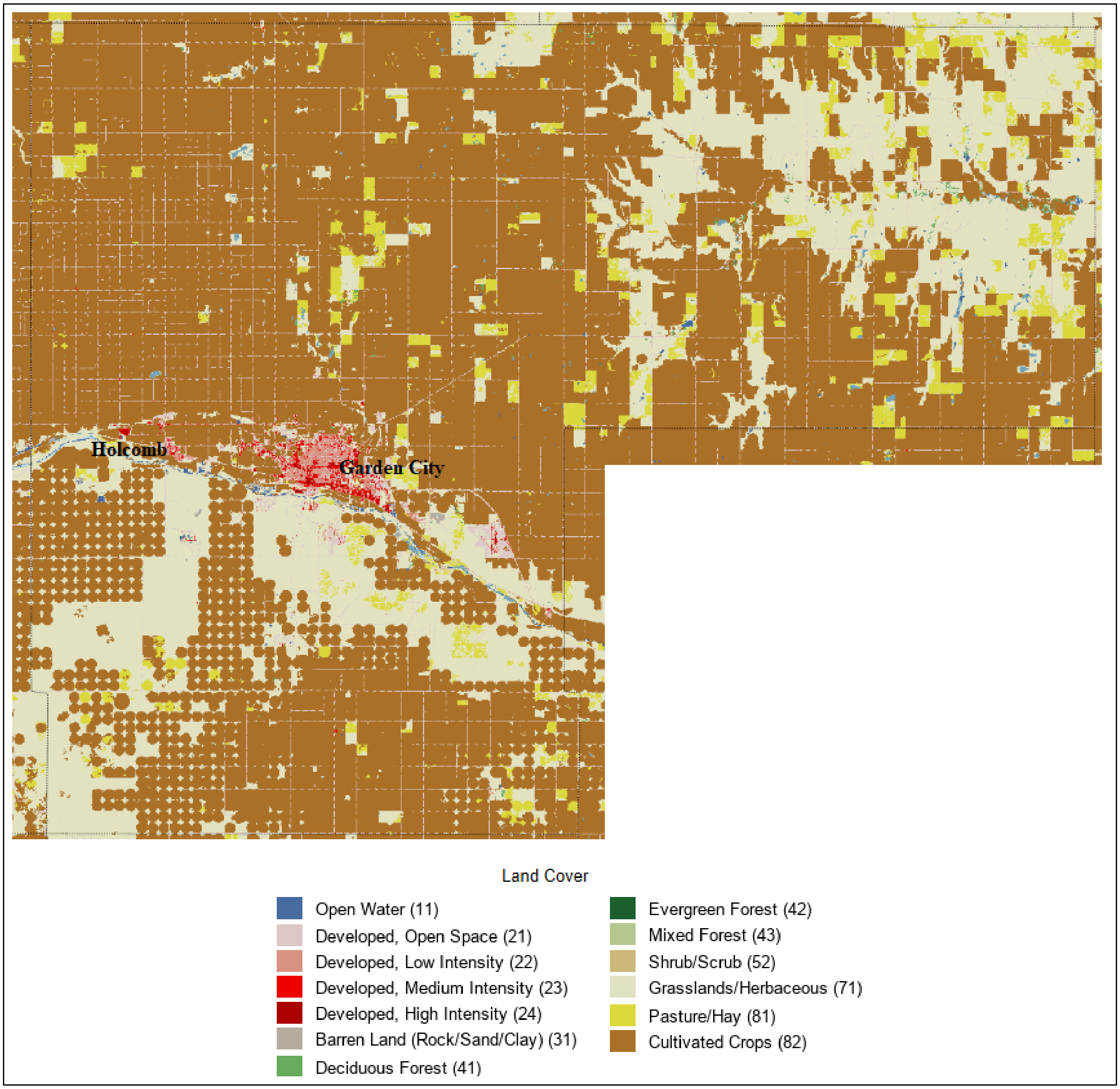
3.9 – Regional Land Cover

The 2016 USGS land cover map illustrates land usage. As indicated by the following maps, large areas of the region are grasslands and cultivated crops. Additionally, each county has at least one area of low to high intensity development corresponding with larger cities.

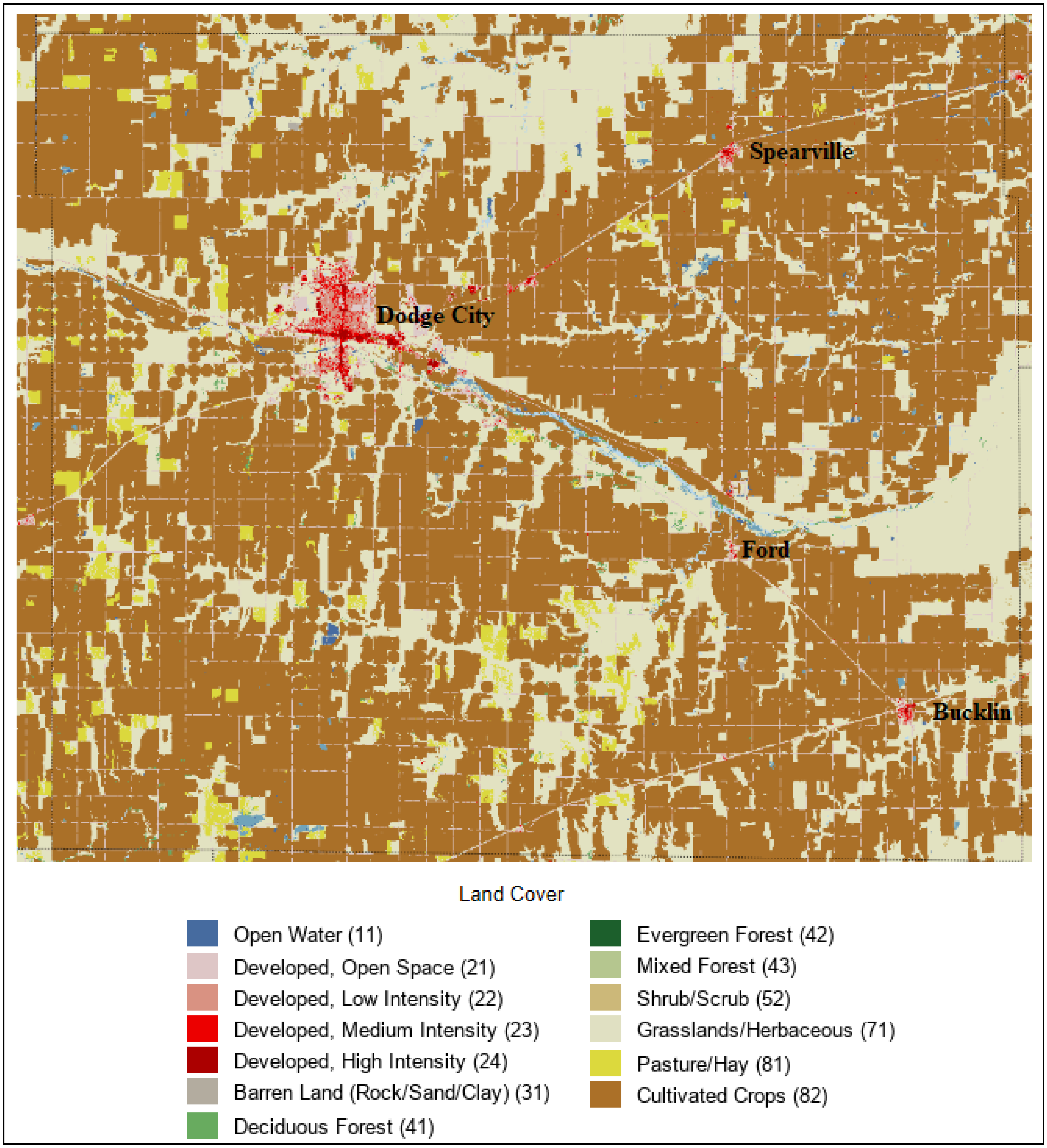
Clark County Land Cover Map



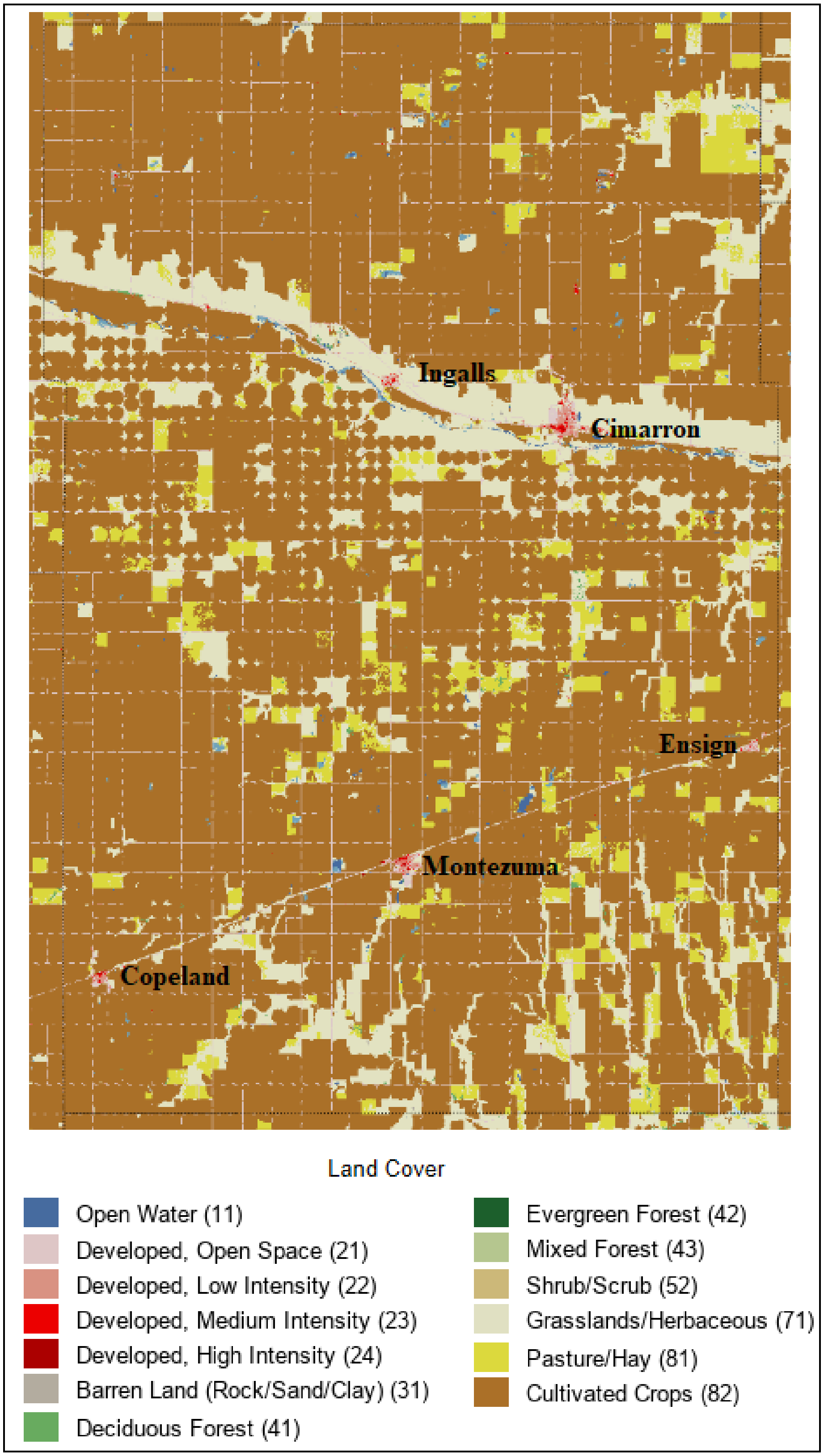
Finney County Land Cover Map



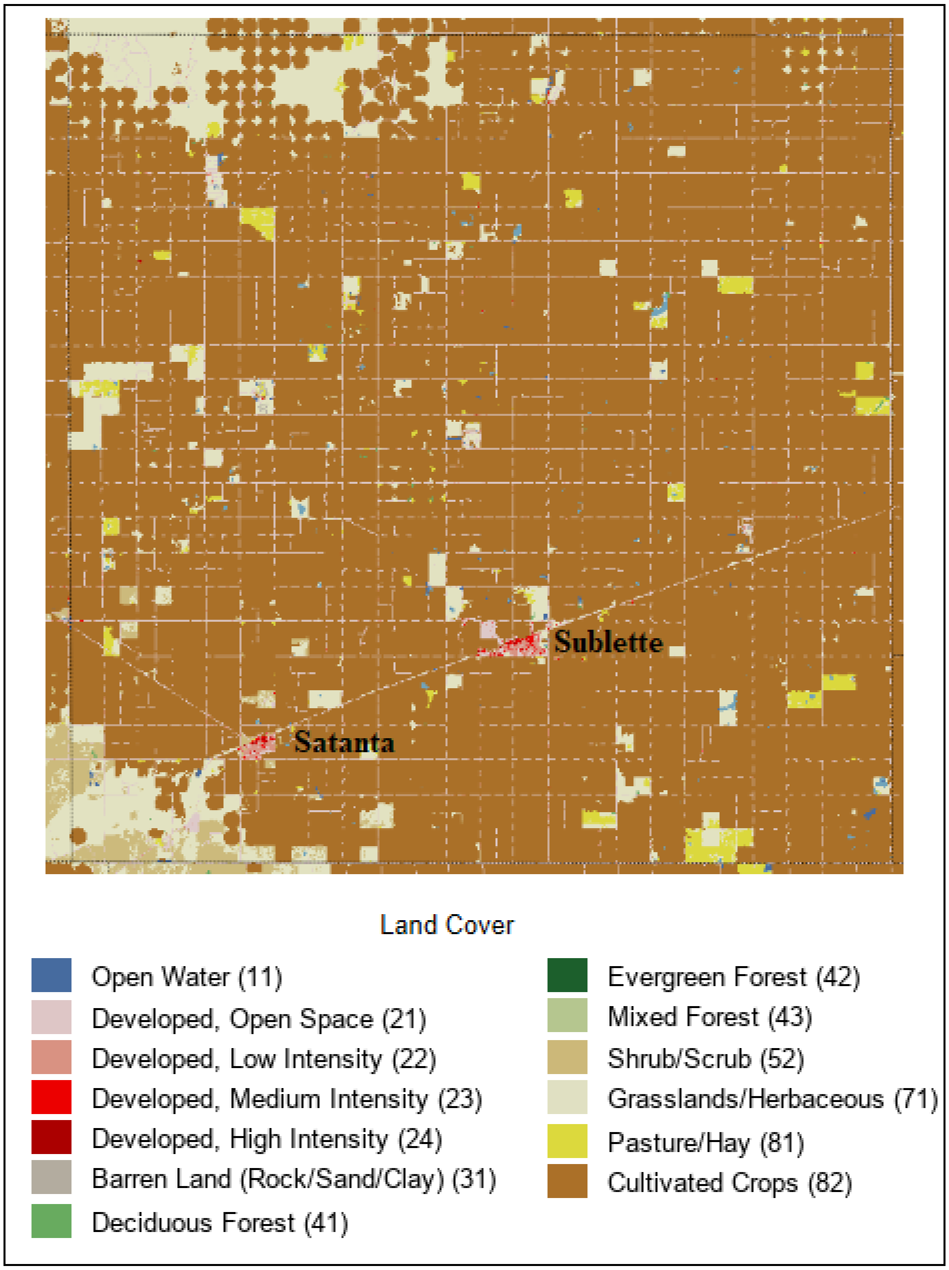
Ford County Land Cover Map



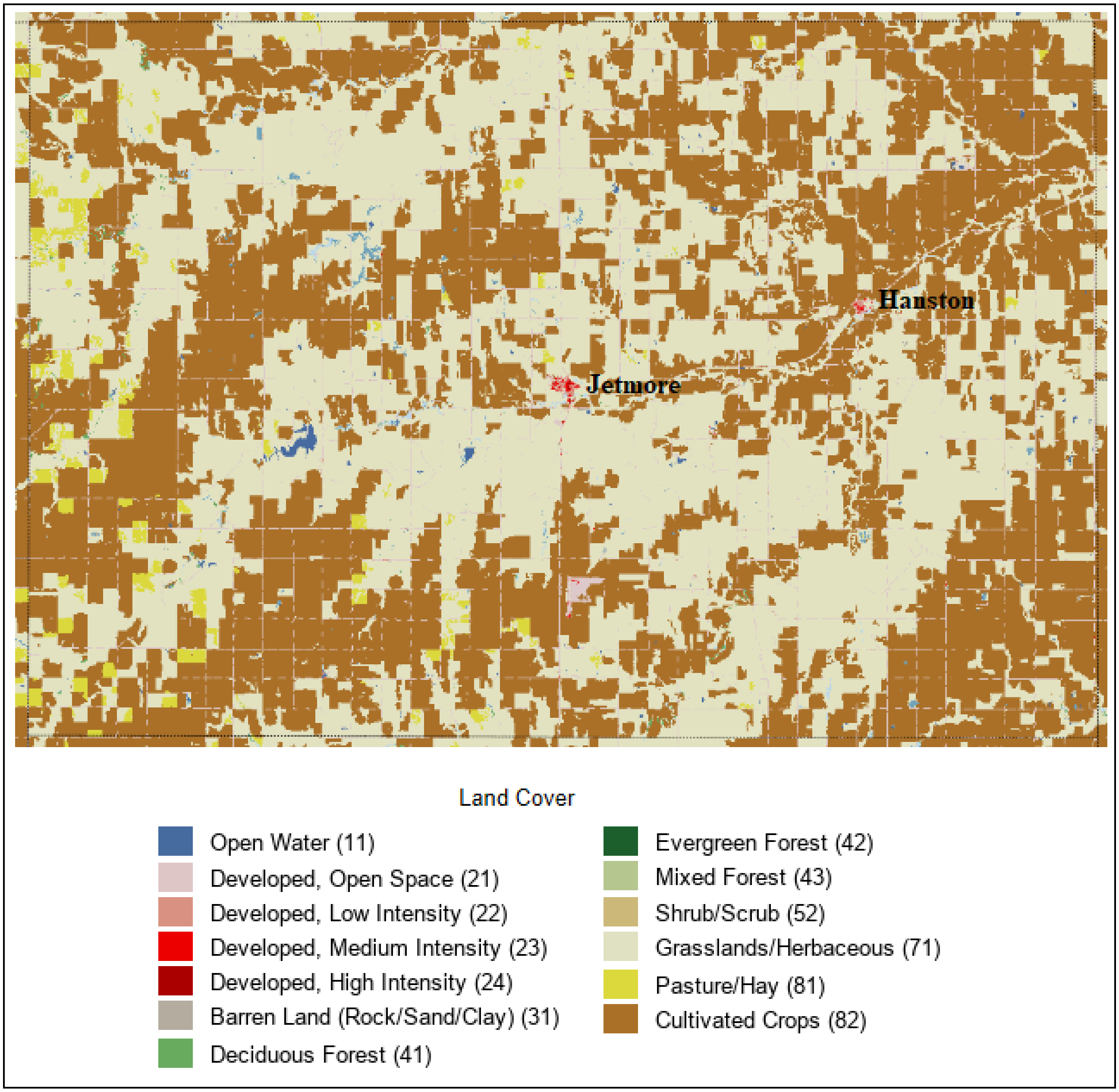
Gray County Land Cover Map



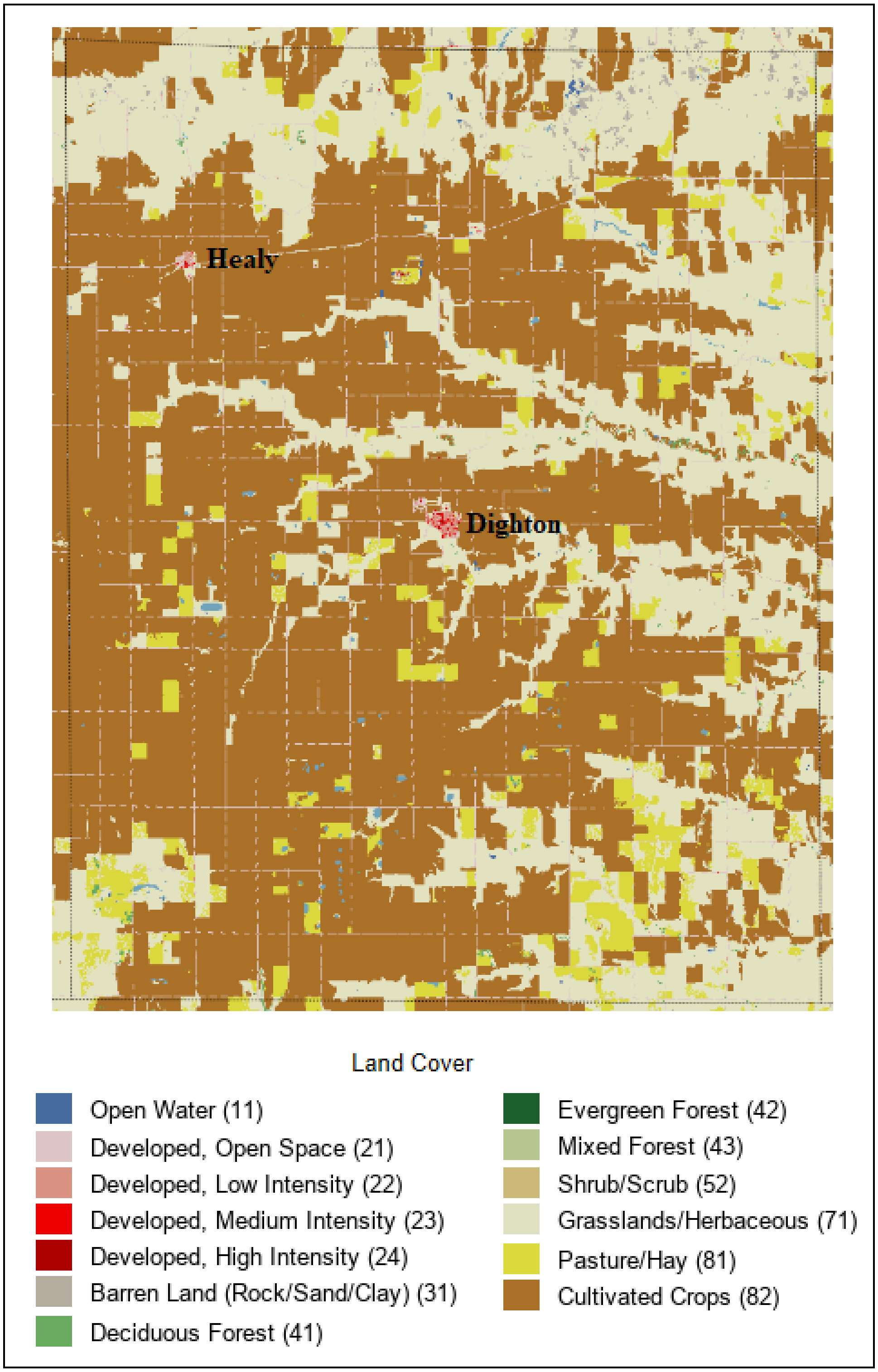
Haskell County Land Cover Map



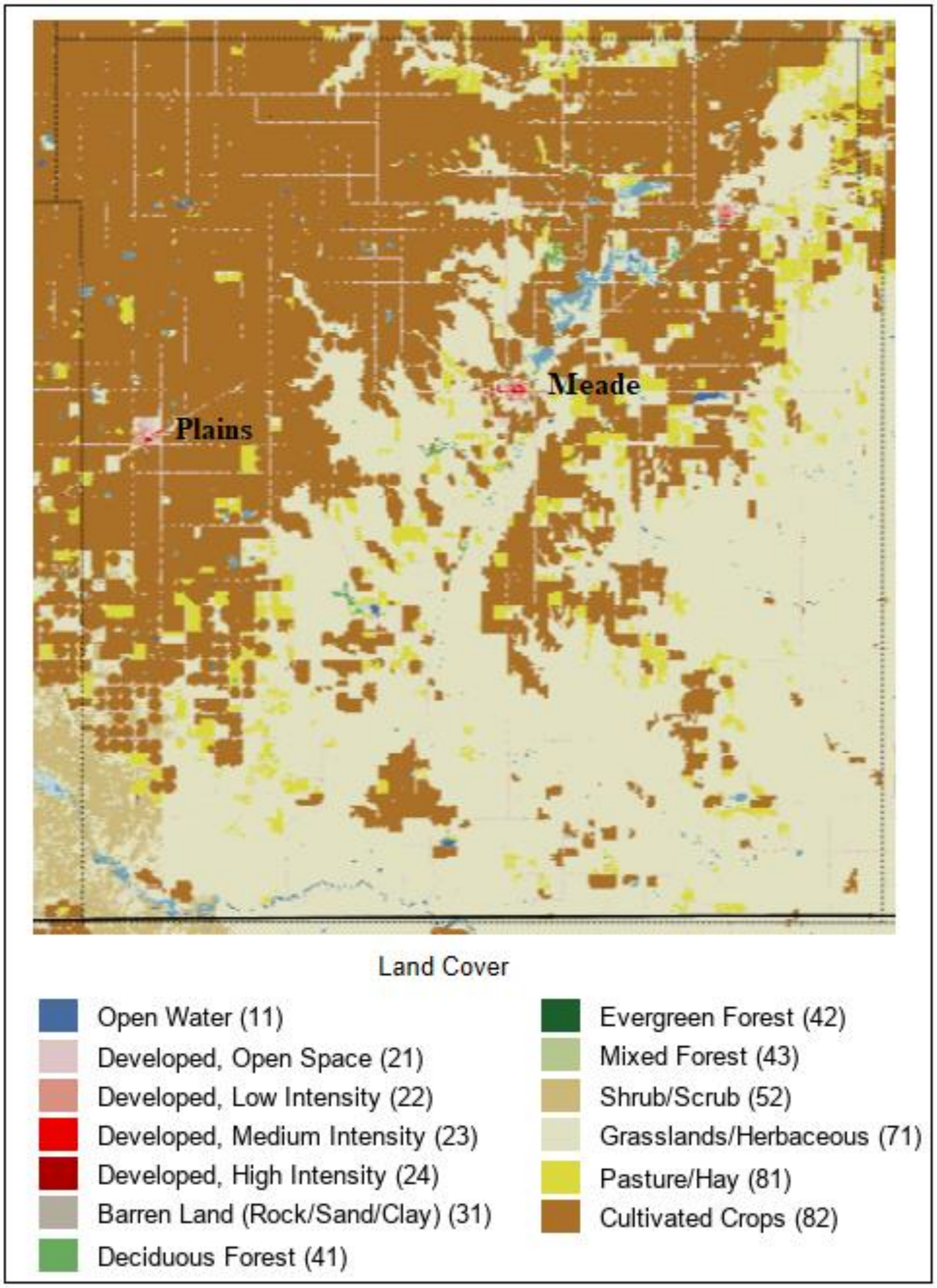
Hodgeman County Land Cover Map



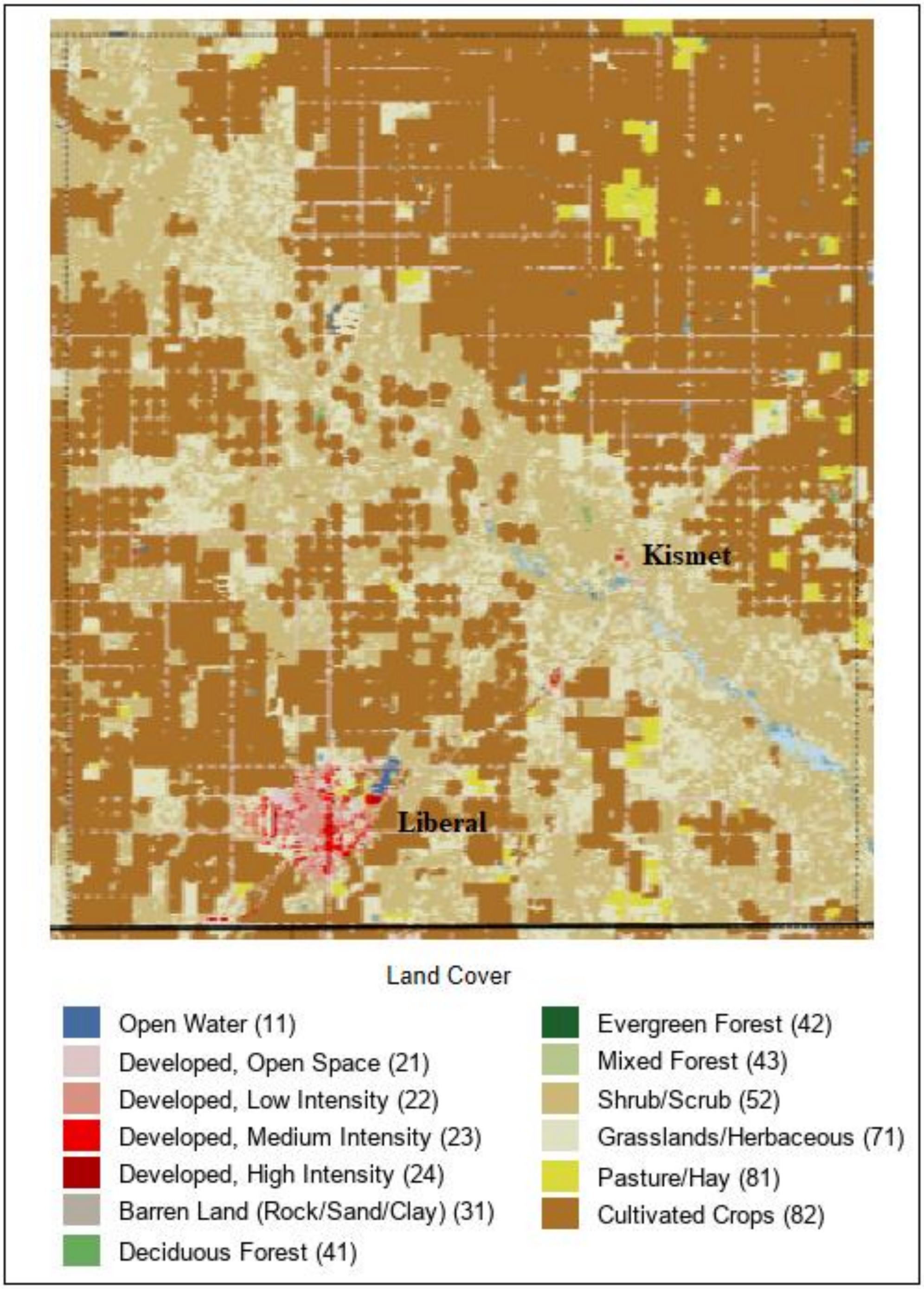
Lane County Land Cover Map



Meade County Land Cover Map



Seward County Land Cover Map



3.10 – Regional Agricultural Data

Agriculture is a major component of the economy of Kansas. According to the Kansas Department of Agriculture, Agriculture is the largest economic driver in Kansas, valued at nearly $67.5 billion and accounting for 44.5 percent of the state's total economy. In Kansas, there are approximately 46,000,000 acres of farmland, which accounts for 88% of all Kansas land.

The following tables present information from the USDA National Agricultural Statistics Service 2017 Census of Agriculture (the latest availed data) relating to farm totals, agricultural acreage and livestock (cattle, hogs and pigs) for Kansas Region C.

Table 3.25: Kansas Region C Farm Data, 2017 Census of Agriculture

County	Number of Farms	Farm Acreage	Percent of Acreage as Cropland	Percent of Acreage as Pastureland	Market Value of Products Sold (Yearly)	Percentage of State Agriculture Sales
Clark	230	434,295	36%	63%	$111,420,000	1%
Finney	450	790,500	86%	12%	$823,091,000	4%
Ford	505	669,832	79%	18%	$515,252,000	3%
Gray	422	556,070	79%	19%	$990,653,000	5%
Haskell	207	363,751	88%	10%	$1,159,098,000	6%
Hodgeman	351	494,925	65%	34%	$191,891,000	1%
Lane	242	417,017	75%	25%	$266,374,000	1%
Meade	407	587,924	56%	41%	$233,384,000	1%
Seward	282	360,711	73%	24%	$424,697,000	2%

Source: United States Department of Agriculture National Agricultural Statistics Service

Table 3.26: Kansas Region C Livestock Data, 2017 Census of Agriculture

County	Cattle	Hogs and Pigs
Clark	95,830	
Finney	630,616	
Ford	405,994	
Gray	757,159	-
Haskell	1,052,545	-
Hodgeman	-	-
Lane	-	157
Meade	120,891	-
Seward	-	-

Source: United States Department of Agriculture National Agricultural Statistics Service
-: Data not reported

3.11 – Regional Development Trends

44 CFR 201.6 (c)(2)(ii)(A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas

Future development speaks to the potential impacts of land use and demographic changes in hazard prone areas. Data in this section is based on the best available data but is speculative as future conditions are subject to numerous unpredictable factors. While past trends are used to inform the discussion, previous historical trends are no guarantee of future conditions.

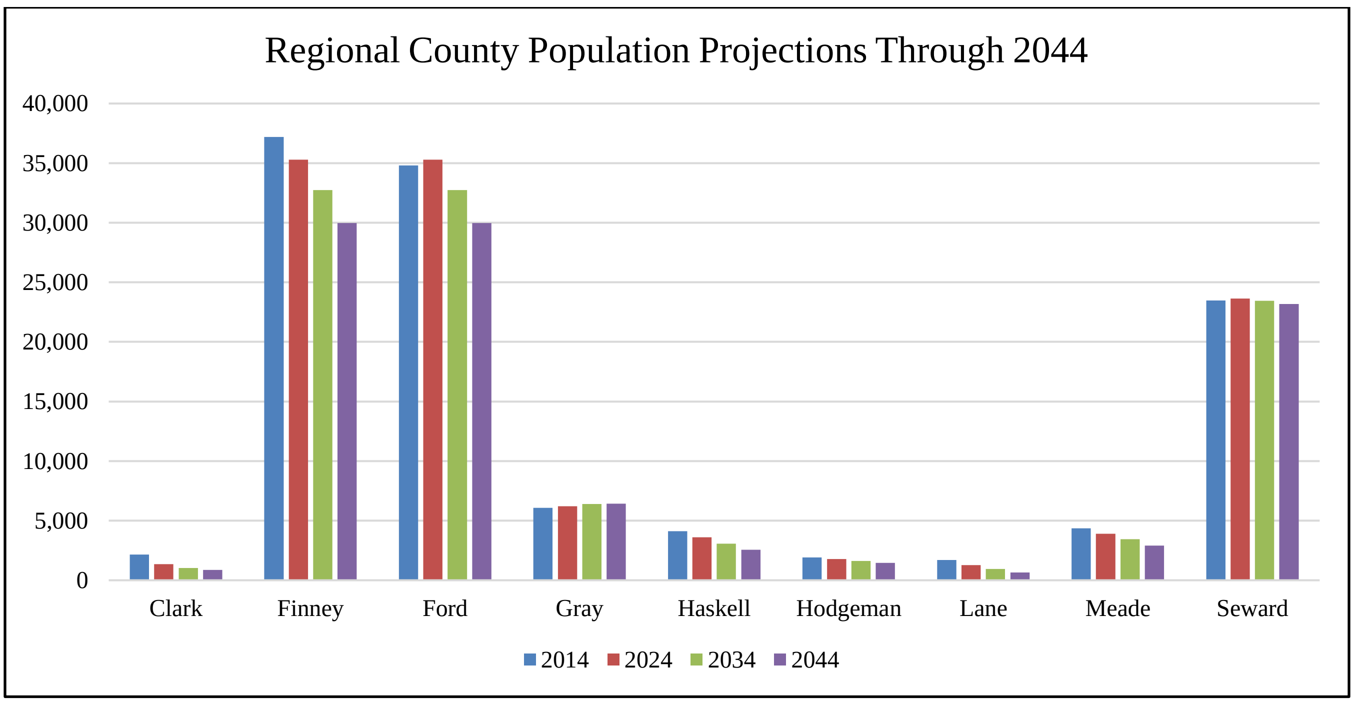
The University of Kansas Institute for Policy and Social Research developed population projections for the region using historical and trend data. Indications are the region will experience a decline in population through the year 2044.

Table 3.27: Kansas Region C Population Projections Through 2044

County	2014	2024	2034	2044	Projected Growth Percentage Through 2044
Clark	2,144	1,361	1,025	856	-60.1%
Finney	37,184	35,293	32,742	29,978	-19.4%
Ford	34,795	35,293	32,742	29,978	17.7%
Gray	6,082	6,211	6,390	6,425	5.6%
Haskell	4,106	3,602	3,077	2,552	-37.8%
Hodgeman	1,916	1,780	1,618	1,459	-23.9%
Lane	1,687	1,278	939	652	-61.3%
Meade	4,357	3,897	3,442	2,915	-33.1%
Seward	23,465	23,640	23,449	23,174	-1.4%

Source: University of Kansas Institute for Policy and Social Research

The following chart illustrates the above data.



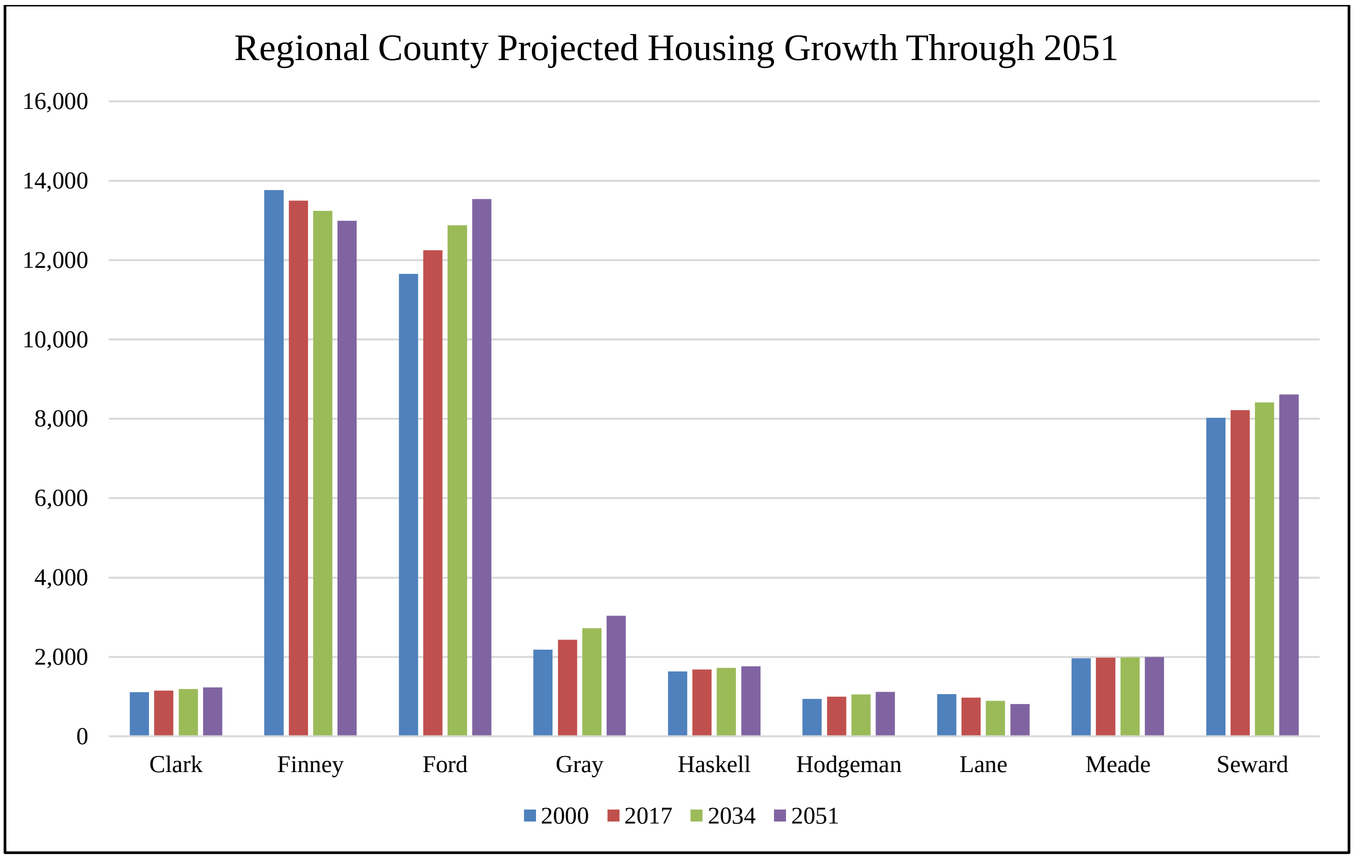
US Census Bureau data was used to develop housing projections for the region using historical and trend data. Indications are the region will experience declining growth in housing through the year 2051.

Table 3.28: Kansas Region C Housing Projections Through 2051

County	2000	2017	2034	2051	Projected Growth Percentage Through 2051
Clark	3,027	2,955	2,885	2,816	-2.4%
Finney	1,111	1,150	1,190	1,232	3.5%
Ford	13,763	13,500	13,242	12,989	-1.9%
Gray	11,650	12,247	12,875	13,534	5.1%
Haskell	2,181	2,436	2,721	3,039	11.7%
Hodgeman	1,639	1,680	1,722	1,765	2.5%
Lane	945	1,000	1,058	1,120	5.8%
Meade	1,065	974	891	815	-8.5%
Seward	1,968	1,978	1,988	1,998	0.5%

Source: US Census Bureau

The following chart illustrates the above data.



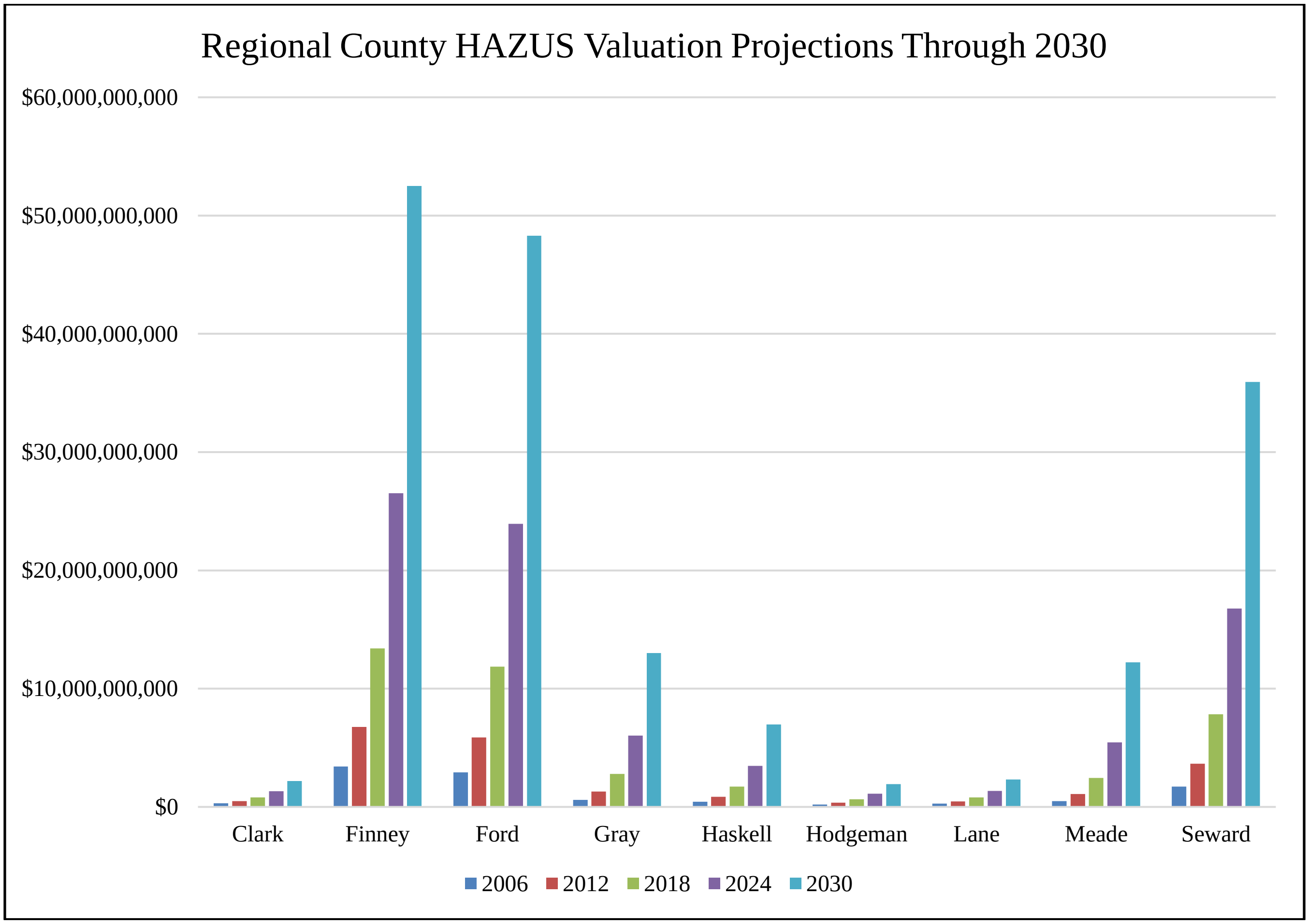
FEMA's loss estimation software HAZUS data was used to developed property valuation projections for the region using historical and trend data. Indications are the region will experience steady growth in the property valuation through the year 2030.

Table 3.29: Kansas Region C Property Valuation Projections Through 2030

County	2006	2012	2018	2024	2030	Projected Growth Percentage Through 2030
Clark	$302,761,000	$495,884,000	$812,194,904	$1,330,271,924	$2,178,816,171	63.8%
Finney	$3,420,645,000	$6,770,618,000	$13,401,352,114	$26,525,826,517	$52,503,618,026	97.9%
Ford	$2,910,698,000	$5,874,814,000	$11,857,444,343	$23,932,500,050	$48,304,216,497	101.8%
Gray	$599,763,000	$1,294,134,000	$2,792,407,684	$6,025,296,202	$13,001,036,535	115.8%
Haskell	$429,400,000	$861,920,000	$1,730,102,670	$3,472,776,183	$6,970,785,393	100.7%
Hodgeman	$211,055,000	$367,392,000	$639,534,158	$1,113,263,051	$1,937,902,153	74.1%
Lane	$272,750,000	$465,306,000	$793,802,653	$1,354,211,319	$2,310,257,203	70.6%
Meade	$487,192,000	$1,090,544,000	$2,441,103,745	$5,464,233,901	$12,231,291,762	123.8%
Seward	$1,710,716,000	$3,662,220,000	$7,839,907,576	$16,783,303,788	$35,928,903,919	114.1%

Source: HAZUS

The following chart illustrates the above data.



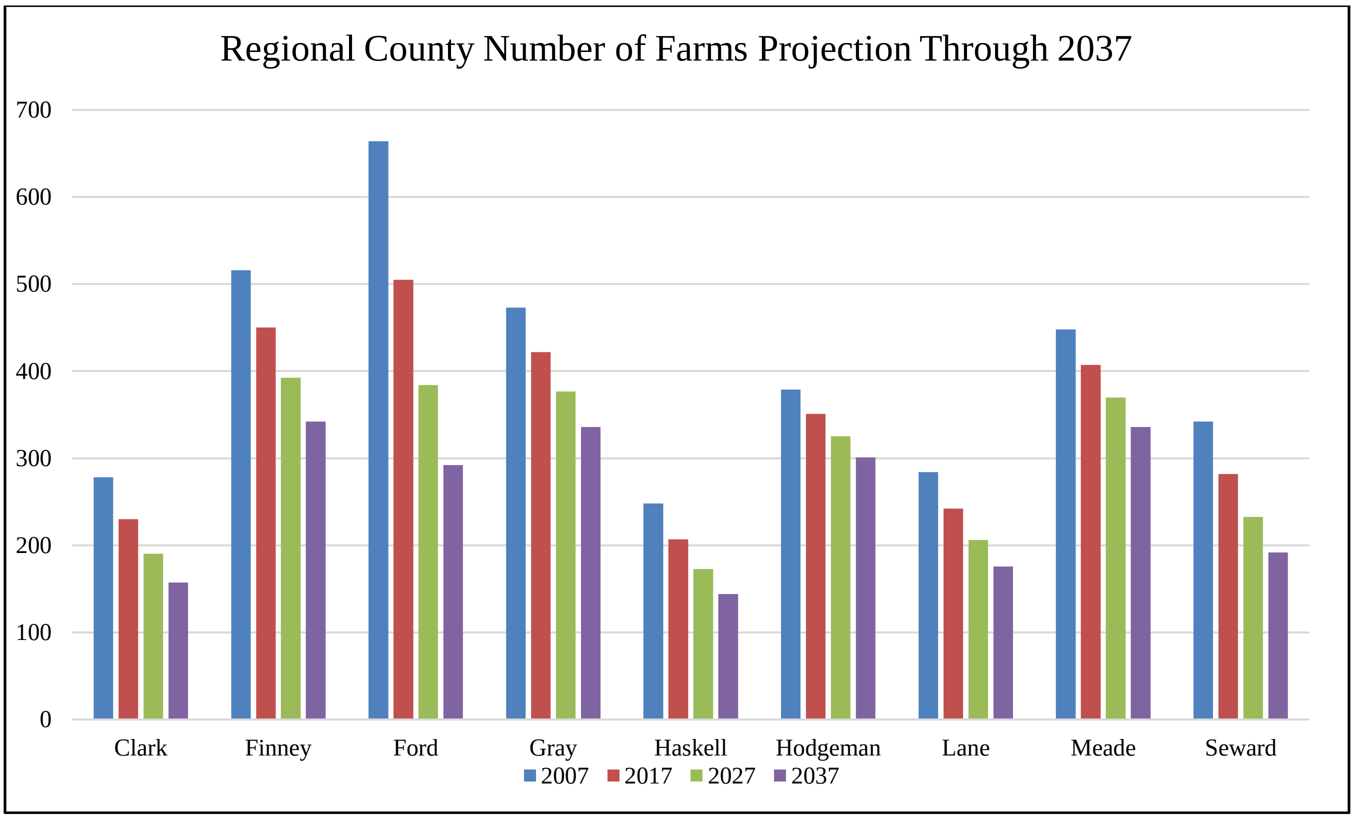
The United States Department of Agriculture (USDA) National Agricultural Statistics Service data was used to develop agricultural projections for the region using historical and trend data. Indications are the region will experience a steady increase in the number of farms through the year 2037.

Table 3.30: Kansas Region C Number of Farms Data Projections Through 2037

County	Number of Farms, 2007	Number of Farms, 2012	Number of Farms, 2017	Number of Farms, 2022	Projected Growth Percentage Through 2037
Clark	278	230	190	157	-17.3%
Finney	516	450	392	342	-12.8%
Ford	664	505	384	292	-23.9%
Gray	473	422	376	336	-10.8%
Haskell	248	207	173	144	-16.5%
Hodgeman	379	351	325	301	-7.4%
Lane	284	242	206	176	-14.8%
Meade	448	407	370	336	-9.2%
Seward	342	282	233	192	-17.5%

Source: United States Department of Agriculture National Agricultural Statistics Service

The following chart illustrates the above data.



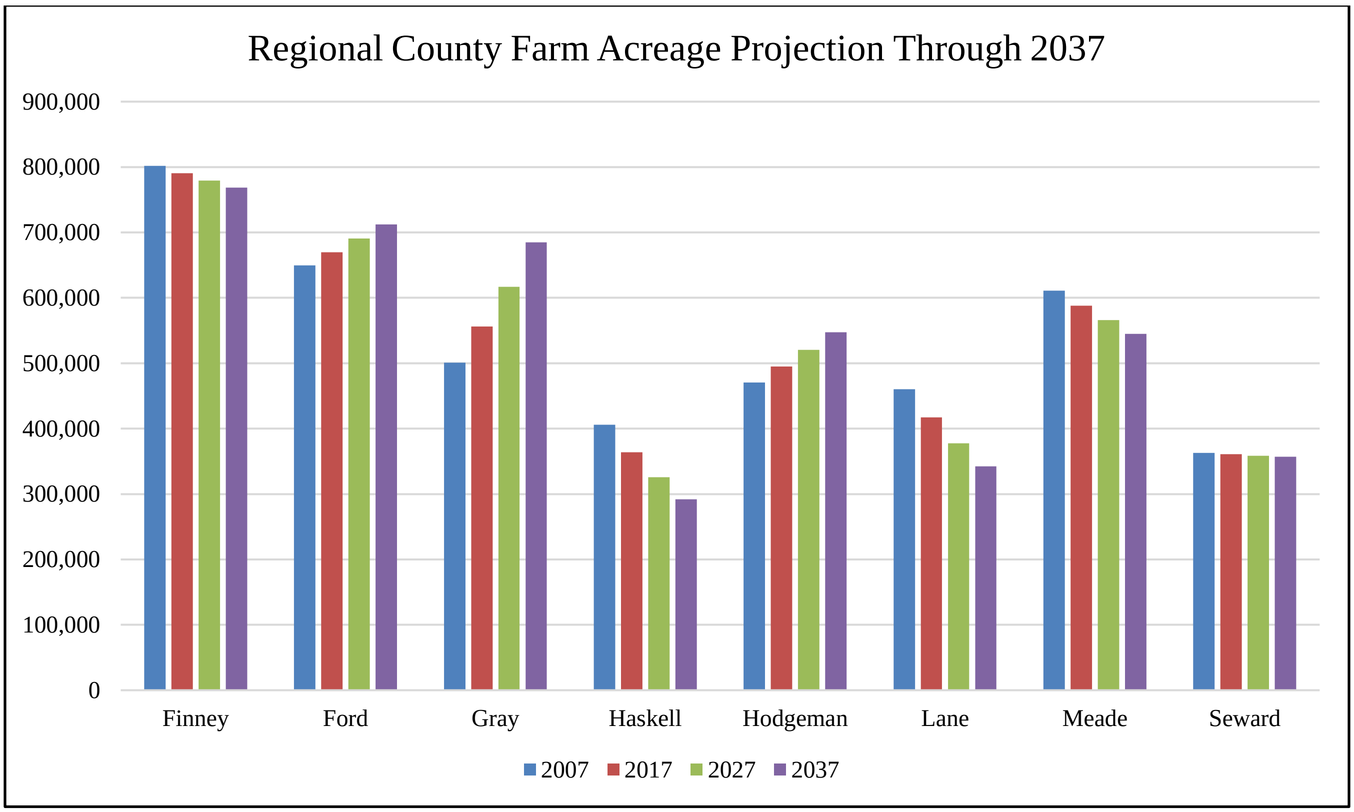
USDA National Agricultural Statistics Service data indicates the region will experience an overall increase in farm acreage through the year 2037.

Table 3.31: Kansas Region C Farm Acreage Data Projections, Through 2037

County	Farm Acreage, 2007	Farm Acreage, 2017	Farm Acreage, 2027	Farm Acreage, 2037	Projected Growth Percentage Through 2037
Clark	491,756	434,295	383,548	338,731	-11.7%
Finney	801,695	790,500	779,461	768,577	-1.4%
Ford	649,460	669,832	690,843	712,513	3.1%
Gray	501,078	556,070	617,097	684,822	11.0%
Haskell	405,930	363,751	325,955	292,086	-10.4%
Hodgeman	470,600	494,925	520,507	547,412	5.2%
Lane	460,370	417,017	377,747	342,174	-9.4%
Meade	610,749	587,924	565,952	544,801	-3.7%
Seward	362,682	360,711	358,751	356,801	-0.5%

Source: United States Department of Agriculture National Agricultural Statistics Service

The following chart illustrates the above data.



USDA National Agricultural Statistics Service data indicates the region will experience steady increase in the number of cattle through the year 2037.

Table 3.32: Kansas Region C Total Cattle Data Projections Through 2037

County	Cattle, 2012	Cattle, 2017	Cattle, 2027	Cattle, 2037	Projected Growth Percentage Through 2037
Clark	47,289	95,830	194,197	393,536	102.6%
Finney	212,712	630,616	1,869,554	5,542,567	196.5%
Ford	141,784	405,994	1,162,551	3,328,928	186.3%
Gray	244,620	757,159	-	-	209.5%
Haskell	400,552	1,052,545	-	-	162.8%
Hodgeman	72,063	-	-	-	-
Lane	62,279	-	-	-	-
Meade	53,032	120,891	-	-	-
Seward	123,422	-	-	-	-

Source: United States Department of Agriculture National Agricultural Statistics Service
-: Data not reported (no projection possible)

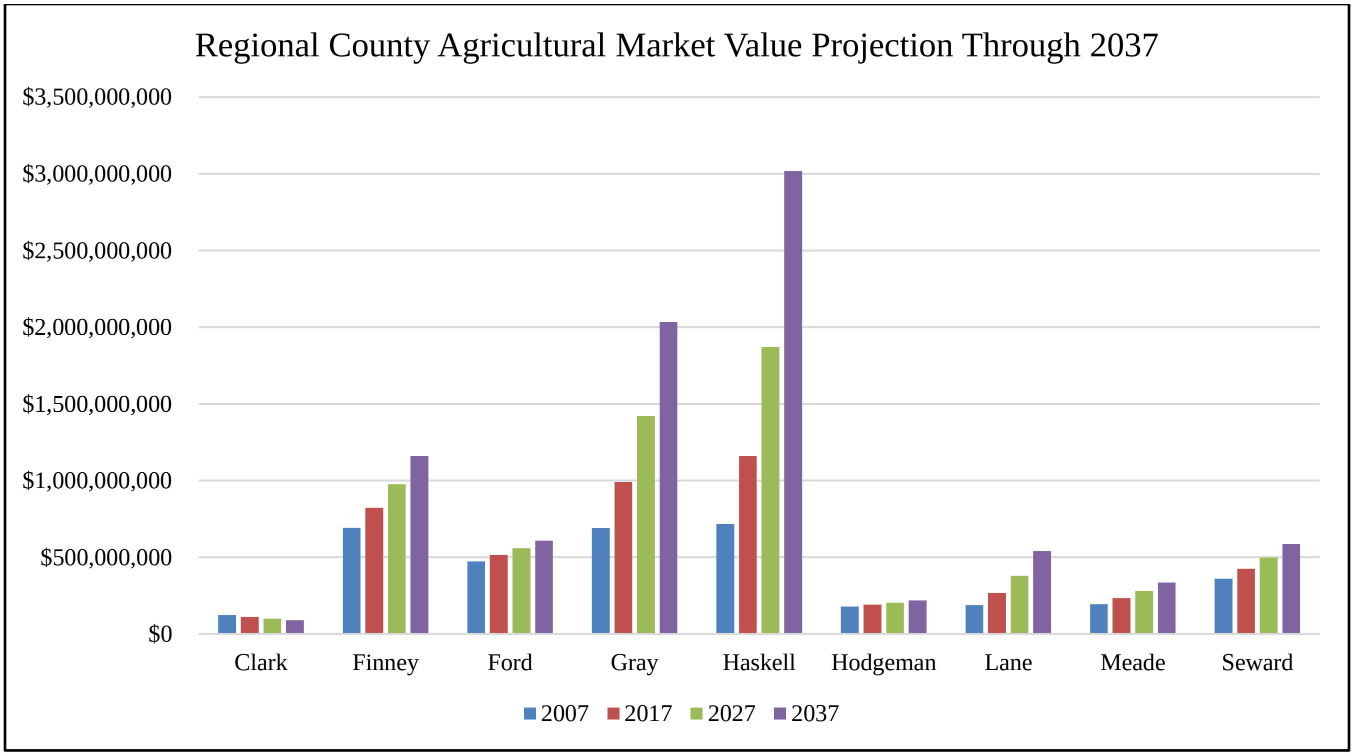
USDA National Agricultural Statistics Service data indicates the region will experience a continued increase in the market value of agricultural products through the year 2037.

Table 3.33: Kansas Region C Agricultural Market Value Data Projections, Through 2037

County	Market Value, 2007	Market Value, 2012	Market Value, 2017	Market Value, 2022	Projected Growth Percentage Through 2037
Clark	$123,547,000	$111,420,000	$100,483,350	$90,620,208	-9.8%
Finney	$693,528,000	$823,091,000	$976,858,605	$1,159,352,651	18.7%
Ford	$474,076,000	$515,252,000	$560,004,353	$608,643,683	8.7%
Gray	$691,381,000	$990,653,000	$1,419,468,233	$2,033,900,937	43.3%
Haskell	$718,293,000	$1,159,098,000	$1,870,418,024	$3,018,263,843	61.4%
Hodgeman	$179,335,000	$191,891,000	$205,326,099	$219,701,845	7.0%
Lane	$187,007,000	$266,374,000	$379,424,876	$540,455,288	42.4%
Meade	$194,591,000	$233,384,000	$279,910,641	$335,712,674	19.9%
Seward	$361,654,000	$424,697,000	$498,729,564	$585,667,377	17.4%

Source: United States Department of Agriculture National Agricultural Statistics Service

The following chart illustrates the above data.



Future development speaks to the potential impacts of land use and demographic changes in hazard prone areas. Future development data is speculative as future conditions are subject to numerous unpredictable factors. While past trends are used to inform the discussion, these historical trends are no guarantee of future conditions.

For hazards that affect the entire planning area, the predicted regional decrease in population will tend to decrease potential vulnerability. It is difficult to quantify the exact change in vulnerability, but it can be depicted as generally directly proportional to the population change itself.

For hazards that affect the entire planning area, the predicted increase in the number of structures will tend to keep increase the potential vulnerability. It is difficult to quantify the exact change in vulnerability, but it can be depicted as generally directly proportional to the change in the number of structures.

As indicated in the data above, the predicted regional market value increase of regional agricultural goods could result in increased exposure to both natural and man-made hazards.

3.12 – Regional Economic Activity Patterns

Kansas Region C's continued economic growth can impact future vulnerability in two ways, by location-based growth in identified hazard prone areas or by the industry type itself, as is the case with chemical manufacturing.

Gross domestic product (GDP) is a measure of the entire output of a defined economy, and roughly equals the total dollar amount of all goods and services produced within a defined area. GDP is the most comprehensive measure of economic activity and business growth. The following table, using data from the Bureau of Economic Analysis, details GDP for all Kansas Region C counties for the period 2015 to 2018 (the latest available data).

Table 3.34: Kansas Region C Gross Domestic Product, 2015 to 2018

County	201	2016	2017	2018	State Rank in 2018 (out of 105)
Clark	$138,368,000	$167,363,000	$230,583,000	$249,258,000	66
Finney	$1,893,785,000	$2,018,161,000	$1,926,680,000	$1,995,782,000	13
Ford	$1,479,374,000	$1,545,775,000	$1,610,187,000	$1,676,999,000	15
Gray	$861,114,000	$926,068,000	$827,623,000	$774,123,000	27
Haskell	$410,248,000	$511,287,000	$396,817,000	$348,946,000	47
Hodgeman	$90,648,000	$89,195,000	$76,241,000	$93,517,000	101
Lane	$263,064,000	$258,786,000	$276,917,000	$302,899,000	56
Meade	$284,711,000	$311,650,000	$324,555,000	$338,981,000	51
Seward	$1,335,459,000	$1,245,933,000	$1,232,004,000	$1,298,434,000	18

Source: Bureau of Economic Analysis

The following table, using data from the Bureau of Economic Analysis, details the percentage GDP change from the preceding period for 2016 to 2018 (the latest available data).

Table 3.35: Kansas Region C GDP Percentage Change from Preceding Period, 2016 to 2018

County	2016	2017	2018	State Rank in 2018 (out of 105)
Clark	21.0%	37.8%	8.1%	21
Finney	6.6%	-4.5%	3.6%	38
Ford	4.5%	4.2%	4.1%	35
Gray	7.5%	-10.6%	-6.5%	99
Haskell	24.6%	-22.4%	-12.1%	1
Hodgeman	-1.6%	-14.5%	22.7%	3
Lane	-1.6%	7.0%	9.4%	17
Meade	9.5%	4.1%	4.4%	32
Seward	-6.7%	-1.1%	5.4%	30

Source: Bureau of Economic Analysis

The average Kansas Region C unemployment rate for December 2019 of 2.1% is lower than the average State of Kansas unemployment rate of 3.1%. The following table details the regional unemployment rates, using data from the Kansas Department of Labor, for the months of December 2018 and December 2019.

Table 3.36: Kansas Region C Unemployment Rate, December 2018 to December 2019

County	December 2018	December 2019
Clark	2.2%	2.3%
Finney	2.3%	2.2%
Ford	2.5%	2.4%
Gray	1.9%	1.9%
Haskell	2.0%	1.9%
Hodgeman	2.3%	2.3%
Lane	2.2%	2.6%

Table 3.36: Kansas Region C Unemployment Rate, December 2018 to December 2019

County	December 2018	December 2019
Meade	1.9%	2.1%
Seward	3.0%	2.9%

Source: Kansas Department of Labor

3.13 – Climate Change

For hazards related to weather patterns, climate change should be considered as it may cause significant changes in patterns and event frequency. There is a scientific consensus that climate change is occurring, and recent climate modeling results indicate that extreme weather events may become more common. Rising average temperatures produce a more variable climate system which may result in an increase in the frequency and severity of some extreme weather events, including:

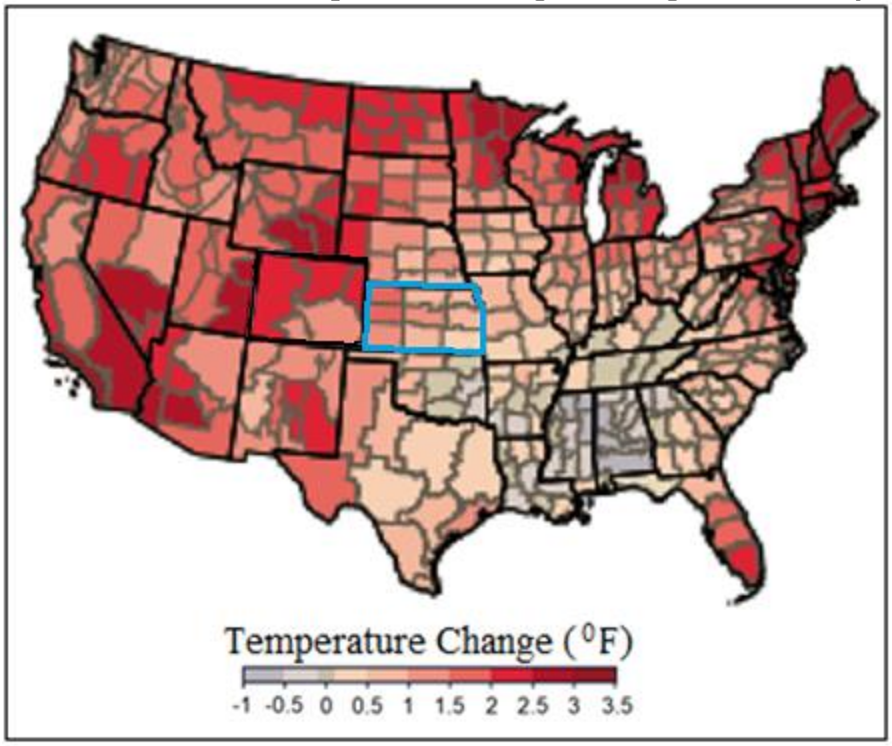
- Longer and hotter heat waves
- An increased risk of wildfires
- Higher wind speeds
- Greater rainfall intensity
- Increased tornado activity.

As climate modeling improves, future plan updates should include climate change as a factor in the ranking of natural hazards as these are expected to have a significant impact on Kansas Region C communities. Where applicable, potential climate change factors will be addressed in subsequent sections for relevant identified hazards.

According to the United State Environmental Protection Agency (USEPA) "What Climate Change Means for Kansas" (August 2016), "In the past century, most of the state has warmed by at least half a degree (F). The soil is becoming drier. Rainstorms are becoming more intense, and floods are becoming more severe. Warming winters and changes in the timing and size of rainfall events have altered crop yields. In the coming decades, summers are likely to become increasingly hot and dry, creating problems for agriculture and possibly human health."

The following map, from the USEPA Climate Change Indicators in the United States, illustrates modeled temperature changes during the last century.

USEPA Modeled Temperature Changes During Last Century



Concerning potential impacts on agriculture, the report states "Rising temperatures, drier soils, and decreasing water availability are likely to present challenges for Kansas's farms. Yields would decline by about 50 percent in fields that can no longer be irrigated. Even where ample water is available, higher temperatures would reduce yields of corn. Increased concentrations of carbon dioxide, however, may increase yields of wheat and soybean enough to offset the impact of higher temperature. Although warmer and shorter winters may allow for a longer growing season, they may also promote the growth of weeds and pests, and shorten the dormancy for many winter crops, which could increase crop losses during spring freezes. The early flowering of winter wheat could have negative repercussions on livestock farmers who depend on it for feed. Livestock themselves may also be affected by more intense heat waves and lack of water. Hot weather causes cows to eat less, grow more slowly, and produce less milk, and it can threaten their health."

Concerning potential impacts on rainfall, flooding, and drought, the report states "Although summer droughts are likely to become more severe, floods may also intensify. During the last 50 years, the amount of rain falling during the wettest four days of the year has increased about 15 percent in the Great Plains. River levels associated with flooding have increased in eastern Kansas. Over the next several decades, the amount of rainfall during the wettest days of the year is likely to continue to increase, which would increase flooding."

Concerning potential impacts on tornados, the report states "Scientists do not know how the frequency and severity of tornados will change. Rising concentrations of greenhouse gases tend to increase humidity, and thus atmospheric instability, which would encourage tornados. But wind shear is likely to decrease, which would discourage tornados. Research is ongoing to learn whether tornados will be more or less frequent in the future. Because Kansas experiences about 100 tornados a year, such research is closely followed by meteorologists in the state."

Concerning potential impacts on human health, the report states "By 2050, Kansas is likely to have four times as many days above 100°F. Certain people are especially vulnerable, including children, the elderly, the sick, and the poor. The elderly may be particularly prone to heat stress and other heat-related health problems, including dehydration, cardiovascular strain, and respiratory problems. Those with low incomes may be particularly vulnerable due to a lack of air conditioning. Power failures due to severe weather can also present risks, especially in lightly populated areas where access to the necessary support services may be limited."

4.0 Hazard Profiles

4.1 – Introduction

The ultimate purpose of this HMP is to minimize the loss of life and property. To accomplish this, all relevant hazards and vulnerabilities the Region faces have been identified. Once this identification has been completed, Kansas Region D and all participating jurisdictions can use the accumulated data to assist in the development of and prioritization of mitigation action to defend against these potential risks.

4.2 – Methodology

Each hazard that has historically, or could potentially, affect Kansas Region D is reviewed and discussed in detail. In general, each hazard details the following information:

- Location and Extent
- Previous Occurrences
- Hazard Probability Analysis
- Vulnerability Assessment

Data sets used for this HMP were designed to follow the lead of the 2018 State of Kansas Hazard Mitigation Plan. Ten-year data sets from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) (2009 to 2018, with 2010 and 2019 being full data set years) were used, where applicable, for hazard occurrence and impact data. Ten-year data sets from the United States Department of Agriculture (USDA) Risk Management Agency (2009 to 2018, with 2013 and 2018 being full data set years) were used to determine agricultural losses. The ten-year data set was used to reflect the change in the climate and more accurately depict changes in the region. Where data sets were unavailable for a hazard, local reporting from participating jurisdictions was relied upon.

In addition, to ensure compliance with EMAP standards, a hazard consequence analysis was conducted for each hazard detailing the following potential impacts:

- Health and Safety of the Public
- Health and Safety of Responders
- Continuity of Operations; Property, Facilities, and Infrastructure
- Environment
- Economic Conditions
- Public Confidence in the Jurisdiction's Governance.

4.3 – Declared Federal Disasters

Historical events of significant magnitude or impact can result in a Secretarial or Presidential Disaster Declaration. The MPC reviewed the historical federal disaster declarations to assist in hazard identification. Since the approval of the previous Kansas Region D hazard mitigation plan in 2015, there has been three federal disaster declarations for the region, as follows:

- DR 4449: Declared on June 20, 2019 – Severe Storms, Straight-Line Winds, Tornados, Flooding, Landslides and Mudslides

- DR 4319: Declared on June 16, 2017 – Severe Winter Storm, Snowstorm, Straight-Line Winds, and Flooding
- DR 4304: Declared on February 24, 2017 – Severe Winter Storm

In addition, since the 2015 plan, there has been one Fire Management Assistance Declarations, as follows:

- FM 5173, Kansas Ford County Fire Complex: Declared on March 06, 2017
- FM 5171, Clark County Fire Complex: Declared on March 06, 2017

For the 20-year period from 2000 to 2019 (data set includes full years for 2000 and 2019), Kansas Region D has had five federal disaster declarations. These declarations included the following identified hazards:

- Flooding
- Severe Storms
- Straight-Line Winds
- Severe Winter Storms
- Tornados

Information on past declared disasters are presented in the subsequent, relevant sections.

4.4 – Identified Potential Hazards

Based on the above data, and data contained in previous mitigation plans, Kansas Region D's MPC met to discuss previously identified hazards and deliberate on any changes or additions. Based on this review, no changes, additions or subtractions were indicated for any identified hazard. Additionally, a thorough and comprehensive revision of data for each hazard was completed as part of this plan update.

The MPC confirmed sixteen natural hazards that may impact Kansas Region D, as listed below:

- Agricultural Infestation
- Dam/Levee Failure
- Drought
- Earthquake
- Expansive Soils
- Extreme Temperatures
- Flood
- Hailstorm
- Land Subsidence
- Landslide
- Lightning
- Soil Erosion and Dust
- Tornado
- Wildfire
- Windstorm
- Winter Storm

Additionally, the MPC confirmed six man-made hazards that may impact Kansas Region D, as listed below:

- Civil Disorder
- Hazardous Materials Incident
- Major Disease Outbreak
- Radiological Event
- Terrorism/Agri-Terrorism
- Utility/Infrastructure Failure

Based on discussion with the MPC, a lack of identified risk or history, and geographic improbability, numerous FEMA identified hazards such as coastal erosion, hurricane, tsunami were not included in the scope of this plan.

4.5 – Hazard Planning Significance

Previous planning efforts used the calculated priority risk index (CPRI) methodology to assign a planning significance to each of the identified hazards. CPRI considers the following four elements of risk:

- Probability of an Impactful Event
- Magnitude/Severity
- Warning Time
- Duration

Each element was then assigned a number based on pre-established rating parameters. The following tables provide a summary for each of the risk elements, including a rationale behind each numerical rating.

Table 4.1: CPRI Element Ratings

CPRI Element	Rating Number and Definition			
	1	2	3	4
Probability	Unlikely (10% chance of occurrence)	Occasional (20% chance of occurrence)	Likely (33% chance of occurrence)	Highly Likely (100% chance of occurrence)
Magnitude	Negligible (Minor injuries and <10% of property severely damaged)	Limited (Multiple injuries and 10-25% of property severely damaged)	Critical (Multiple disabling injuries and 25-50% of property severely damaged)	Catastrophic (Multiple deaths and 50% of property severely damaged)
Warning Time	24+ hours	12-24 hours	6-12 hours	<6 hours
Duration	< 6 hours	< 1 day	< 1 week	1 week +

Using the rankings, the following weighted formula was used to determine each hazard's CPRI:

(Probability x 0.45) + **(Magnitude/Severity x 0.30)** + **(Warning Time x 0.15)** + **(Duration x 0.10)**

Each planning significance category was assigned a CPRI range, with a higher score indicating greater planning criticality. The following table details planning significance CPRI ranges.

Table 4.2: CPRI Planning Significance Range

	CPRI Range	
Planning Significance	**Low CPRI**	**High CPRI**
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

The terms high, moderate and low indicate the level of planning significance for each hazard, and do not indicate the potential impact of a hazard occurring. Hazards rated with moderate or high planning significance were more thoroughly investigated and discussed due to the availability of data and historic occurrences, while those with a low planning significance were generally addressed due to lack of available data and historical occurrences. The following table shows the CPRI ratings for Kansas Region D.

Table 4.3: Kansas Region D Natural Hazard CPRI Planning Significance

Hazard	Probability	Magnitude/Severity	Warning Time	Duration	CPRI
Agricultural Infestation	2.0	2.0	1.0	4.0	2.1
Dam and Levee Failure	1.0	2.5	2.0	3.5	1.9
Drought	3.0	2.5	1.0	4.0	2.7
Earthquake	1.0	1.5	4.0	1.0	1.6
Expansive Soils	1.0	1.0	1.0	4.0	1.3
Extreme Temperature	2.5	1.5	1.0	3.5	2.1
Flood	2.0	2.0	2.0	2.5	2.1
Hailstorm	4.0	3.0	3.0	1.0	3.3
Land Subsidence	1.0	1.0	2.0	4.0	1.5
Landslide	1.0	1.0	4.0	1.0	1.5
Lightning	1.5	1.0	4.0	1.0	1.7
Soil Erosion & Dust	2.0	1.5	1.0	4.0	1.9
Tornado	3.0	3.0	3.5	1.0	2.9
Wildfire	3.0	2.0	4.0	2.0	2.8
Windstorm	4.0	2.5	2.5	2.0	3.1
Winter Storm	4.0	3.0	2.0	3.0	3.3

Table 4.4: Kansas Region D Man-Made Hazard CPRI Planning Significance

Hazard	Probability	Magnitude/Severity	Warning Time	Duration	CPRI
Civil Disorder	1.0	1.0	4.0	1.0	1.5
Hazardous Materials Event	1.5	1.5	4.0	1.5	1.9
Major Disease Outbreak	4.0	3.0	1.0	4.0	3.3
Radiological Event	1.0	1.0	4.0	4.0	1.8
Terrorism, Agri-Terrorism	1.0	2.0	4.0	1.0	1.8
Utility / Infrastructure Failure	2.5	2.0	4.0	2.5	2.6

The average CPRI for each identified hazard remained the same as the calculated CPRI for the 2015 planning effort, where individual county rankings were combined into a regional ranking, with the exception of Major Disease Outbreak. As of this plan a worldwide pandemic is taking place from the SARS COV-2 virus. The revised ranking reflects this on-going event, with a complete description provided in the Major Disease Outbreak section.

4.6 – Hazard Profiles

44 CFR 201.6(c)(2)(i) A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Each identified hazard is profiled in the subsequent sections, with the level of detail varying based on available information. Sources of information are cited in the detailed hazard profiles below.

With each update of this plan, new information will be incorporated to provide for better evaluation and prioritization of the hazards.

The following hazards are presented in alphabetical order, and not by planning significance, for ease of reference. Additionally, man-made hazards are presented, again in alphabetical order, after natural hazards.

4.7 – Agricultural Infestation

Agricultural infestation is the naturally occurring infection of vegetation, crops or livestock with insects, vermin (to include lice, roaches, mice, coyote, fox, fleas, etc.), or diseases that render the crops or livestock unfit for consumption or use. The levels and types of agricultural infestation will vary according to many factors, including cycles of heavy rains and drought. A certain level of agricultural infestation is normal; however, infestation becomes an issue when the level of an infestation escalates suddenly, or a new infestation appears, overwhelming normal control efforts. Infestation of crops or livestock can pose a significant risk to state and local economies due to the dominance of the agricultural industry.

Onset of agricultural infestation can be rapid. Controlling an infestation's spread is critical to limiting impacts through methods including quarantine, culling, premature harvest and/or crop destruction when necessary. Duration is largely affected by the degree to which the infestation is aggressively controlled but is generally more than one week. Maximizing warning time is also critical for this hazard and is most affected by methodical and accurate monitoring and reporting of livestock and crop health and vigor, including both private individuals and responsible agencies.

4.7.1 –Location and Extent

The entire planning area may be affected by agricultural infestation. While rural areas within the region are more susceptible to crop and livestock infestation, urban and suburban areas are also at risk due to landscaping, urban gardens and parks, all of which add value to homes and communities, may be susceptible to damage or loss. The magnitude and severity of an agricultural infestation is relative to the type of infestation. A foreign animal disease like foot and mouth could potentially cause the economy to crumble, whereas an infestation of fleas would be manageable. The MPC has determined that the magnitude of this hazard in the planning area would be limited, as most infestations are manageable in scope.

Animal Disease

Of key concern regarding this hazard is the potential introduction of a rapid and economically devastating foreign animal disease, including Foot and Mouth disease and Bovine Spongiform Encephalopathy (BSE) disease. Because Kansas is a major cattle state, with cattle raised locally as well as imported into the state, the potential for highly contagious diseases such as these is a continuing, significant threat. The loss of production, death of animals, and other lasting problems resulting from an outbreak could cause continual and severe economic losses, as well as widespread unemployment. It would affect not only farmers, ranchers, and butchers, but also support and related industries

Of particular concern are Confined Animal Feeding Operations (CAFO) facilities, defined as facilities with 300 or more animal units. The CAFO facilities are regulated by the Kansas Department of Health & Environment (KDHE), Bureau of Water, and Livestock Waste Management. The CAFO includes beef, dairy, sheep, swine, chicken, turkey, and horses. The following is a list of the number of CAFOs per county, using the latest available data, in Kansas Region D:

- Clark County: 6
- Finney County: 19
- Ford County: 24
- Gray County: 19
- Haskell County: 14
- Hodgeman County: 22
- Lane County: 10
- Meade County: 11
- Seward County: 17

Knowing where diseased and at-risk animals are, where they've been and when, is important to ensuring a rapid response when animal disease events take place. The Kansas Department of Agriculture (KDA), Division of Animal Health monitors and reports on animal reportable diseases. Producers are required by state law to report any of the reportable animal diseases.

Crop Pests and Diseases

Many factors influence disease development in plants, including hybrid/variety genetics, plant growth stage at the time of infection, weather (e.g., temperature, rain, wind, hail, etc.), single versus mixed infections, and genetics of the pathogen populations.

Field crops in the region are also subject to various types of infestation. According to KDA, Plant Protection and Weed Control Division, the following are the highest risk crop pests to this region and the potentially impacted crop:

- Aspergillus Ear Rot (Alfatoxin): Corn
- Austro-Asian Rust: Soybean
- Black Stem Rust, Blast: Wheat
- South American strains, Stripe Rust, Leaf Rust, Karnal: Wheat

Infestation is not only a risk to crops in the field, but insect infestation can also cause major losses to stored grain. It is estimated that damage to stored grain by the lesser grain borer, rice weevil, red flour beetle, and rusty grain beetle costs the United States about $500 million annually.

Tree Pests

According to the KDA, Plant Protection and Weed Control Division, the following are the highest risk plant pests by host to Kansas Region D:

- Emerald Ash Borer (EAB): Ash Trees
- Asian Longhorned Beetle: Maple, Birch, Willow, Mimosa, Ash, Sycamore & Poplar Trees
- Thousand Cankers: Walnut Trees

As of this plan, neither the Asian Longhorned Beetle nor Thousand Cankers have been detected in Kansas.

As of this plan, the EAB has been discovered in numerous Kansas countries to the east of Kansas Region D. However, no instances of EAB have been detected in Kanas Region D or in any adjacent counties.

Wildlife Pests

The region's farmers also lose a significant amount of crops each year as a result of wildlife foraging. This can be particularly problematic in areas where natural habitat has been diminished or in years where weather patterns such as early/late frost deep snow, or drought has caused the wild food sources to be limited. Also, of concern are the following wildlife diseases:

- Chronic Wasting Disease (CWD), affecting deer and captive elk populations.
- Hemorrhagic Disease (HD), affecting white-tailed deer

In a continuing effort to monitor the prevalence and spread of CWD in Kansas deer, the Kansas Department of Wildlife, Parks and Tourism (KDWPT) has collected and tested samples from 360 deer in 2018 and 2019. Thirty-seven of those samples were confirmed positive. The 37 confirmed positives came from deer taken in Cheyenne, Rawlins, Decatur, Norton, Phillips, Smith, Thomas, Sheridan, Gove, Rooks, Meade, Hodgeman, Lane, Ford, Haskell, Hodgeman, Ford, Edwards, Stafford, Reno, and Pratt counties. While most positives are still coming from northwest Kansas, new counties were added to the list this year, including several that show the disease's spread to the south and east.

These diseases can seriously damage the populations of the captive deer and elk farms and the wild deer populations but also affect the annual $350 million-dollar regional and statewide hunting economy.

4.7.2 – Previous Occurrences

There have been no major reported or recorded agricultural infestations, above what is considered a normal level, for Kansas Region D.

Crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of agricultural infestation on the region's agricultural base. Crop loss data for the ten-year period of 2009- 2018 (with 2009 and 2018 being full data years) for the region indicates 218 claims on 72,443 acres for $10,788,725.

Table 4.5: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Agricultural Infestation

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Clark	15	928	$80,304
Finney	28	3,833	$399,922
Ford	36	13,545	$1,886,894
Gray	26	9,309	$1,543,575
Haskell	30	15,805	$2,535,016
Hodgeman	22	2,266	$237,173
Lane	11	1,870	$93,687
Meade	25	4,911	$707,975
Seward	25	19,976	$3,304,178

Source: USDA Farm Service Agency

4.7.3 – Hazard Probability Analysis

Kansas Region D experiences agricultural losses every year because of insects, vermin or diseases that impact plants and livestock. Data from the UDSA Risk Management Agency indicates that there has been at least one claimed incident of agricultural infestation for Kansas Region D for the period 2009 through 2018. Using the binomial probability equation (number of years with an event divided by total number of years in reporting period) we derive a probability 100% of a reportable agricultural infestation event in a given year. However, the large majority of events are expected to be small and limited in scope.

4.7.4 – Vulnerability Assessment

Regional populations and facilities are not directly vulnerable to losses as a result of agricultural infestation. The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region D County. The USDA Risk Management Agency provides information on insured crop losses related to identified hazards, with data from the five-year period of 2014 to 2018 (with 2010 and 2019 being full data set years) used for analysis. The higher the percentage loss, the higher the potential vulnerability the county has to agricultural infestation events.

Table 4.6: Agricultural Infestation Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Clark	434,295	93	0.02%	$111,420,000	$8,030	0.01%
Finney	790,500	383	0.05%	$823,091,000	$39,992	0.00%
Ford	669,832	1,354	0.20%	$515,252,000	$188,689	0.04%
Gray	556,070	931	0.17%	$990,653,000	$154,357	0.02%
Haskell	363,751	1,581	0.43%	$1,159,098,000	$253,502	0.02%
Hodgeman	494,925	227	0.05%	$191,891,000	$23,717	0.01%
Lane	417,017	187	0.04%	$266,374,000	$9,369	0.00%
Meade	587,924	491	0.08%	$233,384,000	$70,798	0.03%
Seward	360,711	1,998	0.55%	$424,697,000	$330,418	0.08%

Source: USDA

This table only reflects insured losses that were claimed. According to the 2017 Kansas Crop Insurance Profile Report issued by the USDA Risk Management Agency, 75-94% percent of major Kansas row crops were insured. Data regarding the number or value of livestock and wildlife lost to disease or infestation was not available for this planning effort.

In addition, threats have been identified which, while currently not impacting Kansas, may present a future risk. According to the KDA, Plant Protection and Weed Control Division the following table lists the highest risk plant pests to Kansas.

Table 4.7: Potential High-Risk Plant Pests

Pest (Disease Insect, or weed)	Crop or Host Plant	Current Distribution	Type of Loss
Rust, Austro-Asian	Soybean	Australia, Japan, Gulf of Mexico	Direct loss to production
Aspergillus ear rot (Alfatoxin)	Corn	Worldwide, endemic to Kansas	Toxin renders the grain unusable
Black Stem Rust UG99 strain	Wheat	Africa, Asia	Direct loss to production
Blast – South American strains	Wheat	South America	Direct loss to production
Stripe Rust (new races)	Wheat	North America	Direct Loss to production
Leaf Rust (new races)	Wheat	North America	Direct Loss to production
Karnal Bunt	Wheat	Asia, Mexico, Arizona	International export quarantines, degradation of flour quality
Thousand Cankers	Walnut	Western US states and PA, VA, TN	Death of municipal trees, loss of nut crop, loss of timber
Emerald Ash Borer	Ash	North Central and North Eastern U.S., including northeast Kansas	Death of trees. Cost of removal and re-vegetation.
Asian Longhorned Beetle	Maples, Birches, Willows, Mimosa, Ash, Sycamore, Poplar trees	Small parts of Ohio, New York, and Massachusetts	Death of trees. Cost of removal and re-vegetation.
Hydrilla	Water Bodies	Southern U.S. and one park pond in Olathe	Economic and environmental.

4.7.5 – Impact and Consequence Analysis

As per EMAP standards, the information in the following table provides the Consequence Analysis.

Table 4.8: Agricultural Infestation Consequence Analysis

Subject	Impacts of Agricultural Infestation
Health and Safety of the Public	Impact in the area would be minimal. If the infestation is unrecognized, then there is the potential for the food supply to be contaminated.
Health and Safety of Responders	Impact would be minimal with protective clothing, gloves, etc. as these diseases cause no risk to humans.
Continuity of Operations	Minimal expectation of execution of the COOP.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the incident area is minimal to non-existent.
Environment	Impact could be severe to the incident area, specifically, plants, trees, bushes, and crops.
Economic Conditions	Impacts to the economy will depend on the severity of the infestation. The potential for economic loss to the community and state could be severe if the infestation is hard to contain, eliminate, or reduce. Impact could be minimized due to crop insurance.
Public Confidence in the Jurisdiction’s Governance	Confidence could be in question depending on timeliness and steps taken to warn the producers and public, and treat/eradicate the infestation.

4.8 – Dam and Levee Failure

A dam is a barrier across flowing water that obstructs, directs or slows down the flow, often creating a reservoir, lake or impoundments. Common reasons for dam failure include:

- Flooding
- Sub-standard construction materials/techniques
- Spillway design error
- Geological instability caused by changes to water levels during filling or poor surveying
- Flood waters exceeding design capacity
- Poor maintenance, especially of outlet pipes
- Human, computer or design error
- Internal erosion, especially in earthen dams
- Earthquakes

A levee is an artificial barrier, usually an earthen embankment, constructed along rivers to protect adjacent lands from flooding. Common reasons for levee failure include:

- Surface erosion due to water velocities
- Subsurface actions
- Flood waters exceeding the design capacity of the structure
- Animal or plant damage to structure

4.8.1 – Dam Location and Extent

In Kansas, the State has regulatory jurisdiction over non-federal dams that meet the following definition of a "jurisdictional" dam as defined by K.S.A. 82a-301 et seq, and amendments thereto:

- *any artificial barrier including appurtenant works with the ability to impound water, waste water or other liquids that has a height of 25 feet or more; or has a height of six feet or greater and also has the capacity to impound 50 or more acre feet. The height of a dam or barrier shall be determined as follows: (1) A barrier or dam that extends across the natural bed of a stream or watercourse shall be measured from the downstream toe of the barrier or dam to the top of the barrier or dam; or (2) a barrier or dam that does not extend across a stream or watercourse shall be measured from the lowest elevation of the outside limit of the barrier or dam to the top of the barrier or dam.*

The KDA Division of Water Resources (KDA-DWR) is the State agency responsible for regulation of jurisdictional dams. Within the DWR, the Water Structures Program has the following responsibilities:

- Reviewing and approving of plans for constructing new dams and for modifying existing dams
- Ensuring quality control during construction,
- Monitoring dams that, if they failed, could cause loss of life, or interrupt public utilities or services

The KDA-DWR uses a three-tiered classification system to describe the potential risk and severity associated with dam failure, with the tiers relating to potential downstream impact rather than the physical condition of the dam.

- **High Hazard (Class C):** Dams assigned the high hazard-potential classification are those where failure could result in any of the following: extensive loss of life, damage to more than one home, damage to industrial or commercial facilities, interruption of a public utility serving a large number of customers, damage to traffic on high-volume roads that meet the requirements for hazard class C dams or a high-volume railroad line, inundation of a frequently used recreation facility serving a relatively large number of persons, or two or more individual hazards described in hazard class B. Emergency Action Plans (EAPs) are required for all High Hazard Dams.
- **Significant Hazard (Class B):** Dams assigned the significant hazard-potential classification are those dams where failure could endanger a few lives, damage an isolated home, damage traffic on moderate volume roads that meet the requirements for hazard class B dams, damage low-volume railroad tracks, interrupt the use or service of a utility serving a small number of customers, or inundate recreation facilities, including campground areas intermittently used for sleeping and serving a relatively small number of persons.
- **Low Hazard (Class A):** Dams assigned the low hazard-potential classification are those where failure could damage only farm or other uninhabited buildings, agricultural or undeveloped land including hiking trails, or traffic on low-volume roads that meet the requirements for hazard class A dams.

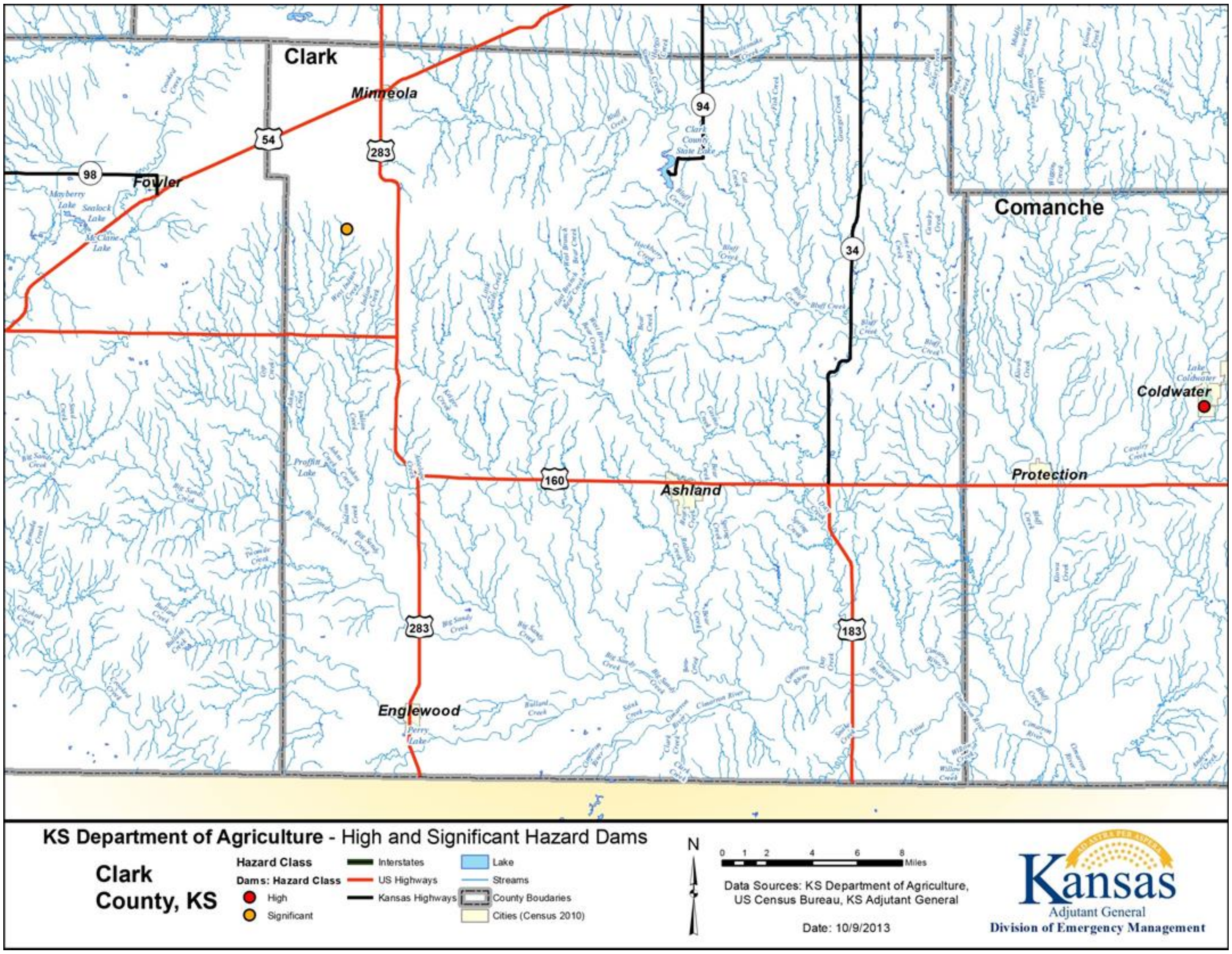
According to the KDA-DWR, there are 130 jurisdictional dams in Kansas Region D. These dams are classified as follows.

Table 4.9: Kansas Region D KDA-DWR Jurisdictional Dams

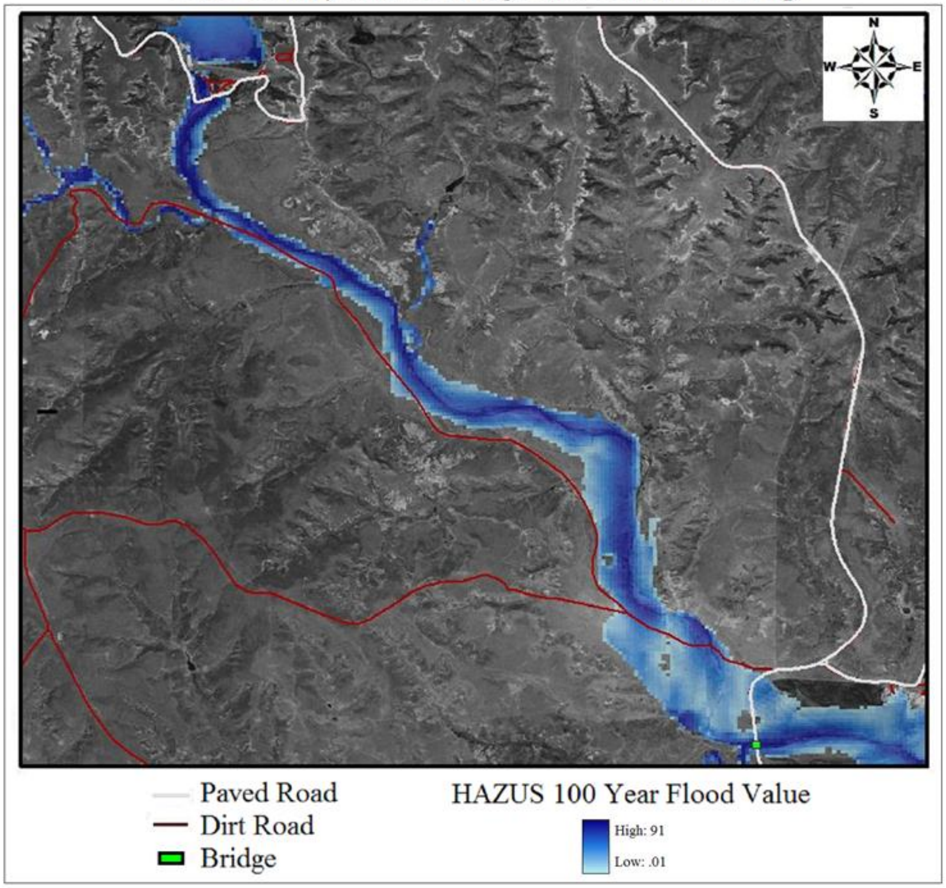
County	Low	Significant	High	High Hazard Without EAP
Clark	14	0	0	0
Finney	39	1	0	0
Ford	14	0	1	0
Gray	11	0	4	0
Haskell	0	0	0	0
Hodgeman	26	0	3	0
Lane	13	0	0	0
Meade	4	0	0	0
Seward	14	0	0	0

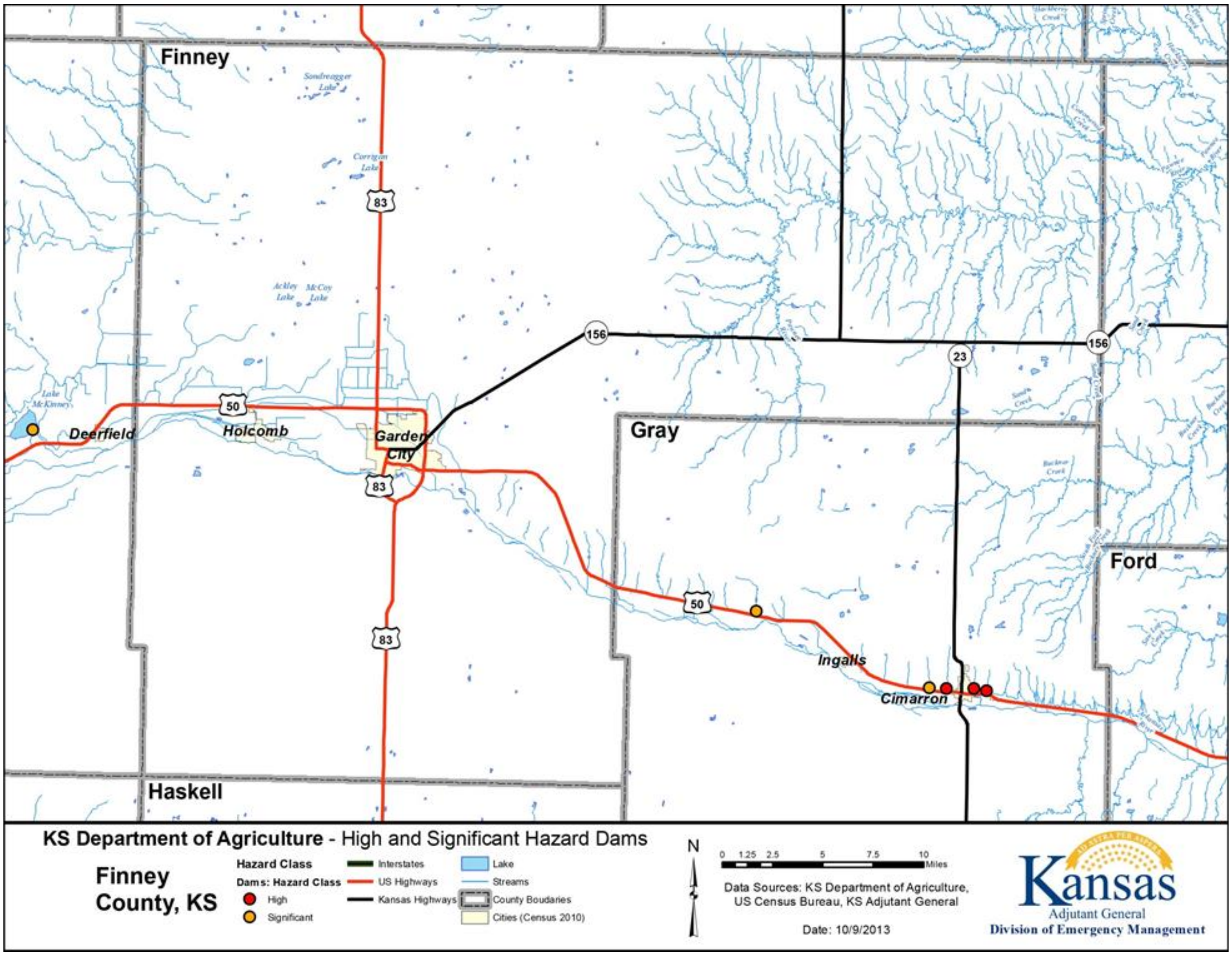
Source: KDA-DWR

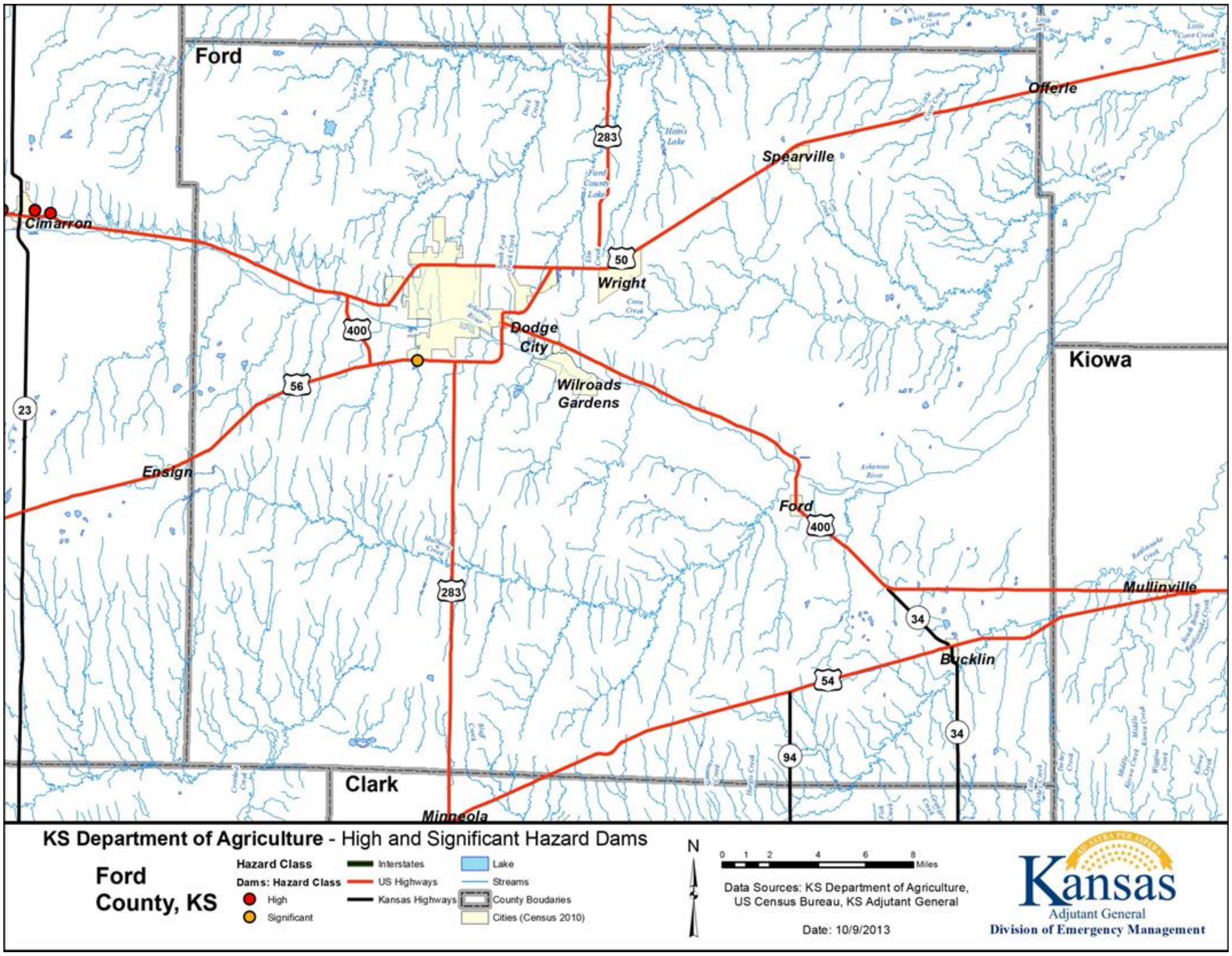
The following maps show all identified dams within Kansas Region D with a Significant or High classification, and available inundation and location mapping. Please note that information related to dams may have been classified and unable for review.

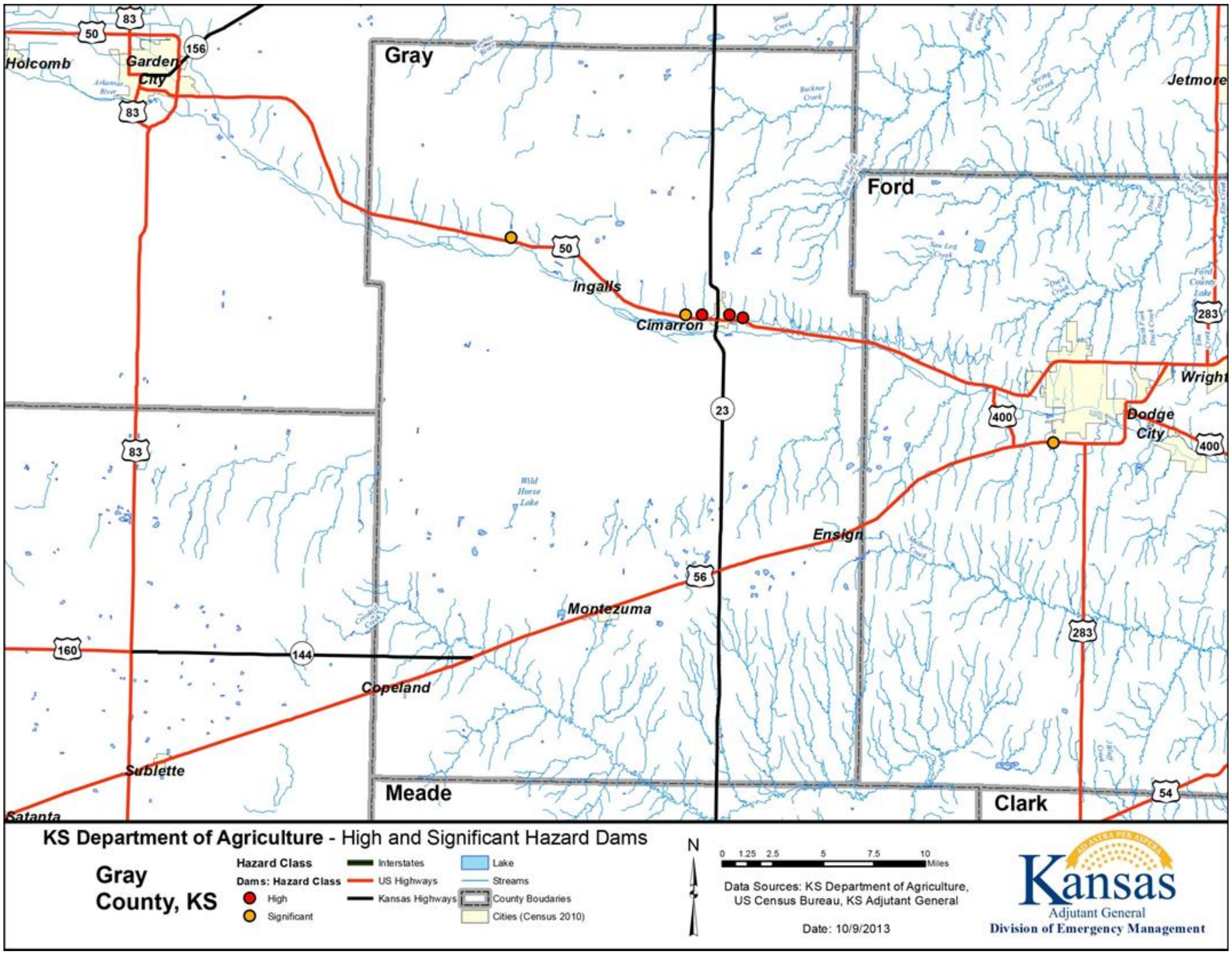

Clark
Minneola
Fowler
Comanche
Coldwater
Protection
Ashland
Englewood
KS Department of Agriculture - High and Significant Hazard Dams
Clark County, KS
Hazard Class
Dams: Hazard Class
High
Significant
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management

Clark County State Fishing Lake Inundation Map




Finney
Gray
Ford
Haskell
Deerfield
Holcomb
Garden City
Ingalls
Cimarron
Sandreagger Lake
Corrigan Lake
Ackley Lake
McCoy Lake
Lake McKinney
50
83
156
23
KS Department of Agriculture - High and Significant Hazard Dams
Finney County, KS
Hazard Class
Dams: Hazard Class
High
Significant
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
N
0 1.25 2.5 5 7.5 10 Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management


KS Department of Agriculture - High and Significant Hazard Dams
Ford County, KS
Hazard Class
Dams: Hazard Class
High
Significant
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management
Ford
Kiowa
Clark
Cimarron
Dodge City
Wright
Spearville
Offerle
Wilroads Gardens
Ensign
Ford
Mullinville
Bucklin
Minneola



Gray
Ford
Meade
Clark
Holcomb
Garden City
Jetmore
Ingalls
Cimarron
Wright
Dodge City
Ensign
Montezuma
Copeland
Sublette
Satanta
Wild Horse Lake
KS Department of Agriculture - High and Significant Hazard Dams
Gray County, KS
Hazard Class
Dams: Hazard Class
High
Significant
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
N
0 1.25 2.5 5 7.5 10 Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management

Cimarron Watershed High Hazard Dam A-1

Source: State of Kansas

Cimarron Watershed High Hazard Dam B-1

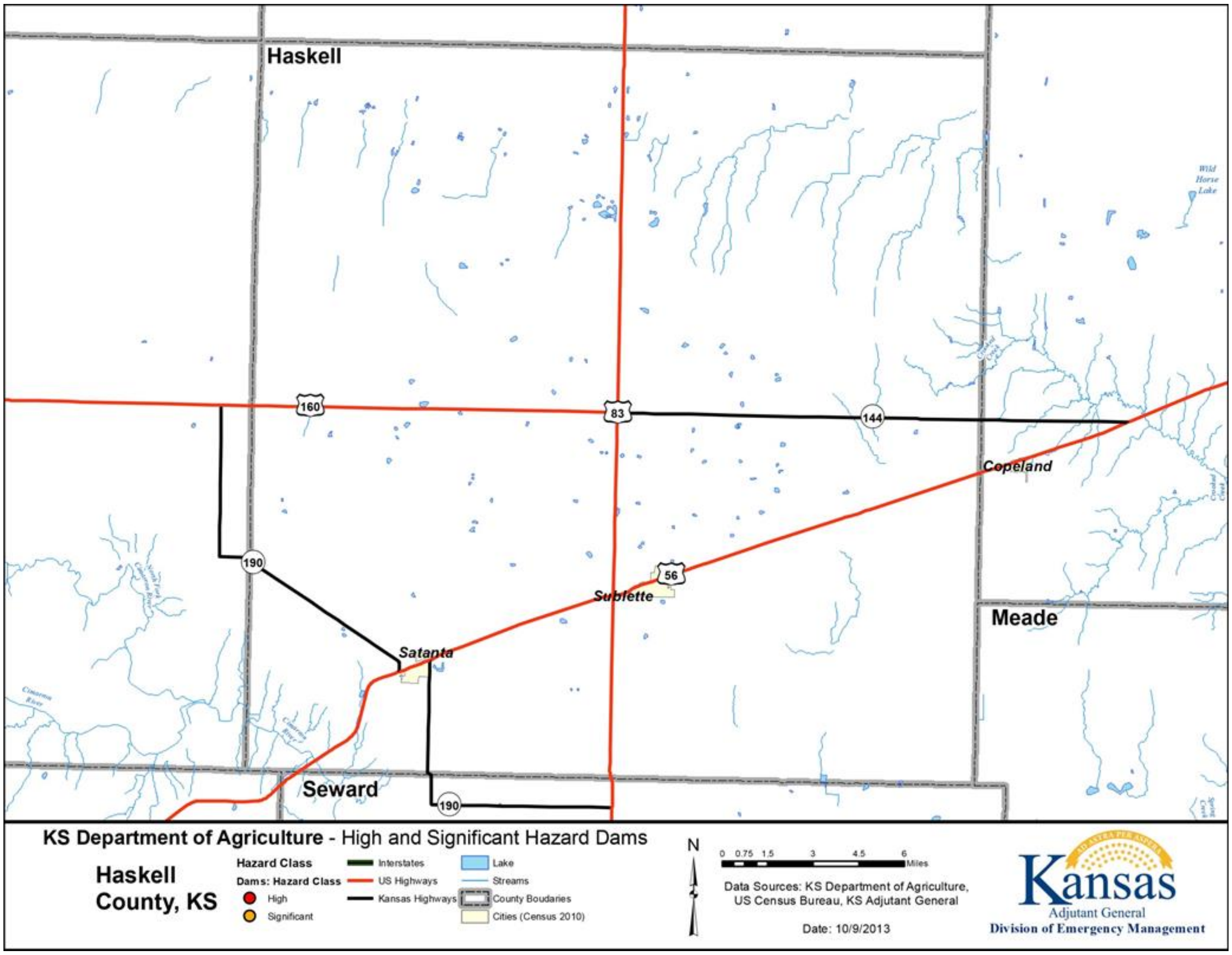
Source: State of Kansas

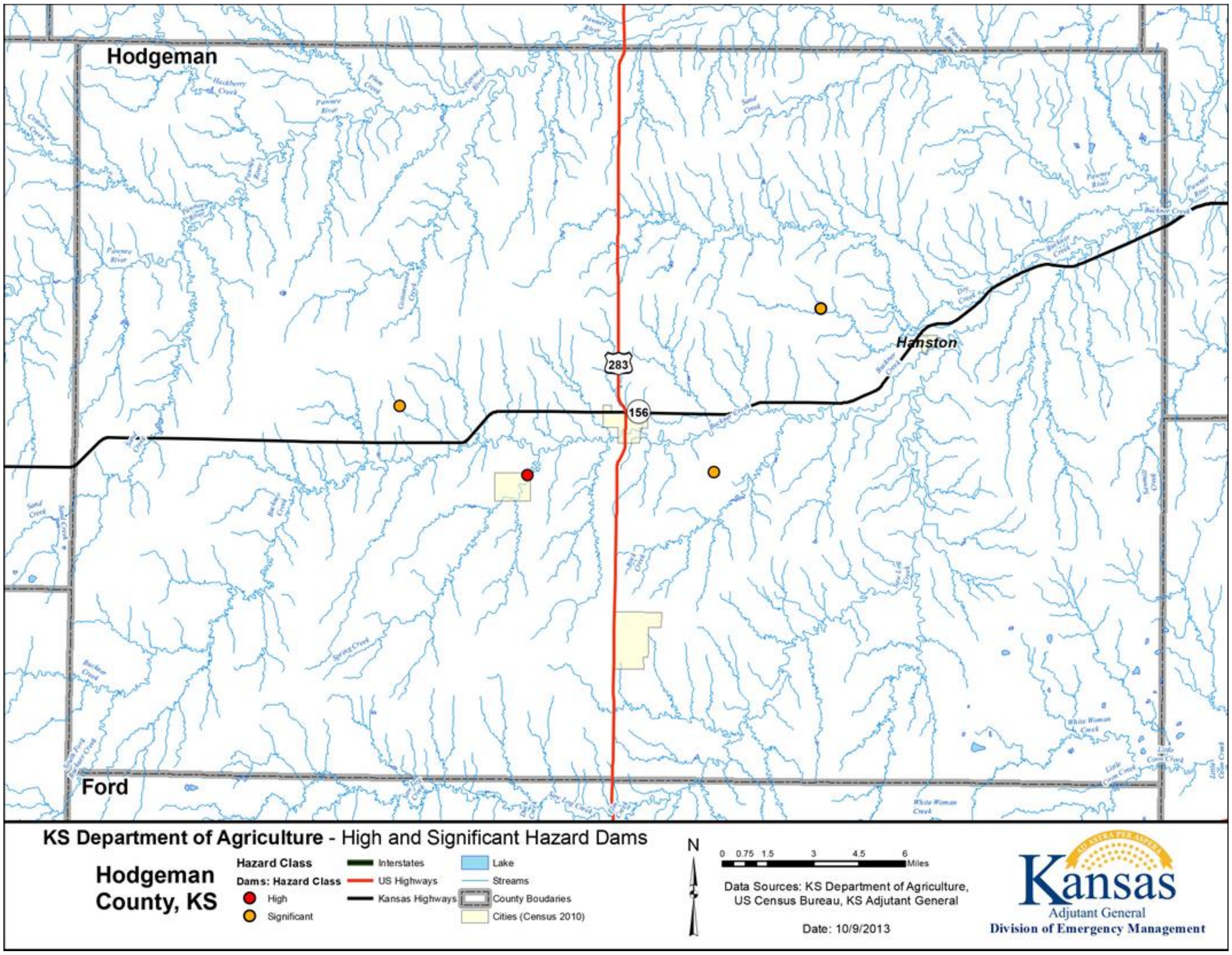
High-Hazard Dam
US Highway
State Highway
City/County Road
Railroad
Stream/Drainage
Water Body
Incorporated Area

Cimarron Watershed High Hazard Dam D-1

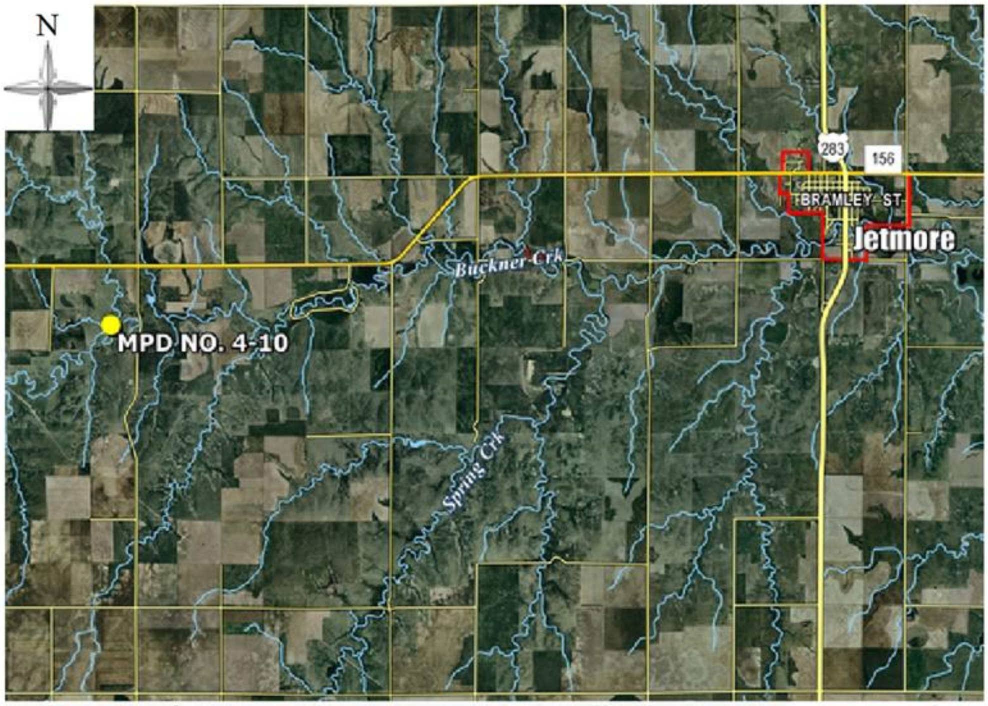
Source: State of Kansas

High-Hazard Dam	Railroad
US Highway	Stream/Drainage
State Highway	Water Body
City/County Road	Incorporated Area


Haskell
Meade
Seward
Copeland
Sublette
Satanta
160
83
144
190
56
KS Department of Agriculture - High and Significant Hazard Dams
Haskell County, KS
Hazard Class
Dams: Hazard Class
High
Significant
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
N
Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management

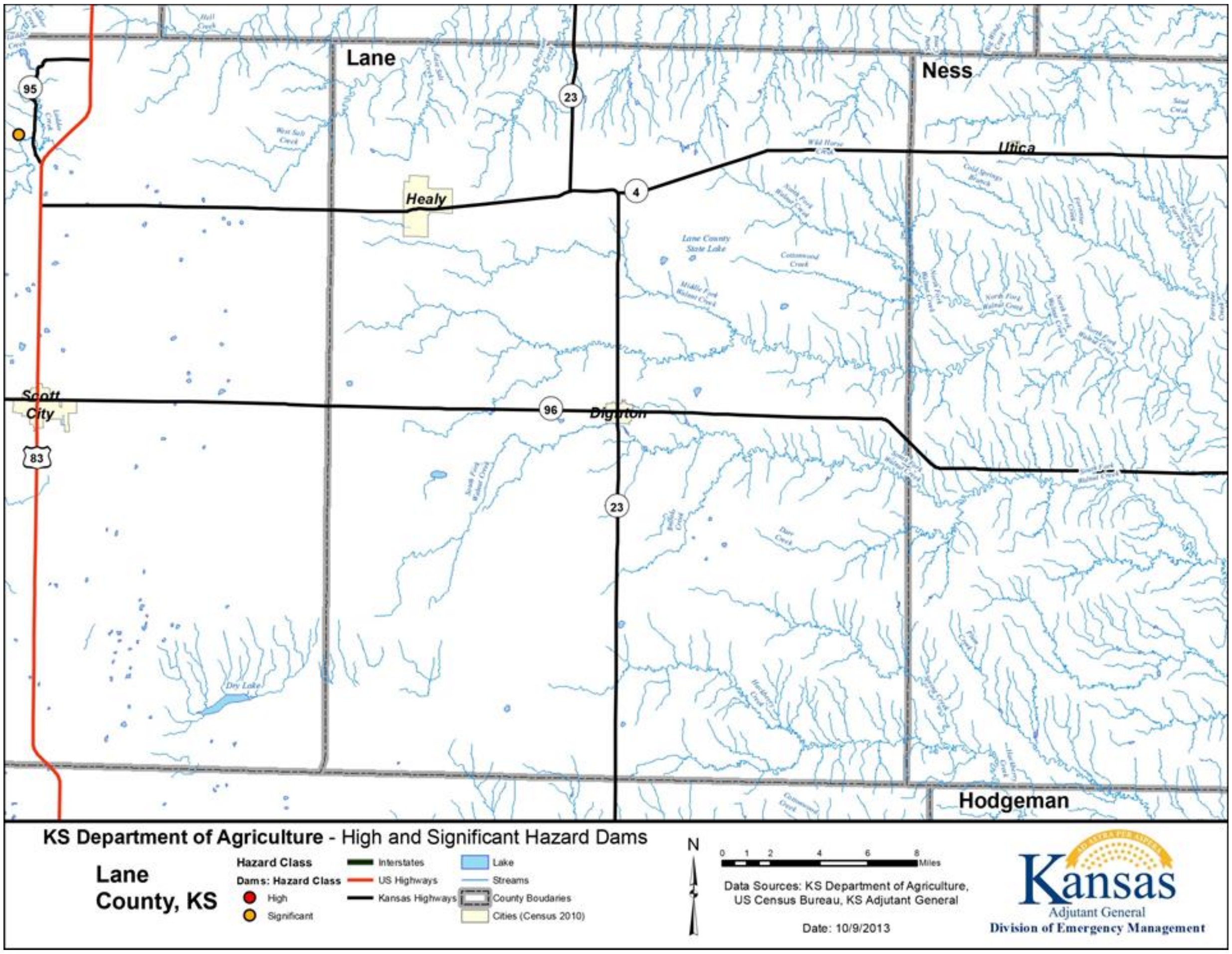

Hodgeman
Ford
Hanston
283
156
KS Department of Agriculture - High and Significant Hazard Dams
Hodgeman County, KS
Hazard Class
Dams: Hazard Class
High
Significant
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
N
0 0.75 1.5 3 4.5 6 Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management

Hodgeman County MPD No. 4 High Hazard Dam

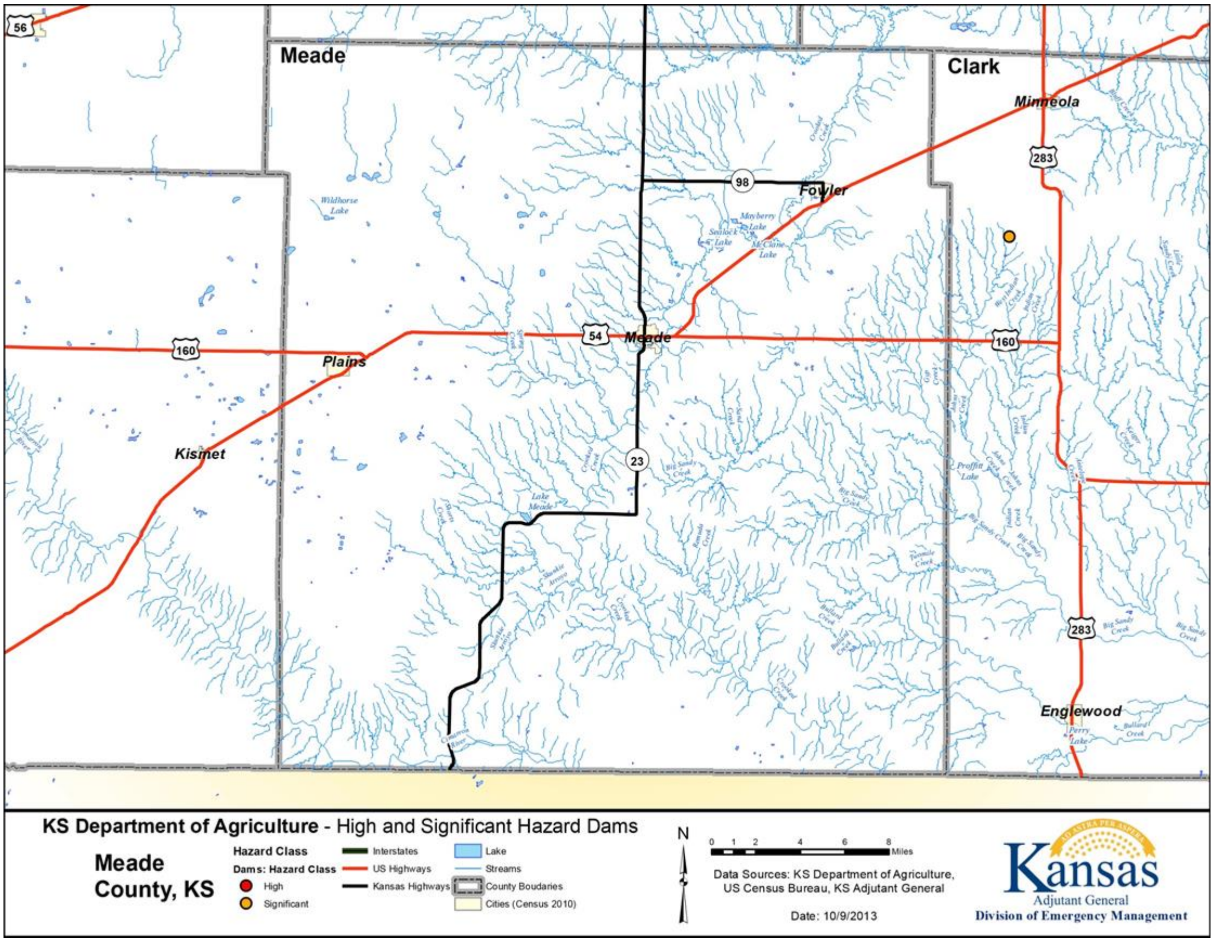


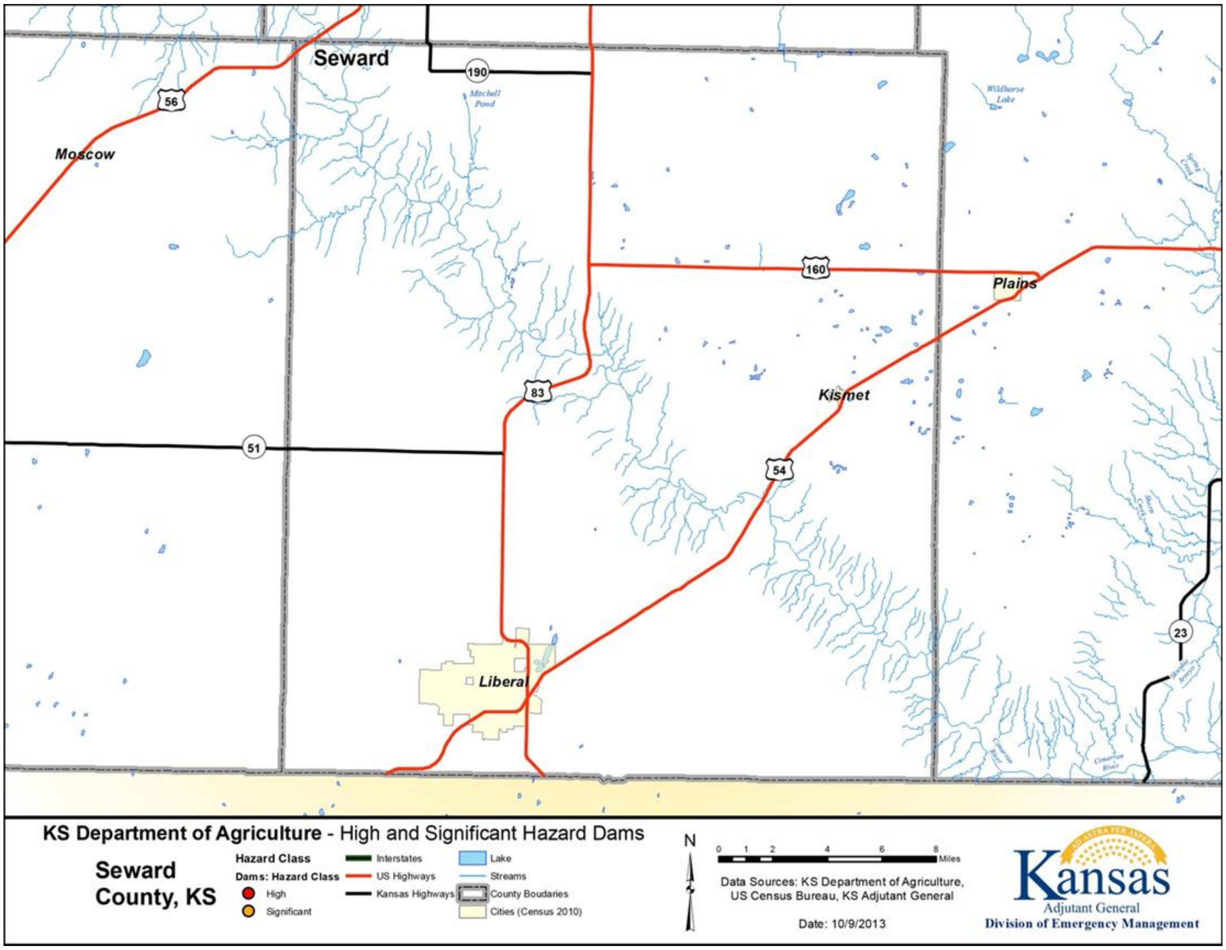
Source: State of Kansas

High-Hazard Dam
US Highway
State Highway
City/County Road
Railroad
Stream/Drainage
Water Body
Incorporated Area



Lane
Ness
Utica
Healy
Scott City
Dighton
Hodgeman
95
23
4
96
83
KS Department of Agriculture - High and Significant Hazard Dams
Lane County, KS
Hazard Class
Dams: Hazard Class
High
Significant
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
N
Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management


Meade
Clark
Minneola
Fowler
Meade
Plains
Kismet
Englewood
56
98
283
160
54
23
KS Department of Agriculture - High and Significant Hazard Dams
Meade County, KS
Hazard Class
Dams: Hazard Class
High
Significant
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
Cities (Census 2010)
N
0 1 2 4 6 8 Miles
Data Sources: KS Department of Agriculture, US Census Bureau, KS Adjutant General
Date: 10/9/2013
Kansas
Adjutant General
Division of Emergency Management



In addition, the KDA-DWR indicates that there are no dams within Kansas Region D that are operated by Federal Government agencies.

Table 4.10: Kansas Region D Federally Operated Dams

Reservoir	County	Year Storage Began	Operating Agency	River Basin	Contributing Drainage Area (Square Miles)	Surface Area (Acres)	Estimated Storage Capacity (Acre Feet)
None							

Source: Kansas Water Office and Kansas Department of Agriculture, Division of Water Resources

The following detail specific local concerns as related to dam failure:

- In Clark County there are approximately six homes downstream from the Clark County State Lake Dam that would be severely damaged if a breach were to occur.
- In Finney County dam DD No. 7-22 (State ID No. DFI-0113) / Pawnee WJD No. 81 does not have a completed EAP.
- In Gray County, Cimarron Watershed Dam A-1 / Cimarron Watershed District No. 3 - Detention Dam A -1, Cimarron Watershed Dam B-1 / Cimarron Watershed District No. 3 - Detention Dam

B -1, Cimarron Watershed Dam D-1 / Cimarron Watershed District No. 3 - Detention Dam D-1 and Cimarron Watershed Dam E-1 / Cimarron Watershed District No. 3 - Detention Dam E-1 are earth-fill structures that was constructed in late 1950s and early 1960s. These dams are located outside of Cimarron in rural/agricultural portions of the county and are generally upstream from US Highway 50 and the Burlington Northern and Santa Fe railroad. A review of the EAPs and available inundation maps for these dams show that the High Hazard rating appears to be based on the potential to impact to US-50 and the Burlington Northern and Santa Fe railroad in the event of a breach or failure.

- In Hodgeman County, a failure or breach of the Horse Thief Reservoir Dam (MPD No. 4-10) could impact a small, sparsely populated portion of Hodgeman County, including small areas in Jetmore and Hanston.

Of additional potential concern are high hazard dams in neighboring regions. To the west of the region, there is one dam located in Colorado that could potentially present flooding consequences in the event of failure, the John Martin Dam on the Arkansas River. This dam is federally owned and regulated, and due to the distance upstream from the region it is unlikely that a failure would have a significant impact on Kansas Region D. No other dams in adjacent regions were identified that would cause major impacts to the planning region in the event of a catastrophic failure.

4.8.2 – Levee Location and Extent

As there is no one, comprehensive list of all levees within the region, two sources of data were reviewed to determine a list of all known levees. These sources are:

- The U.S. Army Corps of Engineers (USACE) Integrated National Levee Database (NLD), containing levees enrolled in the USACE National Levee Safety Program (NLSP).
- The FEMA National Levee Inventory Report (NLIR)

According the USACE Integrated NLD, there are three levees in the NLSP in Kansas Region D. The following table provides available information on the one identified levee that provide protection to people and/or structures.

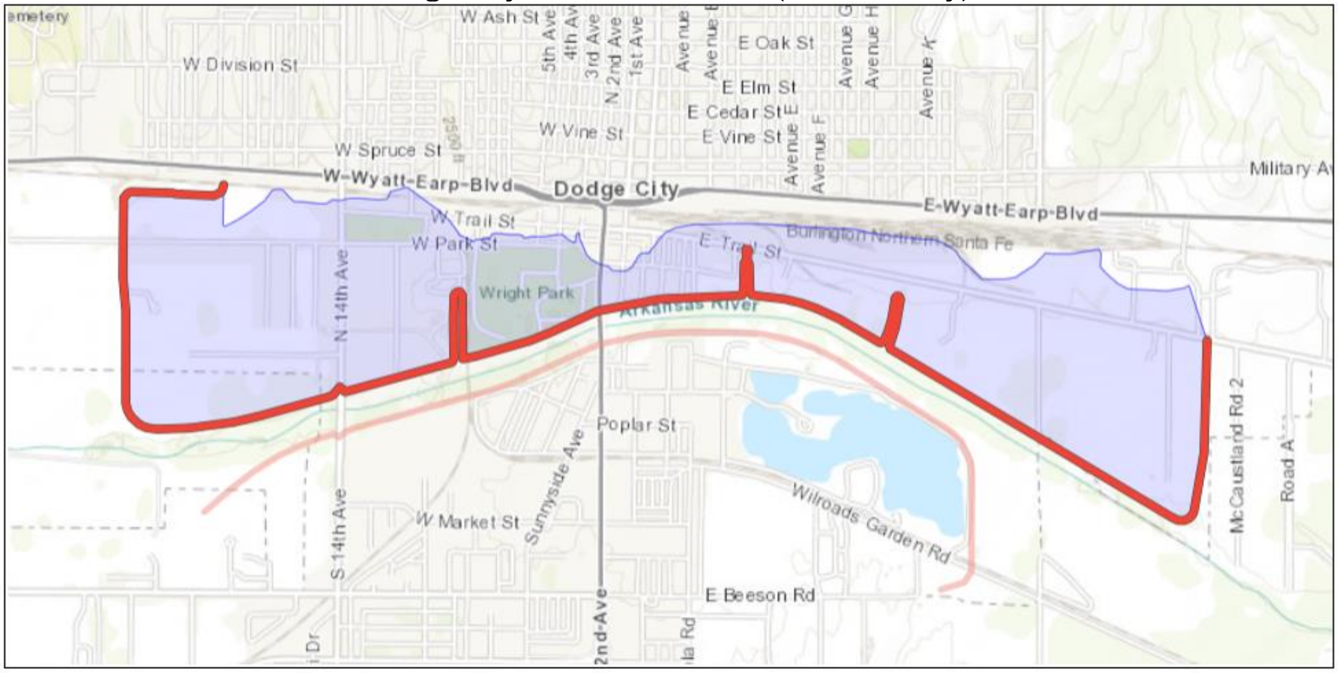
Table 4.11: Kansas Region D USACE NLD Levees

County(ies)	Jurisdiction(s)	Name	Waterway	Total Length	Leveed Area in Square Miles	Inspection Rating Description	Sponsors
Ford	Dodge City	Dodge City Levee North Side	Arkansas River	5.61	1.26	-	Dodge City
Ford	Dodge City	Dodge City Levee South Side	Arkansas River	2.85	1.38	-	Dodge City
Ford	Wilroads Gardens	LFO-0006		2.99	1.07	-	-

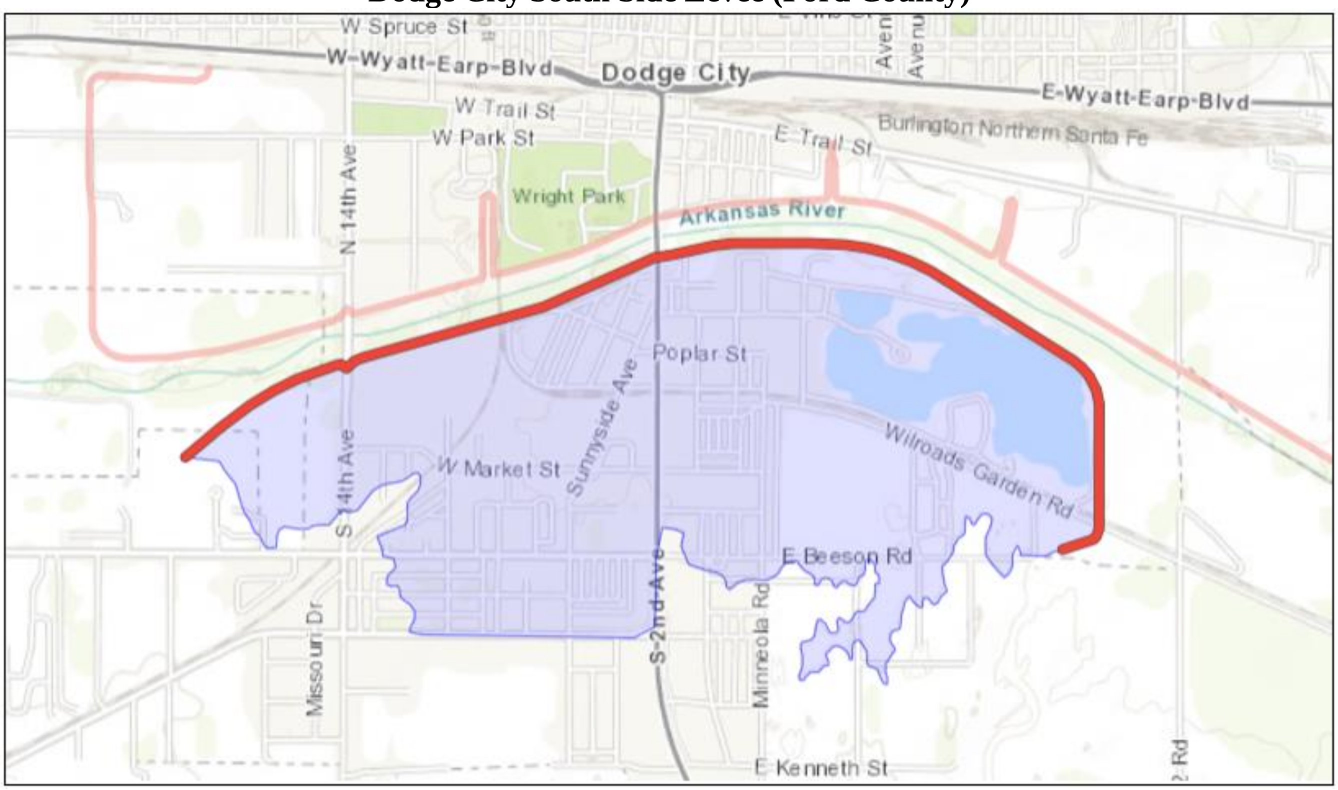
Source: USACE
-: Data not available

The following maps detail the locations of the above levees.

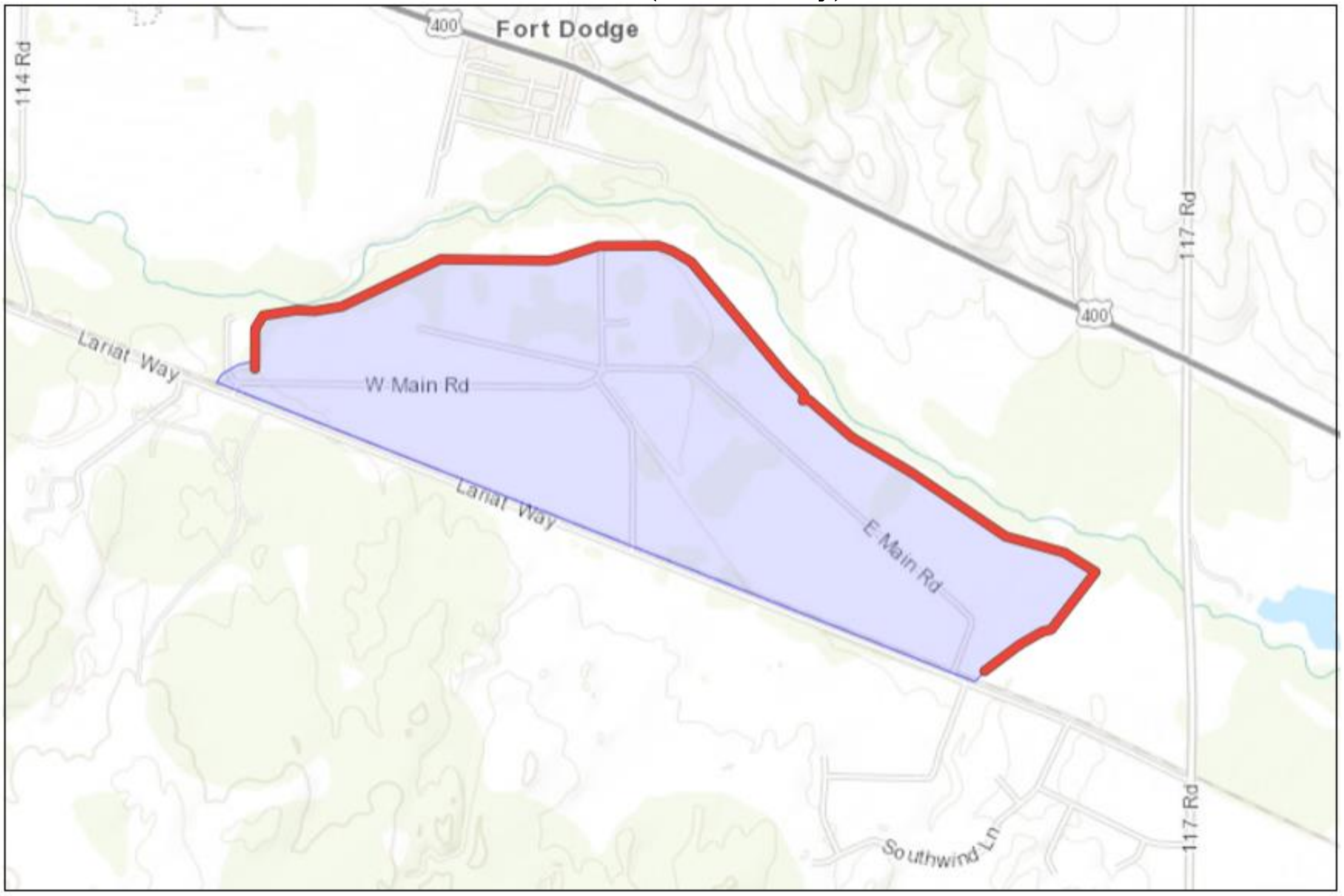
Dodge City North Side Levee (Ford County)



Dodge City South Side Levee (Ford County)



LFO-0006 (Ford County)



The following detail specific local concerns as related to levee failure:

- In Ford County, Dodge City owns and maintains a levee located on the Arkansas River, on the south side of the city. A review of the Ford County DFIRM indicates that the areas behind the levee are identified as Zone X (Protected by Levee (Non-SFHA)). The DFIRM further identified these areas as being protected from the one-percent annual chance or greater flood hazard by a levee that has been Provisionally Accredited by FEMA. Areas adjacent to the Arkansas River are designated as Floodway in Zone AE. Areas further beyond the levee are designated as Zone AE (an area inundated by 100-year flooding, for which base flood elevations have been determined) and Zone A (an area inundated by 100-year flooding, for which no BFEs have been established).

4.8.3 – Previous Occurrences

Kansas Region D has had no reported dam or levee failure incidents

4.8.4 – Hazard Probability Analysis

Due to the variability of the size and construction of the dams in Region D, estimating the probability of dam failure is difficult on any scale greater than a case-by-case basis. Historically, the limited available data indicates there have been no reported dam failure events in Kansas Region D over a 20-year period. Using the binomial probability equation (number of years with an event divided by total number of years in reporting period) we derive a 0% probability of a dam failure in a given year. However, because past non-occurrence does not guarantee future non-occurrence, both federal and nonfederal dams may be damaged in future catastrophic regional flood events or due to the impacts of age.

Historically, the limited available data indicates there has been no reported levee failure events in Kansas Region D over a 20-year period. Using the binomial probability equation, we derive a probability of 0% for a levee failure in a given year. However, because past non-occurrence does not guarantee future non-occurrence, both federal and nonfederal levees may be damaged in future catastrophic regional flood events.

4.8.5 – Vulnerability Assessment, Dams

Following the metric established in the State of Kansas 2018 Hazard Mitigation Plan, an analysis of vulnerability to dam failure was completed by points being assigned to each type of dam and then aggregated for a total point score for each county. This analysis does not intend to demonstrate vulnerability in terms dam structures that are likely to fail, but rather provides a general overview of the counties that have a high number of dams, with weighted consideration given to dams whose failure would result in greater damages. Points were assigned as follows:

- Low Hazard Dams: 1 point
- Significant Hazard Dams: 2 point
- High Hazard Dams: 3 points
- High Hazard Dams without an EAP: 2 points
- Federal Reservoir Dams: 3 points.

Based on these categories, an awarded point total was determined for each participating county and a vulnerability rating assigned based on the following schedule.

Table 4.12: Dam Vulnerability Rating Schedule

	Low	Medium-Low	Medium	Medium-High	High
Awarded Point Range	0 – 26	27 – 50	51 – 100	101 – 200	201 - 327

The following table presents the dam failure vulnerability rating for each Kansas Region D participating county.

Table 4.13: Kansas Region D County Vulnerability Assessment for Dam Failure

County	Low Hazard Dams	Significant Hazard Dams	High Hazard Dams	High Hazard Dams Without EAP	Federal Reservoirs	Vulnerability Rating	Vulnerability Level
Clark	14	0	0	0	0	14	Low
Finney	39	1	0	0	0	41	Medium-Low
Ford	14	0	1	0	0	17	Low
Gray	11	0	4	0	0	22	Low

Table 4.13: Kansas Region D County Vulnerability Assessment for Dam Failure

County	Low Hazard Dams	Significant Hazard Dams	High Hazard Dams	High Hazard Dams Without EAP	Federal Reservoirs	Vulnerability Rating	Vulnerability Level
Haskell	0	0	0	0	0	0	Low
Hodgeman	26	0	3	0	0	35	Medium-Low
Lane	20	0	0	0	0	20	Low
Meade	13	0	0	0	0	13	Low
Seward	4	0	0	0	0	4	Low

Source: Analysis by KDEM utilizing data from: Kansas Department of Agriculture, Division of Water Resources, Water Structures program; U.S. Army Corps of Engineers; Bureau of Reclamation; U.S. Army, U.S. Fish and Wildlife.

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to potential dam failure events. The following table indicates the total county population and registered growth over the period 2000 to 2018.

Table 4.14: Kansas Region D Population Vulnerability Data for Dam Failure

County	2018 Population	Percent Population Change 2000 to 2018
Clark	2,005	-16.1%
Finney	36,611	-9.7%
Ford	33,888	4.1%
Gray	6,033	2.2%
Haskell	3,997	-6.9%
Hodgeman	1,818	-12.8%
Lane	1,560	-27.6%
Meade	4,146	-10.5%
Seward	21,780	-3.2%

Source: US Census Bureau

4.8.6 – Vulnerability Assessment, Levees

Data was obtained from the USACE NLD to help determine the vulnerability of participating jurisdictions to potential levee failure. Available data includes:

- Number of people at risk
- Structures at risk
- Property value for structures at risk
- Levee safety action risk classification

Additionally, for the NFIP, FEMA will only recognize a levee system in its flood risk mapping effort that meet minimum design, operation, and maintenance standards as established by 44 CFR 65.10 – Mapping of Areas Protected by Levee Systems. In general, evaluated levees are assigned to one of these categories:

- **Accredited Levee:** Area behind the levee is mapped as a moderate risk, with no mandatory flood insurance requirement.
- **To Be Accredited:** A levee system that has been approved for accreditation.
- **Provisionally Accredited Levee (PAL):** Area behind the levee is mapped as a moderate risk, with no mandatory flood insurance requirement, for a two-year grace period while compliance with 44 CFR 65.10 is sought
- **Non-Accredited Levee:** Area behind the levee is mapped according to FEMA protocols, likely resulting in a high-risk area designation and associate flood insurance requirements
- **To Be Non-Accredited:** A levee system that no longer meets the requirements stipulated in 44 CFR 65.10 and is scheduled to lose accredited status

Additionally, some levees are classified by the Levee Safety Action Risk Classification. Descriptions of these classifications are as follows:

- **Very High (1):** Based on risk drivers, take immediate action to implement interim risk reduction measures. Increase frequency of levee monitoring, communicate risk characteristics to the community within an expedited timeframe; verify emergency plans and flood inundation maps are current; ensure community is aware of flood warning systems and evacuation procedures; and, recommend purchase of flood insurance. Support risk reduction actions as very high priority. Likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in very high risk.
- **High (2):** Based on risk drivers, implement interim risk reduction measures. Increase frequency of levee monitoring; communicate risk characteristics to the community within an expedited timeframe; verify emergency plans and flood inundation maps are current; ensure community is aware of flood warning and evacuation procedures; and, recommend purchase of flood insurance. Support risk reduction actions as high priority. Likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in high risk.
- **Moderate (3):** Based on risk drivers, implement interim risk reduction measures as appropriate. Verify risk information is current and implement routine monitoring program; assure O&M is up to date; communicate risk characteristics to the community in a timely manner; verify emergency plans and flood inundation maps are current; ensure community is aware of flood warning and evacuation procedures; and, recommend purchase of flood insurance. Support risk reduction actions as a priority. Likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in moderate risk.
- **Low (4):** Verify risk information is current and implement routine monitoring program and interim risk reduction measures if appropriate; assure O&M is up to date; communicate risk characteristics to the community as appropriate; verify emergency plans and flood inundation maps are current; ensure community is aware of flood warning and evacuation procedures; and, recommend purchase of flood insurance. Support risk reduction actions to further reduce risk to as low as practicable. Likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in low risk.
- **Very Low (5):** Continue to implement routine levee monitoring program, including operation and maintenance, inspections, and monitoring of risk. Communicate risk characteristics to the

community as appropriate; verify emergency plans and flood inundation maps are current; ensure community is aware of flood warning and evacuation procedures; and recommend purchase of flood insurance. Likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in very low risk.

The following table presents the above information for each vulnerable jurisdiction.

Table 4.15: Kansas Region D Levee Failure Vulnerability Data

County(ies)	Jurisdiction	Name	People at Risk	Structures at Risk	Property Value	Levee Safety Action Risk Classification	Levee System Status on Effective FIRM
Ford	Dodge City	Dodge City Levee North Side	691	280	$116,000,000	Low	Provisionally Accredited
Ford	Dodge City	Dodge City Levee North Side	2,875	1,096	$190,000,000	Low	Provisionally Accredited
Ford	Wilroads Gardens	LFO-0006	347	101	$21,000,000	Not Screened	Non-Accredited

Source: USACE NLD
-: No data available

The following table indicates the total number of county structures and the associated percentage of the total number of county structures, and the total population and associated percentage of the total county population identified as at risk to levee failure.

Table 4.16: Kansas Region D Vulnerability Data for Levee Failure

County	Structures Identified as at Risk to Levee Failure	Percentage of Structures Identified at Risk	Population Identified as at Risk to Levee Failure	Percentage of Population Identified at Risk
Clark	0	0.0%	0	0.0%
Finney	0	0.0%	0	0.0%
Ford	3,913	32.0%	1,477	4.4%
Gray	0	0.0%	0	0.0%
Haskell	0	0.0%	0	0.0%
Hodgeman	0	0.0%	0	0.0%
Lane	0	0.0%	0	0.0%
Meade	0	0.0%	0	0.0%
Seward	0	0.0%	0	0.0%

Source: US Census Bureau and FEMA

4.8.7 – Impact and Consequence Analysis

As per EMAP standards, the information in the following table provides the Consequence Analysis.

Table 4.17: Dam and Levee Failure Consequence Analysis

Subject	Impacts of Dam and Levee Failure
Health and Safety of the Public	In areas of inundation, the impact to the public is expected to be severe. Impacts to the public in adjacent or minimally impacted areas is expected to be minimal to moderate.
Health and Safety of Responders	Impact to responders is expected to be minimal with proper training. Impact could be severe if there is lack of training.
Continuity of Operations	Temporary relocation may be necessary if facilities or infrastructure is damaged.
Property, Facilities, and Infrastructure	In areas of inundation, impacts could be severe to facilities and infrastructure. .
Environment	In areas of inundation, impact to the environment are expected to be severe. Impact will lessen as distance increases.
Economic Conditions	In areas of inundation, impacts to the economy will depend on the scope of the inundation and the time it takes for the water to recede.
Public Confidence in the Jurisdiction's Governance	Perception of whether the failure could have been prevented, warning time, and response and recovery time will greatly impact the public's confidence.

4.9 – Drought

Drought is an abnormally dry period lasting months or years when an area has a deficiency of water and precipitation in its surface and/or underground water supply. The hydrological imbalance can be grouped into the following non-exclusive categories.

- ***Agricultural:*** When the amount of moisture in the soil no longer meets the needs of previously grown crops.
- ***Hydrological:*** When surface and subsurface water levels are significantly below their normal levels.
- ***Meteorological:*** When there is a significant departure from the normal levels of precipitation.
- ***Socio-Economic:*** When the water deficiency begins to significantly affect the population.

4.9.1 – Location and Extent

All of Kansas Region D is vulnerable to drought, and it is most disastrous in the rural areas where the majority of agricultural businesses are located.

4.9.2 – Previous Occurrences

One of the best indicators of historic drought periods is provided by the U.S. Drought Monitor, which lists weekly drought conditions for the State of Kansas. The following table details the U.S. Drought Monitor categories.

Table 4.18: U.S. Drought Monitor Categories

Rating	Described Condition
None	No drought conditions
D0	Abnormally Dry
D1	Moderate Drought
D2	Severe Drought
D3	Extreme Drought
D4	Exceptional Drought

Source: U.S. Drought Monitor

According to the February 13, 2020 map, the region is rated as D2 or below. Current drought maps for the region may be found at:

- https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?KS

Historical data was gathered from the U.S. Drought Monitor weekly reports from the 10-year period 2010 through 2019 (data set includes full years for 2010 and 2019). This data was compiled and aggregated to provide a yearly estimate of the percentage of the year Kansas Region D was in each Drought Monitor category.

Table 4.19: Percentage of Kansas Region D in U.S. Drought Monitor Category, 2010-2019

Year	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
2019	61.9%	38.2%	25.9%	3.9%	0.0%	0.0%
2018	38.6%	61.4%	56.3%	50.1%	25.6%	4.7%
2017	59.4%	40.6%	29.1%	5.5%	0.0%	0.0%
2016	65.1%	34.9%	25.1%	9.5%	0.0%	0.0%
2015	61.0%	39.0%	22.4%	11.9%	0.2%	0.0%
2014	0.0%	100.0%	86.3%	71.9%	15.8%	0.0%
2013	0.0%	100.0%	100.0%	100.0%	69.7%	24.7%
2012	0.0%	100.0%	97.8%	82.2%	72.7%	6.8%
2011	0.0%	100.0%	100.0%	70.0%	42.4%	23.9%
2010	73.1%	26.9%	9.0%	0.0%	0.0%	0.0%

Source: U.S. Drought Monitor

Another good indicator of historical droughts is USDA Disaster Declarations. The following table details USDA Drought Declarations during the five-year period 2015 through 2019 (with 2015 and 2019 being full data set years) for Kansas Region D.

Table 4.20: Kansas Region D Secretarial Drought Declarations, 2015 - 2019

Year	Number of Secretarial Drought Disaster Declarations
2019	0
2018	4
2017	3
2016	0
2015	3

Source: USDA

Crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of drought on the Region's agricultural base. Crop loss data for the ten-year period of 2010 - 2019, for the region, indicates 1,261 drought related claims on 2,808,771 acres for $324,082,878.

Table 4.20: Kansas Region D USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Drought

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Clark	126	217,047	$23,149,246
Finney	174	555,516	$73,966,391
Ford	163	378,238	$41,231,570
Gray	140	384,271	$45,544,705
Haskell	128	257,438	$31,092,687
Hodgeman	122	241,088	$22,452,654
Lane	146	419,333	$50,676,807
Meade	126	186,851	$17,071,375
Seward	136	168,988	$18,897,441

Source: USDA

4.9.3 – Hazard Probability Analysis

Reviewing historical data from the U.S. Drought Monitor weekly reports from the 10-year period of 2009 through 2018 (data set includes full years for 2009 and 2018) a yearly average can be created indicating the percentage of the region in each Drought Monitor category. This average can be used to extrapolate the potential likelihood of future drought conditions.

Table 4.21: Kansas Region D Estimated Probability of Being in U.S. Drought Monitor Category

None	D0-D4	D1-D4	D2-D4	D3-D4	D4
35.9%	64.1%	55.2%	40.5%	22.6%	6.0%

Source: U.S. Drought Monitor

Data was reviewed from the USDA Risk Management agency to determine vulnerability to drought. The following table summarizes drought event data for **Clark County**

Table 4.22: Clark County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	126
Average Number of Claims per Year	13
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	217,047
Average Number of Acres Damaged per Year	21,705
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$23,149,246
Average Crop Damage per Year	$2,314,925

Source: USDA

According to the USDA Risk Management Agency, Clark County can expect on a yearly basis, relevant to drought occurrences:

- 13 insurance claims
- 21,705 acres impacted
- $2,314,925 in insurance claims

The following table summarizes drought event data for **Finney County**.

Table 4.23: Finney County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	174
Average Number of Claims per Year	17
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	555,516
Average Number of Acres Damaged per Year	55,552
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$73,966,391
Average Crop Damage per Year	$7,396,639

Source: USDA

According to the USDA Risk Management Agency, Finney County can expect on a yearly basis, relevant to drought occurrences:

- 17 insurance claims
- 55,552 acres impacted
- $7,396,639 in insurance claims

The following table summarizes drought event data for **Ford County**.

Table 4.24: Ford County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	163
Average Number of Claims per Year	16
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	378,238
Average Number of Acres Damaged per Year	37,824
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$41,231,570
Average Crop Damage per Year	$4,123,157

Source: USDA

According to the USDA Risk Management Agency, Ford County can expect on a yearly basis, relevant to drought occurrences:

- 16 insurance claims
- 37,824 acres impacted
- $4,123,157 insurance claims

The following table summarizes drought event data for **Gray County**.

Table 4.25: Gray County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	140
Average Number of Claims per Year	14
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	384,271
Average Number of Acres Damaged per Year	38,427
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$45,544,705
Average Crop Damage per Year	$4,554,470

Source: USDA

According to the USDA Risk Management Agency, Gray County can expect on a yearly basis, relevant to drought occurrences:

- 14 insurance claims
- 38,427 acres impacted
- $4,554,470 in insurance claims

The following table summarizes drought event data for **Haskell County**.

Table 4.26: Haskell County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	128
Average Number of Claims per Year	13
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	257,438
Average Number of Acres Damaged per Year	25,744
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$31,092,687
Average Crop Damage per Year	$3,109,269

Source: USDA

According to the USDA Risk Management Agency, Haskell County can expect on a yearly basis, relevant to drought occurrences:

- 13 insurance claims
- 25,744 acres impacted
- $3,109,269 in insurance claims

The following table summarizes drought event data for **Hodgeman County**.

Table 4.27: Hodgeman County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	122
Average Number of Claims per Year	12
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	241,088
Average Number of Acres Damaged per Year	24,109
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$22,452,654
Average Crop Damage per Year	$2,245,265

Source: USDA

According to the USDA Risk Management Agency, Hodgeman County can expect on a yearly basis, relevant to drought occurrences:

- 12 insurance claims
- 24,1094 acres impacted
- $2,245,265 in insurance claims

The following table summarizes drought event data for **Lane County**.

Table 4.28: Lane County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	146
Average Number of Claims per Year	15
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	419,333
Average Number of Acres Damaged per Year	41,933
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$50,676,807
Average Crop Damage per Year	$5,067,681

Source: USDA

According to the USDA Risk Management Agency, Lane County can expect on a yearly basis, relevant to drought occurrences:

- 15 insurance claims
- 41,933 acres impacted
- $5,067,681 in insurance claims

The following table summarizes drought event data for **Meade County**.

Table 4.29: Meade County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	126
Average Number of Claims per Year	13
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	186,851
Average Number of Acres Damaged per Year	18,685
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$17,071,375
Average Crop Damage per Year	$1,707,138

Source: USDA

According to the USDA Risk Management Agency, Meade County can expect on a yearly basis, relevant to drought occurrences:

- 13 insurance claims
- 18,685 acres impacted
- $1,707,138 in insurance claims

The following table summarizes drought event data for **Seward County**.

Table 4.30: Seward County Drought Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	136
Average Number of Claims per Year	14
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	168,988
Average Number of Acres Damaged per Year	16,899
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$18,897,441
Average Crop Damage per Year	$1,889,744

Source: USDA

According to the USDA Risk Management Agency, Seward County can expect on a yearly basis, relevant to drought occurrences:

- 14 insurance claims
- 16,899 acres impacted
- $1,889,744 in insurance claims

4.9.4 Vulnerability Analysis

In general, structures and populations are not directly vulnerable to losses as a result of drought. However, there is a small potential that bridges could be impacted by shrinking soil as a result of drought conditions that could cause foundational or support damages.

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region D County. USDA Risk Management Agency crop loss data (for the ten-year period from 2009 – 2018) allows us to quantify the monetary impact of drought conditions on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to drought events.

Table 4.31: Drought Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Clark	434,295	21,705	5.00%	$111,420,000	$2,314,925	2.08%
Finney	790,500	55,552	7.03%	$823,091,000	$7,396,639	0.90%
Ford	669,832	37,824	5.65%	$515,252,000	$4,123,157	0.80%
Gray	556,070	38,427	6.91%	$990,653,000	$4,554,470	0.46%
Haskell	363,751	25,744	7.08%	$1,159,098,000	$3,109,269	0.27%
Hodgeman	494,925	24,109	4.87%	$191,891,000	$2,245,265	1.17%
Lane	417,017	41,933	10.06%	$266,374,000	$5,067,681	1.90%
Meade	587,924	18,685	3.18%	$233,384,000	$1,707,138	0.73%
Seward	360,711	16,899	4.68%	$424,697,000	$1,889,744	0.44%

Source: USDA

Additional predictions about drought vulnerability can be made by reviewing data with the National Weather Service (NWS) Climate Prediction Center at www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php. The following map was the latest published data at the time of this report, and indicates no predicted drought conditions for the region.

Drought can severely challenge a public water supplier through depletion of the raw water supply and greatly increased customer water demand. Even if the raw water supply remains adequate, problems due to limited treatment capacity or limited distribution system capacity may be encountered. In addition, the water for cropland and livestock can be greatly impacted. The following are the potential water supply limitations that may result from drought conditions:

- **Basic Source Limitation** - The supplier's primary raw water source is particularly sensitive to drought as evidenced by depleted streamflow, depleted reservoir inflow and storage, or by declining water levels in wells. Restrictions imposed due to inability to use a well(s) because water quality problems were considered indicative of a basic source limitation.
- **Contractual Limitation** - The supplier's sole water source is purchased from another system that is drought vulnerable and there is a drought-cut-off clause in their water purchase contract. In such situations where there is not a drought cut-off clause, the purchaser is considered drought vulnerable under the same limitation category as the seller.

- **Distribution System Limitation** - The supplier has difficulty or is unable to meet drought-induced customer demand for water because of inadequate finished water storage capacity, inadequate finished water pumping capacity, inadequate transmission line sizes.
- **Minimum Desirable Streamflow** - The supplier reported imposing restrictions because of minimum desirable streamflow administration. Water rights junior to those Clarked for maintenance of established minimum desirable flows are subject to such administration.
- **Single Well Source** - The supplier relies upon a single well as its sole source for raw water. Suppliers with one active well and one emergency well were considered drought vulnerable because emergency wells are not a dependable long-term water source. Excessive hours of operation to meet drought-induced customer demand for water will result in the increased likelihood of mechanical breakdown with no alternative water supply source available.
- **Treatment Capacity Limitation** - The supplier has difficulty or is unable to meet drought-induced customer demand for water due to inadequate raw water treatment capacity.
- **Water Right Limitation** - The supplier reported imposing restrictions because the quantity of water they are authorized to divert under their water right(s) was insufficient to meet customer demands.

Water supply planning is the key to minimizing the effects of drought on the population and economy of the region. State of Kansas agencies have worked with public water suppliers to identify vulnerabilities and develop infrastructure, conservation plans, and partnerships to reduce the likelihood of running out of water during a drought. Information concerning these plans, and any current water supply limitations, may be found with the Kansas Water Office.

4.9.5 – Impact and Consequence Analysis

As per EMAP standards, the following table provides the consequence analysis for drought conditions.

Table 4.32: Drought Consequence Analysis

Subject	Impacts of Drought
Health and Safety of the Public	Drought impact tends to be agricultural however, because of the lack of precipitation water supply disruptions can occur which can affect people. Impact is expected to be minimal.
Health and Safety of Responders	Impact to responders is expected to be minimal.
Continuity of Operations	Minimal expectation for utilization of the COOP.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the length and intensity of the drought. Structural integrity of buildings and buckling of roads could occur.
Environment	The impact to the environment could be severe. Drought can severely affect farming, ranching, wildlife and plants due to the lack of precipitation.
Economic Conditions	Impacts to the economy will be dependent on how extreme the drought is and how long it lasts. Communities that depend on an agricultural economic engine will likely be severely stressed.
Public Confidence in the Jurisdiction's Governance	Confidence could be an issue during periods of extreme drought if planning is not in place to address intake needs and loss of crops.

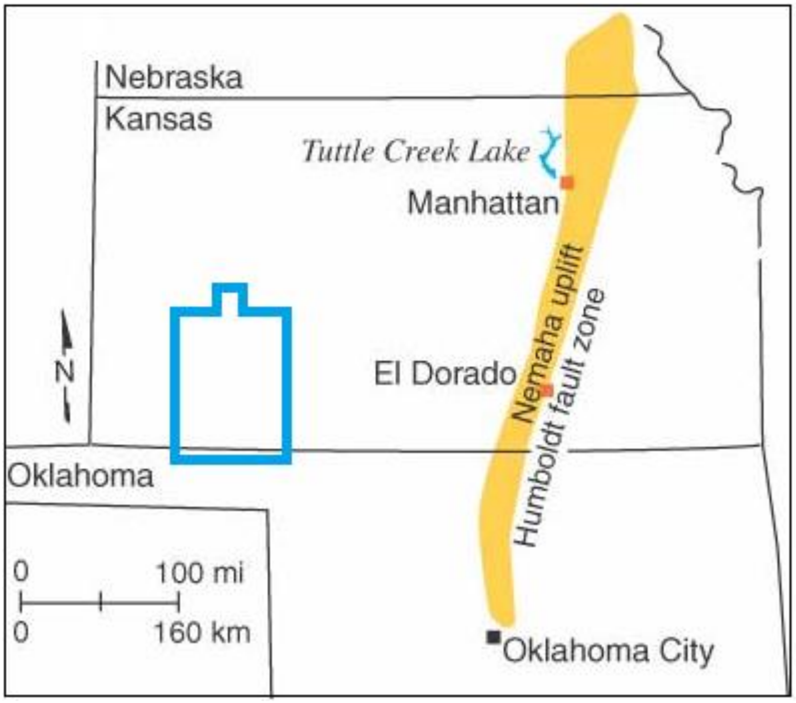
4.10 – Earthquake

An earthquake is the result of a sudden release of energy in the Earth's crust that creates seismic waves that are typically caused by the rupturing of geological faults.

4.10.1 – Location and Extent

Kansas Region D is in an area of low potential seismic activity, with the Humboldt Fault (also known as the Nemaha Uplift) passing to the east of the region. Most earthquakes in the Humboldt Fault Zone are small and are detected only with instruments.

Humboldt Fault Zone



Two scales are used when referring to earthquake activity. Estimating the total force of an earthquake is the Richter scale, and the observed damage from an earthquake is the Modified Mercalli Intensity Scale. Additionally, both Acceleration (%g) and Velocity (cm/s) can be used to measure and quantify force and movement.

The following table equates the above referenced earthquake scales.

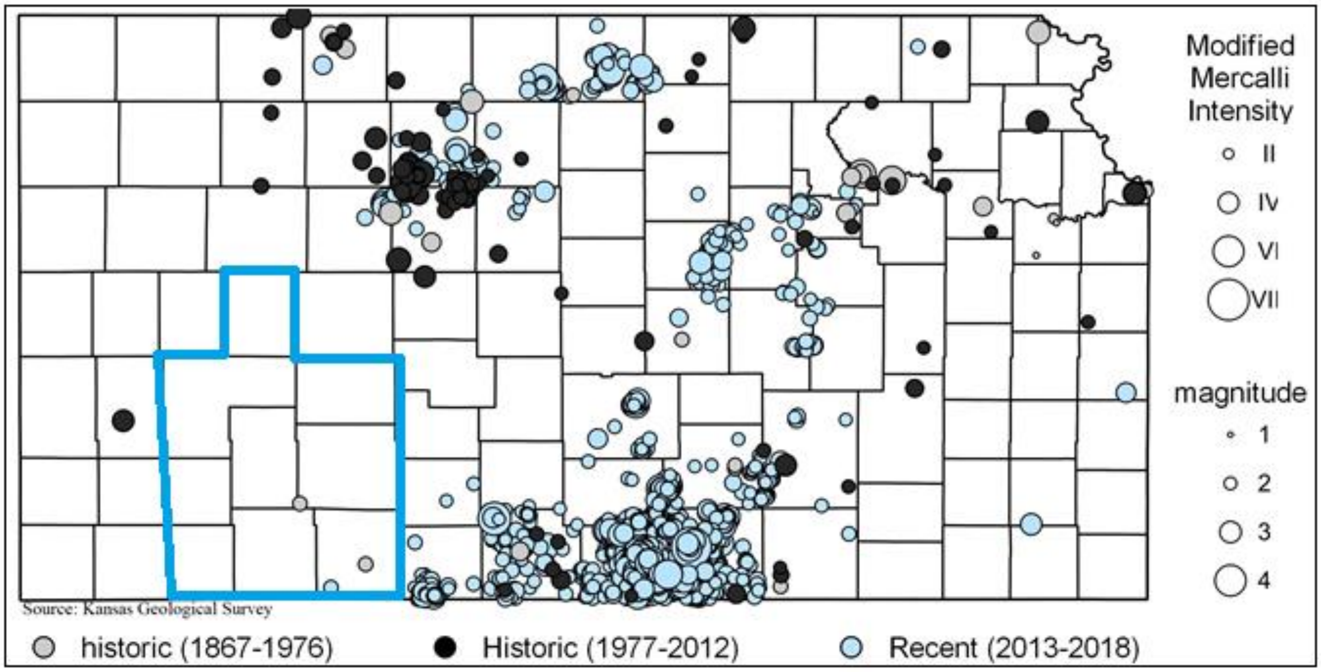
Table 4.33: Earthquake Magnitude Scale Comparison

Mercalli Scale Intensity	Verbal Description	Richter Scale Magnitude	Acceleration (%g)	Velocity (cm/s)	Witness Observations
I	Instrumental	1 to 2	0.17%	<0.1	None
II	Feeble	2 to 3	1.40%	1.1	Noticed only by sensitive people
III	Slight	3 to 4	1.40%	1.1	Resembles vibrations caused by heavy traffic
IV	Moderate	4	3.90%	3.4	Felt by people walking; rocking of free-standing objects
V	Rather Strong	4 to 5	9.20%	8.1	Sleepers awakened; bells ring
VI	Strong	5 to 6	18.00%	16	Trees sway, some damage from falling objects
VII	Very Strong	6	34.00%	31	General alarm, cracking of walls
VIII	Destructive	6 to 7	65.00%	60	Chimneys fall and some damage to building
IX	Ruinous	7	124.00%	116	Ground crack, houses begin to collapse, pipes break
X	Disastrous	7 to 8	>124.0%	>116	Ground badly cracked, many buildings destroyed. Some landslides
XI	Very Disastrous	8	>124.0%	>116	Few buildings remain standing, bridges destroyed.
XII	Catastrophic	8 or greater	>124.0%	>116	Total destruction; objects thrown in air, shaking and distortion of ground

4.10.2 – Previous Occurrences

The following map, from the KGS, shows all recorded earthquakes from 1867 through 2018.

KGS Historic Earthquake Map



The KGS Earthquake Catalog records earthquake events from 1979 through present. The following table details the Richter Scale Magnitude of any recorded events in the catalog.

Table 4.34: Region D Number of Earthquakes by Richter Scale Magnitude, 1979 - 2018

	0.1 -3.9	4.0 – 4.9	5.0 – 5.9	6.0 – 6.9	7.0- 7.9	8.0 +	Highest
Clark	1	0	0	0	0	0	2.2
Finney	0	0	0	0	0	0	-
Ford	0	0	0	0	0	0	-
Gray	0	0	0	0	0	0	-
Haskell	0	0	0	0	0	0	-
Hodgeman	0	0	0	0	0	0	-
Lane	0	0	0	0	0	0	-
Meade	0	0	0	0	0	0	-
Seward	0	0	0	0	0	0	-

Source: KGS

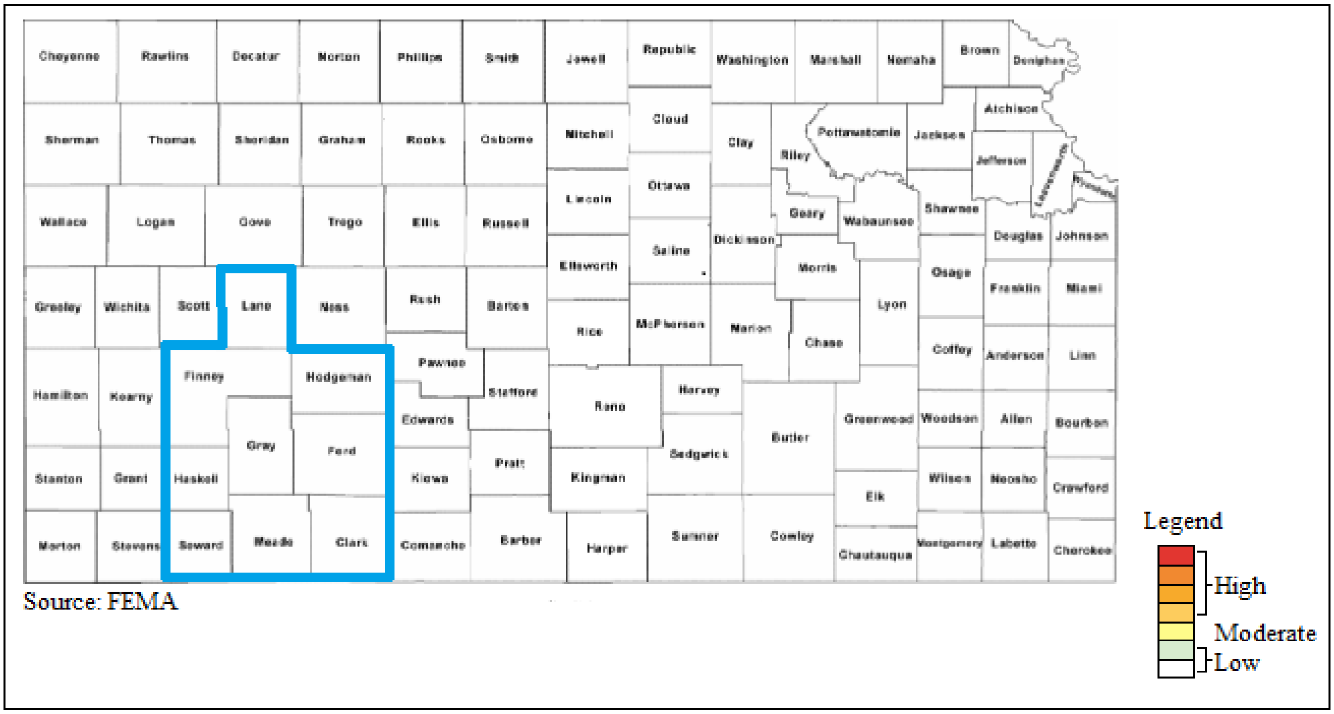
According to this archive, Kansas Region D has had no earthquakes over magnitude 4.0 earthquake since 1979.

Recently, concern about earthquakes caused by oil and gas exploration and production operations, has grown. Commonly, detected seismic activity associated with oil and gas operations, also known as induced seismicity, is thought to be triggered when wastewater is injected into disposal wells. According to the KGS, linking earthquakes to wastewater injection is difficult. Complex subsurface geology and limited data about that geology make it hard to pinpoint the cause seismic events. However, an established pattern of increased earthquake activity in an area over time may indicate a correlation between injection and seismic events.

4.10.3 – Hazard Probability Analysis

The following FEMA Seismic Risk Map for the United States indicates that all of the State of Kansas, including Kansas Region D, falls into the low hazard rankings.

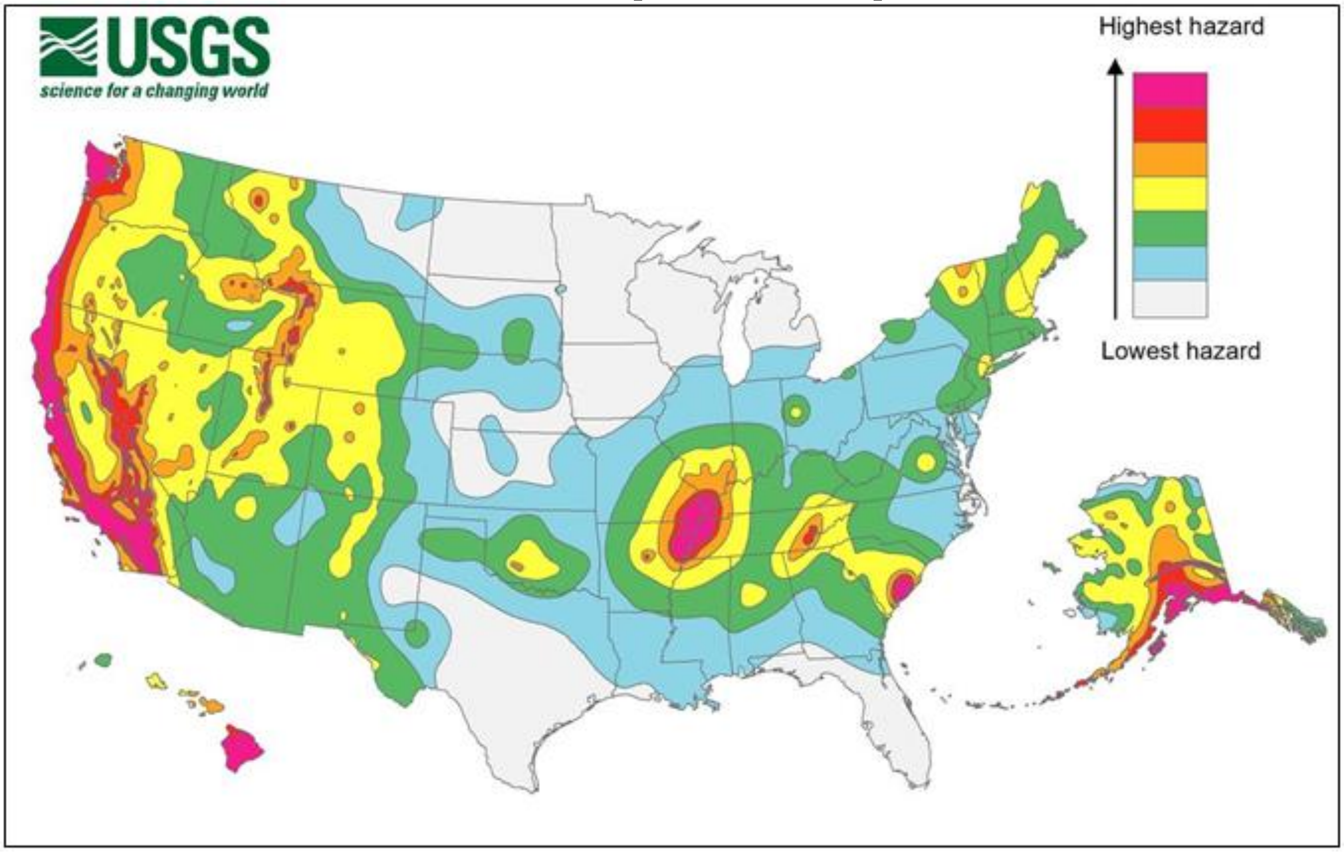
FEMA Seismic Risk Map



Source: FEMA

The USGS also published a map that indicates hazard rankings based on acceleration (%g) for the United States, with the data correlating with the indicated FEMA risk. This map indicates the probability that ground shaking will exceed a certain level over a 50-year period. The low-hazard areas have a 2% chance of exceeding a designated low level of shaking and the high-hazard areas have a 2% chance of topping a much greater level.

USGS Earthquake Hazard Map

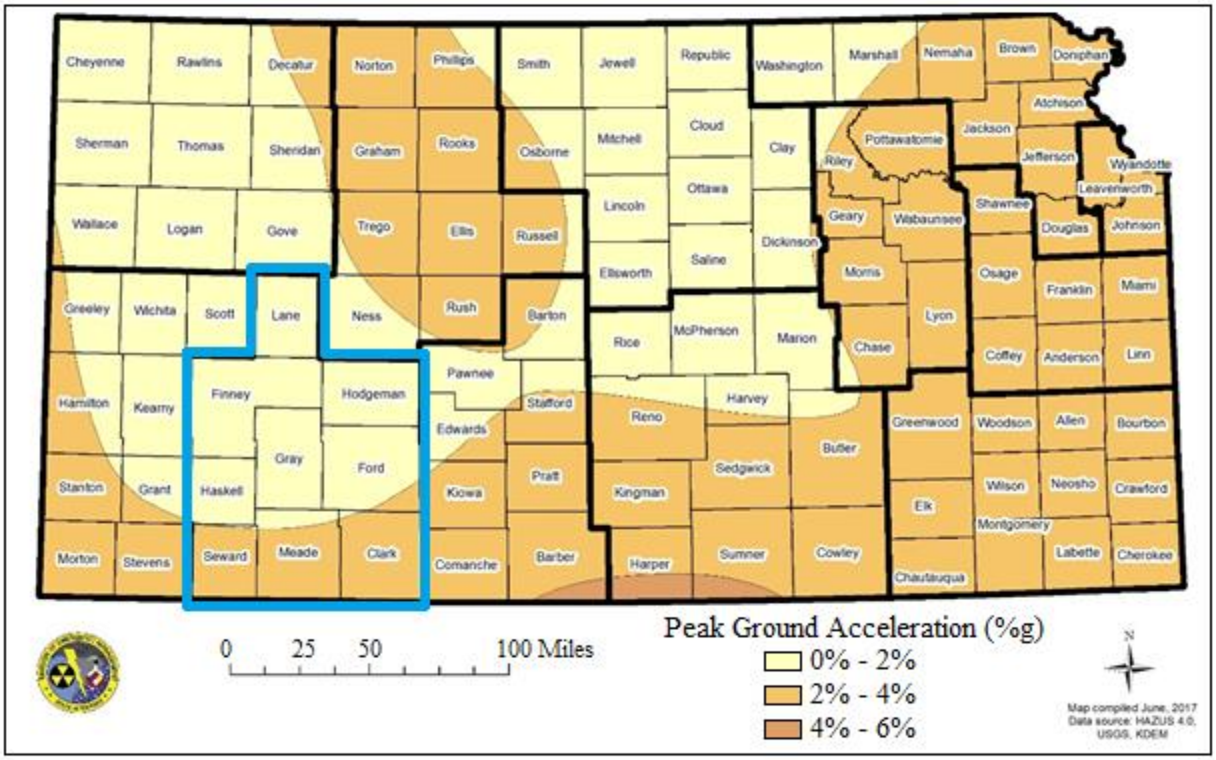


4.10.4 – Vulnerability Analysis

HAZUS, using the default inventory 2010 building valuations, was used to analyze vulnerability and estimate potential losses to earthquakes. A probabilistic, 2,500 Year 6.7 magnitude earthquake scenario was chosen to reveal areas of the region and state that are most vulnerable. These results are not meant to indicate annualized losses or damages as a result of a more typical low-magnitude event, but rather reveal vulnerabilities and losses for the worst-case scenario.

The following map, created using available HAZUS data, shows the ground shaking potential of a worst-case scenario 2,500-year 6.7 magnitude earthquake.

Regional Peak Ground Acceleration



Using available HAZUS data, the following potential losses from a worst-case scenario 2,500-year 6.7 Magnitude earthquake.

Table 4.35: Kansas Region D Probabilistic 6.7 Magnitude Earthquake Damages

County	Total Earthquake Losses	Displaced Households
Clark	$1,104,000	<1
Finney	$10,273,000	6
Ford	$9,886,000	6
Gray	$1,907,000	<1
Haskell	$1,506,000	<1
Hodgeman	$529,000	<1
Lane	$722,000	<1
Meade	$2,019,000	<1
Seward	$8,917,000	5

Source: KDEM and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to earthquake events. The following table indicates the total county population and the percentage change over the period 2000 to 2018.

Table 4.36: Kansas Region D Population Vulnerability Data for Earthquakes

County	2018 Population	Percent Population Change 2000 to 2018
Clark	2,005	-16.1%
Finney	36,611	-9.7%
Ford	33,888	4.1%
Gray	6,033	2.2%
Haskell	3,997	-6.9%
Hodgeman	1,818	-12.8%
Lane	1,560	-27.6%
Meade	4,146	-10.5%
Seward	21,780	-3.2%

Source: US Census Bureau

Counties with a higher number of structures are to be considered to have a potentially greater vulnerability. The following table indicates the total number of housing units in each county (used as a representative figure for the total number of structures in each county, as housing numbers are closely tied to commercial structures) and the percentage change over the period 2000 to 2018.

Table 4.37: Kansas Region D Structure Vulnerability Data for Earthquakes

County	2018 Housing Units	Percent Change 2000 to 2018
Clark	1,150	3.5%
Finney	13,500	-1.9%
Ford	12,247	5.1%
Gray	2,436	11.7%
Haskell	1,680	2.5%
Hodgeman	1,000	5.8%
Lane	974	-8.5%
Meade	1,978	0.5%
Seward	8,218	2.4%

Source: US Census Bureau

4.10.5 – Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis

Table 4.38: Earthquake Consequence Analysis

Subject	Impacts of Earthquake
Health and Safety of the Public	Severity and location dependent. Impacts on persons near the epicenter are expected to be severe.
Health and Safety of Responders	Severity and location dependent. Impacts on persons near the epicenter are expected to be severe.
Continuity of Operations	Severity and location dependent. Event will likely require relocation, essential function prioritization based on capabilities and severe disruption of services.

Table 4.38: Earthquake Consequence Analysis

Subject	Impacts of Earthquake
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the location of the facility and the severity of the event. Loss of structural integrity of buildings and infrastructure could occur.
Environment	The impact to the environment could be severe, including topological changes and severe destruction.
Economic Conditions	Impacts to the economy will be dependent severity of earthquake and proximity to the epicenter. Impacts will likely be long lasting and possibly permanent for most severely impacted businesses.
Public Confidence in the Jurisdiction's Governance	Confidence could be an issue if planning is not in place to address need of population, including mass sheltering and mass care.

4.11 – Expansive Soils

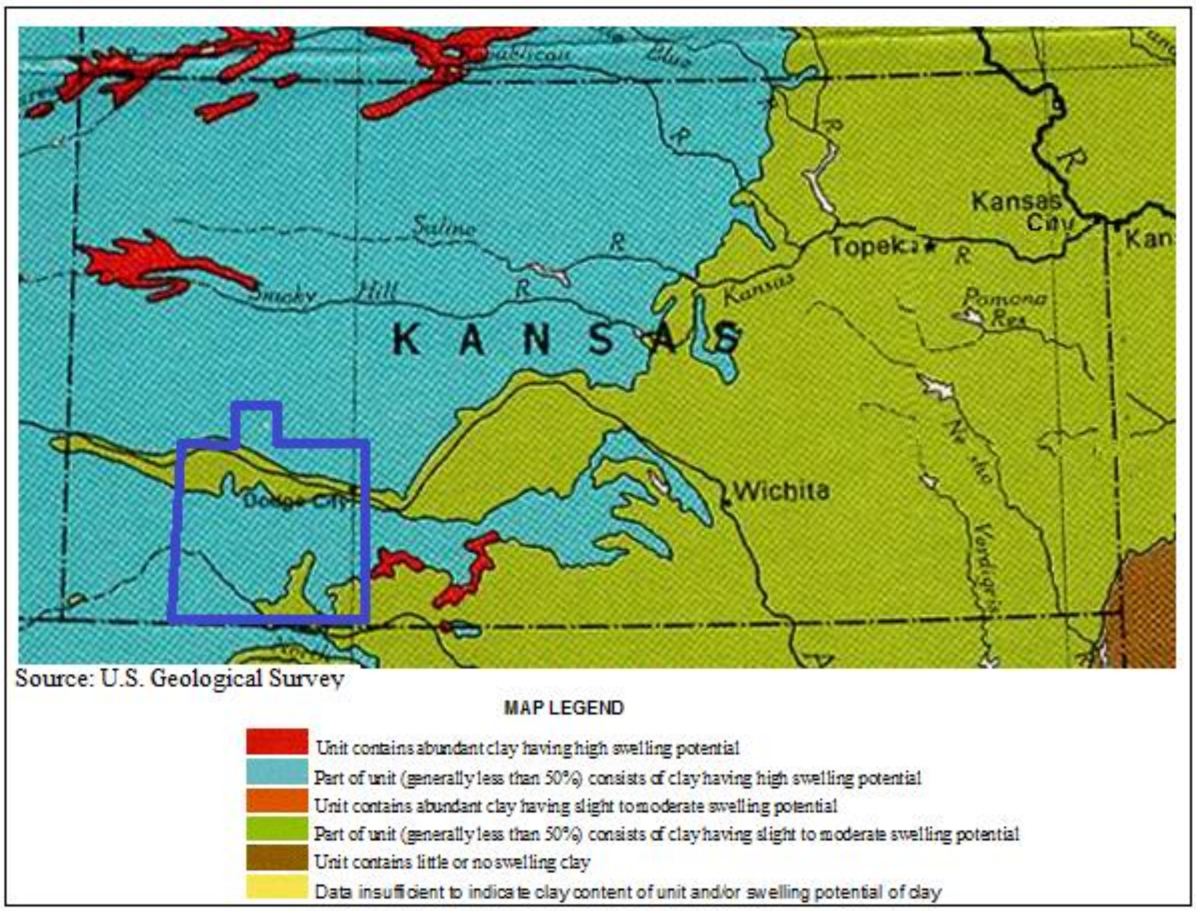
Expansive soils are slow to develop and do not usually pose a risk to public safety. The slow expansion and contraction of soil places pressure on structural foundations and subsurface dwellings. This pressure can become so great it damages foundations, cracks walls, and deforms structures.

4.11.1 – Location and Extent

Kansas Region D possesses a wide array of soils with a range of permeability from moderate to low. Generally, the permeability of the soils is related to the clay content. Clay soils tend to shrink when dry and swell when wet which has large implications on underground utility infrastructure and home foundations.

The map shows the swelling potential of soils in Kansas Region D, indicating it is located in an area where generally less than 50% of the soil unit consists of clay having high swelling potential.

USGS Soil Swelling Potential Map



4.11.2 – Previous Occurrences

No statewide database of expansive soils events is available.

Locally, there have been no reported major or impactful expansive soil events within the past ten years.

4.11.3 – Hazard Probability Analysis

Currently there is limited available data on this hazard, but it is held that each year in the United States, expansive soils cause billions of dollars in damage to buildings, roads, pipelines, and other structures. But, as expansive soils cause damage over extended periods of time damages caused may be attributed to other factors such as extended drought or heavy periods of moisture, both of which may exacerbate the hazard.

Because there is high clay content, high swell soils in the region, the probability of shrink/swell occurrence is 100%. However, the probability of damage is so poorly documented that is presently not possible to quantify the potential occurrence of a major damaging expansive soils event.

4.11.4 – Vulnerability Analysis

Physical structures are potentially vulnerable to highly expansive soil. It is estimated by KDEM that approximately 10% of the homes built on expansive soils could experience significant damage. Based on this, and using current available building valuations, the following table estimates the potential damages assuming a 50% impact on the value of the structure.

Table 4.39: Kansas Region D Estimated Potential Structural Damages, Expansive Soil

County	HAZUS Property Valuation	Property Valuation for 10% of Building Stock	Estimated 50% Damage
Clark	$495,884,000	$49,588,400	$24,794,200
Finney	$6,770,618,000	$677,061,800	$338,530,900
Ford	$5,874,814,000	$587,481,400	$293,740,700
Gray	$1,294,134,000	$129,413,400	$64,706,700
Haskell	$861,920,000	$86,192,000	$43,096,000
Hodgeman	$367,392,000	$36,739,200	$18,369,600
Lane	$465,306,000	$46,530,600	$23,265,300
Meade	$1,090,544,000	$109,054,400	$54,527,200
Seward	$3,662,220,000	$366,222,000	$183,111,000

Source: US Census Bureau and HAZUS

4.11.5 – Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.40: Expansive Soils Consequence Analysis

Subject	Impacts of Expansive Soils
Health and Safety of the Public	Minimal impact.
Health and Safety of Responders	Minimal impact.
Continuity of Operations	Minimal expectation for utilization of COOP unless structures have extensive damage.
Property, Facilities, and Infrastructure	Localized impact could be moderate, including structural integrity to be lost, and roadways, railways to buckle.
Environment	Expansive soils could cause moderate damage to dams, levees, watersheds.
Economic Conditions	Economic impacts include rebuilding of the properties and infrastructure. Drought and extreme rain events could increase impact.
Public Confidence in the Jurisdiction's Governance	Confidence will be dependent on development trends and mitigation efforts at reducing the effect of expansive soils on new construction.

4.12 – Extreme Temperatures

Extreme temperature events occur when climate conditions produce temperatures well outside of the predicted norm. These extremes can have severe impacts on human health and mortality, natural ecosystems, agriculture, and other economic sectors.

4.12.1 – Location and Extent

The Midwest climate region is known for extremes in temperature. Specifically, Kansas lacks any mountain ranges that could act as a barrier to cold air masses from the north or hot, humid air masses from the south or any oceans or large bodies of water that could provide a moderating effect on the climate. The polar jet stream is often located over the region during the winter, bringing frequent storms and precipitation. Kansas summers are generally warm and humid due to the clockwise air rotation caused by Atlantic high-pressure systems bringing warm humid air up from the Gulf of Mexico.

All of Kansas Region D is vulnerable to both extreme heat and extreme cold, defined as follows.

Table 4.41: Extreme Temperature Definitions

Term	Definition
Extreme Heat	Extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Ambient air temperature is one component of heat conditions, with relative humidity being the other. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when an area of high atmospheric pressure traps moisture laden air near the ground.
Extreme Cold	Although no specific definition exists for extreme cold, an extreme cold event can generally be defined as temperatures at or below freezing for an extended period of time. Extreme cold events are usually part of Winter Storm events but can occur during anytime of the year and can have devastating effects on agricultural production.

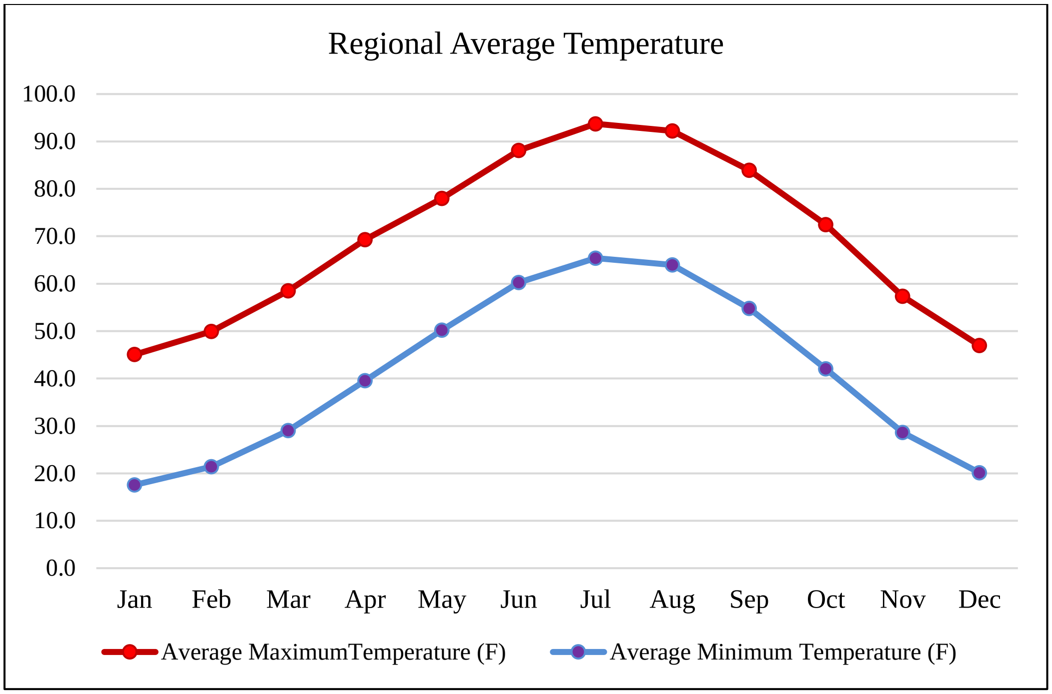
Data from the following High Plains Regional Climate Center weather stations from the first available date to present was obtained to illustrate regional temperature norms.

The following tables and charts present average climate data the region.

Table 4.41: Regional Average Temperatures

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Minimum Temperature (F)	17.6	21.4	29.0	39.5	50.2	60.3	65.4	64.0	54.8	42.0	28.6	20.1	41.1
Average Maximum Temperature (F)	45.0	49.9	58.5	69.3	78.0	88.1	93.7	92.2	83.9	72.5	57.4	47.0	69.6

Source: High Plains Regional Climate Center



Source: High Plains Regional Climate Center

When discussing weather patterns climate change should be taken into account as it may markedly change future weather-related events. There is a scientific consensus that climate change is occurring, and recent climate modeling results indicate that extreme weather events may become more common. Rising average temperatures produce a more variable climate system which may result in an increase in the frequency and severity of some extreme weather events including longer and hotter heat waves (and by correlation, an increased risk of wildfires), higher wind speeds, greater rainfall intensity, and increased tornado activity.

4.12.2 – Previous Occurrences

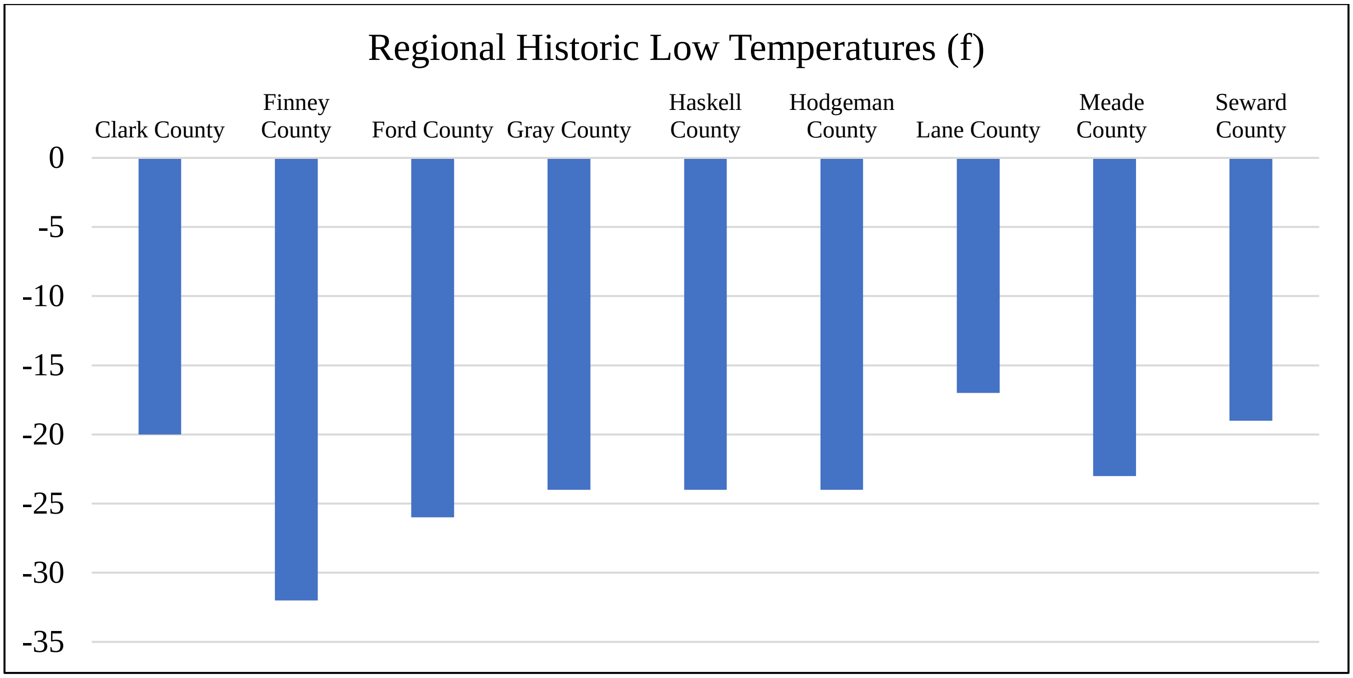
Data from the High Plains Regional Climate Center indicates the following historic high and low temperatures.

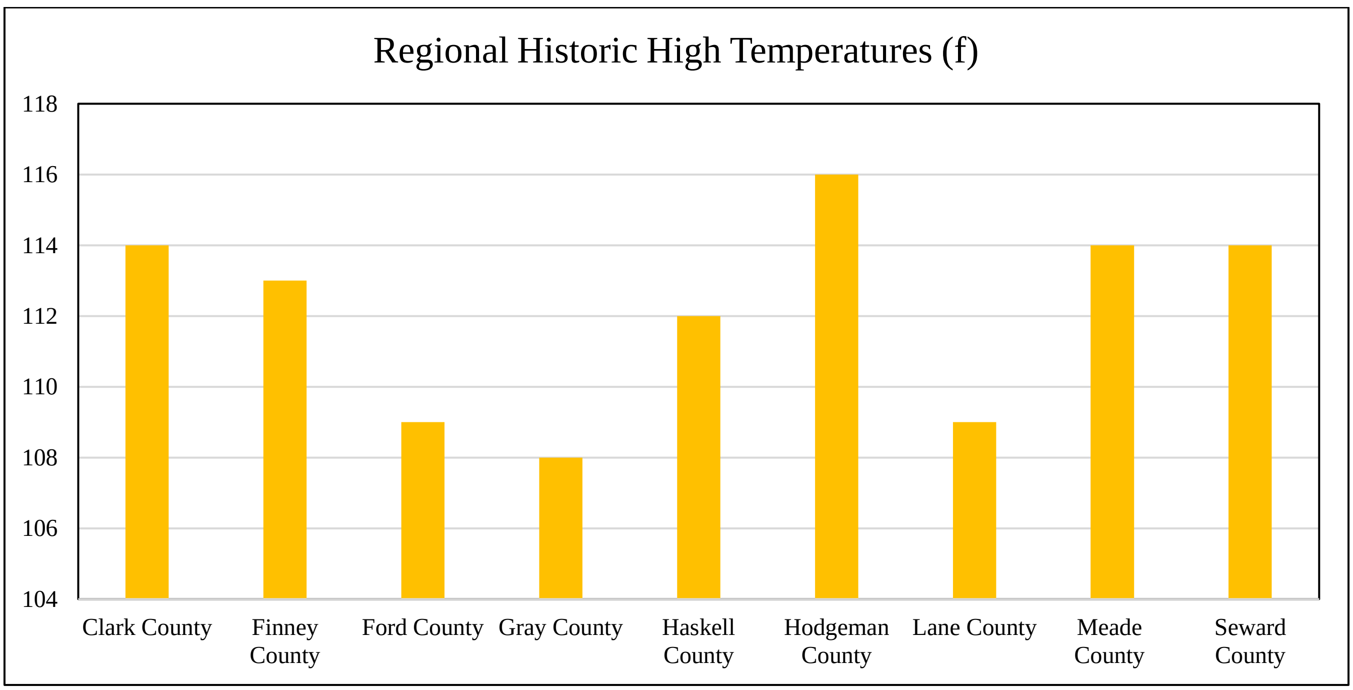
Table 4.43: Kansas Region D Historic Temperatures

County	Historic Low Temperature (F)	Historic High Temperature (F)
Clark	-20 (2011)	114 (2011)
Finney	-32 (1899)	113 (1934)
Ford	-26 (1899)	109 (1936)
Gray	-24 (1912)	108 (1911)
Haskell	-24 (1984)	112 (1953)
Hodgeman	-24 (1914)	116 (1934)
Lane	-17 (1982)	109 (1980)
Meade	-23 (1899)	114 (1896)
Seward	-19 (1912)	114 (1981)

Source: High Plains Regional Climate Center

The following graphs represent he above historic temperature data.





The following table presents National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) identified extreme temperature events (Excessive Heat and Extreme Cold/Wind Chill) and the resulting damage totals in Kansas Region D from the ten-year period 2009- 2018 (data set includes full years for 2009 and 2018) for the region. Data was reviewed regionally as the extreme temperature events covered large areas.

Table 4.44: Kansas Region D NCEI Extreme Temperature Events, 2010 - 2019

County	Event Type	Number of Events	Property Damage	Deaths	Injuries
Kansas Region D	Cold	0	$0	0	0
	Heat	0	$0	0	0

Source: NOAA NCEI

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of extreme temperatures on the Region's agricultural base. Crop loss data for the five-year period 2010 - 2019 (data set includes full years for 2009 and 2018), for the region, indicates 1,151 extreme temperature related claims on 758,859 acres for $144,187,718.

Table 4.45: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Extreme Temperatures

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Clark	54	10,974	$1,248,752
Finney	186	189,409	$38,838,409
Ford	107	79,145	$16,967,716
Gray	154	131,838	$27,766,405
Haskell	163	156,349	$28,892,115
Hodgeman	125	33,650	$5,399,211
Lane	99	25,167	$4,189,871
Meade	126	58,693	$8,148,196
Seward	137	74,635	$13,187,718

Source: USDA Farm Service Agency

4.12.3 – Hazard Probability Analysis

Although periods of extreme heat and cold occur on an annual basis, events that create a serious public health risk or threaten infrastructure capacity occur less often. An extreme heat event is more likely to occur in the months of June, July, August, and September, and an extreme cold event is more likely to occur in the months of November, December, January, February, and March. Also, the EPA has projected that with climate changes in the Great Plains, temperatures will continue to increase and impact all Kansas Region D communities.

The following table summarizes extreme temperature event data for **Kansas Region D**.

Table 4.46: Kansas Region D Extreme Temperature Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	0
Average Events per Year	0
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Kansas Region D can expect on a yearly basis, relevant to extreme temperature events:

- No events
- No deaths
- No injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to extreme temperatures. The following table summarizes extreme temperature event data for **Clark County**

Table 4.47: Clark County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	54
Average Number of Claims per Year	5
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	10,974
Average Number of Acres Damaged per Year	1,097
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$1,248,752
Average Crop Damage per Year	$124,875

Source: USDA

According to the USDA Risk Management Agency, Clark County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- Five insurance claims
- 1,097 acres impacted
- $124,875 in insurance claims

The following table summarizes extreme temperatures event data for **Finney County**.

Table 4.48: Finney County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	186
Average Number of Claims per Year	19
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	189,409
Average Number of Acres Damaged per Year	18,941
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$38,838,409
Average Crop Damage per Year	$3,883,841

Source: USDA

According to the USDA Risk Management Agency, Finney County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 19 insurance claims
- 18,941 acres impacted
- $3,883,841 in insurance claims

The following table summarizes extreme temperatures event data for **Ford County**.

Table 4.49: Ford County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	107
Average Number of Claims per Year	11
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	79,145
Average Number of Acres Damaged per Year	7,914
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$16,967,716
Average Crop Damage per Year	$1,696,772

Source: USDA

According to the USDA Risk Management Agency, Ford County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 11 insurance claims
- 7,941 acres impacted
- $1,696,772 in insurance claims

The following table summarizes extreme temperatures event data for **Gray County**.

Table 4.50: Gray County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	154
Average Number of Claims per Year	15
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	131,838
Average Number of Acres Damaged per Year	13,184
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$27,766,405
Average Crop Damage per Year	$2,776,640

Source: USDA

According to the USDA Risk Management Agency, Gray County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 15 insurance claims
- 13,184 acres impacted
- $2,776,640 in insurance claims

The following table summarizes extreme temperatures event data for **Haskell County**.

Table 4.51: Haskell County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	163
Average Number of Claims per Year	16
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	156,349

Table 4.51: Haskell County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
Average Number of Acres Damaged per Year	15,635
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$28,892,115
Average Crop Damage per Year	$2,889,212

Source: USDA

According to the USDA Risk Management Agency, Haskell County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 16 insurance claims
- 15,635 acres impacted
- $2,889,212 in insurance claims

The following table summarizes extreme temperatures event data for **Hodgeman County**.

Table 4.52: Hodgeman County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	125
Average Number of Claims per Year	13
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	33,650
Average Number of Acres Damaged per Year	3,365
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$5,399,211
Average Crop Damage per Year	$539,921

Source: USDA

According to the USDA Risk Management Agency, Hodgeman County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 13 insurance claims
- 3,365 acres impacted
- $539,921 in insurance claims

The following table summarizes extreme temperatures event data for **Lane County**.

Table 4.53: Lane County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	99
Average Number of Claims per Year	10
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	25,167
Average Number of Acres Damaged per Year	2,517
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$4,189,871
Average Crop Damage per Year	$418,987

Source: USDA

According to the USDA Risk Management Agency, Lane County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 10 insurance claims
- 2,517 acres impacted
- $418,987 in insurance claims

The following table summarizes extreme temperatures event data for **Meade County**.

Table 4.54: Meade County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	126
Average Number of Claims per Year	13
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	58,693
Average Number of Acres Damaged per Year	5,869
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$8,148,196
Average Crop Damage per Year	$814,820

Source: USDA

According to the USDA Risk Management Agency, Meade County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 13 insurance claims
- 5,869 acres impacted
- $814,820 in insurance claims

The following table summarizes Extreme temperatures event data for **Seward County**.

Table 4.55: Seward County Extreme Temperatures Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	137
Average Number of Claims per Year	14
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	74,635
Average Number of Acres Damaged per Year	7,463
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$13,187,718
Average Crop Damage per Year	$1,318,772

Source: USDA

According to the USDA Risk Management Agency, Seward County can expect on a yearly basis, relevant to extreme temperatures occurrences:

- 14 insurance claims
- 7,463 acres impacted
- $1,318,772 in insurance claims

4.12.4 – Vulnerability Analysis

The primary concerns with this hazard are human health safety issues. Specific at-risk groups identified were outdoor workers, farmers, and senior citizens. Due to the potential for fatalities and the possibility for the loss of electric power due to increased strain on power generation and distribution for air conditioning, periods of extreme heat can affect the planning area.

Exposure to direct sun can increase Heat Index values by as much as 15°F. The zone above 105°F corresponds to a Heat Index that may cause increasingly severe heat disorders with continued exposure and/or physical activity. The following table discusses potential impacts on human health related to excessive heat.

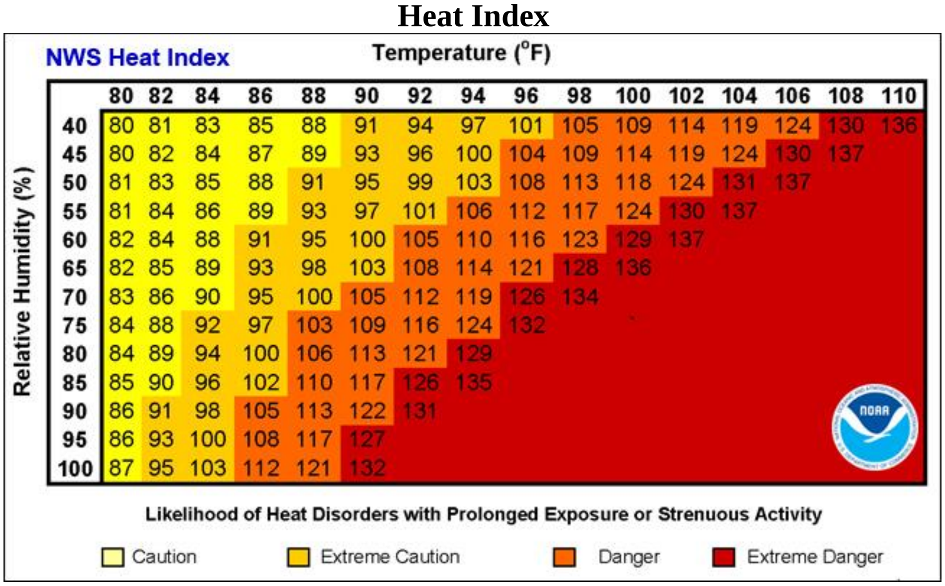
Table 4.56: Extreme Heat Impacts on Human Health

Heat Index (HI) Temperature	Potential Impact on Human Health
80-90° F	Fatigue possible with prolonged exposure and/or physical activity
90-105° F	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F	Heatstroke/sunstroke highly likely with continued exposure

Source: National Weather Service Heat Index Program

The following graph, from the NWS, indicates Heat Index values.

Heat Index

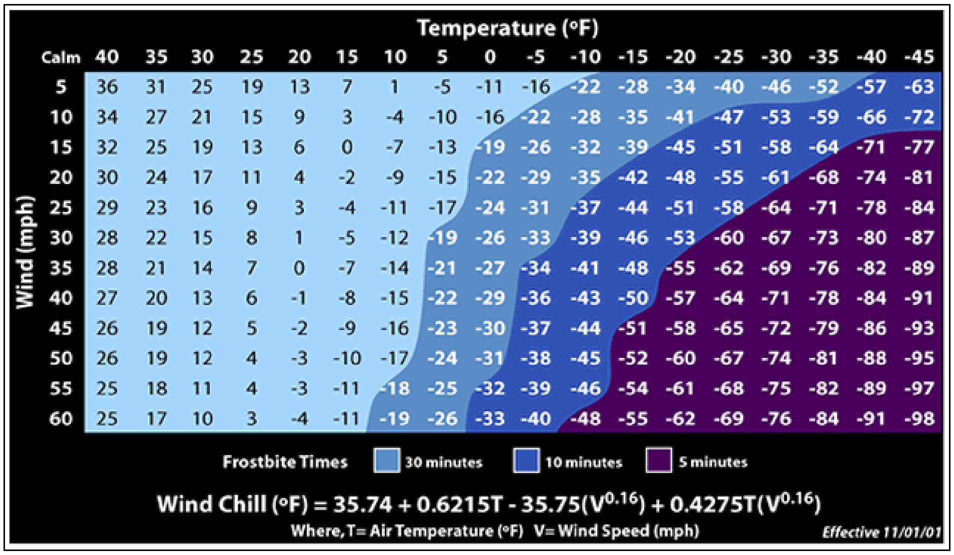


Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60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

Extreme cold can cause hypothermia, an extreme lowering of the body's temperature, frostbite and death. Infants and the elderly are particularly at risk, but anyone can be affected. Other impacts of extreme cold include asphyxiation from toxic fumes from emergency heaters, household fires, which can be caused by fireplaces and emergency heaters, and frozen/burst water pipes. There are no specific data sources recording cold related deaths in east-central Kansas.

The following graph, from the NWS, shows wind chill values.

Wind Chill Values



Temperature (°F)

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

Frostbite Times: 30 minutes, 10 minutes, 5 minutes

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

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

Effective 11/01/01

Counties with a high population and/or a growing population are at increased risk. The following table indicates the total county population and registered growth over the period 2000 to 2018.

Table 4.57: Kansas Region D Population Vulnerability Data for Extreme Temperatures

County	2018 Population	Percent Population Change 2000 to 2018
Clark	2,005	-16.1%
Finney	36,611	-9.7%
Ford	33,888	4.1%
Gray	6,033	2.2%
Haskell	3,997	-6.9%
Hodgeman	1,818	-12.8%
Lane	1,560	-27.6%
Meade	4,146	-10.5%
Seward	21,780	-3.2%

Source: US Census Bureau

Additionally, there is an increased likelihood of mortality for very young and very old populations due to extreme temperatures. The following table indicates the percentage of the total county population that may be considered especially vulnerable to extreme temperatures.

Table 4.58: Kansas Region D Vulnerable Population Vulnerability Data for Extreme Temperatures

County	Percentage of Population 5 and Under (2018)	Percentage of Population 65+ (2018)
Clark	5.30%	21.90%
Finney	8.70%	11.00%
Ford	8.90%	11.20%
Gray	7.60%	15.10%

Table 4.58: Kansas Region D Vulnerable Population Vulnerability Data for Extreme Temperatures

County	Percentage of Population 5 and Under (2018)	Percentage of Population 65+ (2018)
Haskell	7.00%	14.80%
Hodgeman	6.40%	24.00%
Lane	5.70%	23.50%
Meade	6.60%	19.30%
Seward	9.20%	9.80%

Source: US Census Bureau

In addition, extreme temperatures may exacerbate agricultural and economic losses. The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region D County. USDA Risk Management Agency crop loss data for the five-year period 2010 - 2019 (data set includes full years for 2009 and 2018) allows us to quantify the monetary impact of extreme temperature conditions on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to extreme temperature events.

Table 4.59: Extreme Temperature Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Clark	434,295	1,097	0.25%	$111,420,000	$124,875	0.11%
Finney	790,500	18,941	2.40%	$823,091,000	$3,883,841	0.47%
Ford	669,832	7,914	1.18%	$515,252,000	$1,696,772	0.33%
Gray	556,070	13,184	2.37%	$990,653,000	$2,776,640	0.28%
Haskell	363,751	15,635	4.30%	$1,159,098,000	$2,889,212	0.25%
Hodgeman	494,925	3,365	0.68%	$191,891,000	$539,921	0.28%
Lane	417,017	2,517	0.60%	$266,374,000	$418,987	0.16%
Meade	587,924	5,869	1.00%	$233,384,000	$814,820	0.35%
Seward	360,711	7,463	2.07%	$424,697,000	$1,318,772	0.31%

Source: USDA

4.12.5 – Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.60: Extreme Temperature Consequence Analysis

Subject	Impacts of Extreme Temperatures
Health and Safety of the Public	Depending on the duration of the event, impact is expected to be severe for unprepared and unprotected persons. Impact will be minimal to moderate for prepared and protected persons.
Health and Safety of Responders	Impact could be severe if proper precautions are not taken, i.e. hydration in heat, clothing in extreme cold. With proper preparedness and protection, the impact would be minimal.

Table 4.60: Extreme Temperature Consequence Analysis

Subject	Impacts of Extreme Temperatures
Continuity of Operations	Minimal expectation for utilization of the COOP.
Property, Facilities, and Infrastructure	Impact to infrastructure could be minimal to severe depending on the temperature extremes.
Environment	The impact to the environment could be severe. Extreme heat and extreme cold could seriously damage wildlife and plants, trees, crops, etc.
Economic Conditions	Impacts to the economy will be dependent on how extreme the temperatures get, but only in the sense of whether people will venture out to spend money. Utility bills could increase causing more financial hardship.
Public Confidence in the Jurisdiction's Governance	Confidence will be dependent on how well utilities hold up as they are stretched to provide heat and cool air, depending on the extreme. Planning and response could be challenged.

4.13 – Flood

Floods are most common in seasons of rain and thunderstorms. Floods that threaten Kansas Region D can be generally classified under two categories:

- **Flash Flood:** The product of heavy, localized precipitation in a short time period over a given location
- **Riverine Flood:** Occurs when precipitation over a given river basin for a long period of time causes the overflow of rivers, streams, lakes and drains

4.13.1 – Location and Extent

Flash Flooding

The NWS provides the following definitions of warnings for actual and potential flood conditions for Flash Floods:

- **Flash Flood Watch**: Issued to indicate current or developing hydrologic conditions that are favorable for flash flooding in and close to the watch area, but the occurrence is neither certain or imminent.
- **Flash Flood Warning**: Issued to inform the public, emergency management and other cooperating agencies that flash flooding is in progress, imminent, or highly likely.
- **Flash Flood Statement**: In hydrologic terms, a statement by the NWS which provides follow-up information on flash flood watches and warnings.

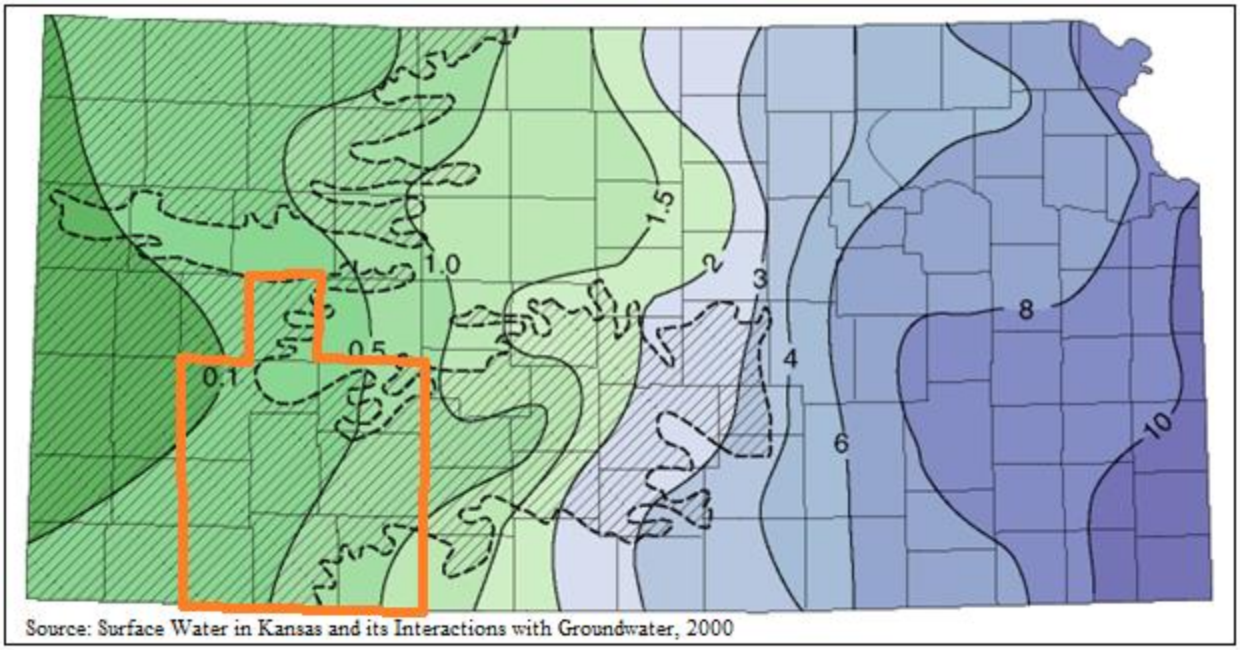
In general, flash flooding occurs in those locations in the planning area that are low-lying and/or do not have adequate drainage. Data from University of Kansas indicates that the average annual precipitation for Kansas Region D counties for 2013 - 2018 (the latest available data):

- Clark County: 30.0 inches
- Finney County: 26.0 inches
- Ford County: 18.6 inches
- Gray County: 29.8 inches
- Haskell County: 25.7 inches
- Hodgeman County: 28.4 inches
- Lane County: 27.7 inches
- Meade County: 30.5 inches
- Seward County: 27.7 inches

This equates to a regional average of 27.2 inches of precipitation for the six-year period 2013 - 2018.

The following map illustrates the distribution of water runoff in Kansas. Surface runoff is water from rain or snowmelt that flows on the surface and does not percolate into the subsurface. In general, the higher the surface runoff, the higher the potential for flash flooding.

Kansas Region D Average Annual Runoff, In Inches



Riverine Flooding

In general, riverine flooding occurs from the overflow of rivers, streams, drains, and lakes due to excessive rainfall. The NWS provides the following definitions of warnings for actual and potential flood conditions for riverine flooding:

- **Flood Potential Outlook:** In hydrologic terms, a NWS outlook that is issued to alert the public of potentially heavy rainfall that could send rivers and streams into flood or aggravate an existing flood.
- **Flood Watch:** Issued to inform the public and cooperating agencies that current and developing hydro meteorological conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent.
- **Flood Warning:** In hydrologic terms, a release by the NWS to inform the public of flooding along larger streams in which there is a serious threat to life or property. A flood warning will usually contain river stage (level) forecasts.
- **Flood Statement:** In hydrologic terms, a statement issued by the NWS to inform the public of flooding along major streams in which there is not a serious threat to life or property. It may also follow a flood warning to give later information.

All areas of Kansas Region D located near a stream or river are at risk of riverine flooding. While riverine floods can and do occur at various levels, the one percent annual chance flood has been chosen as the basis for this risk assessment. This level is the accepted standard for flood insurance and regulatory purposes.

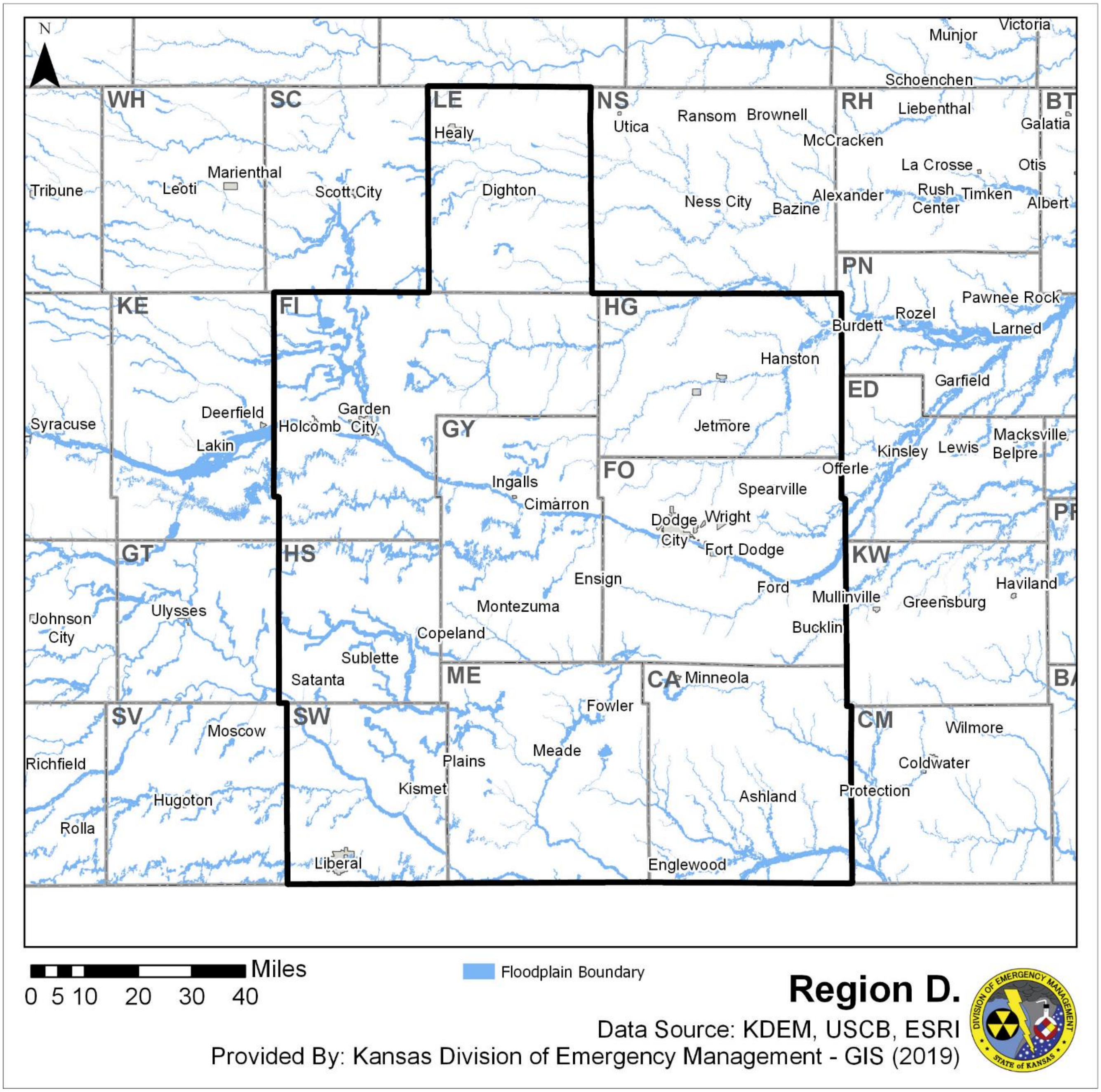
Flood probability can be expressed by recurrence interval, the average period of time for a flood that equals or exceeds a given magnitude, expressed as a period of years. The probability of occurrence of a given flood can also be expressed as the odds of recurrence of one or more similar or bigger floods in a certain number of years. Large, catastrophic floods have a very low frequency or probability of occurrence, whereas smaller floods occur more often. The larger the number of years in a recurrence interval, the smaller the chances of experiencing that flood in a year. However, the odds are never zero, even very large, uncommon floods always have a very small chance of recurring every year. When reviewing flood probability, it is important to note that once a flood occurs its chance of recurring the next year remains the same.

Table 4.61: Flood Recurrence Interval Probability

Recurrence Interval, in Years	Probability of Occurrence in Any Given Year	Percent Chance of Occurrence in Any Given Year
100	1 in 100	1
50	1 in 50	2
25	1 in 25	4
10	1 in 10	10
5	1 in 5	20
2	1 in 2	50

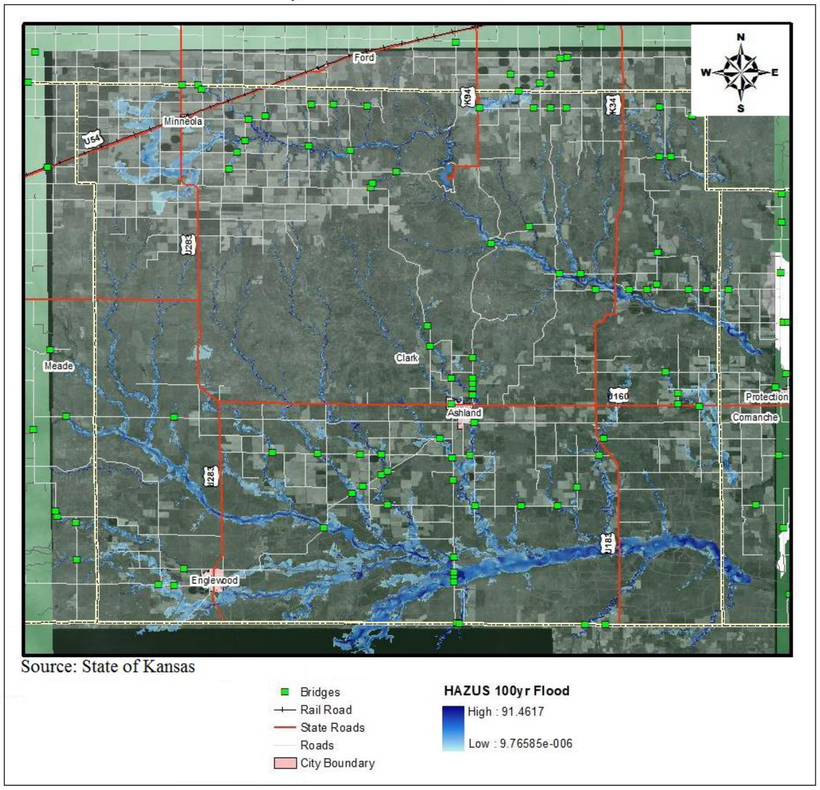
Source: FEMA

The following map, generated by KDEM using available data, depicts regional one percent annual flood areas.



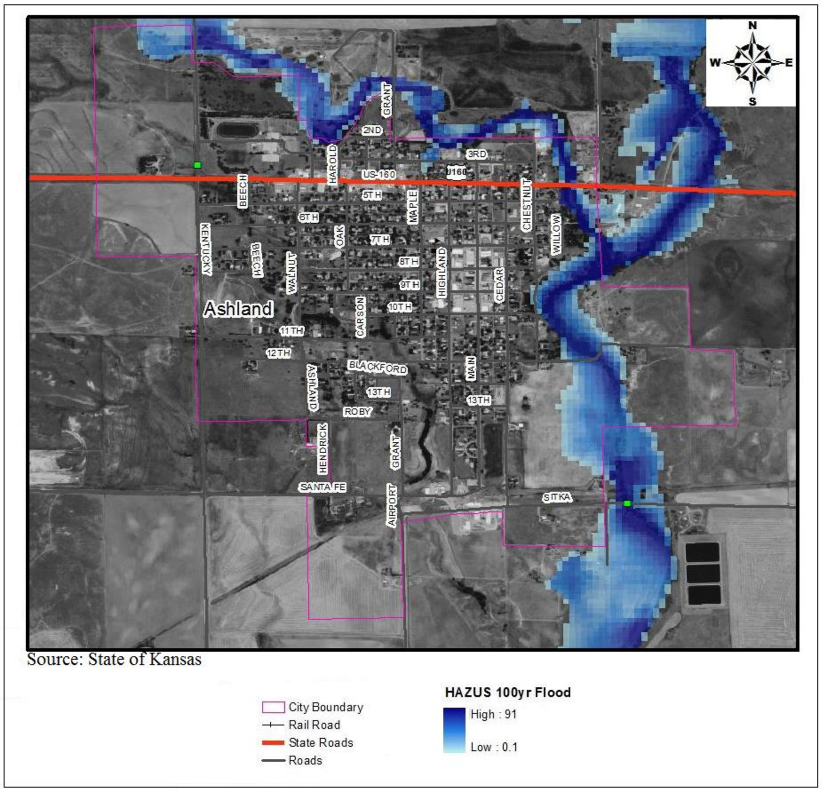
Please note that at the time of this plan not all countries were fully mapped. If available, other relevant maps indicating potential flooding zones have been included.

Clark County HAZUS 100 Year Flood Zone



Source: State of Kansas

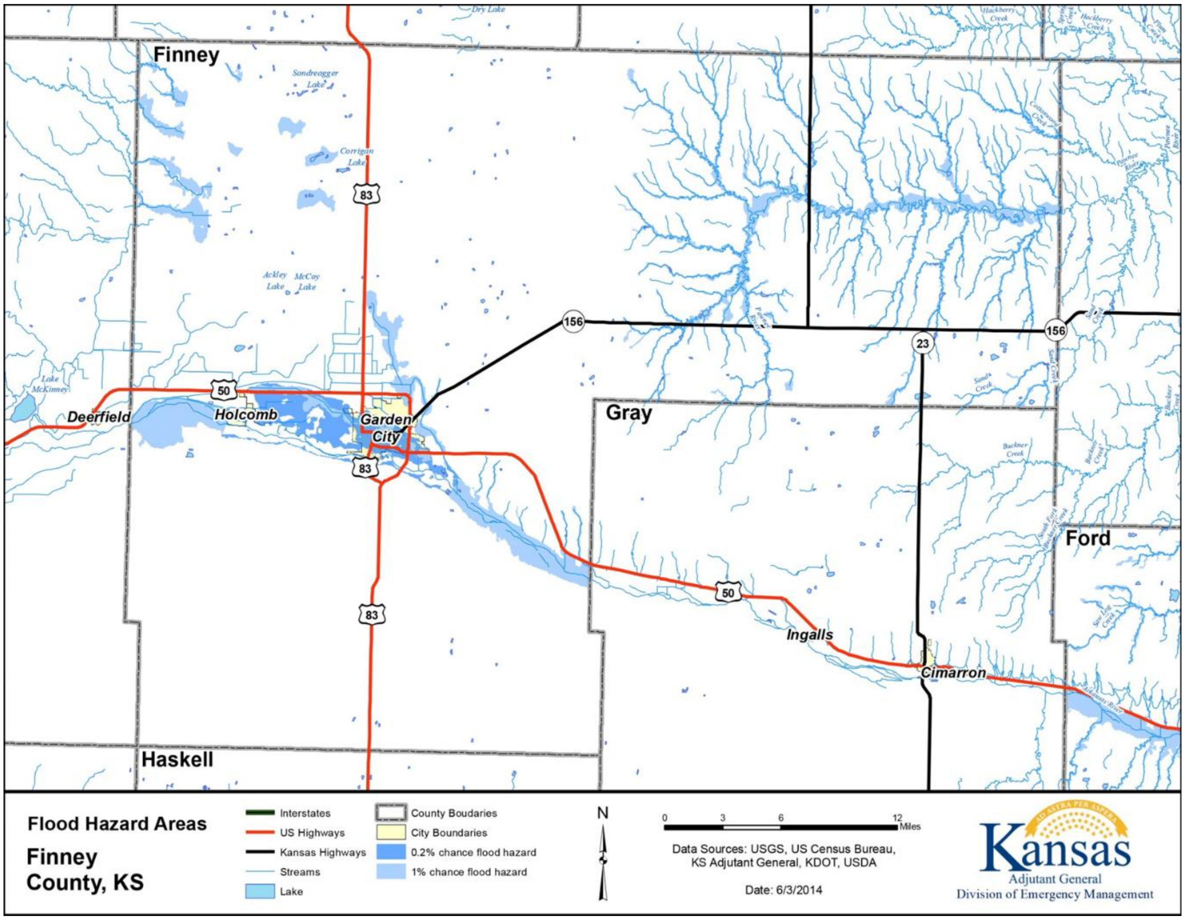
Ashland HAZUS 100 Year Flood Zone

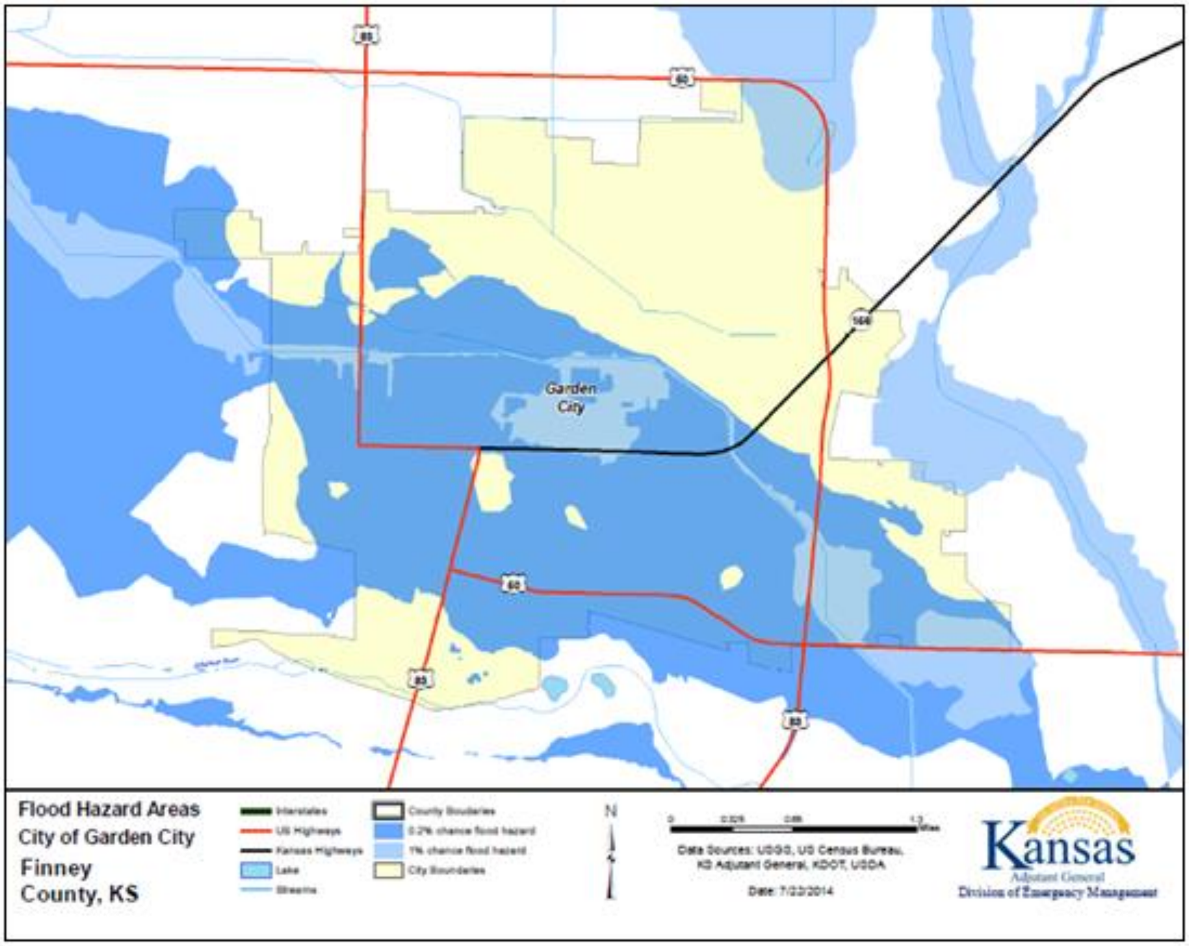


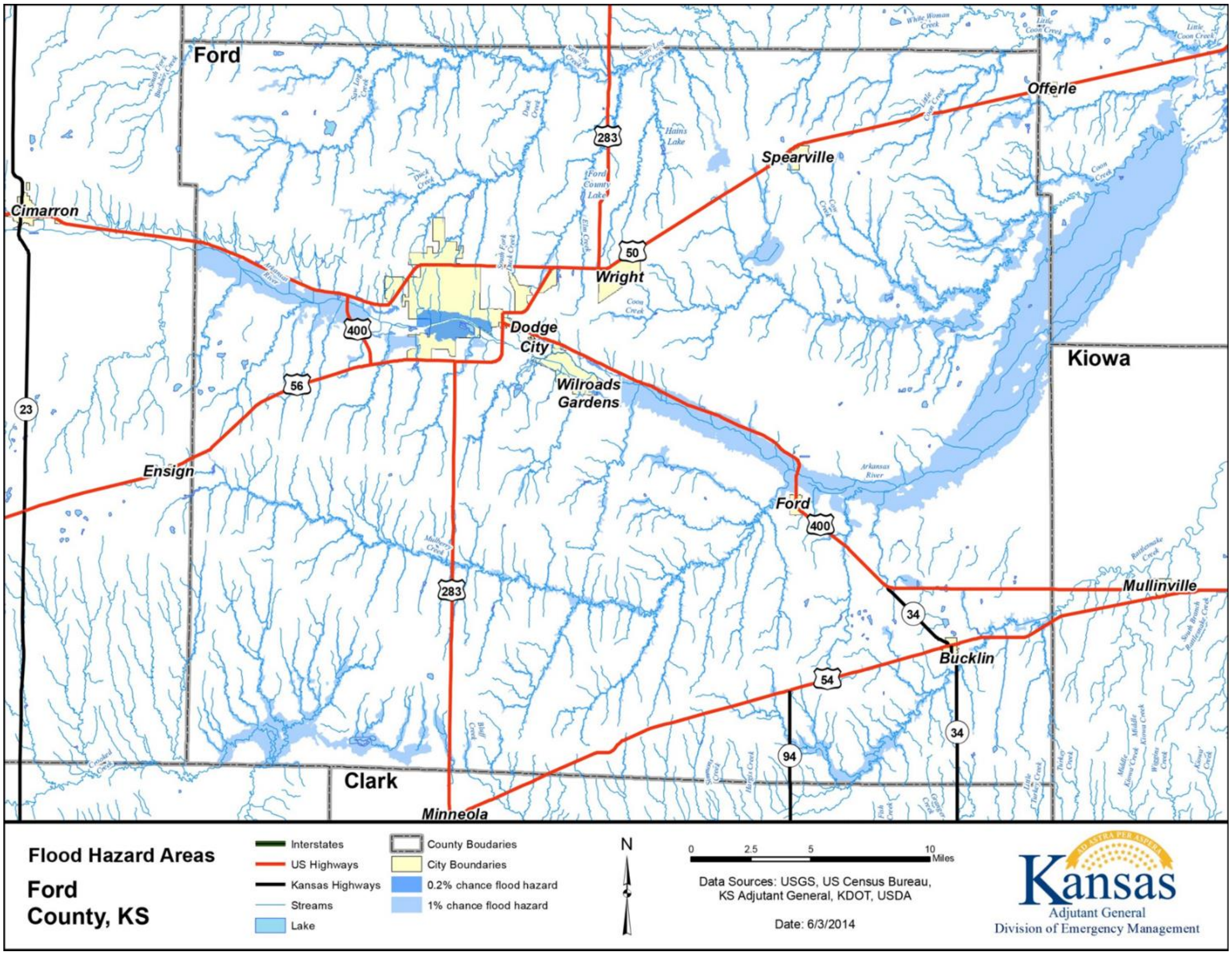
Source: State of Kansas

Minneola HAZUS 100 Year Flood Zone

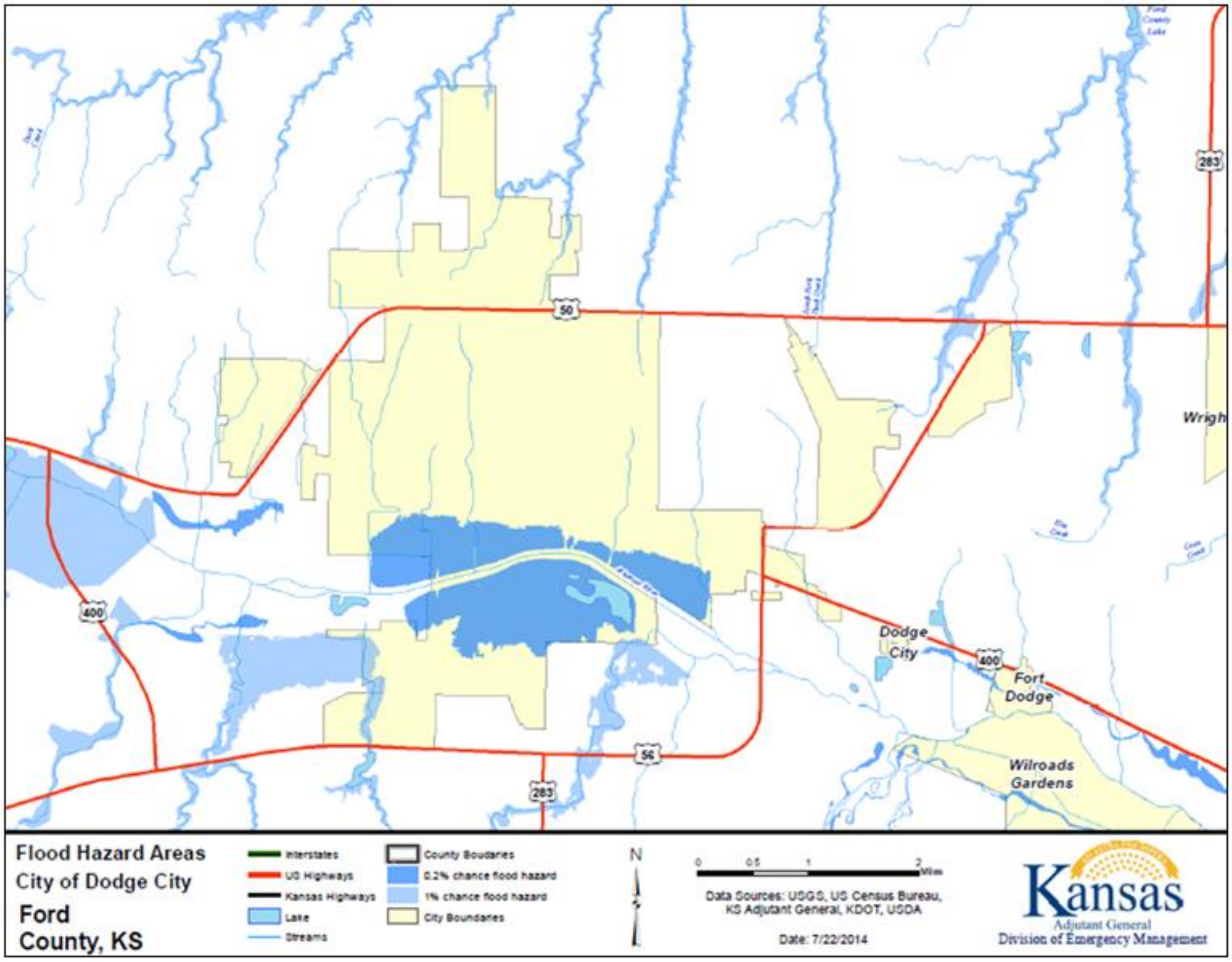
Source: State of Kansas


Finney
Gray
Ford
Haskell
Deerfield
Holcomb
Garden City
Ingalls
Cimarron
50
83
156
23
Flood Hazard Areas
Finney County, KS
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries
0.2% chance flood hazard
1% chance flood hazard
N
0 3 6 12 Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 6/3/2014
Kansas
Adjutant General
Division of Emergency Management


Garden City
Flood Hazard Areas
City of Garden City
Finney
County, KS
Interstates
US Highways
Kansas Highways
Lake
Streams
County Bouderies
0.2% chance flood hazard
1% chance flood hazard
City Boundaries
N
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 7/23/2014
Kansas
Adjutant General
Division of Emergency Management

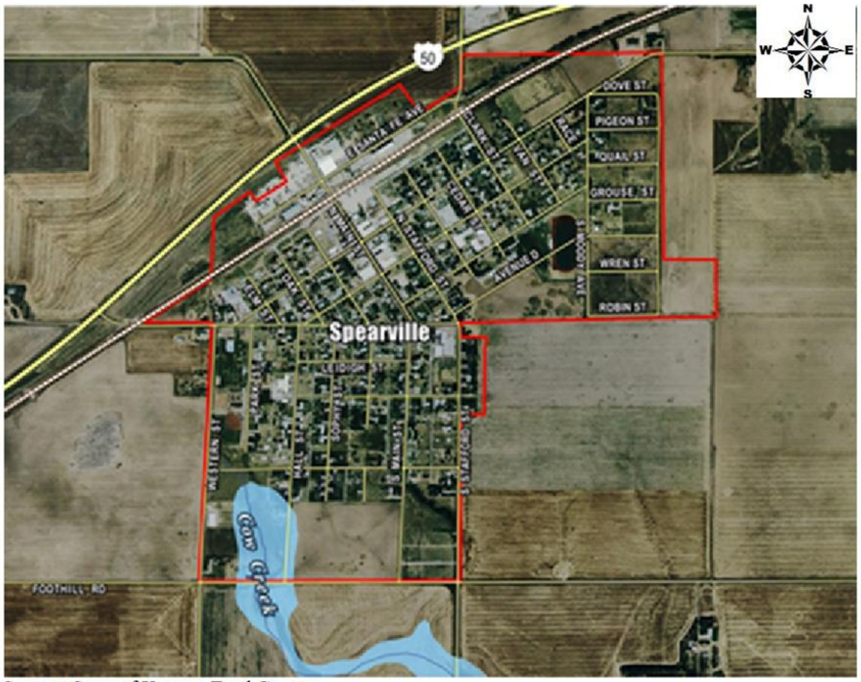


Ford
Kiowa
Clark
Cimarron
Offerle
Spearville
Wright
Dodge City
Wilroads Gardens
Ensign
Ford
Mullinville
Bucklin
Minneola
Flood Hazard Areas
Ford County, KS
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries
0.2% chance flood hazard
1% chance flood hazard
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 6/3/2014
Kansas
Adjutant General
Division of Emergency Management



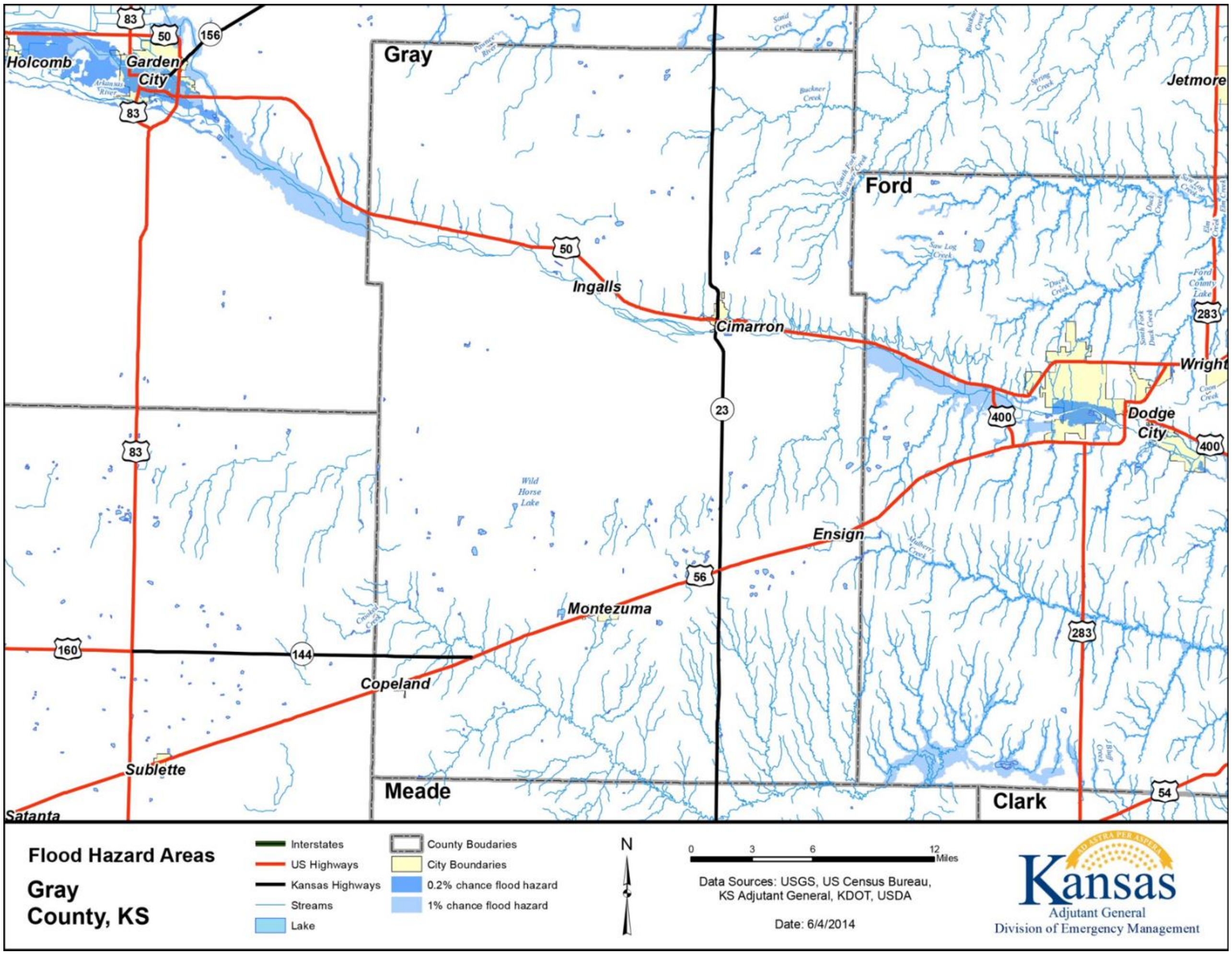
Flood Hazard Areas
City of Dodge City
Ford
County, KS
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
0.2% chance flood hazard
1% chance flood hazard
City Boundaries
N
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 7/22/2014
Kansas
Adjutant General
Division of Emergency Management
Dodge City
Fort Dodge
Wilroads Gardens
Wrigh
50
56
283
400

FEMA Special Hazard Flood Areas, Sprearville, Ford County



Source: State of Kansas, Ford County

City Limit
Stream/Drainage
Levee
Zone A
Zone AE
Floodway in Zone AE
US Highway
State Highway
City/County Road
Railroad



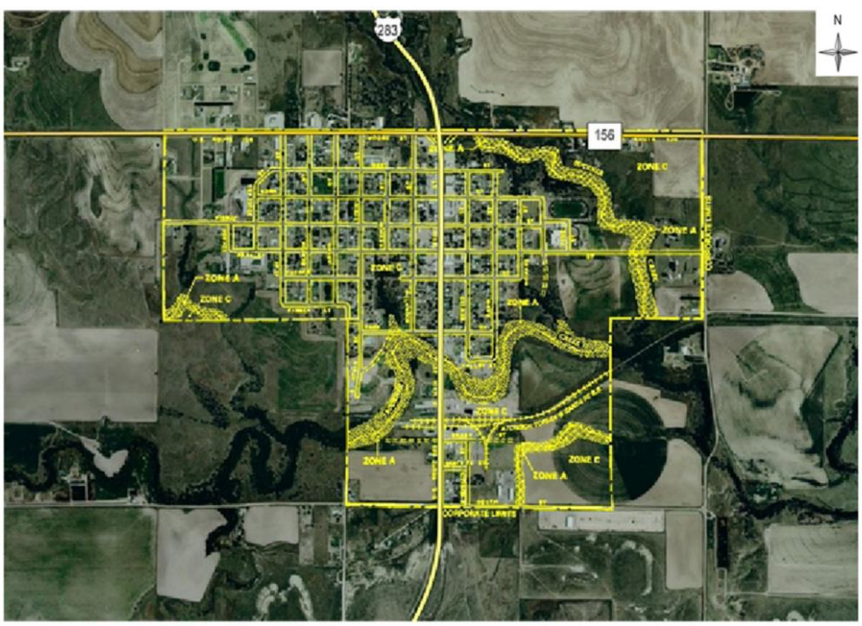
Flood Hazard Areas
Gray
County, KS
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries
0.2% chance flood hazard
1% chance flood hazard
N
0 3 6 12 Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 6/4/2014
Kansas
Adjutant General
Division of Emergency Management
Gray
Ford
Meade
Clark
Holcomb
Garden City
Jetmore
Ingalls
Cimarron
Wright
Dodge City
Ensign
Montezuma
Copeland
Sublette
Satanta

FEMA FIRM, Cimarron, Gray County

Source: State of Kansas

Special Flood Hazard Area

FEMA FIRM, Jetmore, Hodegman County



Source: State of Kansas

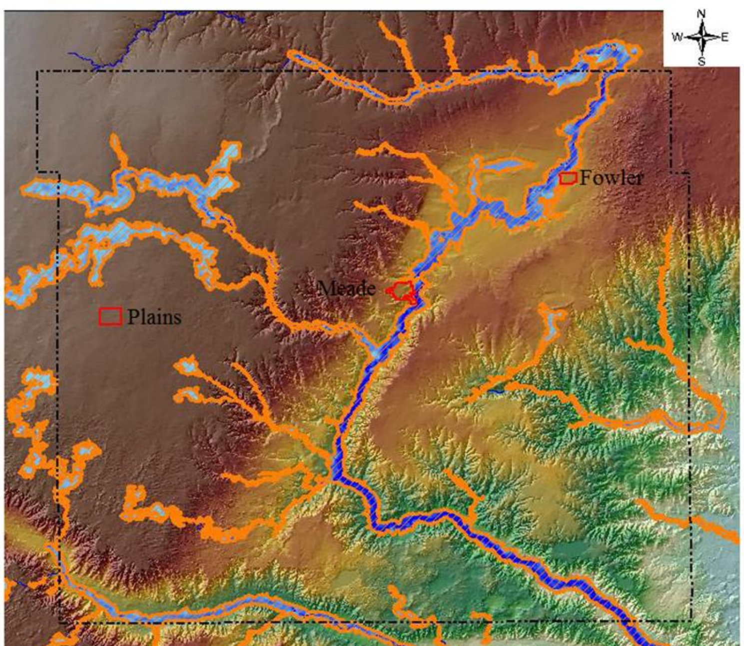
Special Flood Hazard Area

FEMA FIRM, Hanston, Hodegman County

Source: State of Kansas

Special Flood Hazard Area

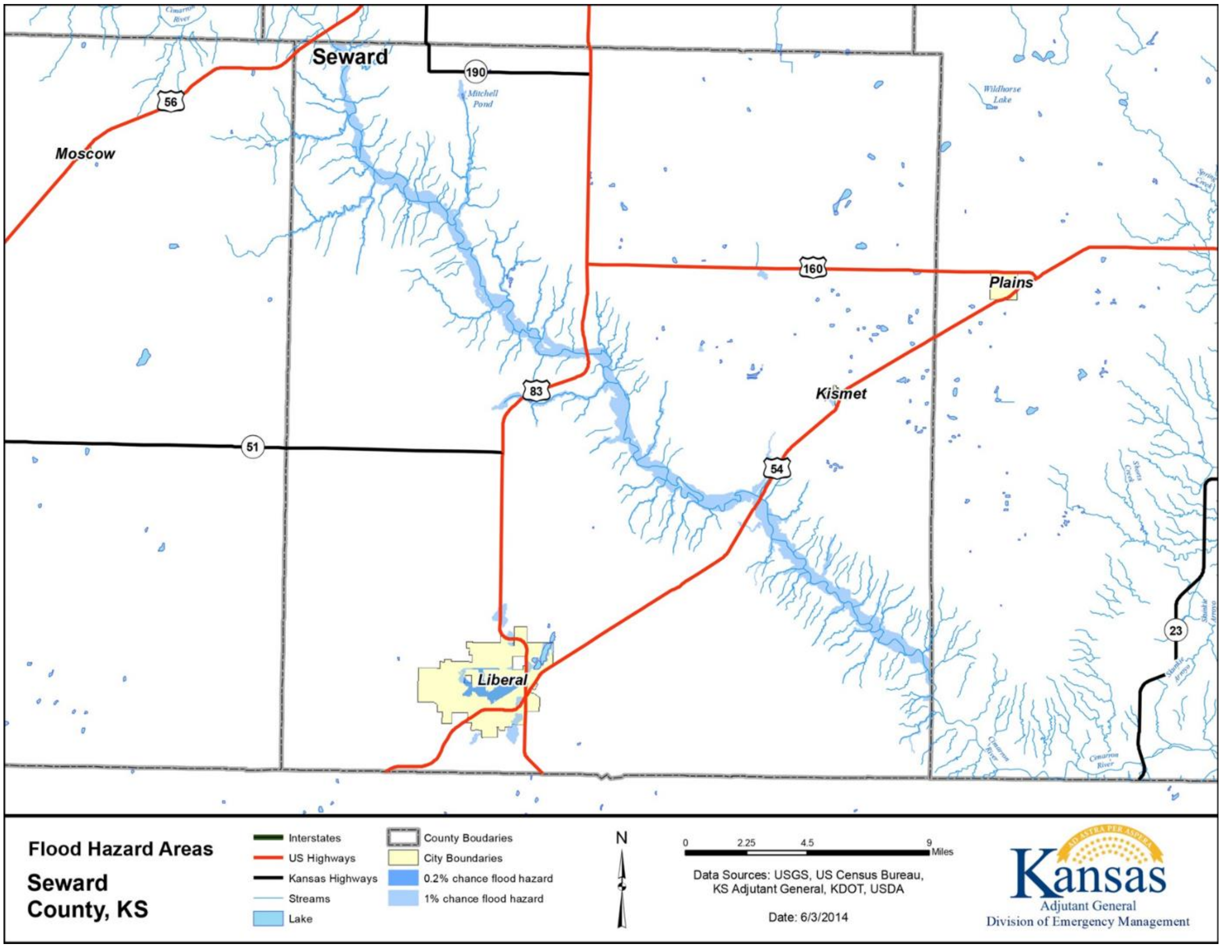
Meade County HAZUS 100 Year Flood Depth

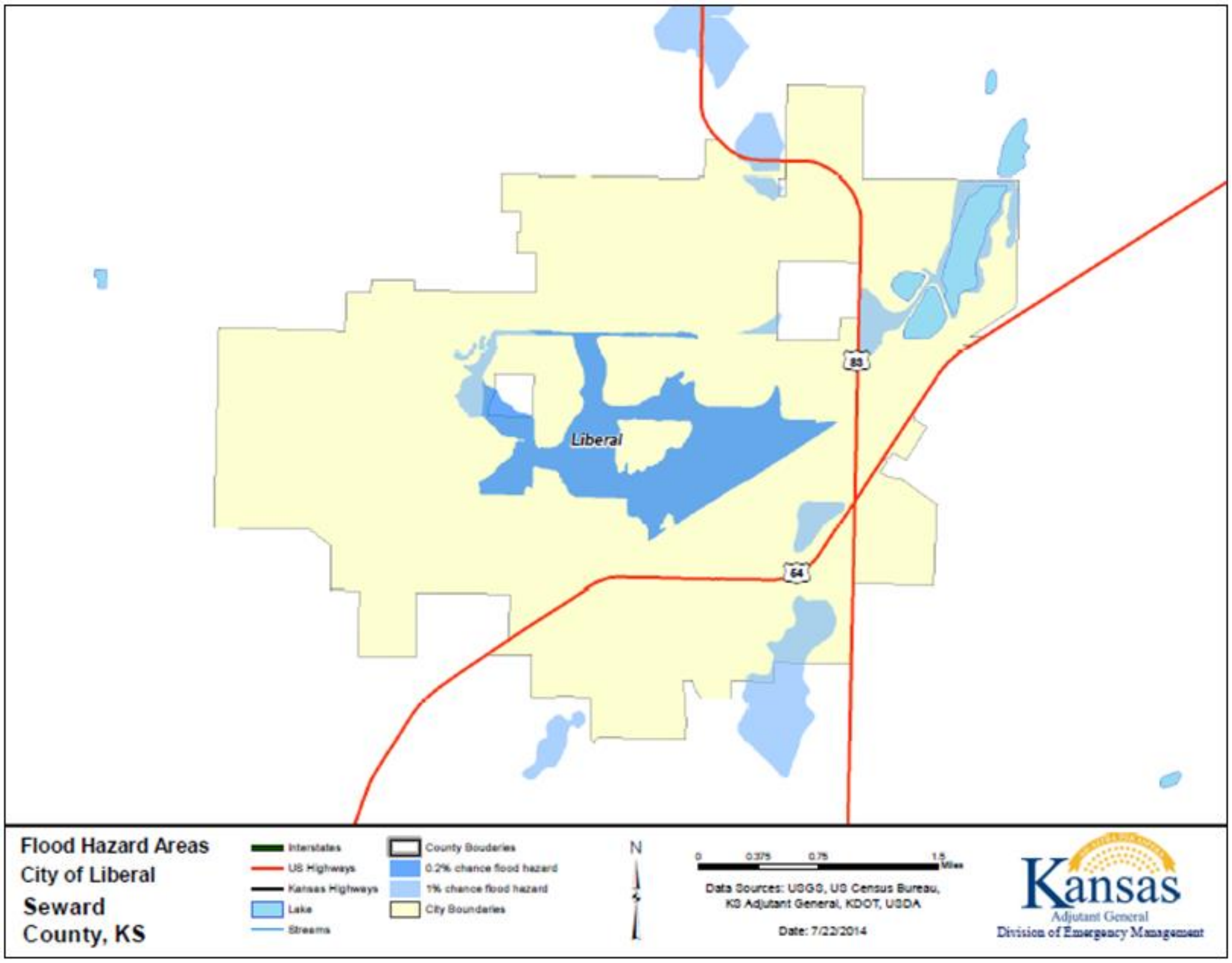


Source: State of Kansas, Meade County

Incorporated Area
100 Year Floodplain

Flood Depth
High: 53.1101
Low: 9.76655 e-006


Seward
Moscow
Mitchell Pond
Wildhorse Lake
Plains
Kismet
Liberal
56
190
160
83
51
54
23
Flood Hazard Areas
Seward County, KS
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries
0.2% chance flood hazard
1% chance flood hazard
N
0 2.25 4.5 9 Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 6/3/2014
Kansas
Adjutant General
Division of Emergency Management



Local Concerns

The following detail specific local concerns as related to flooding:

- In Finney County, Garden City has two flood zones, a Zone AE located in the southwest portion of that includes some developed areas and a Zone X along the southern portion of the city that includes developed areas. The City of Holcomb has four areas designated Zone AE located on the southern boundaries of the city along the Arkansas River.
- In Ford County, Dodge City has a SFHA present in the southern part of the city in proximity to the Arkansas River. A levee is present in this area, which is identified as Zone X - Protected by Levee, however small areas inside the levee are designated as Floodway - Zone AE. Additional SFHA areas are located in the northern portion of the city, primarily in areas located along un-named creeks or tributaries. These areas appear to encompass small areas of both developed and undeveloped land. The City of Spearville has a SFHA located in the southwest corner of the city, in the area of Cow Creek which includes a small developed area.
- In Gray County, the City of Cimarron has one flood hazard area, divided into Zones X and AE, located in the southern portion of the town in close proximity to the Arkansas River and including some developed areas. The City of Ensign has one flood hazard area designated as Zone A located in the southwest portion of the town in an area with no major development.

- In Hodgeman County, the City of Jetmore has two Zone As, one following Buckner Creek around the city touching the north, east, south, and west boundaries of the corporate limits, the other in the southeast corner city. Both flood zones appear to contact developed areas. The City of Hanston has two Zone As, one crossing the north end of the city and the other following the Buckner River across the southern edges of the corporate limits. Both flood zones appear to contact developed areas of the city.
- In Meade County, the City of Plains has experienced flash flooding during periods of severe rainfall.
- In Seward County, the City of Kismet has one flood zone, identified as Zone AE, which lies in the north-central portion of the city and covers approximately two square developed city blocks. There are three SFHAs, with two on the southern limits of the city in relatively undeveloped areas, and one in the northern portion of the city that appears to cover some developed area. The majority of the properties located within the city limits of Liberal are identified as within Flood Zone A.

Many local jurisdictions are subject to areas of repeat flooding. In an effort to identify these areas the KDA, in conjunction with the USACE Silver Jackets, has created a mapping system under the Recurring Flood Identification Project. This system allows for the local mapping of known flood areas within regional jurisdictions. Three classifications of flooding areas are used, minimal moderate and severe. A review of the mapping system indicates no recorded repeat flood areas within the region.

4.13.2 – Previous Occurrences

In the 20-year period from 2000 to present, there have been nine Presidential Disaster Declarations for Kansas Region D for floods (along with other associates hazard events such as tornados or severe storms). The following 20-year information (with 2000 and 2019 being full data years) on past declared disasters is presented to provide a historical perspective on flood events that have impacted Kansas Region D. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2015.

Table 4.62: Kansas Region D FEMA Flood Disaster and Emergency Declarations, 2000 - 2019

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4449	06/20/2019 (04/28/2019 – 07/12/2019)	Severe Storms, Straight-Line Winds, Tornados, Flooding, Landslides, and Mudslides	Clark, Ford, Hodgeman, Gray, Meade	$1,087,913
4319	06/16/2017 (04/28/2017 – 05/03/2017)	Severe Winter Storm, Snowstorm, Straight-line Winds, Flooding	Finney, Haskell, Lane, and Seward	$53,126,486
4230	07/20/2015 (05/04/2015 – 06/21/2015)	Severe Storms, Tornados, Straight-line Winds, and Flooding	Gray, Haskell, and Hodgeman	$13,848,325
4150	10/22/2013 (07/22/2013 – 08/15/2013)	Severe Storms, Straight-line Winds, Tornados, and Flooding	Clark, Ford, Hodgeman, Lane, and Meade	$11,412,827

Table 4.62: Kansas Region D FEMA Flood Disaster and Emergency Declarations, 2000 - 2019

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4063	05/24/2012 (4/14-4/15/2012)	Severe Storms, Tornados, Straight-line Winds and Flooding	Hodgeman	$6,923,919
1849	06/25/2009 (4/25-5/16/2009)	Severe Storms, Flooding, Straight-line Winds, and Tornados	Finney	$15,013,488
1776	07/09/2008	Severe Storms, Flooding, and Tornados	Clark, Haskell, Hodgeman, Lane, and Seward	$70,629,544
1579	2/8/2005 (1/4-6/2005)	Severe Winter Storm, Heavy Rains, and Flooding	Clark	$106,873,672
1462	5/6/2003 (5/4-30/2003)	Severe Storms, Tornados, and Flooding	Haskell, Meade, and Seward	$988,056

Source: FEMA

The following provides details concerning Presidential Disaster Declarations DR 4449 and DR 4319 for Kansas Region D.

Kansas –Severe Storms, Straight-line Winds, Tornados, Flooding, Landslides, and Mudslides FEMA-4449-DR
Declared June 20, 2019

On June 7, 2019, Governor Laura Kelly requested a major disaster declaration due to severe storms, straight-line winds, tornadoes, flooding, landslides, and mudslides beginning on April 28, 2019, and continuing. The Governor requested a declaration for Public Assistance for 63 counties and Hazard Mitigation statewide. Beginning on May 20, 2019, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested areas and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On June 20, 2019, President Trump declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe storms, straight-line winds, tornadoes, flooding, landslides, and mudslides in Allen, Anderson, Atchison, Barber, Barton, Butler, Chase, Chautauqua, Cherokee, Clark, Clay, Cloud, Coffey, Cowley, Doniphan, Elk, Ellsworth, Franklin, Geary, Greenwood, Harper, Harvey, Hodgeman, Jefferson, Kingman, Leavenworth, Lincoln, Linn, Lyon, Marion, Marshall, McPherson, Meade, Montgomery, Morris, Nemaha, Neosho, Osage, Ottawa, Pawnee, Phillips, Pottawatomie, Pratt, Reno, Rice, Rush, Russell, Saline, Sumner, Wabaunsee, Washington, Wilson, and Woodson Counties. This declaration also made Hazard Mitigation Grant Program assistance requested by the Governor available for hazard mitigation measures statewide.

Kansas – Severe Winter Storm, Snowstorm, Straight-Line Winds, and Flooding FEMA-4319-DR
Declared June 16, 2017

On May 31, 2017, Governor Sam Brownback requested a major disaster declaration due to a severe winter storm, snowstorm, straight-line winds, and flooding during the period of April 28 to May 3, 2017. The Governor requested a declaration for Public Assistance for 29 counties, snow assistance for 9 counties, and Hazard Mitigation statewide. During the period of May 8-21, 2017, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested counties and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On June 16, 2017, President Trump declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe winter storm, snowstorm, straight-line winds, and flooding in Cherokee, Cheyenne, Crawford, Decatur, Finney, Gove, Graham, Clark, Finney, Ford, Haskell, Gray, Lane, Logan, Haskell, Neosho, Norton, Rawlins, Hodgeman, Seward, Sheridan, Sherman, Lane, Meade, Thomas, Wallace, and Seward Counties. This declaration also authorized snow assistance for a period of 48 hours for Finney, Ford, Lane, Logan, Haskell, Hodgeman, Thomas, and Wallace Counties. Finally, this declaration made Hazard Mitigation Clark Program assistance requested by the Governor available for hazard mitigation measures statewide.

In addition to the above reported events, the following table presents NOAA NCEI identified flood events and the resulting damage totals in Kansas Region D for the period 2010 - 2019 (with 2010 and 2019 being full data set years).

Table 4.63: Kansas Region D NCEI Flood and Flash Flood Events, 2010 - 2019

County	Event Type	Number of Days with Events	Property Damage	Deaths	Injuries
Clark	Flood	1	$0	0	0
	Flash Flood	2	$0	0	0
Finney	Flood	2	$0	0	0
	Flash Flood	3	$0	0	0
Ford	Flood	5	$5,000	0	0
	Flash Flood	6	$0	0	0
Gray	Flood	1	$0	0	0
	Flash Flood	3	$0	0	0
Haskell	Flood	1	$0	0	0

Table 4.63: Kansas Region D NCEI Flood and Flash Flood Events, 2010 - 2019

County	Event Type	Number of Days with Events	Property Damage	Deaths	Injuries
	Flash Flood	2	$500,000	0	0
Hodgeman	Flood	3	$0	0	0
	Flash Flood	3	$3,000,000	0	0
Lane	Flood	3	$0	0	0
	Flash Flood	0	$0	0	0
Meade	Flood	1	$0	0	0
	Flash Flood	5	$1,000,000	0	0
Seward	Flood	2	$0	0	0
	Flash Flood	1	$0	0	0

Source: FEMA

The following provides both **local accounts** and NOAA NCEI descriptions of notable recorded events:

- **May 5, 2019: Fowler, Meade County**
  Rainfall of nearly 10 inches caused very severe flash flooding. Water came across highway 23 and washed an old concrete truck full of concrete across the highway and into an adjacent draw about 400 yards away. The drum of concrete had been there for decades. Also, water washed out a bridge and a resident of nearly 90 years had never seen so much water. The majority of the rain fell in a three-hour period. Property damage was recorded at $1,000,000.

- **May 27, 2015: Sublette, Haskell County**
  Several county roads were washed out by flash flooding. Property damage was recorded at $500,000.

- **May 27, 2015: Jetmore, Hodgeman County**
  Several county roads were washed out by flash flooding. Property damage was recorded at $3,000,000.

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of flooding on the region's agricultural base. Crop loss data for the years 2010 - 2019 (with 2010 and 2019 being full data years), for the region, indicates 11 flooding related claims on 630 acres for $870,598.

Table 4.64: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Flooding

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Clark	0	0	0
Finney	0	0	$0
Ford	2	227	$28,314
Gray	2	49	$5,274
Haskell	2	51	$5,099
Hodgeman	2	123	$15,964
Lane	2	163	$15,367
Meade	1	17	$580

Table 4.64: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Flooding

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Seward	0	0	0

Source: USDA Farm Service Agency

4.13.3 – Hazard Probability Analysis

The following table summarizes riverine flood probability data for **Clark County**.

Table 4.65: Clark County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	1
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Clark County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Clark County**.

Table 4.66: Clark County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	2
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Clark County can expect on a yearly basis, relevant to flash flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Clark County**

Table 4.67: Clark County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: USDA

According to the USDA Risk Management Agency, Clark County can expect on a yearly basis, relevant to flooding occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes riverine flood probability data for **Finney County**.

Table 4.68: Finney County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	2
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Finney County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Finney County**.

Table 4.69: Finney County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	3
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Finney County can expect on a yearly basis, relevant to flash flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Finney County**

Table 4.70: Finney County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: USDA

According to the USDA Risk Management Agency, Finney County can expect on a yearly basis, relevant to flooding occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes riverine flood probability data for **Ford County**.

Table 4.71: Ford County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	5
Average Events per Year	1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$5,000
Average Property Damage per Year	$500

Source: NCEI

Data from the NCEI indicates that County can expect on a yearly basis, relevant to riverine flood events:

- One event
- No deaths or injuries
- $500 in property damages

The following table summarizes flash flood probability data for **Ford County**.

Table 4.72: Ford County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	6
Average Events per Year	1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Ford County can expect on a yearly basis, relevant to flash flood events:

- One event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Ford County**

Table 4.73: Ford County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	2
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	227
Average Number of Acres Damaged per Year	23
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$28,314
Average Crop Damage per Year	$2,831

Source: USDA

According to the USDA Risk Management Agency, Ford County can expect on a yearly basis, relevant to flooding occurrences:

- <1 insurance claims
- 23 acres impacted
- $2,831 in insurance claims

The following table summarizes riverine flood probability data for **Gray County**.

Table 4.74: Gray County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	1
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0

Table 4.74: Gray County Riverine Flood Probability Summary

Data	Recorded Impact
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Gray County**.

Table 4.75: Gray County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	3
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Gray County can expect on a yearly basis, relevant to flash flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Gray County**

Table 4.76: Gray County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	2
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	49
Average Number of Acres Damaged per Year	5
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$5,274
Average Crop Damage per Year	$527

Source: USDA

According to the USDA Risk Management Agency, Gray County can expect on a yearly basis, relevant to flooding occurrences:

- <1 insurance claim
- Five acres impacted

- $527 in insurance claims

The following table summarizes riverine flood probability data for **Haskell County**.

Table 4.77: Haskell County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	1
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Haskell County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Haskell County**.

Table 4.78: Haskell County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	2
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$500,000
Average Property Damage per Year	$50,000

Source: NCEI

Data from the NCEI indicates that Haskell County can expect on a yearly basis, relevant to flash flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Haskell County**

Table 4.79: Haskell County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	2
Average Number of Claims per Year	<1

Table 4.79: Haskell County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	51
Average Number of Acres Damaged per Year	5
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$5,099
Average Crop Damage per Year	$510

Source: USDA

According to the USDA Risk Management Agency, Haskell County can expect on a yearly basis, relevant to flooding occurrences:

- <1 insurance claims
- Five acres impacted
- $510 in insurance claims

The following table summarizes riverine flood probability data for **Hodgeman County**.

Table 4.80: Hodgeman County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	3
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Hodgeman County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Hodgeman County**.

Table 4.81: Hodgeman County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	3
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$3,000,000
Average Property Damage per Year	$300,000

Source: NCEI

Data from the NCEI indicates that Hodgeman County can expect on a yearly basis, relevant to flash flood events:

- <1 events
- No deaths or injuries
- $300,000 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Hodgeman County**

Table 4.82: Hodgeman County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	2
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	123
Average Number of Acres Damaged per Year	12
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$15,964
Average Crop Damage per Year	$1,596

Source: USDA

According to the USDA Risk Management Agency, Hodgeman County can expect on a yearly basis, relevant to flooding occurrences:

- <1 insurance claims
- 12 acres impacted
- $1,596 in insurance claims

The following table summarizes riverine flood probability data for **Lane County**.

Table 4.83: Lane County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	3
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Lane County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Lane County**.

Table 4.84: Lane County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	0
Average Events per Year	0
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Lane County can expect on a yearly basis, relevant to flash flood events:

- No events
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Lane County**

Table 4.85: Lane County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	2
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	163
Average Number of Acres Damaged per Year	16
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$15,367
Average Crop Damage per Year	$1,537

Source: USDA

According to the USDA Risk Management Agency, Lane County can expect on a yearly basis, relevant to flooding occurrences:

- <1 insurance claim
- 16 acres impacted
- $1,537 in insurance claims

The following table summarizes riverine flood probability data for **Meade County**.

Table 4.86: Meade County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	1
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Meade County can expect on a yearly basis, relevant to riverine flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Meade County**.

Table 4.87: Meade County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	5
Average Events per Year	1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$1,000,000
Average Property Damage per Year	$100,000

Source: NCEI

Data from the NCEI indicates that Meade County can expect on a yearly basis, relevant to flash flood events:

- One event
- No deaths or injuries
- $100,000 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Meade County**

Table 4.88: Meade County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	1
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	17
Average Number of Acres Damaged per Year	2
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$580
Average Crop Damage per Year	$58

Source: USDA

According to the USDA Risk Management Agency, Meade County can expect on a yearly basis, relevant to flooding occurrences:

- <1 insurance claim
- Two acres impacted
- $58 in insurance claims

The following table summarizes riverine flood probability data for **Seward County**.

Table 4.89: Seward County Riverine Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	2
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Seward County can expect on a yearly basis, relevant to riverine flood events:

- <1 events
- No deaths or injuries
- $0 in property damages

The following table summarizes flash flood probability data for **Seward County**.

Table 4.90: Seward County Flash Flood Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	1
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Days with a Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Seward County can expect on a yearly basis, relevant to flash flood events:

- <1 event
- No deaths or injuries
- $0 in property damages

Data was reviewed from the USDA Risk Management agency to determine vulnerability to flooding. The following table summarizes drought event data for **Seward County**

Table 4.91: Seward County Flooding Agricultural Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0

Table 4.91: Seward County Flooding Agricultural Probability Summary

Data	Recorded Impact
Average Crop Damage per Year	$0

Source: USDA

According to the USDA Risk Management Agency, Seward County can expect on a yearly basis, relevant to flooding occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

In addition, Kansas Region D has had nine Presidentially Declared Disasters relating to flooding (and other causes) in the last 20 years. This represents an average of one declared flood disaster every year.

4.13.4 – Vulnerability Analysis

The results of the HAZUS analysis were utilized to estimate potential losses for riverine flooding. The intent of this analysis was to enable Kansas Region D to estimate where flood losses could occur and the degree of severity using a consistent methodology. The HAZUS model helps quantify risk along known flood-hazard corridors as well as lesser streams and rivers that have a drainage area of 10 square miles or more.

HAZUS determines the displaced population based on the inundation area, not necessarily impacted buildings. As a result, there may be population vulnerable to displacement even if the structure is not vulnerable to damage. Individuals and households will be displaced from their homes even when the home has suffered little or no damage either because they were evacuated or there was no physical access to the property because of flooded roadways.

Flood sheltering needs are based on the displaced population, not the damage level of the structure. HAZUS determines the number of individuals likely to use government-provided short-term shelters through determining the number of displaced households as a result of the flooding. To determine how many of those households and the corresponding number of individuals will seek shelter in government-provided shelters, the number is modified by factors accounting for income and age. Displaced people using shelters will most likely be individuals with lower incomes and those who do not have family or friends within the immediate area. Since the income and age factors are taken into account, the proportion of displaced population and those seeking shelter will vary from county to county.

Additionally, HAZUS takes into account flood depth when modeling damage (based on FEMA's depth-damage functions). Generated reports capture damage by occupancy class (in terms of square footage impacted) by damage percent classes. Occupancy classes include agriculture, commercial, education, government, industrial, religion, and residential. Damage percent classes are grouped by 10 percent increments up to 50%. Buildings that sustain more than 50% damage are considered to be substantially damaged.

The following table provides the HAZUS results for vulnerable populations and the population estimated to seek short term shelter as well as the numbers of damaged and substantially damaged buildings for each Kansas Region D county.

Table 4.92: Kansas Region D HAZUS Flood Scenario Displaced Population Building Damages

County	Population Vulnerable to Displacement	Population with Short Term Shelter Needs	Vulnerable Buildings	Damaged Buildings	Substantially Damaged Buildings
Clark	32	1	62	1	0
Finney	6,173	4,814	2,003	878	1
Ford	3895	3,201	827	376	1
Gray	134	17	75	3	0
Haskell	104	2	131	3	0
Hodgeman	98	2	109	0	0
Lane	229	53	12	35	0
Meade	75	3	46	3	0
Seward	2,604	1,397	1,458	249	0

Source: FEMA and HAZUS

The HAZUS analysis also provides an estimate the repair costs for impacted buildings as well as the associated loss of building contents and business inventory. Building damage can also cause additional losses to a community by restricting a building's ability to function properly. Income loss data accounts for losses such as business interruption and rental income losses as well as the resources associated with damage repair and job and housing losses. These losses are calculated by HAZUS using a methodology based on the building damage estimates.

The damaged building counts generated by HAZUS are susceptible to rounding errors and are likely the weakest output of the model due to the use of census blocks for analysis. Generated reports include this disclaimer: "Unlike the earthquake and hurricane models, the flood model performs its analysis at the census block level. This means that the analysis starts with a small number of buildings within each census block and applies a series of distributions necessary for analyzing the potential damage. The application of these distributions and the small number of buildings make the flood model more sensitive to rounding errors that introduces uncertainty into the building count results." Additionally, losses are not calculated for individual buildings, but instead are based on the performances of entire classes of buildings obtained from the general building stock data. In the flood model, the number of grid cells (pixels) at each flood depth value is divided by the total number of grid cells in the census block. The result is used to weight the flood depths applied to each specific occupancy type in the general building stock. First floor heights are then applied to determine the damage depths to analyze damages and losses.

The following table provides the HAZUS results for building damages and lost income due to these damages.

Table 4.93: Kansas Region D HAZUS Flood Scenario Structural Damage and Income Loss

County	Structural Damage	Contents Damage	Inventory Loss	Total Direct Loss	Total Income Loss	Total Direct and Income Loss
Clark	$352,000	$241,000	$0	$593,000	$2,000	$595,000
Finney	$40,131,000	$50,334,000	$1,699,000	$92,164,000	$988,000	$93,152,000
Ford	$23,011,000	$30,797,000	$1,700,000	$55,508,000	$361,000	$55,869,000
Gray	$1,047,000	$875,000	$37,000	$1,959,000	$82,000	$2,041,000
Haskell	$506,000	$255,000	$0	$761,000	$1,000	$762,000
Hodgeman	$1,201,000	$507,000	$3,000	$1,711,000	$0	$1,711,000
Lane	$1,472,000	$2,683,000	$203,000	$4,358,000	$58,000	$4,416,000
Meade	$1,205,000	$1,072,000	$56,000	$2,333,000	$20,000	$2,353,000
Seward	$7,043,000	$9,235,000	$175,000	$16,453,000	$415,000	$16,868,000

Source: FEMA and HAZUS

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region D County. USDA Risk Management Agency crop loss data for the years 2010 - 2019 (with 2010 and 2019 being full data years) allows us to quantify the monetary impact of flood conditions on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to flood events.

Table 4.94: Flood Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Clark	434,295	0	0.00%	$111,420,000	$0	0.00%
Finney	790,500	0	0.00%	$823,091,000	$0	0.00%
Ford	669,832	23	0.00%	$515,252,000	$2,831	0.00%
Gray	556,070	5	0.00%	$990,653,000	$527	0.00%
Haskell	363,751	5	0.00%	$1,159,098,000	$510	0.00%
Hodgeman	494,925	12	0.00%	$191,891,000	$1,596	0.00%
Lane	417,017	16	0.00%	$266,374,000	$1,537	0.00%
Meade	587,924	2	0.00%	$233,384,000	$58	0.00%
Seward	360,711	0	0.00%	$424,697,000	$0	0.00%

Source: USDA

Flood risk can also change over time because of new building and development, weather patterns and other factors. Although the frequency or severity of impacts cannot be changed, FEMA is working with federal, state, tribal and local partners across the nation to identify flood risk and promote informed planning and development practices to help reduce that risk through the Risk Mapping, Assessment and Planning (Risk MAP) program. Risk MAP uses the watershed boundaries to conduct studies. This watershed approach allows communities to come together to develop partnerships, combine resources, share flood risk information with FEMA, and identify broader opportunities for mitigation action.

The Flood Risk Products and datasets present information that can enhance hazard mitigation planning activities, especially the risk and vulnerability assessment portion of a hazard mitigation plan, and the development of risk-based mitigation strategies. Risk MAP can also help guide land use and development decisions and help you take mitigation action by highlighting areas of highest risk, areas in need of mitigation, and areas of floodplain change.

Mold

Mold is plant-like organism that obtains nourishment it directly from surrounding organic materials. Mold can grow on a variety of materials and thrives in damp environments. As such, a recently flooded home or business provides an ideal environment for mold growth, especially on materials such as drywall and carpeting. The young, old and ill may be specifically susceptible to the effects of mold, with symptoms including:

- congestion
- cough
- breathing difficulties
- sore throat
- membrane irritation
- upper respiratory infections

As such, any instance of flood related mold should be remediated as soon as possible.

4.13.5 – National Flood Insurance Program Communities

The National Flood Insurance Program (NFIP) is a federal program, managed by FEMA, that exists to provide flood insurance for property owners in participating communities, to improve floodplain management practices, and to develop maps of flood hazard areas. The following table presents the number of NFIP participating communities in each county.

Table 4.95: Kansas Region D NFIP Communities

Community	Initial Flood Hazard Boundary Map Identified	Initial Flood Insurance Rate Map Identified	Current Effective Map Date
Clark County			
Ashland	05/17/74		(NSFHA)
Minneola	02/08/74		(NSFHA)
Finney County			
Finney County	02/28/78	09/03/97	09/25/09
Garden City	03/03/73	03/24/71	09/03/97
Holcomb		02/19/92	09/17/97
Ford County			
Ford County	12/6/1977	07/03/86	09/25/09
Bucklin		09/25/09	(NSFHA)
Dodge City	05/19/72	05/19/72	09/25/09
City of Ford	03/26/76	09/25/09	(NSFHA)
Gray County			
Cimarron	05/31/74	09/06/89	09/06/89

Table 4.95: Kansas Region D NFIP Communities

Community	Initial Flood Hazard Boundary Map Identified	Initial Flood Insurance Rate Map Identified	Current Effective Map Date
Copeland	06/17/77		(NSFHA)
Haskell County			
Satanta	06/07/74		(NSFHA)
Hodgeman County			
Hanston	12/27/1974	09/04/85	09/04/85(M)
Lane County			
Lane County	-	-	-
Dighton	-	-	-
Meade County			
Seward County			
Seward County	09/13/77	05/01/99	09/25/09
Kismet	11/22/1974	09/25/09	09/25/09
Liberal	03/01/74	09/28/90	09/25/09

Notes: NSFHA: No Special Flood Hazard Area - All Zone C
(L): Original FIRM by letter - All Zone A, C and X
(M): No elevation determined - All Zone A, C and X

Additionally, the NFIP's Community Rating System (CRS) incentive rewards communities for the work they do managing their floodplains. Eligible communities that qualify for this voluntary program go above the minimum NFIP requirements and can offer their citizens discounted flood insurance in both Special Flood Hazard Areas (SFHAs) areas or non-SFHA areas. Additionally, work already being done by the state of Kansas (e.g., dam safety program and state freeboard requirements) gives communities additional discounts. No Region D communities are currently CRS participants:

Table 4-96: Kansas Region D CRS Participating Jurisdictions

Jurisdiction	County	CRS Entry Date	CRS Class	% Discount for SFHA	% Discount for Non-SFHA	Status
No current participating jurisdictions						

4.13.6 – FEMA Flood Policy and Loss Data

Kansas Region D flood-loss information was pulled from FEMA's "Policy and Loss Data by Community with County and State Data." There are several limitations to this data, including:

- Only losses to participating NFIP communities are represented
- Communities joined the NFIP at various times since 1978
- The number of flood insurance policies in effect may not include all structures at risk to flooding
- Some of the historical loss areas have been mitigated with property buyouts

Some properties are under-insured. The flood insurance purchase requirement is for flood insurance in the amount of federally backed mortgages, not the entire value of the structure. Additionally, contents coverage is not required.

The following table shows the details of NFIP policy and loss statistics for each county in Kansas Region D. Loss statistics include losses through December 31, 2018.

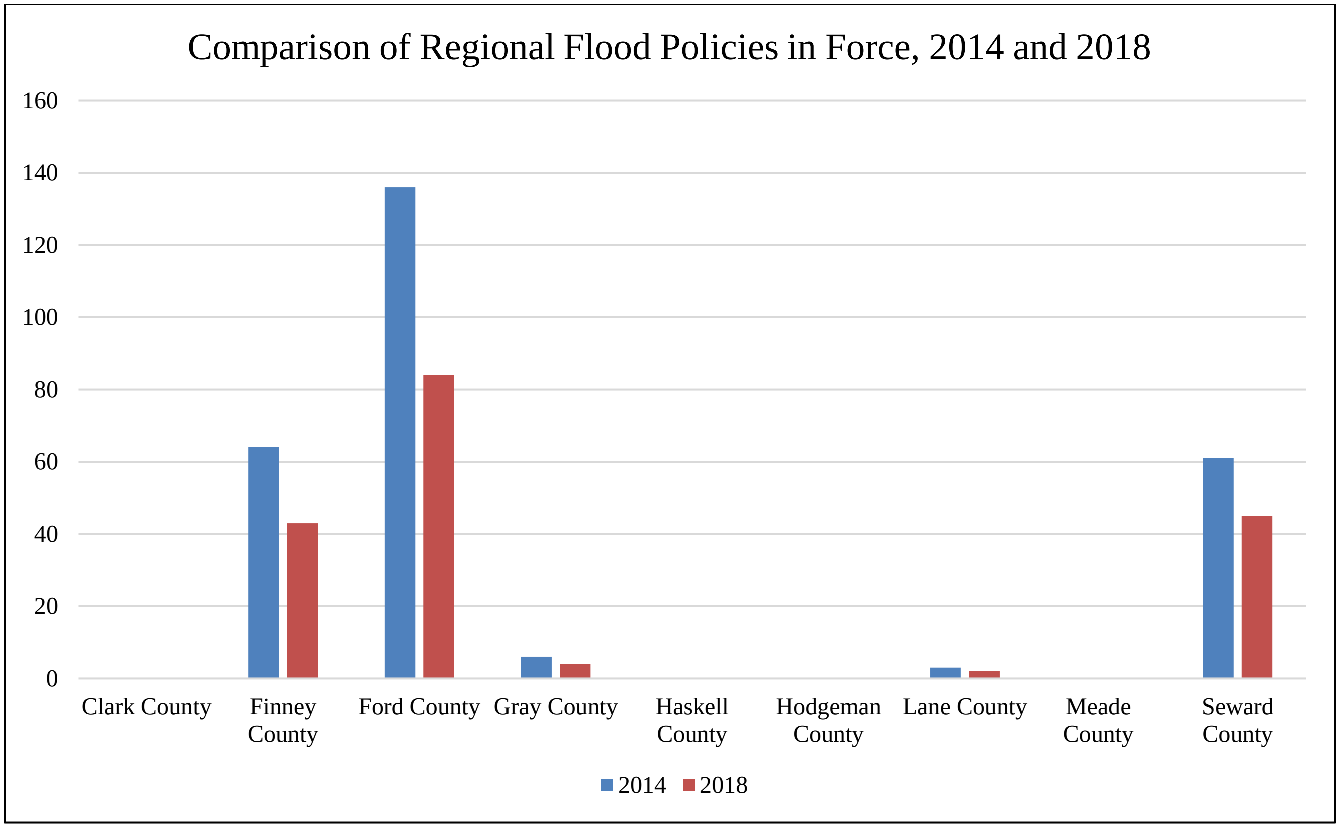
Table 4.97: Kansas Region D NFIP Policy and Loss Statistics, As of December 31. 2018

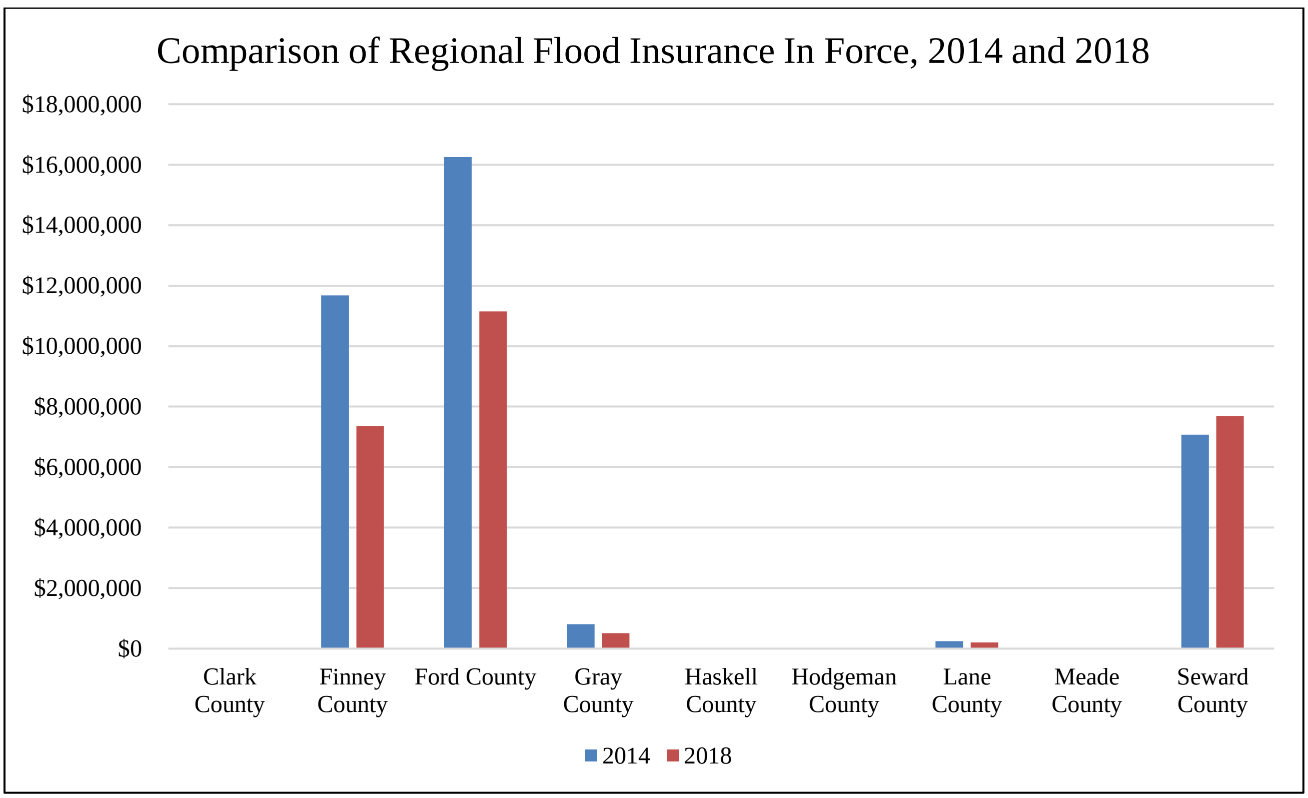
Jurisdiction	Number of Policies in Force	Insurance in Force	Number of Closed Losses	Total Payments
Clark County				
Ashland	0	$0	0	$0
Englewood	0	$0	0	$0
Minneola	0	$0	0	$0
Finney County				
Finney County	13	$3,124,800	1	$10,871
Garden City	24	$3,356,100	6	$15,553
Holcomb	6	$878,000	1	$3,234
Ford County				
Ford County	62	$7,092,800	8	$38,557
Bucklin	0	$0	0	$0
Dodge City	22	$4,052,100	19	105,595
City of Ford	0	$0	0	$0
Gray County				
Cimarron	4	$506,000	0	$0
Copeland	0	$0	0	$0
Haskell County				
Satanta	0	$0	0	$0
Hodgeman County				
Hanston	0	$0	1	$2,493
Lane County				
Lane County	2	$200,000	0	$0
Dighton	0	$0	0	$0
Meade County				
Seward County				
Seward County	2	$1,201,000	0	$0
Kismet	0	$0	0	$0
Liberal	43	$6,487,800	0	$0

Source: FEMA, "Policy and Loss Data by Community with County and State Data"

The following graphs summarize data from the above table for Kansas Region D in comparison to 2014 data. Of note:

- Regionally the number of flood policies has decreased from 2014 to 2018, from 270 to 178
- Regionally the amount of flood insurance in-force has decreased from 2014 to 2018, from $36,063,000 to $26,898,600


Comparison of Regional Flood Policies in Force, 2014 and 2018
160
140
120
100
80
60
40
20
0
Clark County
Finney County
Ford County
Gray County
Haskell County
Hodgeman County
Lane County
Meade County
Seward County
2014
2018


Comparison of Regional Flood Insurance In Force, 2014 and 2018
$18,000,000
$16,000,000
$14,000,000
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$0
Clark County
Finney County
Ford County
Gray County
Haskell County
Hodgeman County
Lane County
Meade County
Seward County
2014
2018

4.13.7 – Repetitive Loss Properties

A high priority to Kansas Region D is the reduction of losses to Repetitive Loss (RL) and Severe Repetitive Loss (SRL) structures. The NFIP defines a RL property as:

- Any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978

At least two of the claims must be more than 10 days apart.

The definition of severe repetitive loss as applied to this program was established in section 1361A of the National Flood Insurance Act, as amended, 42 U.S.C. 4102a. An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
- For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both of the above, at least two of the referenced claims must have occurred within any ten-year period and must be greater than ten days apart.

No RL or SRL properties were reported in Kansas Region D.

Table 4.98: Kansas Region D Repetitive Loss Properties, As of December 2018

County Name	Community Name	Mitigated	Insured	Occupancy	Total Building Payment	Total Contents Payment	Losses	Total Paid
Ford	Dodge City	No	No	Single Family	$4,722.45	$0.00	2	$4,722.45
Ford	Dodge City	No	Yes	Single Family	$38,336.30	$3,630.74	2	$41,967.04
Ford	Dodge City	No	No	Other Non-Residential	$19,467.91	$0.00	2	$19,467.91
Seward	Liberal	No	No	Other Non-Residential	$6,077.48	$0.00	2	$6,077.48

4.13.8 – Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.99: Flood Consequence Analysis

Subject	Impacts of Flood
Health and Safety of the Public	Impact dependent on the level of flood waters. Individuals further away from the incident area are at a lower risk. Casualties are dependent on warning time.

Table 4.99: Flood Consequence Analysis

Subject	Impacts of Flood
Health and Safety of Responders	Impact to responders is expected to be minimal unless responders live within the affected area.
Continuity of Operations	Temporary relocation may be necessary if inundation affects government facilities.
Property, Facilities, and Infrastructure	Localized impact could be severe in the inundation area of the incident to facilities and infrastructure. The further away from the incident area the damage lessens.
Environment	Impact will be severe for impacted area. Impact will lessen with distance.
Economic Conditions	Impacts to the economy depend on the area flooded, depth of water, and the amount of time it takes for the water to recede.
Public Confidence in the Jurisdiction's Governance	Perception of whether the flood could have been prevented, warning time, and response and recovery time will greatly impact the public's confidence.

4.14 – Hailstorms

According to NOAA, hail is precipitation that is formed when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere causing them to freeze. The raindrops form into small frozen droplets and then continue to grow as they come into contact with super-cooled water which will freeze on contact with the frozen rain droplet. This frozen rain droplet can continue to grow and form hail.

.

4.14.1 – Location and Extent

Hailstorms occur over broad geographic regions. The entire planning area, including all participating jurisdictions, is at risk to hailstorms.

Based on information provided by the Tornado and Storm Research Organization, the following table describes typical damage impacts of the various sizes of hail.

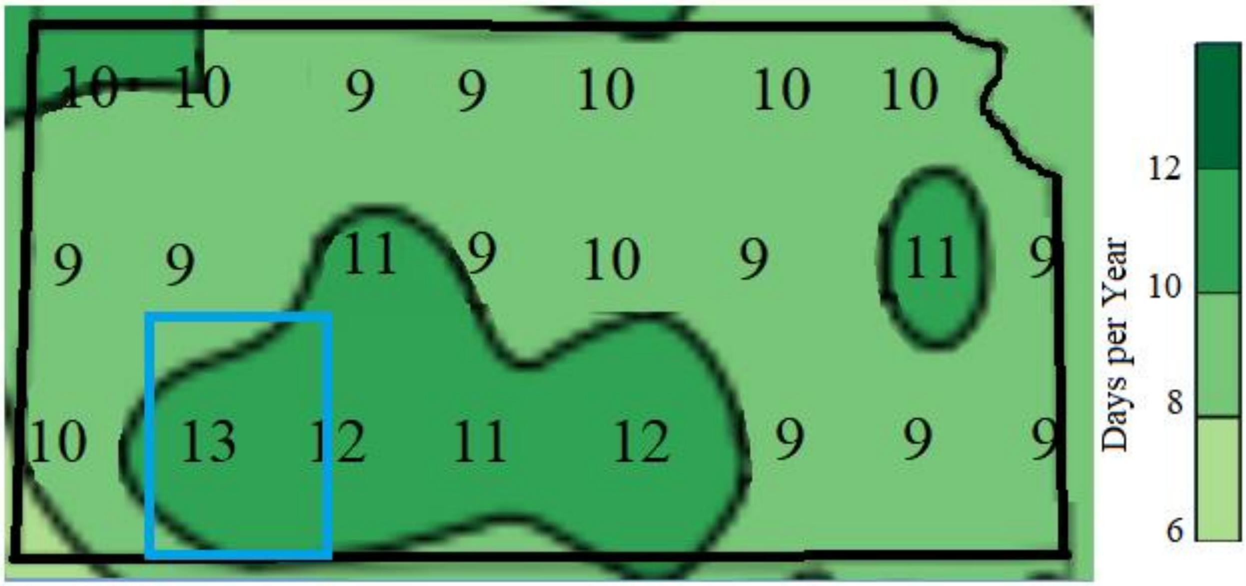
Table 4.99: Hailstorm Intensity Scale

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5-9	0.2-0.4	Pea	No damage
Potentially Damaging	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
Significant	16-20	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	21-30	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
Severe	31-40	1.2-1.6	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	41-50	1.6-2.0	Golf ball > Pullet's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	51-60	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	61-75	2.4-3.0	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries
Destructive	76-90	3.0-3.5	Large orange > Soft ball	Severe damage to aircraft bodywork
Super Hailstorms	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
Super Hailstorms	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: Tornado and Storm Research Organization

The following map, generated by data compiled by NOAA, indicates the average number of severe hail event days for Kansas Region D (9).

Kansas Region D Severe Hail Days per Year from 2003 to 2012 Reports



Source: NOAA

4.14.2 – Previous Occurrences

In the 20-year period from 2000 to present, there have been six Presidential Disaster Declarations for Kansas Region D for severe storms (along with other associated hazards), of which hail may be a component. The following 20-year information (with 2000 and 2019 being full data years) on past declared disasters is presented to provide a historical perspective on hail events that have impacted Kansas Region D. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2015.

Table 4.100: Kansas Region D FEMA Severe Storm Disaster and Emergency Declarations, 2000 - 2019

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4230	07/20/2015 (05/04/2015 – 06/21/2015)	Severe Storms, Tornados, Straight-line Winds, and Flooding	Gray, Haskell, and Hodgeman	$13,848,325
4150	10/22/2013 (07/22/2013 – 08/15/2013)	Severe Storms, Straight-line Winds, Tornados, and Flooding	Clark, Ford, Hodgeman, Lane, and Meade	$11,412,827
4063	05/24/2012 (4/14-4/15/2012)	Severe Storms, Tornados, Straight-line Winds and Flooding	Hodgeman	$6,923,919
1849	06/25/2009 (4/25-5/16/2009)	Severe Storms, Flooding, Straight-line Winds, and Tornados	Finney	$15,013,488

Table 4.100: Kansas Region D FEMA Severe Storm Disaster and Emergency Declarations, 2000 - 2019

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
1776	07/09/2008	Severe Storms, Flooding, and Tornados	Clark, Haskell, Hodgeman, Lane, and Seward	$70,629,544
1462	5/6/2003 (5/4-30/2003)	Severe Storms, Tornados, and Flooding	Haskell, Meade, and Seward	$988,056

Source: FEMA
-: Data unavailable

In addition to the above reported events, the following table presents NOAA NCEI identified hailstorm events and the resulting damage totals in Kansas Region D for the period 2010 - 2019 (with 2010 and 2019 being full data set years).

Table 4.101: Kansas Region D NCEI Hailstorm Events, 2010 - 2019

County	Number of Days with Events	Property Damage	Deaths	Injuries
Clark	50	$0	0	0
Finney	57	$0	0	0
Ford	75	$7,700	0	0
Gray	56	$0	0	0
Haskell	32	$0	0	0
Hodgeman	51	$0	0	0
Lane	34	$0	0	0
Meade	53	$8,000	0	0
Seward	37	$600	0	0

Source: NOAA NCEI

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of hail on the region's agricultural base. Crop loss data for the years 2010 - 2019 (with 2010 and 2019 being full data years), for the region, indicates 678 hail related claims on 512,010 acres for $57,630,958.

Table 4.102: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Hail

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Clark	38	24,431	$2,650,294
Finney	135	136,670	$19,862,075
Ford	98	88,177	$11,346,410
Gray	98	62,912	$9,309,181
Haskell	87	51,539	$5,268,371
Hodgeman	81	69,053	$6,931,338
Lane	56	36,872	$3,605,910
Meade	54	23,484	$2,387,826
Seward	86	31,463	$6,047,571

Source: USDA Farm Service Agency

y

4.12.3 – Hazard Probability Analysis

The following table summarizes hailstorm probability data for **Clark County**.

Table 4.103: Clark County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	50
Average Events per Year	5
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	38
Average Number of Claims per Year	4
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	24,431
Average Number of Acres Damaged per Year	2,443
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$2,650,294
Average Crop Damage per Year	$265,029

Source: NCEI and USDA

Data from the NCEI indicates that Clark County can expect on a yearly basis, relevant to hail events:

- Five events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Clark County can expect on a yearly basis, relevant to hail occurrences:

- Four insurance claims
- 2,443 acres impacted
- $265,029 in insurance claims

The following table summarizes hailstorm probability data for **Finney County**.

Table 4.104: Finney County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	57
Average Events per Year	6
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	135
Average Number of Claims per Year	14
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	136,670

Table 4.104: Finney County Hailstorm Probability Summary

Data	Recorded Impact
Average Number of Acres Damaged per Year	13,667
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$19,862,075
Average Crop Damage per Year	$1,986,208

Source: NCEI and USDA

Data from the NCEI indicates that Finney County can expect on a yearly basis, relevant to hail events:

- Six events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Finney County can expect on a yearly basis, relevant to hail occurrences:

- 14 insurance claims
- 13,667 acres impacted
- $1,986,208 in insurance claims

The following table summarizes hailstorm probability data for **Ford County**.

Table 4.105: Ford County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	75
Average Events per Year	8
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$7,700
Average Property Damage per Year	$770
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	98
Average Number of Claims per Year	10
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	88,177
Average Number of Acres Damaged per Year	8,818
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$11,346,410
Average Crop Damage per Year	$1,134,641

Source: NCEI and USDA

Data from the NCEI indicates that Ford County can expect on a yearly basis, relevant to hail events:

- Eight events
- No deaths or injuries
- $770 in property damages

According to the USDA Risk Management Agency, Ford County can expect on a yearly basis, relevant to hail occurrences:

- Ten insurance claims
- 8,181 acres impacted
- $1,134,641 in insurance claims

The following table summarizes hailstorm probability data for **Gray County**.

Table 4.106: Gray County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	56
Average Events per Year	6
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	98
Average Number of Claims per Year	10
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	62,912
Average Number of Acres Damaged per Year	6,291
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$9,309,181
Average Crop Damage per Year	$930,918

Source: NCEI and USDA

Data from the NCEI indicates that Gray County can expect on a yearly basis, relevant to hail events:

- Six events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Gray County can expect on a yearly basis, relevant to hail occurrences:

- Ten insurance claim
- 6,291 acres impacted
- $930,918 in insurance claims

The following table summarizes hailstorm probability data for **Haskell County**.

Table 4.107: Haskell County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	32
Average Events per Year	3
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Table 4.107: Haskell County Hailstorm Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	87
Average Number of Claims per Year	9
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	51,539
Average Number of Acres Damaged per Year	5,154
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$5,268,371
Average Crop Damage per Year	$526,837

Source: NCEI and USDA

Data from the NCEI indicates that Haskell County can expect on a yearly basis, relevant to hail events:

- Three events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Haskell County can expect on a yearly basis, relevant to hail occurrences:

- Nine insurance claims
- 5,154acres impacted
- $526,837 in insurance claims

The following table summarizes hailstorm probability data for **Hodgeman County**.

Table 4.108: Hodgeman County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	51
Average Events per Year	5
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	81
Average Number of Claims per Year	8
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	69,053
Average Number of Acres Damaged per Year	6,905
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$6,931,338
Average Crop Damage per Year	$693,134

Source: NCEI and USDA

Data from the NCEI indicates that Hodgeman County can expect on a yearly basis, relevant to hail events:

- Five events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Hodgeman County can expect on a yearly basis, relevant to hail occurrences:

- Eight insurance claims
- 6,905 acres impacted
- $693,134 in insurance claims

The following table summarizes hailstorm probability data for **Lane County**.

Table 4.109: Lane County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	34
Average Events per Year	3
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	56
Average Number of Claims per Year	6
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	36,872
Average Number of Acres Damaged per Year	3,687
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$3,605,910
Average Crop Damage per Year	$360,591

Source: NCEI and USDA

Data from the NCEI indicates that Lane County can expect on a yearly basis, relevant to hail events:

- Three events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Lane County can expect on a yearly basis, relevant to hail occurrences:

- Six insurance claims
- 3,687 acres impacted
- $360,591 in insurance claims

The following table summarizes hailstorm probability data for **Meade County**.

Table 4.110: Meade County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	53
Average Events per Year	5
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0

Table 4.110: Meade County Hailstorm Probability Summary

Data	Recorded Impact
Total Reported NCEI Property Damage (2009-2018)	$8,000
Average Property Damage per Year	$800
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	54
Average Number of Claims per Year	5
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	23,484
Average Number of Acres Damaged per Year	2,348
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$2,387,826
Average Crop Damage per Year	$238,783

Source: NCEI and USDA

Data from the NCEI indicates that Meade County can expect on a yearly basis, relevant to hail events:

- Five events
- No deaths or injuries
- $800 in property damages

According to the USDA Risk Management Agency, Meade County can expect on a yearly basis, relevant to hail occurrences:

- Five insurance claims
- 2,348acres impacted
- $238,783 in insurance claims

The following table summarizes hailstorm probability data for **Seward County**.

Table 4.111: Seward County Hailstorm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	37
Average Events per Year	4
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$600
Average Property Damage per Year	$60
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	86
Average Number of Claims per Year	9
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	31,463
Average Number of Acres Damaged per Year	3,146
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$6,047,571
Average Crop Damage per Year	$604,757

Source: NCEI and USDA

Data from the NCEI indicates that Seward County can expect on a yearly basis, relevant to hail events:

- Four events
- No deaths or injuries

- $60 in property damages

According to the USDA Risk Management Agency, Seward County can expect on a yearly basis, relevant to hail occurrences:

- Nine insurance claims
- 3,146 acres impacted
- $604,757 in insurance claims

In addition, Kansas Region D has had six Presidentially Declared Disasters relating to severe storms (of which hail is a potential component) in the last 20 years. This represents an average of less than one declared severe storm (hailstorm) related disaster per year.

4.14.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to hailstorm events. Counties with a higher or increasing structural inventory, or having a high structural valuation are to be considered to have a potentially greater vulnerability. Additionally, population vulnerabilities to hail events are expected to be minimal.

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region D county incurring damage over the period 2010 to 2019 from hailstorm events. In general, the greater the percentage of structures damaged the greater overall vulnerability going forward.

.

Table 4.112: Kansas Region D Structural Vulnerability Data for Hailstorms, 2010-2019

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Clark	$495,884,000	$0	0.00%
Finney	$6,770,618,000	$0	0.00%
Ford	$5,874,814,000	$7,700	0.00%
Gray	$1,294,134,000	$0	0.00%
Haskell	$861,920,000	$0	0.00%
Hodgeman	$367,392,000	$0	0.01%
Lane	$465,306,000	$0	0.00%
Meade	$1,090,544,000	$8,000	0.00%
Seward	$3,662,220,000	$600	0.00%

Source: NCEI and HAZUS

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region D County. USDA Risk Management Agency crop loss data allows us to quantify the monetary impact of hailstorm conditions on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to hailstorm events.

Table 4.113: Hailstorm Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Clark	434,295	2,443	0.56%	$111,420,000	$265,029	0.24%
Finney	790,500	13,667	1.73%	$823,091,000	$1,986,208	0.24%
Ford	669,832	8,818	1.32%	$515,252,000	$1,134,641	0.22%
Gray	556,070	6,291	1.13%	$990,653,000	$930,918	0.09%
Haskell	363,751	5,154	1.42%	$1,159,098,000	$526,837	0.05%
Hodgeman	494,925	6,905	1.40%	$191,891,000	$693,134	0.36%
Lane	417,017	3,687	0.88%	$266,374,000	$360,591	0.14%
Meade	587,924	2,348	0.40%	$233,384,000	$238,783	0.10%
Seward	360,711	3,146	0.87%	$424,697,000	$604,757	0.14%

Source: USDA

4.14.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.114: Hailstorm Consequence Analysis

Subject	Impacts of Hailstorm
Health and Safety of the Public	Severity and location dependent. Impacts on persons in the areas of hail are expected to be severe if caught without proper shelter.
Health and Safety of Responders	Impacts will be predicated on the severity of the event. Damaged infrastructure will likely result in hazards such as downed utility lines, main breakages and debris on roadways. .
Continuity of Operations	Temporary relocation may be necessary if government facilities experience damage. Services may be limited to essential tasks if utilities are impacted.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the location and structural capacity of the facility. Loss of structural integrity of buildings and infrastructure could occur. Utility lines, roads, residential and business properties will be affected.
Environment	Impact could be severe for the immediate impacted area, depending on the size of the event. Impact will lessen as distance increases from the immediate incident area
Economic Conditions	Impacts to the economy will be dependent severity of the event and the impact on structures and infrastructure. Impacts could be severe if roads/utilities are affected.
Public Confidence in the Jurisdiction's Governance	Response and recovery will be in question if not timely and effective. Warning systems in place and the timeliness of those warnings could be questioned.

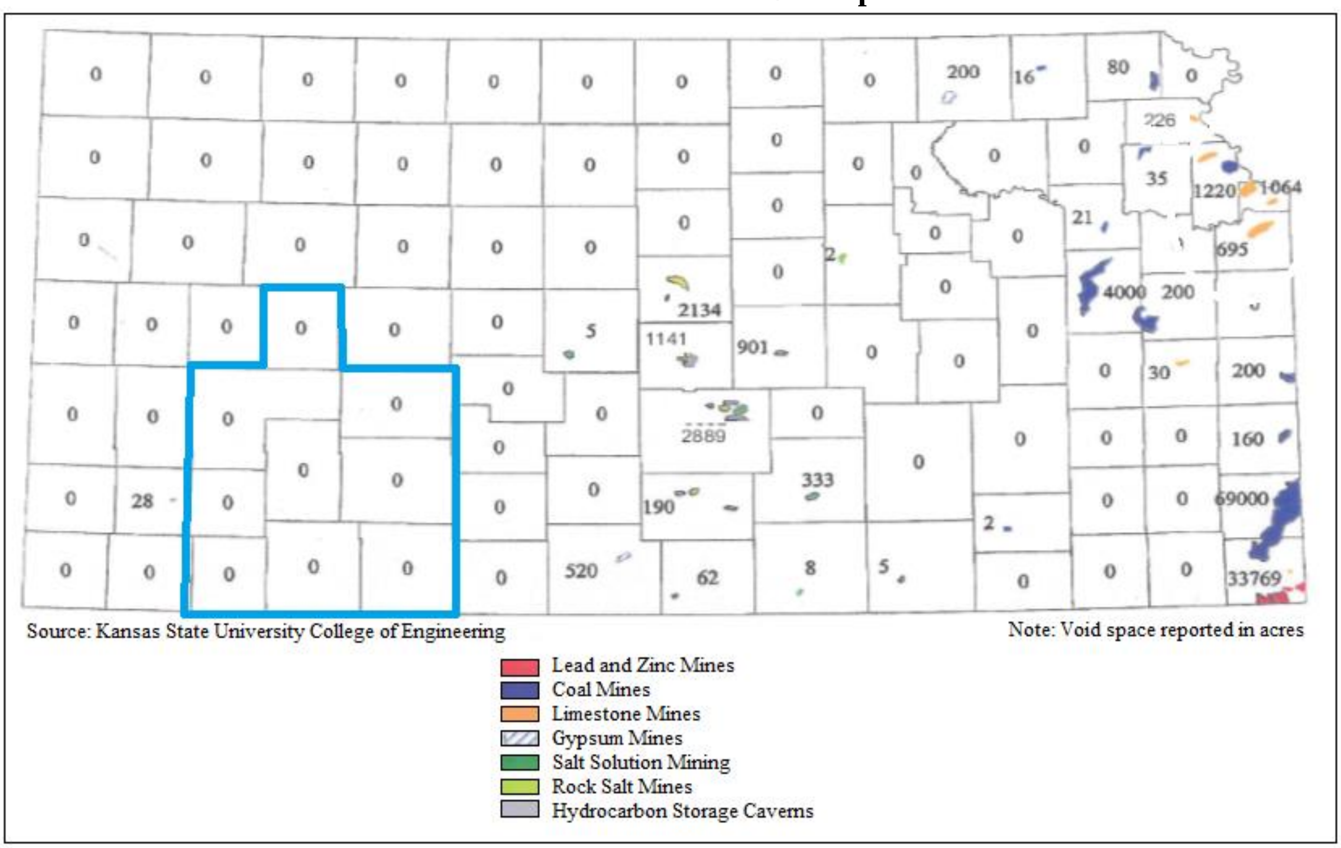
4.15 – Land Subsidence

Land subsidence is caused when the ground above manmade or natural voids collapses. Subsidence can be related to mine collapse, water and oil withdrawal, or natural causes such as shrinking of expansive soils, salt dissolution (which may also be related to mining activities), and cave collapses. The surface depression is known as a sinkhole. If sinkholes appear beneath developed areas, damage or destruction of buildings, roads and rails, or other infrastructure can result. The rate of subsidence, which ranges from gradual to catastrophic, correlates to its risk to public safety and property damage.

4.15.1 – Location and Extent

The Kansas Department of Health and Environment (KDHE) prepared a report on "Subsurface Void Space and Sinkhole/Subsidence Area Inventory for the State of Kansas." The report inventoried subsurface void space from oil and gas exploration and production, natural sources, shaft mining, and solution mining. The following map details the distribution of total acres and major cause of void spaces for all Kansas Region D counties.

KDHE Total Subsurface Void Space



The following table details the total amount of subsurface void space as calculated using data from the KDHE map.

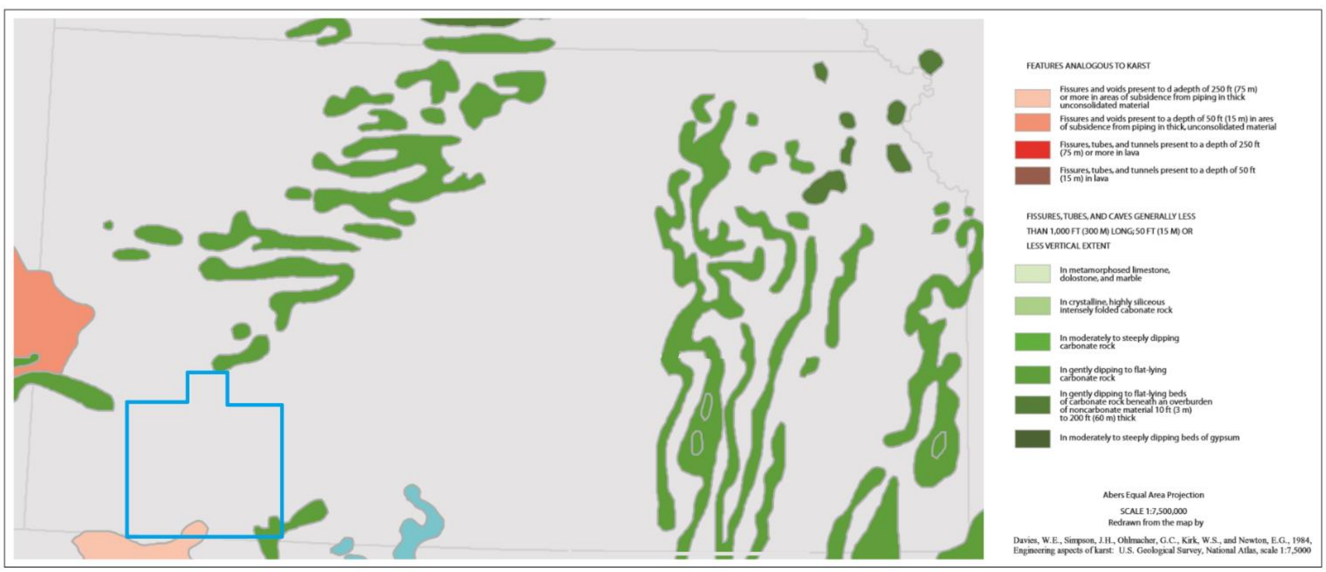
Table 4.115: Kansas Region D Sub-Surface Void Space

County	Total Sub-Surface Void Space
Clark	0
Finney	0
Ford	0
Gray	0
Haskell	0
Hodgeman	0
Lane	0
Meade	0
Seward	0

Source: KDHE

Of additional concern to Kansas Region D is Karst topography. The following map from the United States Geologic Survey (USGS) indicates areas of Karst topography in the region. The green areas shown in the map show fissures, tubes, and caves generally less than 1,000 feet long with 50 feet or less vertical extent in gently dipping to flat-lying carbonate rock. Brown areas have similar features in gently dipping to flat lying gypsum beds. Light pink colored areas are features analogous to karst with fissures and voids present to a depth of 250 feet or more in areas of subsidence from piping in thick unconsolidated material. Darker pink areas contain fissures and voids (analogous to karst) to a depth of 50 feet. There are limited documented problems associated with natural limestone subsidence and sinkholes in Kansas Region D.

USGS Karst Topography



4.15.2 – Previous Occurrences

There have been no reported land subsidence events in Kansas Region D during the ten-year period from 2009 to 2018.

4.15.3 – Hazard Probability Analysis

Land subsidence events with the potential to affect Kansas Region D are incredibly difficult to quantify and forecast. Compounding the difficulty, land subsidence events occur on their own or occur as a secondary hazard with incidents of heavy rain, melting snow, and earthquakes as a primary cause. Hence, their future occurrences are highly dependent on the likelihood of the mentioned hazards.

Based on limited available data, indicating that there have been no reported events in the past ten years, and bearing in mind that many events may be unreported as they have no impact on human activities, the probability of a reported land subsidence occurrence in any given year is very low.

4.15.4 Vulnerability Analysis

Counties with a higher or increasing population, high, or increasing, or having a high structural valuation are to be considered to have a potentially greater vulnerability. Additionally, population vulnerabilities to land subsidence events are expected to be minimal.

Vulnerability to land subsidence in Kansas Region D was analyzed using the KDHE "Subsurface Void Space and Sinkhole/Subsidence Area Inventory for the State of Kansas" report. All documented acres of subsurface void space were classified according to these risk categories for each of the following causes of void space:

- Lead and Zinc Mines
- Coal Mines
- Limestone Mines
- Gypsum Mines
- Salt Solution Mining
- Rock Salt Mines
- Hydrocarbon Storage Caverns

Based on these classifications, a risk category was assigned to each of the subsurface void acres:

- Category I: High Risk
- Category II: Medium Risk
- Category III: Low Risk

The following table shows the classification of the void space in each of Kansas Region D counties.

Table 4.116: Kansas Region D Sub-Surface Void Space Acreage

County	Void Space Classification
All	None

Source: KDHE, "Subsurface Void Space and Sinkhole/Subsidence Area Inventory for the State of Kansas" 2006.

Based on this data, the area for each county underlain by sub-surface void acreage was determined. The higher percentage of acreage underlain by void area the higher the vulnerability.

Table 4.117: Kansas Region D Percentage of Land Underlain by Sub-Surface Void Space

County	Total County Acreage	Sub-Surface Void Space Acreage	Percentage of County Acreage Underlain by Void Space
Clark	625,280	0	0.00%
Finney	833,920	0	0.00%
Ford	703,360	0	0.00%
Gray	556,160	0	0.00%
Haskell	369,920	0	0.00%
Lane	550,400	0	0.00%
Hodgeman	459,520	0	0.00%
Meade	626,560	0	0.00%
Seward	409,600	0	0.00%

Source: KDHE

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region D county incurring damage over the period 2010 to 2019 from land subsidence events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

.

Table 4.118: Kansas Region D Structural Vulnerability Data for Land Subsidence, 2010-2019

County	HAZUS Building Valuation	Reported Structure Damage	Percentage of Building Valuation Damaged
Clark	$495,884,000	$0	0.0%
Finney	$6,770,618,000	$0	0.0%
Ford	$5,874,814,000	$0	0.0%
Gray	$1,294,134,000	$0	0.0%
Haskell	$861,920,000	$0	0.0%
Hodgeman	$367,392,000	$0	0.0%
Lane	$465,306,000	$0	0.0%
Meade	$1,090,544,000	$0	0.0%
Seward	$3,662,220,000	$0	0.0%

Source: HAZUS

4.15.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.119: Land Subsidence Consequence Analysis

Subject	Impacts of Land Subsidence
Health and Safety of the Public	Local impact expected to be moderate to severe for the incident area, depending on the scale of the area.
Health and Safety of Responders	Impact to responders would be minimal.
Continuity of Operations	Minimal expectation of execution of the COOP, unless a facility is impacted.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the incident area has the potential to do severe damage.

Table 4.119: Land Subsidence Consequence Analysis

Subject	Impacts of Land Subsidence
Environment	Impact to the area would be minimal.
Economic Conditions	Impacts to the economy will depend on the severity of the damage.
Public Confidence in the Jurisdiction's Governance	Local development policies will be questioned

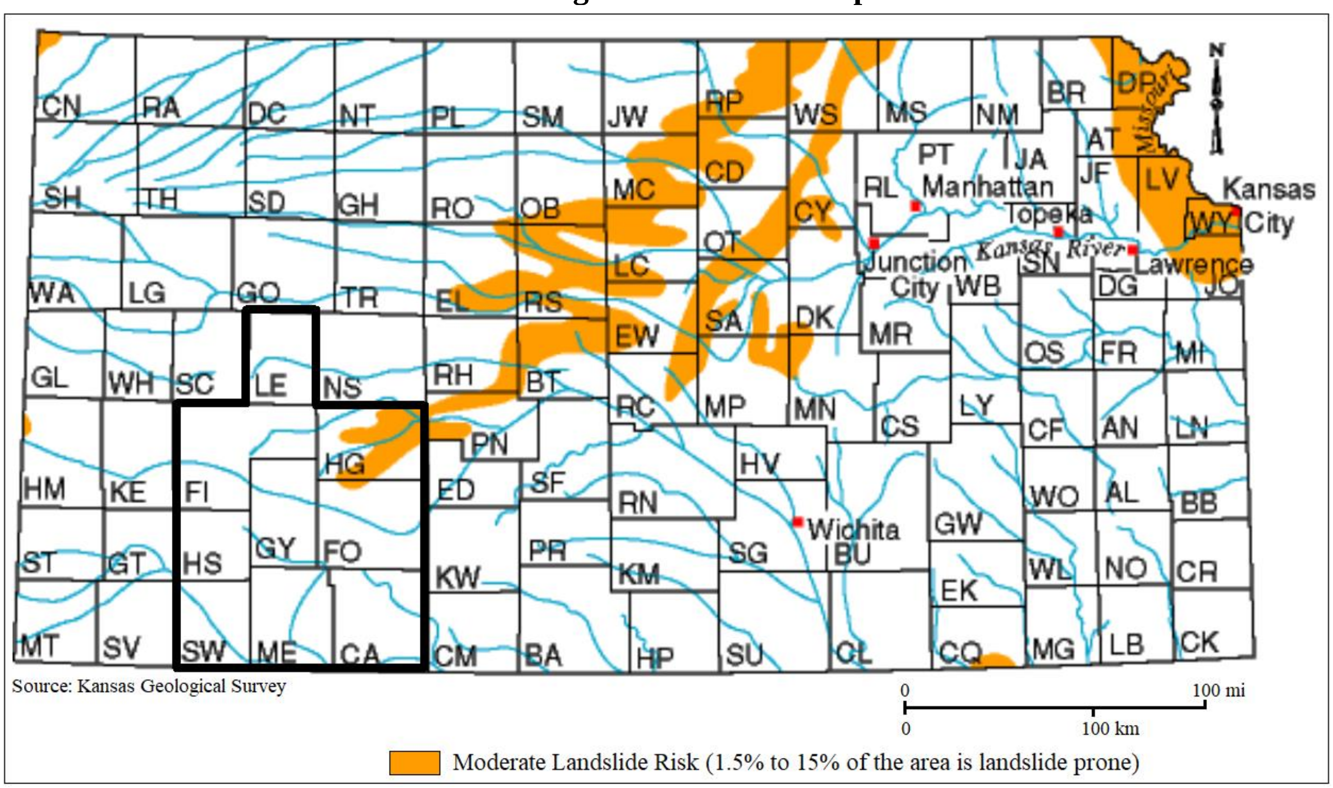
4.16 – Landslides

Landslides are the downward and outward movement of slopes. Landslides include a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on and over steepened slopes is the primary reason for a landslide, landslides are often prompted by the occurrence of other disasters. Other contributing factors include erosion, steep slopes, rain and snow, and earthquakes.

4.16.1 – Location and Extent

Landslides are classified based mostly on their character of movement and degree of internal disruption. These landslide classes are rock fall, flow, slide, and creep. Although these are clear divisions, in the real world a landslide may have components of more than one type. Areas prone to landslides can cover broad geographic regions, but occurrences are generally localized. The entire planning area, including all participating jurisdictions, is potentially at risk to landslides. However, landslides require an earth or rock covered slope, and so flatter areas have a much-decreased risk of occurrence. The following map, produced by the Kansas Geological Survey (KGS), shows areas of the region with a moderate susceptibility of landslides, equating to 1.5% to 15% of the area being landslide prone.

KGS Regional Landslide Map



4.16.2 – Previous Occurrences

At present there is no centralized and complete database containing historical records for landslides in Kansas. For Kansas Region D there have been no reported or recorded landslides impacting either participating jurisdictions or the region in the past 10 years.

4.16.3 – Hazard Probability Analysis

Landslides with the potential to affect Kansas Region D are incredibly difficult to quantify and forecast. Compounding the difficulty, landslides occur on their own or occur as a secondary hazard with incidents of heavy rain, melting snow, earthquakes, and land subsidence are their primary cause. Hence, their future occurrences are highly dependent on the likelihood of the mentioned hazards.

As indicated in the map above, small areas of Kansas Region D (in Ford County) have a moderate susceptibility to landslides. However, the limited available past occurrence data indicate that there is a very low rate of occurrence. Based on limited available data, and bearing in mind that many landslides may be unreported as they have no impact on human activities, it is not likely that a major landslide will impact the region based on zero reported occurrences in 10 years.

4.16.4 Vulnerability Analysis

Based on landslide mapping by the KGS, the area for each county with a moderate landslide risk was estimated. The higher percentage of acreage in a moderate landslide risk area the higher the vulnerability. However, landslides require an earth or rock covered slope, and so flatter areas have a much-decreased risk of occurrence.

Table 4.120: Kansas Region D Percentage of Land in Moderate Landslide Risk Area

County	Total County Acreage	Estimated Acreage with Moderate Landslide Potential	Percentage of County Acreage Identified in Potential Slide Area
Clark	625,280	0	0.00%
Finney	833,920	0	0.00%
Ford	703,360	28,134	4.00%
Gray	556,160	0	0.00%
Haskell	369,920	0	0.00%
Lane	550,400	275,200	50.00%
Hodgeman	459,520	0	0.00%
Meade	626,560	0	0.00%
Seward	409,600	0	0.00%

Source: KDEM and HAZUS

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region D county incurring damage over the period 2010 to 2019 from landslide events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

.

Table 4.121: Kansas Region D Structural Vulnerability Data for Landslides, 2010-2019

County	HAZUS Building Valuation	Reported Structure Damage	Percentage of Building Valuation Damaged
Clark	$495,884,000	$0	0.0%
Finney	$6,770,618,000	$0	0.0%
Ford	$5,874,814,000	$0	0.0%
Gray	$1,294,134,000	$0	0.0%
Haskell	$861,920,000	$0	0.0%
Hodgeman	$367,392,000	$0	0.0%
Lane	$465,306,000	$0	0.0%
Meade	$1,090,544,000	$0	0.0%
Seward	$3,662,220,000	$0	0.0%

Source: HAZUS

Population vulnerabilities to landslide events are expected to be minimal.

4.16.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.122: Landslide Consequence Analysis

Subject	Impacts of Landslide
Health and Safety of the Public	Severity and location dependent. Impacts on persons in the path of the slide are expected to be severe.
Health and Safety of Responders	Impacts are expected to be minimal.
Continuity of Operations	Minimal expectation of execution of the COOP, unless a facility is impacted.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the location of the facility in relation to the slide. Loss of structural integrity of buildings and infrastructure could occur.
Environment	Impact to the area would be minimal other than the immediate area.
Economic Conditions	Impacts to the economy will be dependent severity of landslide and the impact on structures and infrastructure. Impacts could be severe if roads/utilities are affected. Otherwise impact would be non-existent to minimal.
Public Confidence in the Jurisdiction's Governance	Confidence could be an issue if local development policies are questioned.

4.17 – Lightning

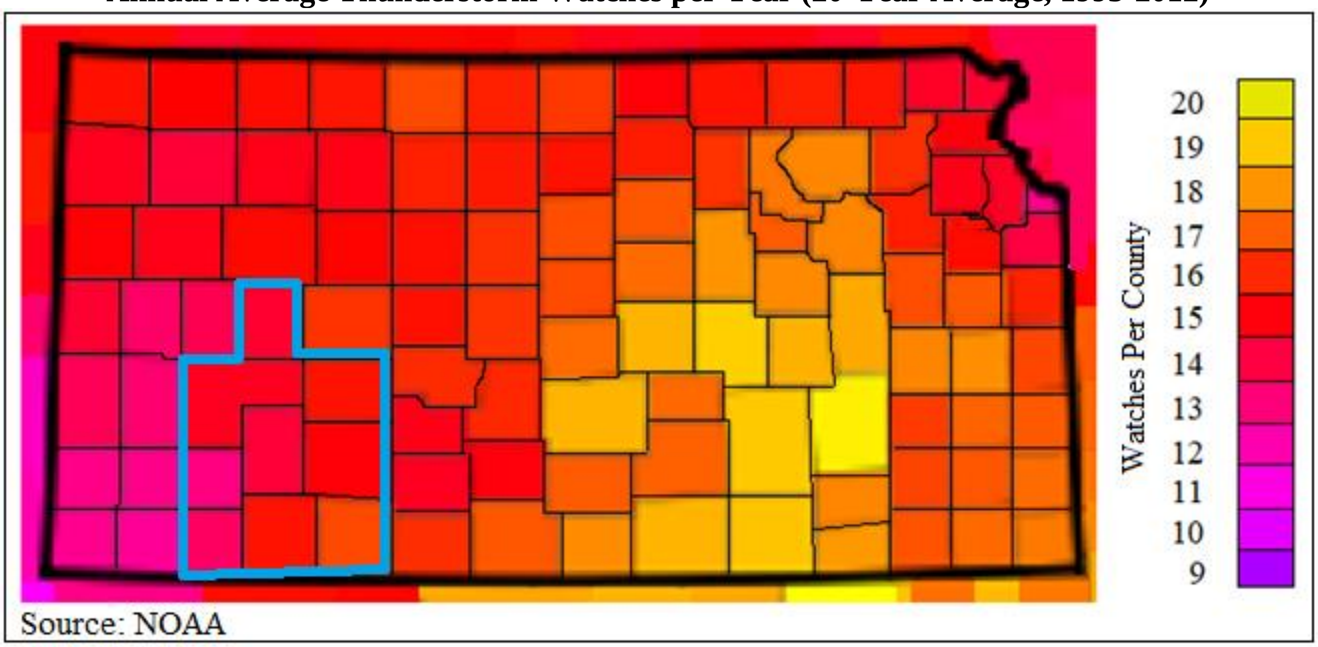
Lightning is a discharge of atmospheric electricity that is triggered by a buildup of differing charges within a Finney. According to the NWS, lightning is one of the most underrated severe weather hazards and is the second deadliest weather killer in the United States.

4.17.1 – Location and Extent

Lightning occurs over broad geographic regions. The entire Kansas Region D planning area, including all participating jurisdictions, is at risk to lightning.

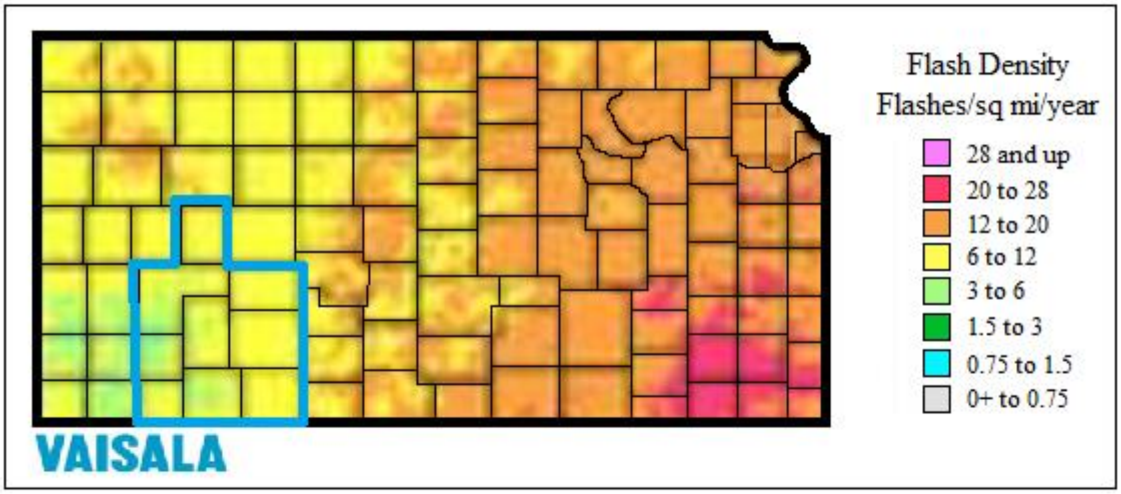
Thunderstorms are often the generator of lightning. The following map, generated by NOAA, indicates the average number severe thunderstorm watches per year for Kansas Region D.

Annual Average Thunderstorm Watches per Year (20-Year Average, 1993-2012)



The following map, generated by Vaisala, indicates the average number of lightning flashes per square mile per year for Kansas Region D. In general, the more recorded flashes the greater the potential for lightning strikes.

Vaisala Lightning Flash Density, 2008-2017



4.17.2 – Previous Occurrences

In the 20-year period from 2000 to present, there have been six Presidential Disaster Declarations for Kansas Region D for severe storms (along with other associates hazard event), of which lightning may be a component. The following 20-year information (with 2000 and 2019 being full data years) on past declared disasters is presented to provide a historical perspective on hail events that have impacted Kansas Region D. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2015.

Table 4.123: Kansas Region D FEMA Severe Storm Disaster and Emergency Declarations, 2000 - 2019

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4230	07/20/2015 (05/04/2015 – 06/21/2015)	Severe Storms, Tornados, Straight-line Winds, and Flooding	Gray, Haskell, and Hodgeman	$13,848,325
4150	10/22/2013 (07/22/2013 – 08/15/2013)	Severe Storms, Straight-line Winds, Tornados, and Flooding	Clark, Ford, Hodgeman, Lane, and Meade	$11,412,827
4063	05/24/2012 (4/14-4/15/2012)	Severe Storms, Tornados, Straight-line Winds and Flooding	Hodgeman	$6,923,919
1849	06/25/2009 (4/25-5/16/2009)	Severe Storms, Flooding, Straight-line Winds, and Tornados	Finney	$15,013,488
1776	07/09/2008	Severe Storms, Flooding, and Tornados	Clark, Haskell, Hodgeman, Lane, and Seward	$70,629,544
1462	5/6/2003 (5/4-30/2003)	Severe Storms, Tornados, and Flooding	Haskell, Meade, and Seward	$988,056

Source: FEMA
-: Data unavailable

In addition to the above reported events, the following table presents NOAA NCEI identified lightning events and the resulting damage totals in Kansas Region D for the period 2010 - 2019 (with 2010 and 2019 being full data set years).

Table 4.124: Kansas Region D NCEI Lightning Events, 2010 - 2019

County	Number of Events	Property Damage	Crop Damage	Deaths	Injuries
Clark	0	$0	$0	0	0
Finney	0	$0	$0	0	0
Ford	0	$0	$0	0	0
Gray	0	$0	$0	0	0
Haskell	0	$0	$0	0	0
Lane	0	$0	$0	0	0
Hodgeman	0	$0	$0	0	0
Meade	0	$0	$0	0	0
Seward	0	$0	$0	0	0

Source: NOAA NCEI

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of lightning on the region's agricultural base. Crop loss data for the years 2010 - 2019 (with 2010 and 2019 being full data years), for the region, indicates no related claims.

Table 4.125: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Lightning

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Clark	0	0	$0
Finney	0	0	$0
Ford	0	0	$0
Gray	0	0	$0
Haskell	0	0	$0
Hodgeman	0	0	$0
Lane	0	0	$0
Meade	0	0	$0
Seward	0	0	$0

Source: USDA Farm Service Agency

4.17.3 – Hazard Probability Analysis

Predicting the probability of lightning occurrences is tremendously challenging due to the large number of factors involved and the random nature of strikes. Data from the NCEI indicates that Region D counties can expect on a yearly basis, relevant to lightning events:

- No impactful events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Region D counties can expect on a yearly basis, relevant to lightning occurrences:

- No claims
- No impacted acres
- $0 in damages

In addition, Kansas Region D has had six Presidentially Declared Disasters relating to severe storms (of which lightning is a potential component) in the last 20 years. This represents an average of less than one declared severe storm (lightning) related disaster per year.

4.17.4 – Vulnerability Analysis

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region D county incurring damage over the period 2010 to 2019 from lightning events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

.

Table 4.126: Kansas Region D Structural Vulnerability Data for Lightning, 2010 - 2019

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Clark	$495,884,000	$0	0.0%
Finney	$6,770,618,000	$0	0.0%
Ford	$5,874,814,000	$0	0.0%
Gray	$1,294,134,000	$0	0.0%
Haskell	$861,920,000	$0	0.0%
Hodgeman	$367,392,000	$0	0.0%
Lane	$465,306,000	$0	0.0%
Meade	$1,090,544,000	$0	0.0%
Seward	$3,662,220,000	$0	0.0%

Source: NCEI and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to potential lightning events. The following table indicates the total county population and registered growth over the period 2000 to 2018.

Table 4.127: Kansas Region D Population Vulnerability Data for Lightning

County	2018 Population	Percent Population Change 2000 to 2018
Clark	2,005	-16.1%
Finney	36,611	-9.7%
Ford	33,888	4.1%
Gray	6,033	2.2%
Haskell	3,997	-6.9%
Hodgeman	1,818	-12.8%
Lane	1,560	-27.6%
Meade	4,146	-10.5%
Seward	21,780	-3.2%

Source: US Census Bureau

In addition, lightning may exacerbate agricultural and economic losses. The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region D County. USDA Risk Management Agency crop loss data (2014 – 2018) allows us to quantify the monetary impact of lightning strikes on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to lightning events.

Table 4.128: Lightning Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Clark	434,295	0	0.0%	$111,420,000	$0	0.0%
Finney	790,500	0	0.0%	$823,091,000	$0	0.0%
Ford	669,832	0	0.0%	$515,252,000	$0	0.0%
Gray	556,070	0	0.0%	$990,653,000	$0	0.0%
Haskell	363,751	0	0.0%	$1,159,098,000	$0	0.0%
Hodgeman	494,925	0	0.0%	$191,891,000	$0	0.0%
Lane	417,017	0	0.0%	$266,374,000	$0	0.0%
Meade	587,924	0	0.0%	$233,384,000	$0	0.0%
Seward	360,711	0	0.0%	$424,697,000	$0	0.0%

Source: USDA

4.17.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.129: Lightning Consequence Analysis

Subject	Impacts of Lightning
Health and Safety of the Public	Severity and location dependent. Impacts on persons in the areas of lightning are expected to be severe if caught without proper shelter.
Health and Safety of Responders	Impacts will be predicated on the severity of the event. Damaged infrastructure will likely result in hazards such as downed utility lines, main breakages and debris on roadways.
Continuity of Operations	Temporary relocation may be necessary if government facilities experience damage. Services may be limited to essential tasks if utilities are impacted.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the location and structural capacity of the facility. Loss of utility infrastructure could occur. Utility lines, residential and business properties will be affected.
Environment	Impact could be severe for the immediate impacted area, depending on the size of the event. Impact will lessen as distance increases from the immediate incident area
Economic Conditions	Impacts to the economy will be dependent severity of the event and the impact on structures and infrastructure. Impacts could be severe if utilities are affected.
Public Confidence in the Jurisdiction's Governance	Response and recovery will be in question if not timely and effective. Warning systems in place and the timeliness of those warnings could be questioned.

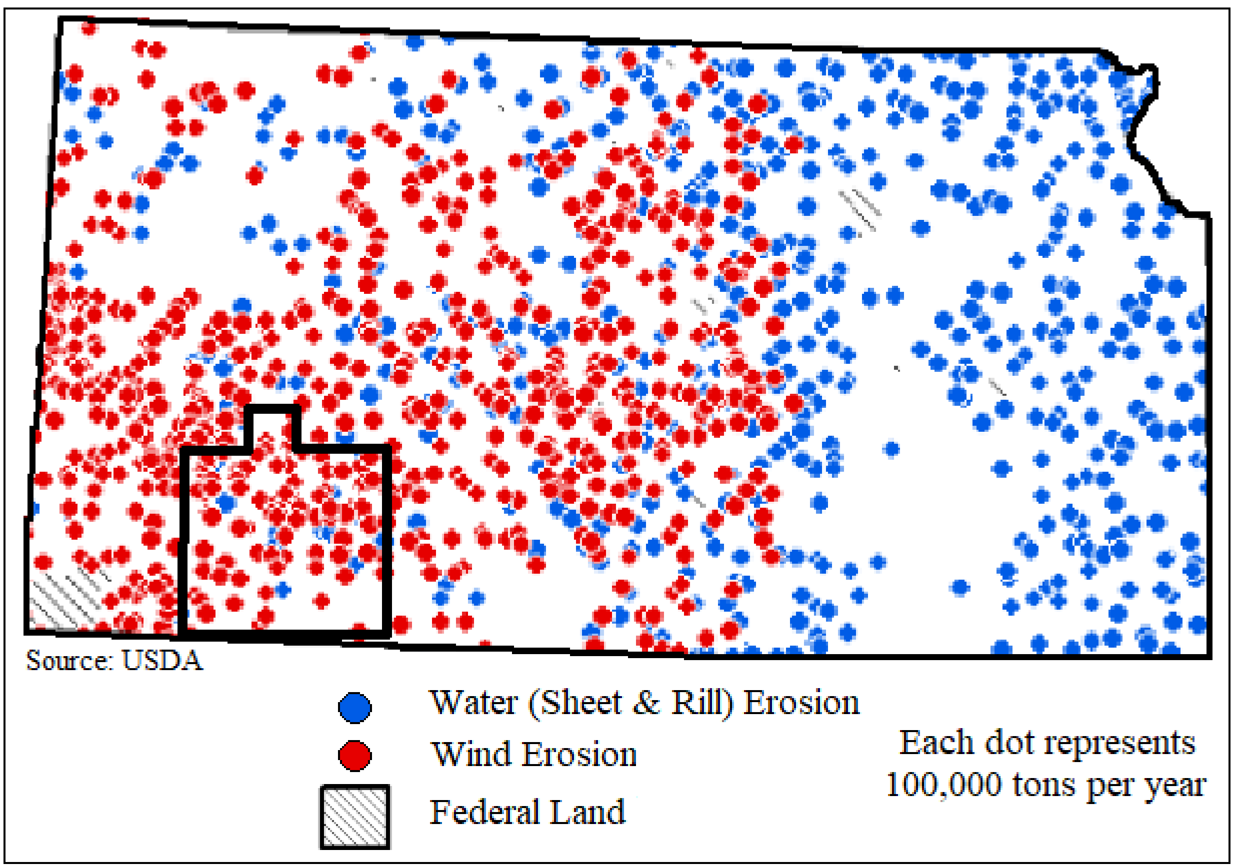
4.18 – Soil Erosion and Dust

Soil erosion, in general, is a process that removes topsoil through the application of water, wind, or farming activities. Soil erosion can be a slow, unobserved process or can happen quickly due to extreme environmental factors. The United States is losing soil 10 times faster than the natural replenishment rate, and related production losses cost the country about $44,000,000,000 each year. On average, wind erosion is responsible for about 40% of this loss and can increase markedly in drought years.

4.18.1 – Location and Extent

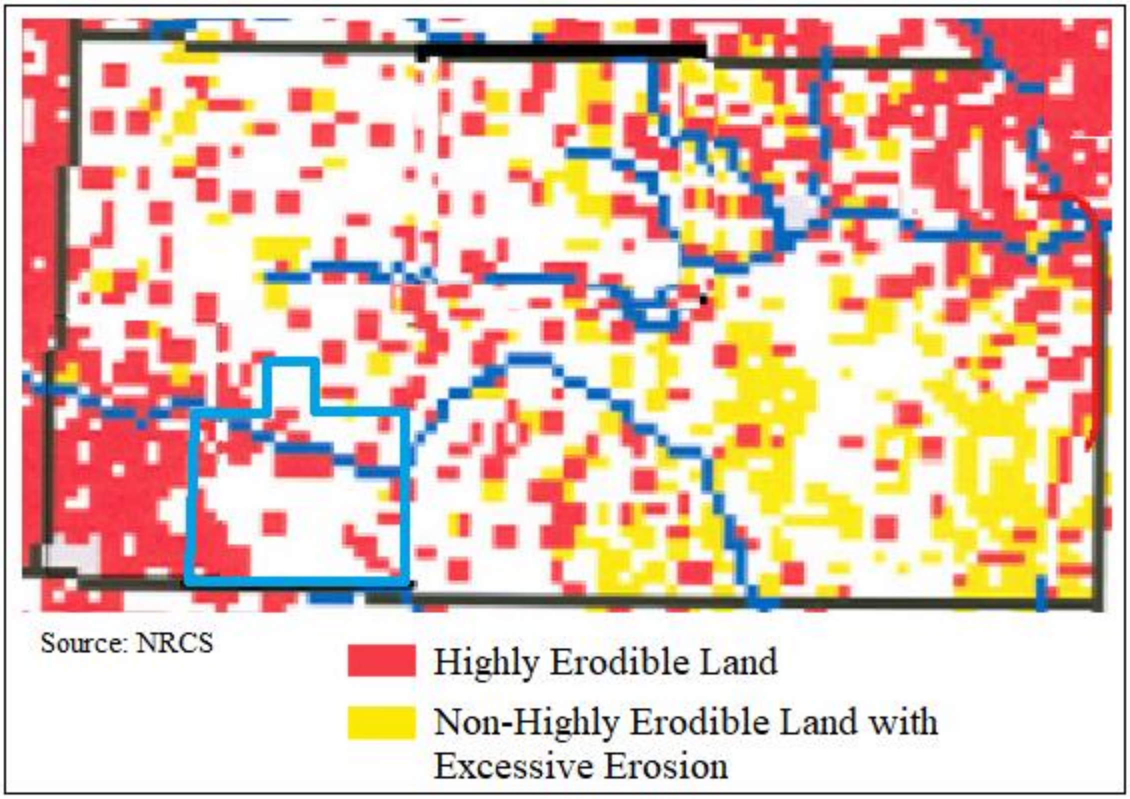
Soil erosion and dust occurs over broad geographic regions. The entire Kansas Region D planning area, including all participating jurisdictions, is at risk to soil erosion and dust.

Wind and Water Erosion on Cropland 2012



The following figure, from the Natural Resources Conservation Service (NRCS) shows areas of excessive erosion of farmland in Kansas. Each red dot represents 5,000 acres of highly erodible land, and each yellow dot represents 5,000 acres of non-highly erodible land with excessive erosion above the tolerable soil erosion rate.

NRCS Highly Erodible Land



4.18.2 – Previous Occurrences

At present there is no centralized and complete database containing historical records for soil erosion in Kansas. For Kansas Region D there have been no reported or recorded soil erosion or dust events impacting either participating jurisdictions or the region in the past 10 years.

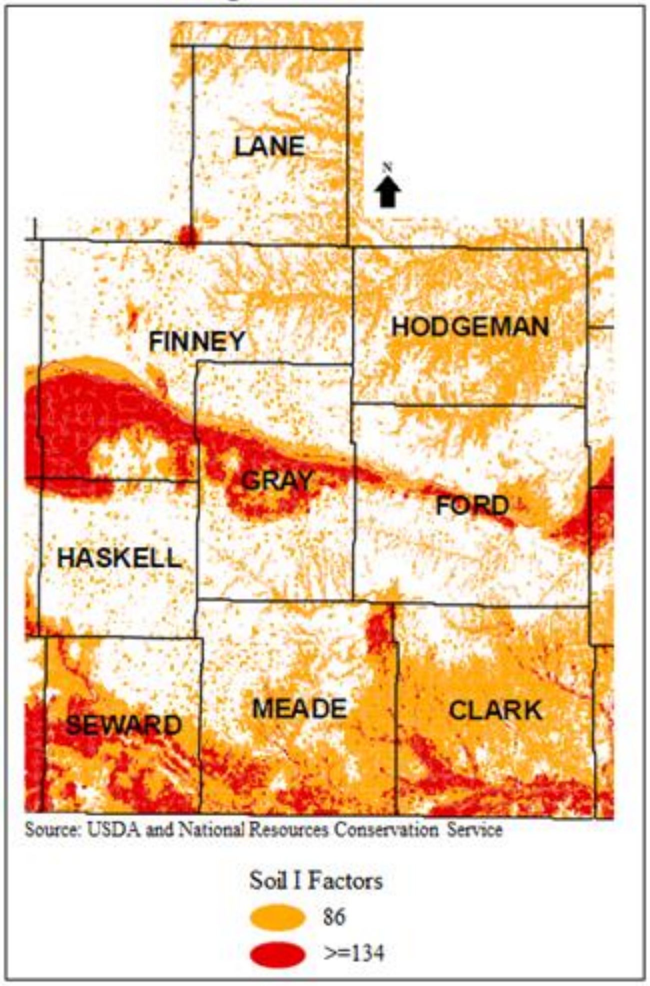
Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of soil erosion and dust on the Region's agricultural base. Crop loss data for the years 2010 - 2019 (with 2010 and 2019 being full data years), for the region, indicates no related claims

4.18.3 – Hazard Probability Analysis

Predicting future erosion amounts is problematic as much relies on farm management practices, available moisture and crop type. Due to the on-going nature of this hazard, and the small agricultural base for the region, it is expected that future events causing minimally measurable impact to the regions crops and farmers will continue occur. Again, the rate of occurrence and potential future occurrence will be predicated on farm management practices and drought and water conditions.

The map below indicates all Kansas Region D soils that have an "I" value, or wind erodibility index, of 86 or greater. The higher the I value, the more susceptible it is to wind erosion.

Regional Soil I Factors



4.18.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to soil erosion and dust events. Additionally, as this hazard disproportionately impacts the agricultural sector, only data on that sector was reviewed for potential vulnerability. Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of soil erosion on the region's agricultural base. Crop loss data for the years 2010 - 2019 (with 2010 and 2019 being full data years), for the region, indicates no soil erosion related claims.

Table 4.130: Soil Erosion and Dust Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Clark	434,295	0	0.0%	$111,420,000	$0	0.0%
Finney	790,500	0	0.0%	$823,091,000	$0	0.0%
Ford	669,832	0	0.0%	$515,252,000	$0	0.0%
Gray	556,070	0	0.0%	$990,653,000	$0	0.0%
Haskell	363,751	0	0.0%	$1,159,098,000	$0	0.0%
Hodgeman	494,925	0	0.0%	$191,891,000	$0	0.0%
Lane	417,017	0	0.0%	$266,374,000	$0	0.0%
Meade	587,924	0	0.0%	$233,384,000	$0	0.0%
Seward	360,711	0	0.0%	$424,697,000	$0	0.0%

Source: USDA

4.18.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.131: Soil Erosion and Dust Consequence Analysis

Subject	Impacts of Soil Erosion and Dust
Health and Safety of the Public	Impact tends to be agricultural; however, dust can be a danger to susceptible individuals in the form of air pollutants.
Health and Safety of Responders	With proper preparedness and protection, impact to the responders is expected to be minimal.
Continuity of Operations	Minimal expectation for utilization of the COOP.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be severe, depending on the site of the soil erosion. This could adversely affect utility poles/lines, and facilities. Dust can also adversely affect machinery, air conditioners, etc.
Environment	The impact to the environment could be severe. Soil erosion and dust can severely affect farming, ranching, wildlife and plants due to production losses and habitat changes.
Economic Conditions	Impacts to the economy will be dependent on how extreme the soil erosion and dust are. Potentially it could severely affect crop yield and productivity. Seedling survival and growth is stressed by erosion and dust, as is the topsoil which agriculture is dependent on.
Public Confidence in the Jurisdiction's Governance	Planning, response, and recovery may be questioned if not timely and effective.

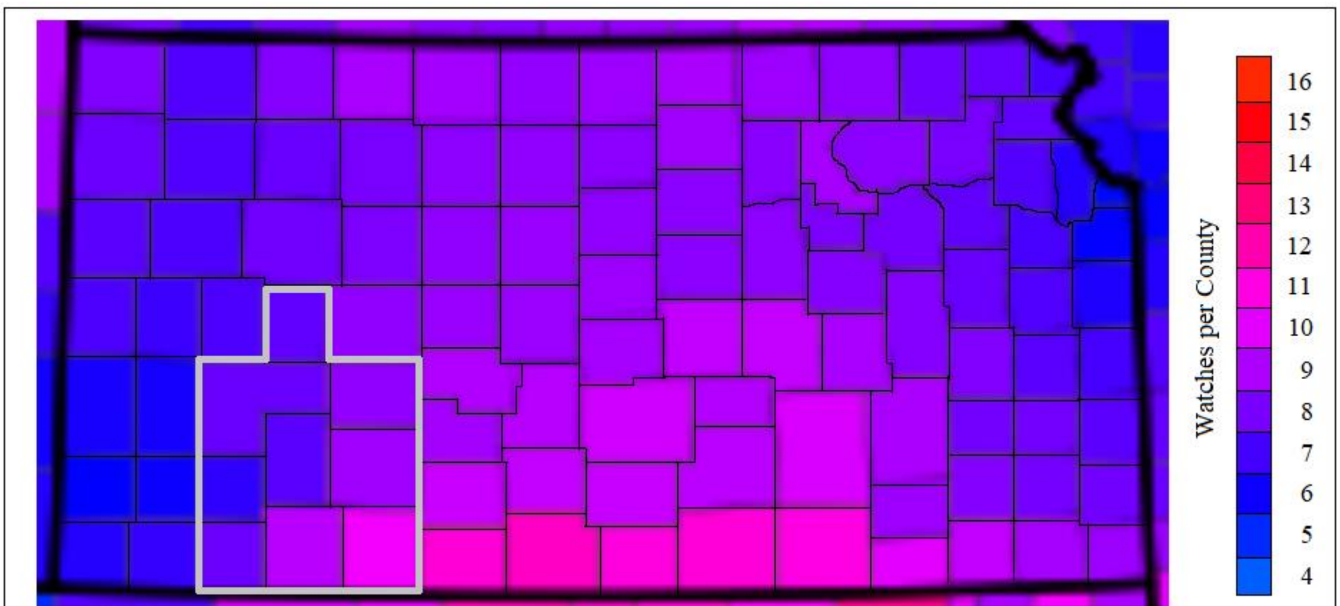
4.19 – Tornado

A tornado is a violently rotating column of air in contact with the ground. Often referred to as a twister or a cyclone, they can strike anywhere and with little warning. Tornados come in many shapes and sizes but are typically in the form of a visible condensation funnel, whose narrow end touches the earth and is often encircled by a Finney of debris and dust.

4.19.1 – Location and Extent

Tornados can strike anywhere in Kansas Region D, placing the entire planning area at risk. The following map, generated by NOAA, shows the average annual tornado watches per year for Kansas Region D.

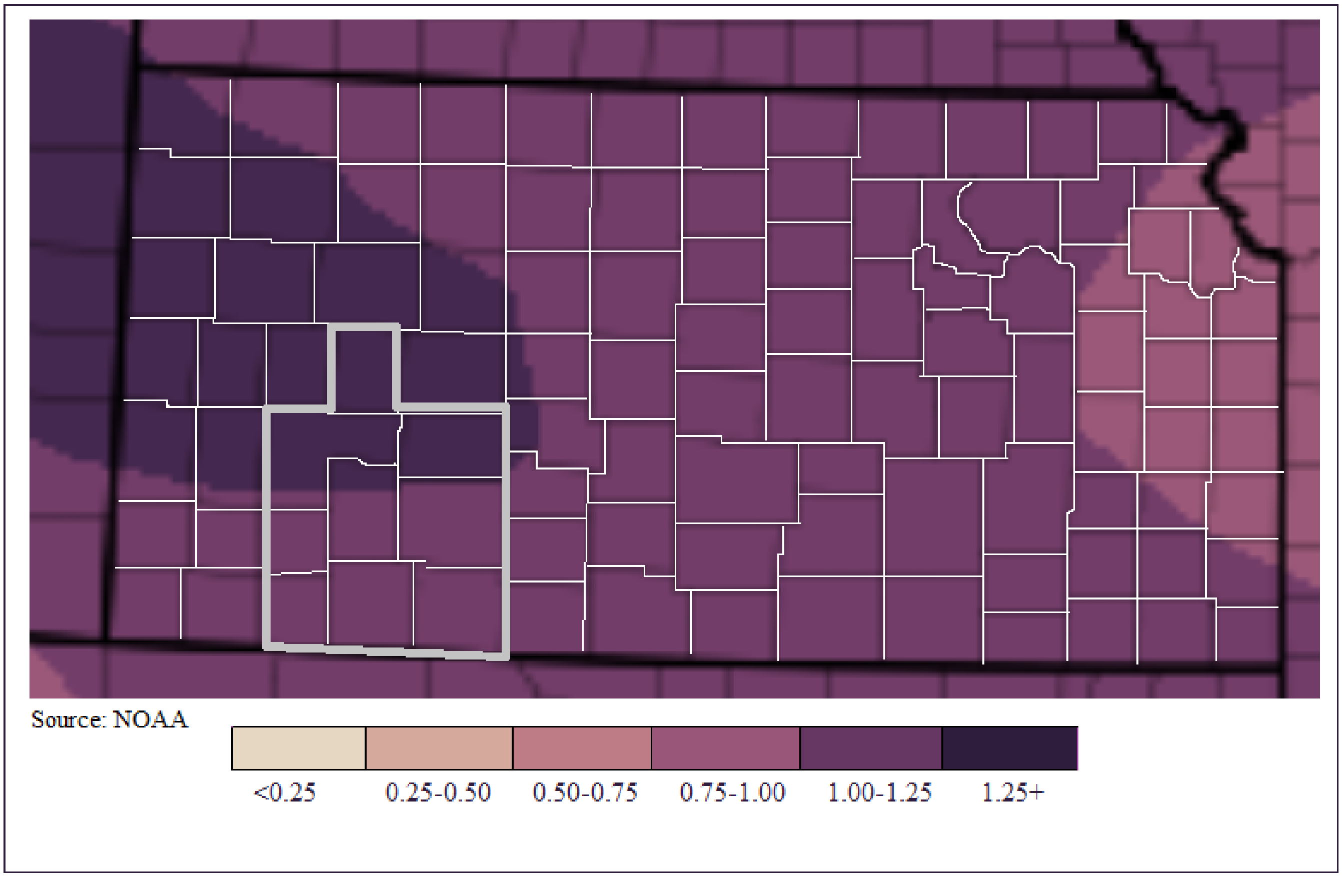
Annual Average Tornado Watches Year Average per Year (1933-2012)



Source: NOAA

Additionally, NOAA generated the following map indicating the mean number of tornado days per year, using data compiled from the years 1986 to 2015.

Mean Number of Tornado Days per Year Within 25 Miles of a Point (1986-2015)



Many tornados only exist for a few seconds in the form of a touchdown. The most extreme tornados can attain wind speeds of more than 200 miles per hour, stretch more than two miles across, and travel dozens of miles.

A tornado may arrive with a squall line or cold front and touch down quickly. Smaller tornados can strike without warning. Other times tornado watches and sirens will alert communities of high potential tornado producing weather or an already formed tornado and its likely path.

Since 2007, the United States uses the Enhanced Fujita Scale to categorize tornados. The scale correlates wind speed values per F level and provides a rubric for estimating damage.

Table 4.132: Enhanced Fujita Scale

Scale	Wind Speed (mph)	Relative Frequency	Potential Damage
EF0	65-85	53.5%	Light. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornados with no reported damage (i.e. those that remain in open fields) are always rated EF0.
EF1	86-110	31.6%	Moderate. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	10.7%	Considerable. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes complete destroyed; large trees snapped or uprooted; light object missiles generated; cars lifted off ground.
EF3	136-165	3.4%	Severe. Entire stores of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	0.7%	Devastating. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	<0.1%	Explosive. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 ft.; steel reinforced concrete structure badly damaged; high rise buildings have significant structural deformation; incredible phenomena will occur.

Source: NOAA Storm Prediction Center

4.19.2 – Previous Occurrences

In the 20-year period from 2000 to present, there have been seven Presidential Disaster Declarations for Kansas Region D for tornados (along with other associates hazard events). The following 20-year information (with 2000 and 2019 being full data years) on past declared disasters is presented to provide a historical perspective on tornado events that have impacted Kansas Region D. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2015.

Table 4.133: Kansas Region D FEMA Tornado Disaster and Emergency Declarations, 2000 - 2019

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4449	06/20/2019 (04/28/2019 – 07/12/2019)	Severe Storms, Straight-Line Winds, Tornados, Flooding, Landslides, and Mudslides	Clark, Ford, Hodgeman, Gray, Meade	$1,087,913
4230	07/20/2015 (05/04/2015 – 06/21/2015)	Severe Storms, Tornados, Straight-line Winds, and Flooding	Gray, Haskell, and Hodgeman	$13,848,325

Table 4.133: Kansas Region D FEMA Tornado Disaster and Emergency Declarations, 2000 - 2019

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4150	10/22/2013 (07/22/2013 – 08/15/2013)	Severe Storms, Straight-line Winds, Tornados, and Flooding	Clark, Ford, Hodgeman, Lane, and Meade	$11,412,827
4063	05/24/2012 (4/14-4/15/2012)	Severe Storms, Tornados, Straight-line Winds and Flooding	Hodgeman	$6,923,919
1849	06/25/2009 (4/25-5/16/2009)	Severe Storms, Flooding, Straight-line Winds, and Tornados	Finney	$15,013,488
1776	07/09/2008	Severe Storms, Flooding, and Tornados	Clark, Haskell, Hodgeman, Lane, and Seward	$70,629,544
1462	5/6/2003 (5/4-30/2003)	Severe Storms, Tornados, and Flooding	Haskell, Meade, and Seward	$988,056

Source: FEMA
-: Data unavailable

The following provides details concerning Presidential Disaster Declaration DR 4449 for Kansas Region D.

Kansas –Severe Storms, Straight-line Winds, Tornados, Flooding, Landslides, and Mudslides FEMA-4449-DR
Declared June 20, 2019

On June 7, 2019, Governor Laura Kelly requested a major disaster declaration due to severe storms, straight-line winds, tornadoes, flooding, landslides, and mudslides beginning on April 28, 2019, and continuing. The Governor requested a declaration for Public Assistance for 63 counties and Hazard Mitigation statewide. Beginning on May 20, 2019, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested areas and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On June 20, 2019, President Trump declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe storms, straight-line winds, tornadoes, flooding, landslides, and mudslides in Allen, Anderson, Atchison, Barber, Barton, Butler, Chase, Chautauqua, Cherokee, Clark, Clay, Cloud, Coffey, Cowley, Doniphan, Elk, Ellsworth, Franklin, Geary, Greenwood, Harper, Harvey, Hodgeman, Jefferson, Kingman, Leavenworth, Lincoln, Linn, Lyon, Marion, Marshall, McPherson, Meade, Montgomery, Morris, Nemaha, Neosho, Osage, Ottawa, Pawnee, Phillips, Pottawatomie, Pratt, Reno, Rice, Rush, Russell, Saline, Sumner, Wabaunsee, Washington, Wilson, and Woodson Counties. This declaration also made Hazard Mitigation Grant Program assistance requested by the Governor available for hazard mitigation measures statewide.

In addition to the above reported events, the following table presents NOAA NCEI identified tornado events and the resulting damage totals in Kansas Region D for the period 2010 - 2019 (with 2010 and 2019 being full data set years).

Table 4.134: Kansas Region D NCEI Tornado Events, 2010 - 2019

County	Number of Days with Event	Property Damage	Deaths	Injuries	Highest Rated Tornado
Clark	4	$0	0	0	EF1
Finney	10	$800	0	0	EF1
Ford	12	$510,000	0	0	EF3
Gray	12	$100,000	0	0	EF2
Haskell	4	$1,000,800	0	0	EF1
Hodgeman	6	$60,000	0	0	EF3
Lane	8	$0	0	0	EF1
Meade	4	$750,000	0	0	EF2
Seward	3	$250,000	0	0	EF3

Source: NOAA NCEI

The following provides both local accounts and NOAA NCEI descriptions of notable recorded events:

- **May 5, 2019: Bloom, Ford County**
  The tornado moved out of Clark County at 1952 LST. One farm that received EF3 damage was unoccupied at the time as the residents left their safe spot (basement) and drove 1 1/2 miles east. Property damage was recorded at $500,000.

- **May 26, 2019: Cimarron, Gray County**
  A tornado heavily damaged a pivot irrigation sprinkler. It was dislodged from the pivot and drug 10 yards. Property damage was recorded at $60,000.

- **May 27, 2015: Sublette, Haskell County**
  This tornado did high end EF1 damage to Pivot irrigation sprinklers along with other damage to several outbuildings and eight large grain bins. A semi was flipped and carried into a field. Property damage was recorded at $1,000,000.

- **May 24, 2015: Plains, Meade County**
  This tornado moved in from Seward County. It appeared to be much stronger and wider, visually. But the cloud bases were extremely low. The tornado turned north and then northwest as is dissipated, based on the survey. Many persons did not see the tornado due to nearby stratus and fog. Property damage was recorded at $750,000.

- **May 24, 2015**
  Kismet, Seward County: This tornado appeared much stronger and wider than it actually was due to very low cloud bases. Irrigation pivots were damaged. Property damage was recorded at $250,000.

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of tornados on the region's agricultural base. Crop loss data for the years 2010 - 2019 (with 2010 and 2019 being full data years), for the region, indicates One tornado related claim on 171 acres for $22,661.

Table 4.135: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Tornados

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Clark	0	0	$0
Finney	0	0	$0
Ford	0	0	$0
Gray	0	0	$0
Haskell	0	0	$0
Hodgeman	1	171	$22,661
Lane	0	0	$0
Meade	0	0	$0
Seward	0	0	$0

Source: USDA Farm Service Agency

4.19.3 – Hazard Probability Analysis

The following table summarizes tornado probability data for **Clark County**.

Table 4.136: Clark County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	4
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Clark County can expect on a yearly basis, relevant to tornado events:

- <1 event
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Clark County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes tornado probability data for **Finney County**.

Table 4.137: Finney County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	10
Average Events per Year	1
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$800
Average Property Damage per Year	$80
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Finney County can expect on a yearly basis, relevant to tornado events:

- One event
- No deaths or injuries
- $80 in property damages

According to the USDA Risk Management Agency, Finney County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes Tornado probability data for **Ford County**.

Table 4.138: Ford County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	12
Average Events per Year	1
Deaths or Injuries (2009-2018)	0

Table 4.138: Ford County Tornado Probability Summary

Data	Recorded Impact
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$510,000
Average Property Damage per Year	$51,000
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Ford County can expect on a yearly basis, relevant to tornado events:

- One event
- No deaths or injuries
- $51,000 in property damages

According to the USDA Risk Management Agency, Ford County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes tornado probability data for **Gray County**.

Table 4.139: Gray County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	12
Average Events per Year	1
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$100,000
Average Property Damage per Year	$10,000
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Gray County can expect on a yearly basis, relevant to tornado events:

- One event

- No deaths or injuries
- $10,000 in property damages

According to the USDA Risk Management Agency, Gray County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes tornado probability data for **Haskell County**.

Table 4.140: Haskell County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	4
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$1,000,800
Average Property Damage per Year	$100,080
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Haskell County can expect on a yearly basis, relevant to tornado events:

- <1 event
- No deaths or injuries
- $100,800 in property damages

According to the USDA Risk Management Agency, Haskell County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes tornado probability data for **Hodgeman County**.

Table 4.141: Hodgeman County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	6
Average Events per Year	1

Table 4.141: Hodgeman County Tornado Probability Summary

Data	Recorded Impact
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$60,000
Average Property Damage per Year	$6,000
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	1
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	171
Average Number of Acres Damaged per Year	17
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$22,661
Average Crop Damage per Year	$2,266

Source: NCEI and USDA

Data from the NCEI indicates that Hodgeman County can expect on a yearly basis, relevant to tornado events:

- One event
- No deaths or injuries
- $6,000 in property damages

According to the USDA Risk Management Agency, Hodgeman County can expect on a yearly basis, relevant to tornado occurrences:

- <1 insurance claim
- 17 acres impacted
- $2,266 in insurance claims

The following table summarizes Tornado probability data for **Lane County**.

Table 4.142: Lane County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	8
Average Events per Year	1
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Lane County can expect on a yearly basis, relevant to tornado events:

- One event
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Lane County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes tornado probability data for **Meade County**.

Table 4.143: Meade County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	4
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$750,000
Average Property Damage per Year	$75,000
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Meade County can expect on a yearly basis, relevant to tornado events:

- <1 event
- No deaths or injuries
- $75,000 in property damages

According to the USDA Risk Management Agency, Meade County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes tornado probability data for **Seward County**.

Table 4.144: Seward County Tornado Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	3
Average Events per Year	<1
Deaths or Injuries (2009-2018)	0
Average Number of Deaths or Injuries	0
Total Reported NCEI Property Damage (2009-2018)	$250,000
Average Property Damage per Year	$25,000
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: NCEI and USDA

Data from the NCEI indicates that Seward County can expect on a yearly basis, relevant to tornado events:

- <1 event
- No deaths or injuries
- $25,000 in property damages

According to the USDA Risk Management Agency, Seward County can expect on a yearly basis, relevant to tornado occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

Based on the number of NCEI reported events we derive the following probability for event occurrence in Kanas Region D:

- **Tornado Probability:** Approximately six events per year

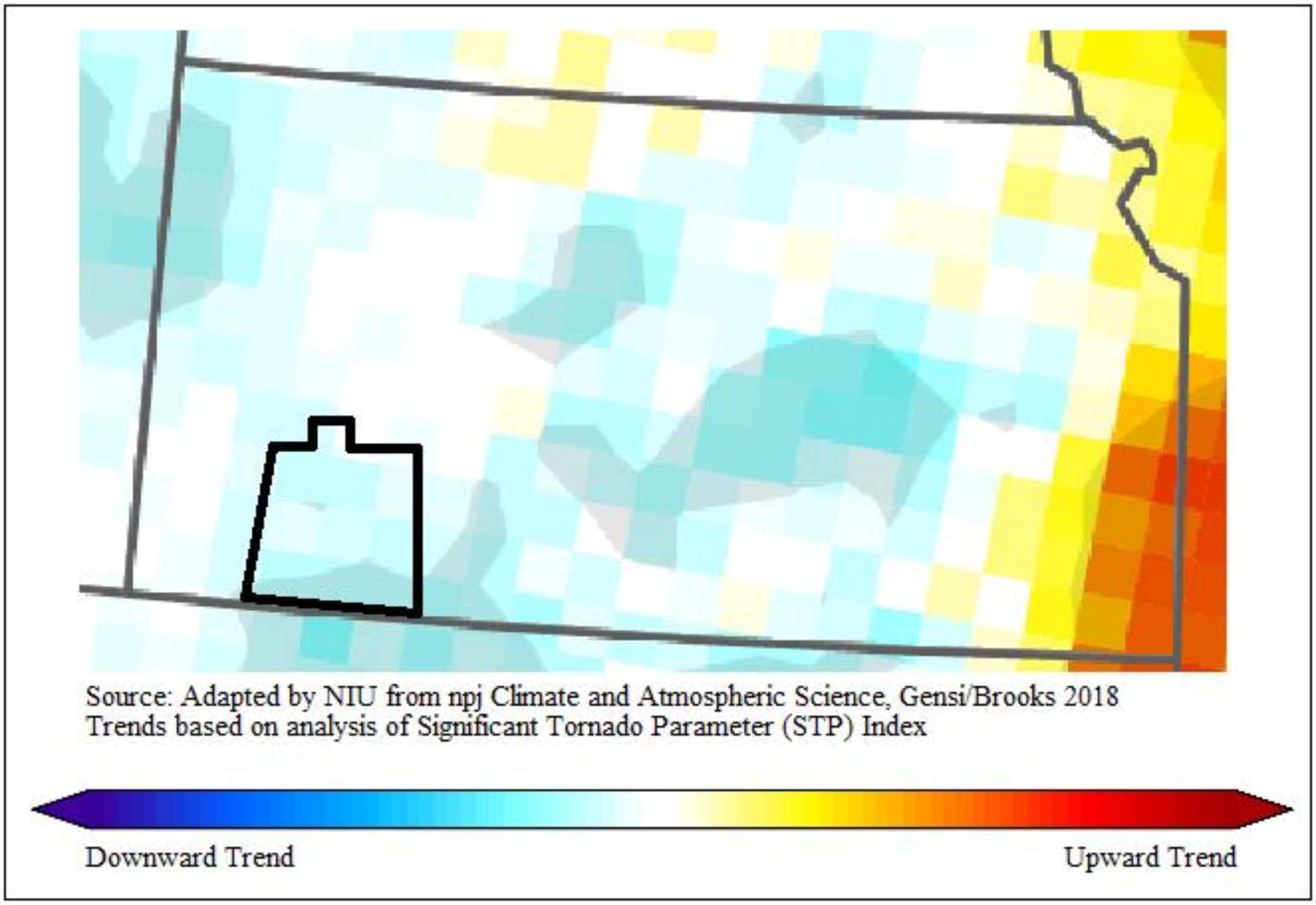
However, if events are normalized for tornados rated above an EF2, we derive the following probability for event occurrence:

- **Probability of an EF2 or greater tornado:** One event per year

In addition, Kansas Region D has had seven Presidentially Declared Disasters relating to tornados (and other concurrent events such as flooding) in the last 20 years. This represents an average less than one declared tornado related disaster per year.

Research conducted by the National Severe Storms Lab looked at Significant Tornado Parameter (STP) to help determine future tornado probability. STP is a measurement of the major parameters of tornado conditions, including wind speed and direction, wind at differing altitudes, unstable air patterns, and humidity. The following map, generated by Northern Illinois University and compiled from STP data, indicates that Kansas Region D may see a decreasing future number of tornados.

Tornado Environmental Frequency Trends



4.19.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to tornado events. Counties with a higher or increasing population, high, or increasing, or having a high structural valuation are to be considered to have a potentially greater vulnerability.

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region D county incurring damage over the period 2010 to 2019 from tornado events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

.

Table 4.145: Kansas Region D Structural Vulnerability Data for Tornados, 2010-2019

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Clark	$495,884,000	$0	0.00%
Finney	$6,770,618,000	$800	0.00%
Ford	$5,874,814,000	$510,000	0.01%

Table 4.145: Kansas Region D Structural Vulnerability Data for Tornados, 2010-2019

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Gray	$1,294,134,000	$100,000	0.01%
Haskell	$861,920,000	$1,000,800	0.12%
Hodgeman	$367,392,000	$60,000	0.02%
Lane	$465,306,000	$0	0.00%
Meade	$1,090,544,000	$750,000	0.07%
Seward	$3,662,220,000	$250,000	0.01%

Source: NCEI and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to potential tornado failure events. The following table indicates the total county population and registered growth over the period 2000 to 2018.

Table 4.146: Kansas Region D Population Vulnerability Data for Tornados

County	2018 Population	Percent Population Change 2000 to 2018
Clark	2,005	-16.1%
Finney	36,611	-9.7%
Ford	33,888	4.1%
Gray	6,033	2.2%
Haskell	3,997	-6.9%
Hodgeman	1,818	-12.8%
Lane	1,560	-27.6%
Meade	4,146	-10.5%
Seward	21,780	-3.2%

Source: US Census Bureau

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region D County. USDA Risk Management Agency crop loss data allows us to quantify the monetary impact of tornados on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to tornado events.

Table 4.147: Tornado Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Clark	434,295	0	0.00%	$111,420,000	$0	0.00%
Finney	790,500	0	0.00%	$823,091,000	$0	0.00%
Ford	669,832	0	0.00%	$515,252,000	$0	0.00%
Gray	556,070	0	0.00%	$990,653,000	$0	0.00%
Haskell	363,751	0	0.00%	$1,159,098,000	$0	0.00%
Hodgeman	494,925	17	0.00%	$191,891,000	$2,266	0.00%
Lane	417,017	0	0.00%	$266,374,000	$0	0.00%
Meade	587,924	0	0.00%	$233,384,000	$0	0.00%

Table 4.147: Tornado Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Seward	360,711	0	0.00%	$424,697,000	$0	0.00%

Source: USDA

Between 2001 and 2010 51% of those killed by tornados were living in mobile homes, according to the NOAA. A 2012 "Kansas Severe Weather Awareness Week" report indicates that people living in mobile homes are killed by tornados at a rate 20 times higher than people living in permanent homes. Additionally, a new study from Michigan State University reported that the two biggest factors related to tornado fatalities were housing quality (measured by mobile homes as a proportion of housing units) and income level. When a tornado strikes, a county with double the number of mobile homes as a proportion of all homes will experience 62% more fatalities than a county with fewer mobile homes, according to the study data.

The following participating jurisdictions may have increased vulnerability to tornado events due to having greater than 20% of housing stock as mobile homes:

- **Ensign** (Gray County)
- **Ingalls (**Gray County)
- **Deerfield** (Gray County)
- **Haskell County**
- **Satanta** (Haskell County)
- **Plains (**Meade County)
- **Kismet (**Seward County)

4.19.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.148: Tornado Consequence Analysis

Subject	Impacts of Tornado
Health and Safety of the Public	Impact of the immediate area could be severe depending on whether individuals were able to seek shelter and get out of the trajectory of the tornado. Casualties are dependent on warning systems and warning times.
Health and Safety of Responders	Impact to responders is expected to be minimal unless responders live within the affected area.
Continuity of Operations	Temporary to permanent relocation may be necessary if government facilities experience damage.
Property, Facilities, and Infrastructure	Localized impact could be severe in the trajectory path. Roads, buildings, and communications could be adversely affected. Damage could be severe.
Environment	Impact will be severe for the immediate impacted area. Impact will lessen as distance increases from the immediate incident area.

Table 4.148: Tornado Consequence Analysis

Subject	Impacts of Tornado
Economic Conditions	Impacts to the economy will greatly depend on the trajectory of the tornado. If a jurisdiction takes a direct hit, then the economic conditions will be severe. With an indirect hit the impact could be low to severe.
Public Confidence in the Jurisdiction's Governance	Response and recovery will be in question if not timely and effective. Warning systems and warning time will also be questioned.

4.20 – Wildfire

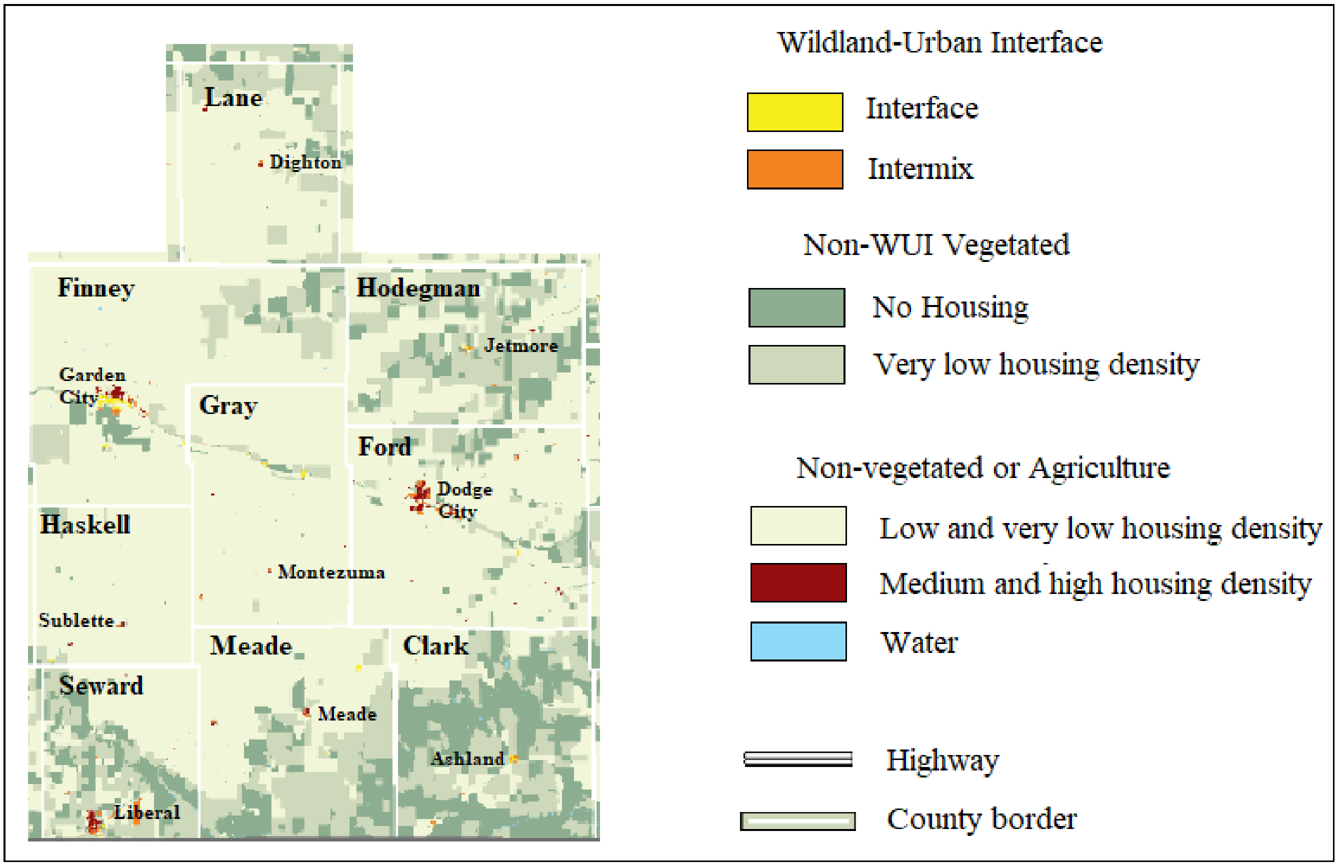
The NWS defines a wildfire as any free burning uncontainable wildland fire not prescribed for the area which consumes the natural fuels and spreads in response to its environment. They can occur naturally, by human accident, and on rare occasions by human action. Population de-concentration in the U.S. has resulted in rapid development in the outlying fringe of metropolitan areas and in rural areas with attractive recreational and aesthetic amenities, especially forests. This expansion has increased the likelihood that wildfires will threaten life and property.

4.20.1 – Location and Extent

Wildfires in Kansas Region D typically originate in pasture or prairie areas following the ignition of dry grasses (by natural or human sources). According to the 2011 Kansas Forest Action Plan, with the exception of Eastern Redcedar, most forest types in Kansas do not pose significant fire management issues. However, grasslands, which make up a majority of the open areas in Kansas Region D, do pose fire management issues due to the expansion of the Wildland Urban Interface (WUI) in recent decades.

The WUI creates an environment in which fire can move readily between structural and vegetation fuels. Two types of WUI are mapped: intermixed and interface. Intermix WUI are areas where housing and vegetation intermingle; interface WUI are areas with housing in the vicinity of dense, contiguous wildland vegetation. The following maps detail WUI areas and information for Kansas Region D.

SILVIS Labs Regional WUI Map



The Eastern Redcedar is an invasive evergreen species can take over fence rows and un-planted fields adding to wildfire fuel and risk. Research conducted through the Journal of Forestry indicates that the percent of the total regional acreage impacted by Eastern Redcedar in Region D is 0%.

4.20.2 – Previous Occurrences

In the 20-year period from 2000 to present, there have been three Fire Management Assistance Declarations for Region D.

- **FM 5171** Clark County Fire; Declared 03/06/2017
  There were seven separate fires. Two moved near or through Englewood, originating in Oklahoma. Another consumed several homes just north of Ashland. Four others in northern Clark County consumed several homes initially but became a monster fire as the cold front moved through. The fires subsided during the first night but flared up the following late morning and afternoon. As of late May there was still no real estimate of the number of dead cattle as many were never found but estimates are large, from three to nine thousand head. Total acres burned in just Clark County were estimated at 425,000. There were 31 homes destroyed and 6 damaged. There were a total of 108 outbuildings destroyed and 13 others damaged. Many, many miles of fence were destroyed. Damage was estimated at $3,000,000.

- **FM 5173** Ford County Fire Complex: Declared 03/06/2017
  The fire started at a burn pile near the racetrack in Dodge City. The fire burned at least 2 dozen structures, fences, trees and a several vehicles. It initially spread northeast and then quickly turned east and southeast as a cold front moved through the area. Visibility was near zero from blowing dirt as the fire progressed through.

- **FM 2878 Haskell County Fire:** Declared 04/03/2011
  A wildfire started around noon on Sunday, April 3rd near Cave in northeastern Stevens County. The fire quickly spread to the northeast, as surface winds were blowing from the southwest at 40 to 50 mph. This fire came very close to Satanta, in southwest Haskell County. Winds shifted to the north around 5 pm CDT, which helped the dozens of residents and fire departments prevent much fire damage in Satanta. In all, 960 acres were burned, caused damage to public infrastructure in both counties, including four bridges. Three homes near Satanta were damaged from the fire. Eleven fire departments from Haskell, Stevens and surrounding counties, as well as two from Oklahoma. The Stevens County Fire Department lost a truck to the blaze. The town of Satanta was evacuated as the fire approached. About 1000 people were evacuated to the Sublette High School. Hospital and Long-Term Care residents were evacuated to Sublette, and then transported to Garden City for the night. The Stevens County Emergency Manager report extensive damage to 6 train bridges, and suspected the fire began from sparks off a railroad train. By 5:30 pm CDT, the Haskell sheriff's office reported the blaze was about 80 percent contained. Several highways in the Satanta area were closed due to smoke.

In the 20-year period from 2000 to present, there have been no Presidential Disaster Declarations for Kansas Region D for wildfires.

The Office of the State of Kansas Fire Marshall's Office (KSFM) was contacted concerning the size and origin of reported wildfires for the region. The following table lists all recorded wildfires, by county, for the six-year period 2013-2018 (currently available data).

Table 4.149: Kansas Region D State Fire Marshall Recorded Wildfire Events, 2013-2018

County	Number of Reported Fires	Deaths	Injuries	Buildings Burned	Burned Acres
Clark	38	1	5	147	440,155
Finney	27	0	1	0	15,240
Ford	36	0	0	0	5,445
Gray	14	0	0	8	1,497
Haskell	10	0	0	0	1,710
Hodgeman	16	0	0	0	668
Lane	15	0	0	40	19,789
Meade	23	0	0	20	52,335
Seward	15	0	0	5	7,264

Source: KSFM

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of wildfires on the region's agricultural base. Crop loss data for the years 2010 - 2019 (with 2010 and 2019 being full data years), for the region, indicates eight wildfire related claims on 347 acres for $17,546.

Table 4.150: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Wildfires

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Clark	0	0	$0
Finney	0	0	$0
Ford	5	257	$45,404
Gray	2	426	$108,572
Haskell	0	0	$0
Hodgeman	0	0	$0
Lane	4	46	$1,843
Meade	0	0	$0
Seward	0	0	$0

Source: USDA Farm Service Agency

4.20.3 – Hazard Probability Analysis

The following table summarizes wildfire probability data for **Clark County**.

Table 4.151: Clark County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	38
Average Events per Year	6
Number Deaths or Injuries (2013-2018)	6
Average Number of Yearly Deaths and Injuries (2013-2018)	1
Total Reported Burned Buildings (2013-2018)	147
Average Burned Buildings per Year	25
Total Reported Burned Acres (2013-2018)	440,155
Average Burned Acres per Year	73,359
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Clark County can expect on a yearly basis, relevant to wildfire events:

- Six events
- One death or injury
- 25 buildings burned
- 73,359 acres burned

According to the USDA Risk Management Agency, Clark County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes wildfire probability data for **Finney County**.

Table 4.152: Finney County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	27
Average Events per Year	5
Number Deaths or Injuries (2013-2018)	1
Average Number of Yearly Deaths and Injuries (2013-2018)	<1
Total Reported Burned Buildings (2013-2018)	0
Average Burned Buildings per Year	0
Total Reported Burned Acres (2013-2018)	15,240
Average Burned Acres per Year	2,540
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Finney County can expect on a yearly basis, relevant to wildfire events:

- Five events
- <1 death or injury
- No buildings burned
- 2,540 acres burned

According to the USDA Risk Management Agency, Finney County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes wildfire probability data for **Ford County**.

Table 4.153: Ford County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	36
Average Events per Year	6
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries (2013-2018)	0
Total Reported Burned Buildings (2013-2018)	0

Table 4.153: Ford County Wildfire Probability Summary

Data	Recorded Impact
Average Burned Buildings per Year	0
Total Reported Burned Acres (2013-2018)	5,445
Average Burned Acres per Year	908
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	5
Average Number of Claims per Year	1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	257
Average Number of Acres Damaged per Year	26
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$45,404
Average Crop Damage per Year	$4,540

Source: KSFM and NOAA

Data from the KSFM indicates that Ford County can expect on a yearly basis, relevant to wildfire events:

- Six events
- No deaths or injuries
- No buildings burned
- 908 acres burned

According to the USDA Risk Management Agency, Ford County can expect on a yearly basis, relevant to wildfire occurrences:

- One insurance claim
- 26 acres impacted
- $4,540 in insurance claims

The following table summarizes wildfire probability data for **Gray County**.

Table 4.154: Gray County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	14
Average Events per Year	2
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries (2013-2018)	0
Total Reported Burned Buildings (2013-2018)	8
Average Burned Buildings per Year	1
Total Reported Burned Acres (2013-2018)	1,497
Average Burned Acres per Year	250
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	2
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	426
Average Number of Acres Damaged per Year	43
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$108,572
Average Crop Damage per Year	$10,857

Source: KSFM and NOAA

Data from the KSFM indicates that Gray County can expect on a yearly basis, relevant to wildfire events:

- Two event
- No deaths or injuries
- One building burned
- 250 acres burned

According to the USDA Risk Management Agency, Gray County can expect on a yearly basis, relevant to wildfire occurrences:

- <1 insurance claims
- 43 acres impacted
- $10,857 in insurance claims

The following table summarizes wildfire probability data for **Haskell County**.

Table 4.155: Haskell County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	10
Average Events per Year	2
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries (2013-2018)	0
Total Reported Burned Buildings (2013-2018)	0
Average Burned Buildings per Year	0
Total Reported Burned Acres (2013-2018)	1,710
Average Burned Acres per Year	285
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Haskell County can expect on a yearly basis, relevant to wildfire events:

- Two event
- No deaths or injuries
- No buildings burned
- 285 acres burned

According to the USDA Risk Management Agency, Haskell County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims

- No acres impacted
- $0 in insurance claims

The following table summarizes wildfire probability data for **Hodgeman County**.

Table 4.156: Hodgeman County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	16
Average Events per Year	3
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries (2013-2018)	0
Total Reported Burned Buildings (2013-2018)	0
Average Burned Buildings per Year	0
Total Reported Burned Acres (2013-2018)	668
Average Burned Acres per Year	111
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Hodgeman County can expect on a yearly basis, relevant to wildfire events:

- Three events
- No deaths or injuries
- No buildings burned
- 111 acres burned

According to the USDA Risk Management Agency, Hodgeman County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes wildfire probability data for **Lane County**.

Table 4.157: Lane County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	15
Average Events per Year	3
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries (2013-2018)	0
Total Reported Burned Buildings (2013-2018)	40

Table 4.157: Lane County Wildfire Probability Summary

Data	Recorded Impact
Average Burned Buildings per Year	7
Total Reported Burned Acres (2013-2018)	19,789
Average Burned Acres per Year	3,298
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	4
Average Number of Claims per Year	<1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	46
Average Number of Acres Damaged per Year	5
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$1,843
Average Crop Damage per Year	$184

Source: KSFM and NOAA

Data from the KSFM indicates that Lane County can expect on a yearly basis, relevant to wildfire events:

- Three events
- No deaths or injuries
- Seven building burned
- 3,298 acres burned

According to the USDA Risk Management Agency, Lane County can expect on a yearly basis, relevant to wildfire occurrences:

- <1 insurance claim
- Five acres impacted
- $184 in insurance claims

The following table summarizes wildfire probability data for **Meade County**.

Table 4.158: Meade County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	23
Average Events per Year	4
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries (2013-2018)	0
Total Reported Burned Buildings (2013-2018)	20
Average Burned Buildings per Year	3
Total Reported Burned Acres (2013-2018)	52,335
Average Burned Acres per Year	8,723
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Meade County can expect on a yearly basis, relevant to wildfire events:

- Four events
- No deaths or injuries
- Three buildings burned
- 8,723 acres burned

According to the USDA Risk Management Agency, Meade County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims
- No acres impacted
- $0 in insurance claims

The following table summarizes wildfire probability data for **Seward County**.

Table 4.159: Seward County Wildfire Probability Summary

Data	Recorded Impact
Number of KSFM Reported Events (2013-2018)	15
Average Events per Year	3
Number Deaths or Injuries (2013-2018)	0
Average Number of Yearly Deaths and Injuries (2013-2018)	0
Total Reported Burned Buildings (2013-2018)	5
Average Burned Buildings per Year	1
Total Reported Burned Acres (2013-2018)	7,264
Average Burned Acres per Year	1,211
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	0
Average Number of Claims per Year	0
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	0
Average Number of Acres Damaged per Year	0
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$0
Average Crop Damage per Year	$0

Source: KSFM and NOAA

Data from the KSFM indicates that Seward County can expect on a yearly basis, relevant to wildfire events:

- Three events
- No deaths or injuries
- No buildings burned
- 1,211 acres burned

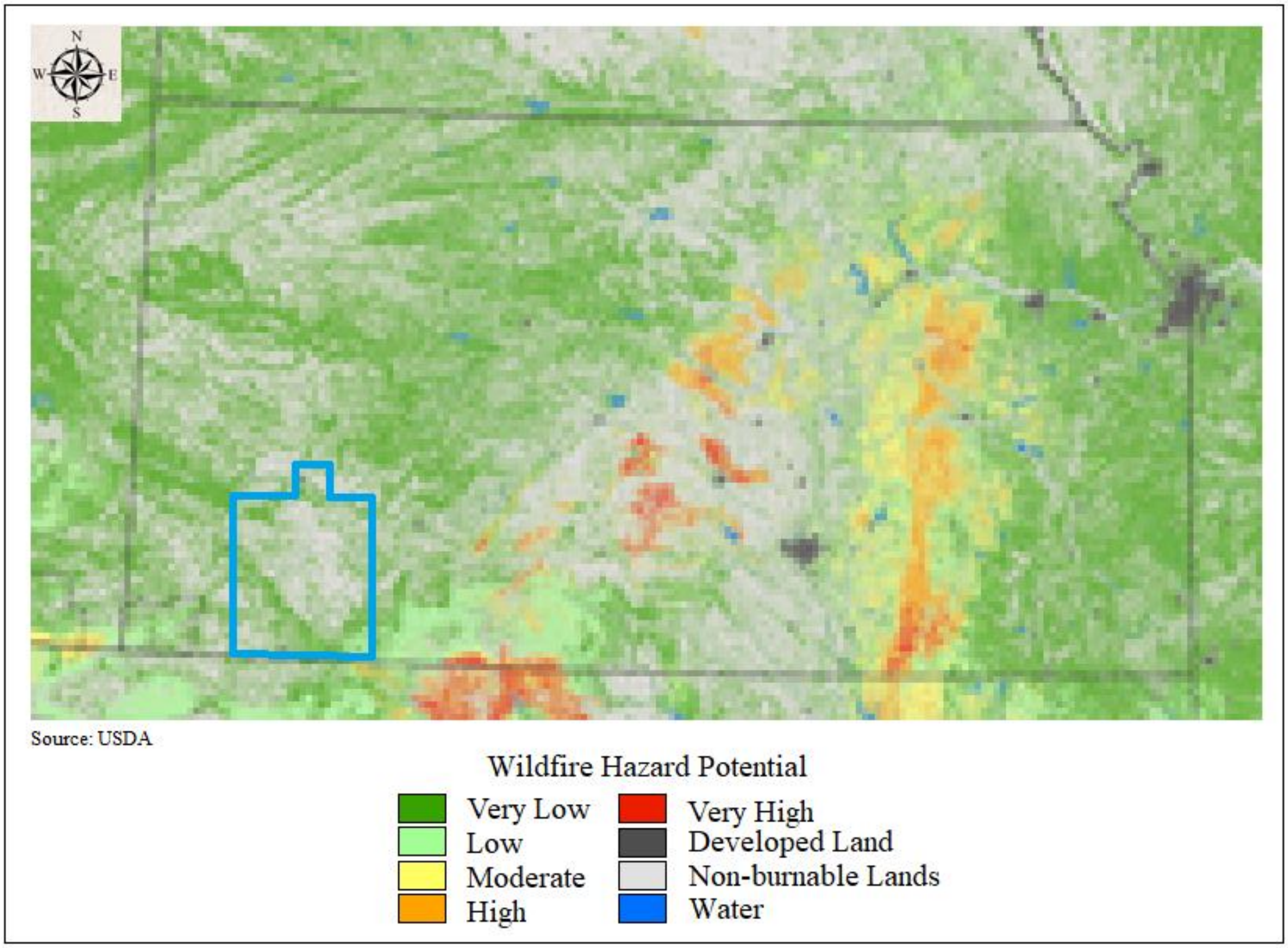
According to the USDA Risk Management Agency, Seward County can expect on a yearly basis, relevant to wildfire occurrences:

- No insurance claims

- No acres impacted
- $0 in insurance claims

Mapping created by the USDA in 2018 indicates the Wildfire Hazard Potential for the United States. In general, the map indicates that Kansas Region D is the low and very low class.

USDA Wildfire Potential Map



4.20.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to wildfire events. Counties with a higher or increasing population, high, or increasing, or having a high structural valuation are to be considered to have a potentially greater vulnerability.

The following table presents data from HAZUS and KSFM concerning the structures and the percentage of structures for each Kansas Region D county incurring damage over the six-year period of 2013 to 2018 (current available data) from wildfire events. As KSFM did not assign a value to the structures burned, an estimate of $32,000 per structure (value determined using a commercial cost calculator for an 800 square foot general purpose barn at $40 per square foot) was used as reports indicate the majority of structures burned were farm out-buildings. The greater the percentage of structures damaged the greater overall vulnerability going forward.

Table 4.160: Kansas Region D Structural Vulnerability Data for Wildfires, 2010-2019

County	HAZUS Building Valuation	KSFM Structure Damage	Percentage of Building Valuation Damaged
Clark	$495,884,000	$4,704,000	0.95%
Finney	$6,770,618,000	$0	0.00%
Ford	$5,874,814,000	$0	0.00%
Gray	$1,294,134,000	$256,000	0.02%
Haskell	$861,920,000	$0	0.00%
Hodgeman	$367,392,000	$0	0.00%
Lane	$465,306,000	$1,280,000	0.28%
Meade	$1,090,544,000	$640,000	0.06%
Seward	$3,662,220,000	$160,000	0.00%

Source: NCEI and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to potential wildfire events. The following table indicates the total county population and registered growth over the period 2000 to 2018.

Table 4.161: Kansas Region D Population Vulnerability Data for Wildfires

County	2018 Population	Percent Population Change 2000 to 2018
Clark	2,005	-16.1%
Finney	36,611	-9.7%
Ford	33,888	4.1%
Gray	6,033	2.2%
Haskell	3,997	-6.9%
Hodgeman	1,818	-12.8%
Lane	1,560	-27.6%
Meade	4,146	-10.5%
Seward	21,780	-3.2%

Source: US Census Bureau

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region D County. USDA Risk Management Agency crop loss data allows us to quantify the monetary impact of wildfires on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to wildfire events.

Table 4.162: Wildfire Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Clark	434,295	0	0.00%	$111,420,000	$0	0.00%
Finney	790,500	0	0.00%	$823,091,000	$0	0.00%
Ford	669,832	26	0.00%	$515,252,000	$4,540	0.00%

Table 4.162: Wildfire Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Gray	556,070	43	0.01%	$990,653,000	$10,857	0.00%
Haskell	363,751	0	0.00%	$1,159,098,000	$0	0.00%
Hodgeman	494,925	0	0.00%	$191,891,000	$0	0.00%
Lane	417,017	5	0.00%	$266,374,000	$184	0.00%
Meade	587,924	0	0.00%	$233,384,000	$0	0.00%
Seward	360,711	0	0.00%	$424,697,000	$0	0.00%

Source: USDA

Potentially lessening future vulnerability to wildfires are Community Wildfire Protection Plans (CWPPs). A CWPP is the most effective way to take advantage of various Federal programs to include the Healthy Forests Restoration Act. By having a CWPP, communities are given priority for funding of Healthy Forests Restoration Act hazardous fuels reduction projects. The three main components of a CWPP are:

- Collaboration between all affected or potentially affected jurisdictions,
- Assessment of the wildfire hazards in an area that leads to recommendation for prioritized fuel reduction, and
- A section on recommendations towards reducing structural ignitability.

Currently, no Kansas Region D county has a CWPP, however both Clark and Meade Cou nties are in the process of creating plans.

4.20.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table prov ides the Consequence Analysis.

Table 4.163: Wildfire Consequence Analysis

Subject	Impacts of Wildfire
Health and Safety of the Public	Impact could be severe for people living and working in the immediate area. Surrounding communities may also be impacted by evacuees.
Health and Safety of Responders	Impact to responders could be severe depending on the size and scope of the fire, especially for firefighters. Impact will be low to moderate for support responders with the main threat as smoke inhalation.
Continuity of Operations	Temporary relocation may be necessary if government facilities experience damage.
Property, Facilities, and Infrastructure	Delivery of services could be affected if there is any disruption to the roads and/or utilities due to damages sustained.
Environment	Impact will be severe for the immediate area with regards to trees, bushes, animals, and crops. Impact will lessen as distance increases.
Economic Conditions	Impacts to the economy could be moderate in the immediate area.
Public Confidence in the Jurisdiction's Governance	Response and recovery will be in question if not timely and effective. Evacuation orders and shelter availability could be called in to question.

4.21 – Windstorm

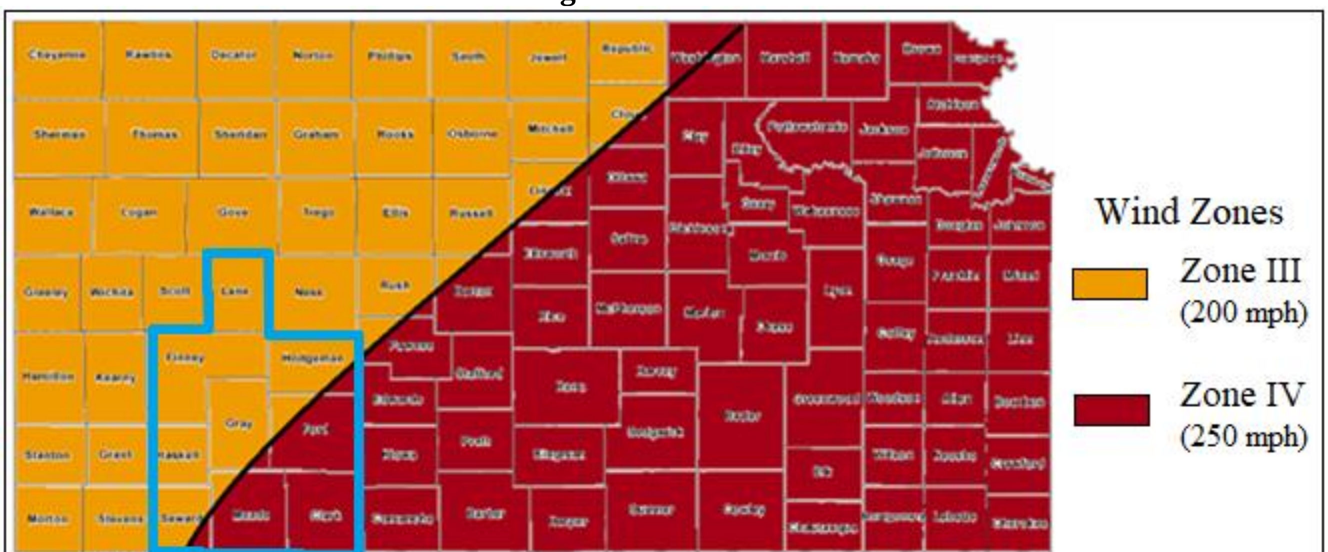
Straight-line winds are generally any thunderstorm wind that is not associated with rotation. It is these winds, which can exceed 100 mph that represent the most common type of severe weather and are responsible for most wind damage related to thunderstorms. Since thunderstorms do not have narrow tracks like tornados, the associated wind damage can be extensive and affect entire counties or regions. Objects like trees, barns, outbuildings, high-profile vehicles, and power lines/poles can be toppled or destroyed, and roofs, windows, and homes can be damaged as wind speeds increase.

4.21.1 – Location and Extent

High winds occur over broad geographic regions. The entire Kansas Region D planning area, including all participating jurisdictions, is at risk to high wind events.

The following figure shows the wind zones of the United States based on maximum wind speeds. Kansas Region D is located within wind zones III and IV, the highest inland categories.

Regional Wind Zone



Source: FEMA

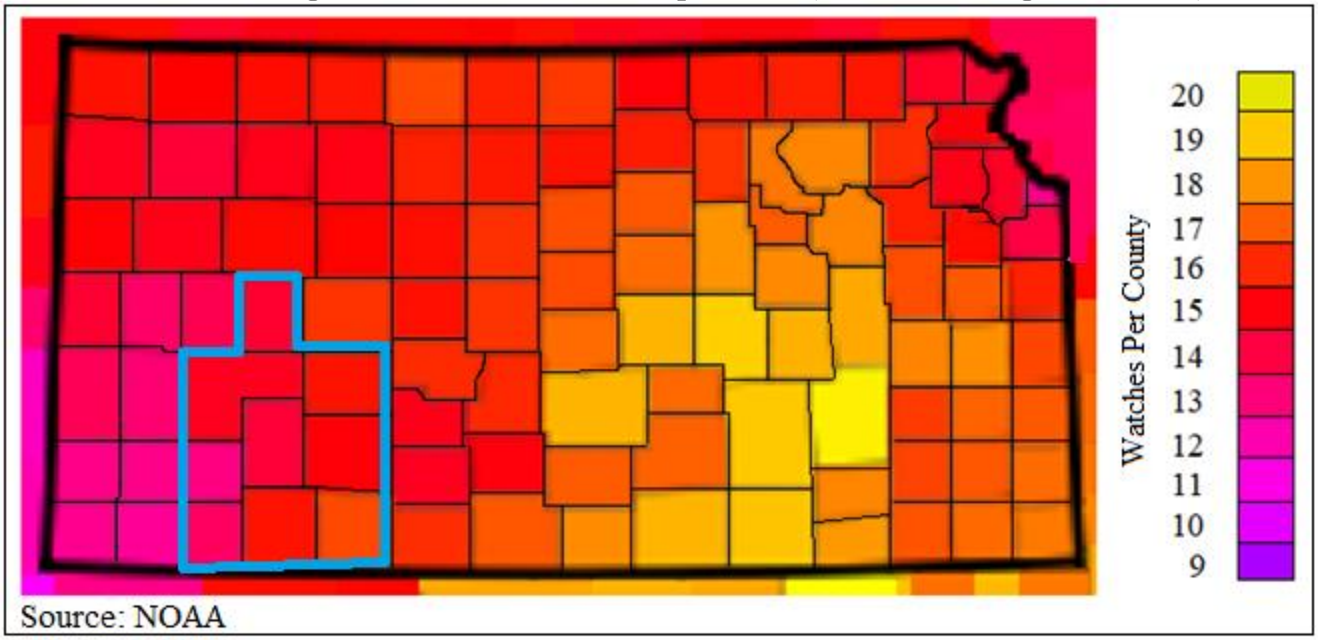
Severe thunderstorms strike Kansas Region D regularly, with accompanying high wind that can cause injury, death, and property damage. The widespread and frequent nature of thunderstorms makes high wind a relatively common occurrence. The NWS classifies thunderstorms, often the generator of high winds, using the following categories.

- **Marginal:** Isolated severe thunderstorms, limited in duration and/or coverage and/or intensity
- **Slight:** Scattered severe storms possible, Short-lived and/or not widespread, isolated intense storms possible

- **Enhanced:** Numerous severe storms possible, more persistent and/or widespread, a few intense
- **Moderate:** Widespread severe storms likely, long-lived, widespread and intense
- **High:** Widespread severe storms expected, long-lived, very widespread and particularly intense

The following map, generated by NOAA, indicates the average number severe thunderstorm watches per year for Kansas Region D.

Annual Average Thunderstorm Watches per Year (20-Year Average 1993-2012)



To measure wind speed and its correlating potential for damage, experts use the Beaufort scale as shown below.

Table 4.164: Beaufort Scale

Beaufort Number	Wind Speed (mph)	Effects on Land
0	Under 1	Calm, smoke rises vertically
1	1-3	Smoke drift indicates wind direction, vanes do not move
2	4-7	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Leaves, small twigs in constant motion. Light flags extended.
4	13-18	Dust, leaves and loose paper raised up, small branches move
5	19-24	Small trees begin to sway
6	25-31	Large branches of trees in motion, whistling heard in wires
7	32-38	While trees in motion, resistance felt in walking against the wind
8	39-46	Twigs and small branches broken off trees
9	47-54	Slight structural damage occurs, slate blown from roofs
10	55-63	Seldom experienced on land, trees broken, structural damage occurs
11	64-72	Very rarely experienced on land, usually with widespread damage
12	73 or higher	Violence and destruction

4.21.2 – Previous Occurrences

In the 20-year period from 2000 to present, there have been six Presidential Disaster Declarations for Kansas Region D for Straight-Line Winds (along with other associates hazard events). The following 20-year information (with 2000 and 2019 being full data years) on past declared disasters is presented to provide a historical perspective on high wind events that have impacted Kansas Region D. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2015.

Table 4.165: Kansas Region D FEMA Straight-Line Winds Disaster and Emergency Declarations, 2000 - 2019

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4449	06/20/2019 (04/28/2019 – 07/12/2019)	Severe Storms, Straight-Line Winds, Tornados, Flooding, Landslides, and Mudslides	Clark, Ford, Hodgeman, Gray, Meade	$1,087,913
4319	06/16/2017 (04/28/2017 – 05/03/2017)	Severe Winter Storm, Snowstorm, Straight-line Winds, Flooding	Finney, Haskell, Lane, and Seward	$53,126,486
4230	07/20/2015 (05/04/2015 – 06/21/2015)	Severe Storms, Tornados, Straight-line Winds, and Flooding	Gray, Haskell, and Hodgeman	$13,848,325
4150	10/22/2013 (07/22/2013 – 08/15/2013)	Severe Storms, Straight-line Winds, Tornados, and Flooding	Clark, Ford, Hodgeman, Lane, and Meade	$11,412,827
4063	05/24/2012 (4/14-4/15/2012)	Severe Storms, Tornados, Straight-line Winds and Flooding	Hodgeman	$6,923,919
1849	06/25/2009 (4/25-5/16/2009)	Severe Storms, Flooding, Straight-line Winds, and Tornados	Finney	$15,013,488

Source: FEMA
-: Data unavailable

The following provides details concerning Presidential Disaster Declarations DR 4319 for Kansas Region D.

Kansas –Severe Storms, Straight-line Winds, Tornados, Flooding, Landslides, and Mudslides FEMA-4449-DR
Declared June 20, 2019

On June 7, 2019, Governor Laura Kelly requested a major disaster declaration due to severe storms, straight-line winds, tornadoes, flooding, landslides, and mudslides beginning on April 28, 2019, and continuing. The Governor requested a declaration for Public Assistance for 63 counties and Hazard Mitigation statewide. Beginning on May 20, 2019, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested areas and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On June 20, 2019, President Trump declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe storms, straight-line winds, tornadoes, flooding, landslides, and mudslides in Allen, Anderson, Atchison, Barber, Barton, Butler, Chase, Chautauqua, Cherokee, Clark, Clay, Cloud, Coffey, Cowley, Doniphan, Elk, Ellsworth, Franklin, Geary, Greenwood, Harper, Harvey, Hodgeman, Jefferson, Kingman, Leavenworth, Lincoln, Linn, Lyon, Marion, Marshall, McPherson, Meade, Montgomery, Morris, Nemaha, Neosho, Osage, Ottawa, Pawnee, Phillips, Pottawatomie, Pratt, Reno, Rice, Rush, Russell, Saline, Sumner, Wabaunsee, Washington, Wilson, and Woodson Counties. This declaration also made Hazard Mitigation Grant Program assistance requested by the Governor available for hazard mitigation measures statewide.

Kansas – Severe Winter Storm, Snowstorm, Straight-Line Winds, and Flooding FEMA-4319-DR
Declared June 16, 2017

On May 31, 2017, Governor Sam Brownback requested a major disaster declaration due to a severe winter storm, snowstorm, straight-line winds, and flooding during the period of April 28 to May 3, 2017. The Governor requested a declaration for Public Assistance for 29 counties, snow assistance for 9 counties, and Hazard Mitigation statewide. During the period of May 8-21, 2017, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested counties and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On June 16, 2017, President Trump declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe winter storm, snowstorm, straight-line winds, and flooding in Cherokee, Cheyenne, Crawford, Decatur, Finney, Gove, Graham, Clark, Finney, Ford, Haskell, Gray, Lane, Logan, Haskell, Neosho, Norton, Rawlins, Hodgeman, Seward, Sheridan, Sherman, Lane, Meade, Thomas, Wallace, and Seward Counties. This declaration also authorized snow assistance for a period of 48 hours for Finney, Ford, Lane, Logan, Haskell, Hodgeman, Thomas, and Wallace Counties. Finally, this declaration made Hazard Mitigation Clark Program assistance requested by the Governor available for hazard mitigation measures statewide.

In addition to the above reported events, the following table presents NOAA NCEI identified high wind events (High Wind and Thunderstorm Wind) and the resulting damage totals in Kansas Region D for the period 2010 - 2019 (with 2010 and 2019 being full data set years).

Table 4.166: Kansas Region D NCEI High Wind Events, 2010 - 2019

County	Number of Days with Events	Property Damage	Highest Recorded Wind Speed	Deaths	Injuries
Clark	16	$0	74 Knots	0	0
Finney	108	$7,500	78 Knots	0	0
Ford	81	$93,570	87 Knots	0	0
Gray	48	$1,204,000	96 Knots	0	0
Haskell	28	$2,040,000	78 Knots	0	0
Hodgeman	41	$110,000	87 Knots	0	0
Lane	29	$0	80 Knots	0	0
Meade	22	$0	102 Knots	0	0
Seward	44	$155,000	78 Knots	0	0

Source: NOAA NCEI

The following provides both **local accounts** and NOAA NCEI descriptions of notable recorded events:

- **May 28, 2018: Charleston, Gray County**
  One half of a school roof was torn off by the high wind. At least 5 pivot irrigation sprinklers were overturned in the area. Property damage was recorded at $700, 000.

- **May 18, 2018: New Wilroads, Ford County**
  A center pivot irrigation sprinkler was overturned by the high wind. Property damage was recorded at $50,000.

- **November 11, 2017: Sublette, Haskell County**
  There was heavy tree damage in Sublette. At least 2 dozen pivot sprinkler irrigation sprinklers were overturned or destroyed, mainly west and north of Sublette. There were a few sprinklers reported damaged south of town. There was video of the downburst wind moving through town with a few brief gustnadoes observed on the leading edge of the wall of dirt that was picked up. Property damage was recorded at $1,800,000.

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of high on the region's agricultural base. Crop loss data for the years 2010 - 2019 (with 2010 and 2019 being full data years), for the region, indicates 278 high wind related claims on 96,091 acres for $9,839,265.

Table 4.167: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, High Winds

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Clark	12	1,270	$93,389
Finney	62	20,872	$2,514,399
Ford	27	2,907	$339,977
Gray	35	8,097	$108,572
Haskell	32	38,948	$4,794,259
Hodgeman	23	3,278	$194,637
Lane	21	3,167	$333,483

Table 4.167: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, High Winds

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Meade	26	5,924	$330,510
Seward	40	11,627	$1,130,040

Source: USDA Farm Service Agency

4.21.3 – Hazard Probability Analysis

The following table summarizes high wind probability data for **Clark County**.

Table 4.168: Clark County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	16
Average Events per Year	2
Deaths or Injuries (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	12
Average Number of Claims per Year	1
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	1,270
Average Number of Acres Damaged per Year	127
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$93,389
Average Crop Damage per Year	$9,339

Source: NCEI and USDA

Data from the NCEI indicates that Clark County can expect on a yearly basis, relevant to high wind events:

- Two events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Clark County can expect on a yearly basis, relevant to high wind occurrences:

- One insurance claim
- 127acres impacted
- $9,339 in insurance claims

The following table summarizes high wind probability data for **Finney County**.

Table 4.169: Finney County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	108
Average Events per Year	11

Table 4.169: Finney County High Wind Probability Summary

Data	Recorded Impact
Deaths or Injuries (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$7,500
Average Property Damage per Year	$750
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	62
Average Number of Claims per Year	6
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	20,872
Average Number of Acres Damaged per Year	2,087
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$2,514,399
Average Crop Damage per Year	$251,440

Source: NCEI and USDA

Data from the NCEI indicates that Finney County can expect on a yearly basis, relevant to high wind events:

- 11 events
- No deaths or injuries
- $750 in property damages

According to the USDA Risk Management Agency, Finney County can expect on a yearly basis, relevant to high wind occurrences:

- Six insurance claims
- 2,087 acres impacted
- $251,440 in insurance claims

The following table summarizes High wind probability data for **Ford County**.

Table 4.170: Ford County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	81
Average Events per Year	8
Deaths or Injuries (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$93,570
Average Property Damage per Year	$9,357
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	27
Average Number of Claims per Year	3
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	2,907
Average Number of Acres Damaged per Year	291
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$339,977
Average Crop Damage per Year	$33,998

Source: NCEI and USDA

Data from the NCEI indicates that Ford County can expect on a yearly basis, relevant to high wind events:

- Eight events
- No deaths or injuries
- $9,357 in property damages

According to the USDA Risk Management Agency, Ford County can expect on a yearly basis, relevant to high wind occurrences:

- Three insurance claims
- 291 acres impacted
- $33,998 in insurance claims

The following table summarizes high wind probability data for **Gray County**.

Table 4.171: Gray County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	48
Average Events per Year	5
Deaths or Injuries (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$1,204,000
Average Property Damage per Year	$120,400
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	35
Average Number of Claims per Year	4
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	8,097
Average Number of Acres Damaged per Year	810
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$108,572
Average Crop Damage per Year	$10,857

Source: NCEI and USDA

Data from the NCEI indicates that Gray County can expect on a yearly basis, relevant to high wind events:

- Five events
- No deaths or injuries
- $120,400 in property damages

According to the USDA Risk Management Agency, Gray County can expect on a yearly basis, relevant to high wind occurrences:

- Four insurance claim
- 810 acres impacted
- $10,857 in insurance claims

The following table summarizes high wind probability data for **Haskell County**.

Table 4.172: Haskell County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	28
Average Events per Year	3
Deaths or Injuries (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$2,040,000
Average Property Damage per Year	$204,000
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	32
Average Number of Claims per Year	3
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	38,948
Average Number of Acres Damaged per Year	3,895
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$4,794,259
Average Crop Damage per Year	$479,426

Source: NCEI and USDA

Data from the NCEI indicates that Haskell County can expect on a yearly basis, relevant to high wind events:

- Three events
- No deaths or injuries
- $204,000 in property damages

According to the USDA Risk Management Agency, Haskell County can expect on a yearly basis, relevant to high wind occurrences:

- Three insurance claims
- 3,895 acres impacted
- $479,426 in insurance claims

The following table summarizes high wind probability data for **Hodgeman County**.

Table 4.173: Hodgeman County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	41
Average Events per Year	4
Deaths or Injuries (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$110,000
Average Property Damage per Year	$11,000
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	23
Average Number of Claims per Year	2
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	3,278
Average Number of Acres Damaged per Year	328
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$194,637
Average Crop Damage per Year	$19,464

Source: NCEI and USDA

Data from the NCEI indicates that Hodgeman County can expect on a yearly basis, relevant to high wind events:

- Four events
- No deaths or injuries
- $11,000 in property damages

According to the USDA Risk Management Agency, Hodgeman County can expect on a yearly basis, relevant to high wind occurrences:

- Two insurance claim
- 328 acres impacted
- $19,464 in insurance claims

The following table summarizes High wind probability data for **Lane County**.

Table 4.174: Lane County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	29
Average Events per Year	3
Deaths or Injuries (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	21
Average Number of Claims per Year	2
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	3,167
Average Number of Acres Damaged per Year	317
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$333,483
Average Crop Damage per Year	$33,348

Source: NCEI and USDA

Data from the NCEI indicates that Lane County can expect on a yearly basis, relevant to high wind events:

- Three events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Lane County can expect on a yearly basis, relevant to high wind occurrences:

- Two insurance claim
- 317 acres impacted
- $33,348 in insurance claims

The following table summarizes high wind probability data for **Meade County**.

Table 4.175: Meade County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	22
Average Events per Year	2
Deaths or Injuries (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	26
Average Number of Claims per Year	3
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	5,924
Average Number of Acres Damaged per Year	592
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$330,510
Average Crop Damage per Year	$33,051

Source: NCEI and USDA

Data from the NCEI indicates that Meade County can expect on a yearly basis, relevant to high wind events:

- Two events
- No deaths or injuries
- $0 in property damages

According to the USDA Risk Management Agency, Meade County can expect on a yearly basis, relevant to high wind occurrences:

- Three insurance claims
- 592 acres impacted
- $33,051 in insurance claims

The following table summarizes high wind probability data for **Seward County**.

Table 4.176: Seward County High Wind Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	44
Average Events per Year	4
Deaths or Injuries (2009-2018)	0
Average Number of Days with Death or Injury	0
Total Reported NCEI Property Damage (2009-2018)	$155,000
Average Property Damage per Year	$15,500
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	40
Average Number of Claims per Year	4
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	11,627
Average Number of Acres Damaged per Year	1,163

Table 4.176: Seward County High Wind Probability Summary

Data	Recorded Impact
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$1,130,040
Average Crop Damage per Year	$113,004

Source: NCEI and USDA

Data from the NCEI indicates that Seward County can expect on a yearly basis, relevant to high wind events:

- Four events
- No deaths or injuries
- $15,500 in property damages

According to the USDA Risk Management Agency, Seward County can expect on a yearly basis, relevant to high wind occurrences:

- Four insurance claims
- 1,163 acres impacted
- $113,004 in insurance claims

In addition, Kansas Region D has had six Presidentially Declared Disaster relating to straight-line winds (and other concurrent events) in the last 20 years. This represents an average of less than one declared straight-line wind related disaster per year.

4.21.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to high wind events. Counties with a higher or increasing population, and/or a high or increasing structural valuation are considered to have a potentially greater vulnerability.

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region D county incurring damage over the period 2010 to 2019 from high wind events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

.

Table 4.177: Kansas Region D Structural Vulnerability Data for High Winds, 2010-2019

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Clark	$495,884,000	$0	0.00%
Finney	$6,770,618,000	$7,500	0.00%
Ford	$5,874,814,000	$93,570	0.00%
Gray	$1,294,134,000	$1,204,000	0.09%
Haskell	$861,920,000	$2,040,000	0.24%
Hodgeman	$367,392,000	$110,000	0.03%
Lane	$465,306,000	$0	0.00%
Meade	$1,090,544,000	$0	0.00%

Table 4.177: Kansas Region D Structural Vulnerability Data for High Winds, 2010-2019

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Seward	$3,662,220,000	$155,000	0.00%

Source: NCEI and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to potential high wind events. The following table indicates the total county population and registered growth over the period 2000 to 2018.

Table 4.178: Kansas Region D Population Vulnerability Data for High Winds

County	2018 Population	Percent Population Change 2000 to 2018
Clark	2,005	-16.1%
Finney	36,611	-9.7%
Ford	33,888	4.1%
Gray	6,033	2.2%
Haskell	3,997	-6.9%
Hodgeman	1,818	-12.8%
Lane	1,560	-27.6%
Meade	4,146	-10.5%
Seward	21,780	-3.2%

Source: US Census Bureau

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region D County. USDA Risk Management Agency crop loss data allows us to quantify the monetary impact of high wind on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to high wind events.

Table 4.179: High Wind Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Clark	434,295	127	0.03%	$111,420,000	$9,339	0.01%
Finney	790,500	2,087	0.26%	$823,091,000	$251,440	0.03%
Ford	669,832	291	0.04%	$515,252,000	$33,998	0.01%
Gray	556,070	810	0.15%	$990,653,000	$10,857	0.00%
Haskell	363,751	3,895	1.07%	$1,159,098,000	$479,426	0.04%
Hodgeman	494,925	328	0.07%	$191,891,000	$19,464	0.01%
Lane	417,017	317	0.08%	$266,374,000	$33,348	0.01%
Meade	587,924	592	0.10%	$233,384,000	$33,051	0.01%
Seward	360,711	1,163	0.32%	$424,697,000	$113,004	0.03%

Source: USDA

As with tornados, the following participating jurisdictions may have increased vulnerability to windstorm events due to having greater than 20% of housing stock as mobile homes:

- **Ensign** (Gray County)
- **Ingalls (**Gray County)
- **Deerfield** (Gray County)
- **Haskell County**
- **Satanta** (Haskell County)
- **Plains (**Meade County)
- **Kismet (**Seward County)

4.21.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.180: High Wind Consequence Analysis

Subject	Impacts of High Winds
Health and Safety of the Public	Impact of the immediate area could be severe depending on whether individuals were able to seek shelter. Casualties are dependent on warning systems and warning times.
Health and Safety of Responders	Impact to responders is expected to be minimal unless responders live within the affected area.
Continuity of Operations	Temporary to permanent relocation may be necessary if government facilities experience damage.
Property, Facilities, and Infrastructure	Localized impact could be severe in the wind path. Roads, buildings, and communications could be adversely affected. Damage could be severe.
Environment	Impact will be severe for the immediate impacted area. Impact will lessen as distance increases from the immediate incident area.
Economic Conditions	Impacts to the economy will greatly depend on the wind severity. Potential economic impact conditions could be minor to severe.
Public Confidence in the Jurisdiction’s Governance	Response and recovery will be in question if not timely and effective. Warning systems and warning time will also be questioned.

4.22 – Winter Storms

Winter weather in Kansas Region D usually come in the form of light to heavy snow or freezing rain. A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. Heavy accumulations of ice, often the result of freezing rain, can bring down trees, utility poles, and communications towers and disrupt communications and power for days.

4.22.1 – Location and Extent

All of Kansas Region D is susceptible to severe winter storms. For winter weather, the NWS describes the different types of events as follows:

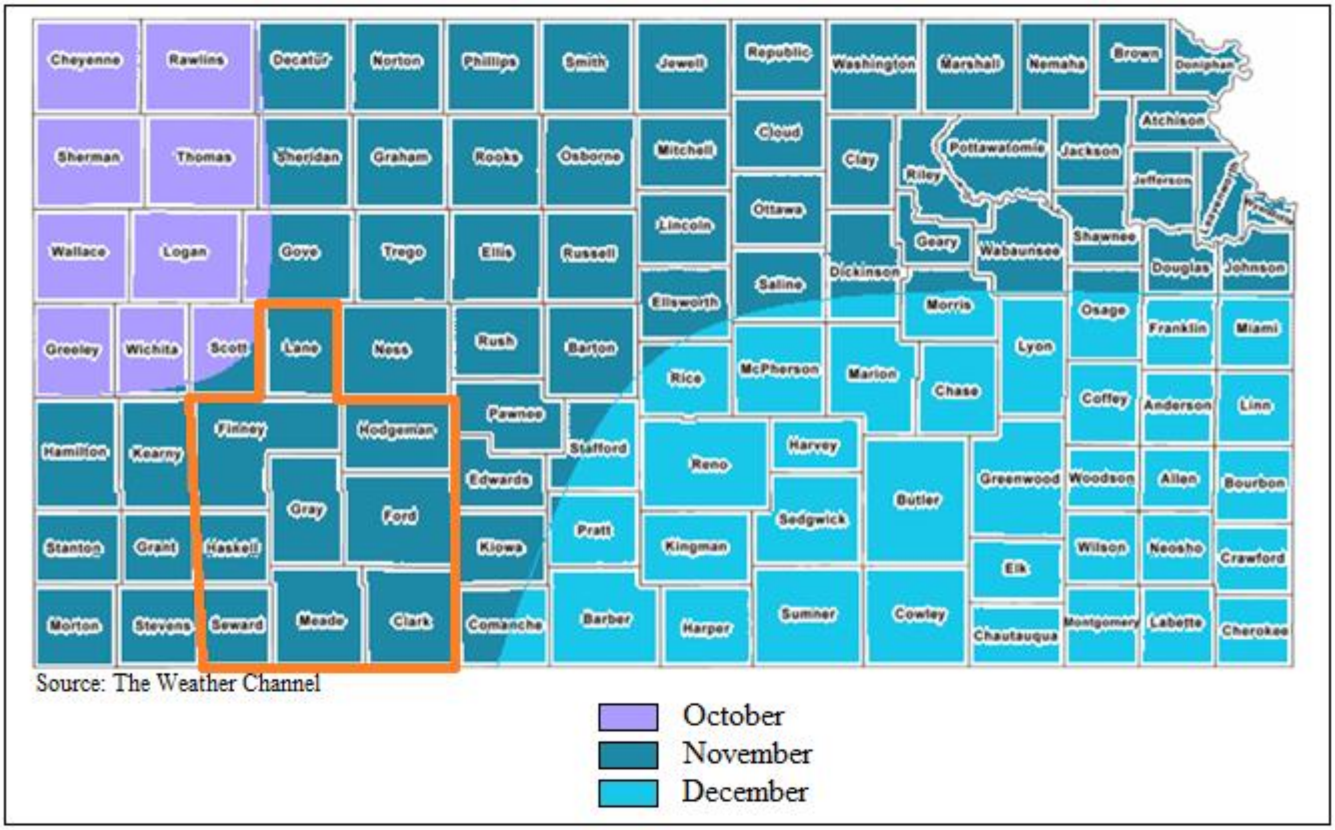
- **Blizzard:** Winds of 35 mph or more with snow and blowing snow reducing visibility to less than 1/4 mile for at least three hours.
- **Blowing Snow:** Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls:** Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- **Snow Showers:** Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- **Freezing Rain:** Rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces forming a coating or glaze of ice. Most freezing-rain events are short lived and occur near sunrise between the months of December and March.
- **Sleet:** Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

The following map, generated Kansas State University, using the latest available data, indicates the average annual snowfall for Kansas Region D for a given year.

Average Annual Snowfall, 1981-2010

Additionally, as indicated by the map below, Kansas Region D can expect to receive the first measurable snow in November of each year.

Average Date of First Measurable Snow



4.22.2 – Previous Occurrences

n the 20-year period from 1999 to present, there have been seven Presidential Disaster Declarations for Kansas Region D for severe winter storms. The following information is presented to provide a historical perspective on severe winter storm events that have impacted Kansas Region D. Declaration numbers in bold indication declared disaster that have occurred since the previous mitigation plan update in 2015.

Table 4.181: Kansas Region D FEMA Severe Winter Storms Disaster and Emergency Declarations, 1999 - 2018

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4319	06/16/2017 (04/28/2017 – 05/03/2017)	Severe Winter Storm, Snowstorm, Straight-Line Winds, Flooding	Clark, Finney, Ford, Gray, Haskell, Hodgeman, Lane, Meade, and Seward	$53,126,486

Declaration Number	Incident Period	Disaster Description	Regional Counties Involved	Dollars Obligated
4304	02/24/2017 (01/13/2017 – 01/16/2017)	Severe Winter Storm	Clark, Ford, Hodgeman, Meade, Ness, and Seward	$8,027,446
4112	04/26/2013 (02/20-02/23/2013)	Snowstorm	Hodgeman	$1,102,861 (Estimate)
1741	02/01/2008	Severe Winter Storms	Clark, Ford, and Hodgeman	$359,557,345
1675	1/7/2007 (12/28-30/2006)	Severe Winter Storm	Clark, Finney, Ford, Gray, Haskell, Hodgeman, Lane, Meade, and Seward	$315,201,639
1626	1/26/2006 (11/27-28/2005)	Severe Winter Storm	Hodgeman	$50,281,517
1579	2/8/2005 (1/4-6/2005)	Severe Winter Storm, Heavy Rains, and Flooding	Clark	$106,873,672

Source: FEMA

The following provides details concerning Presidential Disaster Declarations DR 4319 for Kansas Region D.

Kansas – Severe Winter Storm, Snowstorm, Straight-Line Winds, and Flooding
FEMA-4319-DR
Declared June 16, 2017

On May 31, 2017, Governor Sam Brownback requested a major disaster declaration due to a severe winter storm, snowstorm, straight-line winds, and flooding during the period of April 28 to May 3, 2017. The Governor requested a declaration for Public Assistance for 29 counties, snow assistance for 9 counties, and Hazard Mitigation statewide. During the period of May 8-21, 2017, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested counties and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On June 16, 2017, President Trump declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe winter storm, snowstorm, straight-line winds, and flooding in Cherokee, Cheyenne, Crawford, Decatur, Finney, Gove, Graham, Clark, Finney, Ford, Haskell, Gray, Lane, Logan, Haskell, Neosho, Norton, Rawlins, Hodgeman, Seward, Sheridan, Sherman, Lane, Meade, Thomas, Wallace, and Seward Counties. This declaration also authorized snow assistance for a period of 48 hours for Finney, Ford, Lane, Logan, Haskell, Hodgeman, Thomas, and Wallace Counties. Finally, this declaration made Hazard Mitigation Clark Program assistance requested by the Governor available for hazard mitigation measures statewide.

Kansas – Severe Winter Storm
FEMA-4304-DR
Declared February 24, 2017

On February 13, 2017, Governor Sam Brownback requested a major disaster declaration due to a severe winter storm during the period of January 13-16, 2017. The Governor requested a declaration for Public Assistance for 23 counties and Hazard Mitigation statewide. During the period of January 25 to February 7, 2017, joint federal, state, and local government Preliminary Damage Assessments (PDAs) were conducted in the requested counties and are summarized below. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary.

On February 24, 2017, President Trump declared that a major disaster exists in the State of Kansas. This declaration made Public Assistance requested by the Governor available to state and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe winter storm in Barton, Clark, Comanche, Edwards, Ellsworth, Ford, Hodgeman, Jewell, Kiowa, Meade, Ness, Pawnee, Pratt, Rush, Seward, Sheridan, Stafford, and Trego Counties. This declaration also made Hazard Mitigation Grant Program assistance requested by the Governor available for hazard mitigation measures statewide.

The following presents NOAA NCEI data concerning winter storm events in Kansas Region D for the 10-year period of 2009 – 2018 (2009 and 2018 are full data set years). It is worth noting that the NCEI data is regional, and sometimes statewide. As such reported damage is not specific to a regional county nor to any of the participating jurisdictions.

Table 4.182: Kansas Region D NCEI Winter Storm Events, 2010 - 2019

Event Type	Number of Days with Events	Property Damage	Deaths	Injuries
Blizzards	6	$0	0	0
Ice Storm	1	$0	0	0
Winter Storms	7	$0	0	0

Source: NOAA NCEI

Available crop loss data from the USDA Risk Management Agency detailing cause of loss was researched to determine the financial impacts of winter storms on the region's agricultural base. Crop loss data for the years 2010 - 2019 (with 2010 and 2019 being full data years), for the region, indicates 888 winter storm related claims on 552,138 acres for $60,005,691.

Table 4.183: USDA Risk Management Agency Cause of Loss Indemnities 2009-2018, Winter Storms

County	Number of Reported Claims	Acres Lost	Total Amount of Loss
Clark	39	18,130	$1,793,411
Finney	132	74,855	$7,838,338
Ford	108	63,932	$6,321,877
Gray	135	68,452	$733,030
Haskell	80	57,734	$6,243,972
Hodgeman	91	35,317	$2,756,481
Lane	66	36,249	$2,787,887
Meade	59	45,204	$4,920,608
Seward	83	38,149	$4,886,540

Source: USDA Farm Service Agency

4.22.3 – Hazard Probability Analysis

For probability purposes, each component of severe winter storms was examined and combined. The following table summarizes winter storm event data for **Kansas Region D**.

Table 4.184: Kansas Region D Winter Storm Probability Summary

Data	Recorded Impact
Number of Days with NCEI Reported Event (2010-2019)	14
Average Event Days per Year	1
Deaths or Injuries (2010-2019)	0
Average Number of Yearly Deaths and Injuries (2010-2019)	0
Total Reported NCEI Property Damage (2009-2018)	$0
Average Property Damage per Year	$0

Source: NCEI

Data from the NCEI indicates that Kansas Region D can expect on a yearly basis, relevant to winter storm events:

- One event
- No deaths or injuries
- $0 in property damages

The following table summarizes USDA Risk Management Agency winter storm event data for **Clark County**.

Table 4.185: Clark County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	39
Average Number of Claims per Year	4
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	18,130

Table 4.185: Clark County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
Average Number of Acres Damaged per Year	1,813
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$1,793,411
Average Crop Damage per Year	$179,341

Source: USDA

According to the USDA Risk Management Agency, Clark County can expect on a yearly basis, relevant to winter storm occurrences:

- Four insurance claims
- 1,813 acres impacted
- $179,341 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Finney County**.

Table 4.186: Finney County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	132
Average Number of Claims per Year	13
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	74,855
Average Number of Acres Damaged per Year	7,485
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$7,838,338
Average Crop Damage per Year	$783,834

Source: USDA

According to the USDA Risk Management Agency, Finney County can expect on a yearly basis, relevant to winter storm occurrences:

- 13 insurance claims
- 7,485 acres impacted
- $783,834 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Ford County**.

Table 4.187: Ford County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	108
Average Number of Claims per Year	11
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	63,932
Average Number of Acres Damaged per Year	6,393
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$6,321,877
Average Crop Damage per Year	$632,188

Source: USDA

According to the USDA Risk Management Agency, Ford County can expect on a yearly basis, relevant to winter storm occurrences:

- 11 insurance claims
- 6,393 acres impacted
- $632,188 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Gray County**.

Table 4.188: Gray County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	135
Average Number of Claims per Year	14
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	68,452
Average Number of Acres Damaged per Year	6,845
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$733,030
Average Crop Damage per Year	$73,303

Source: USDA

According to the USDA Risk Management Agency, Gray County can expect on a yearly basis, relevant to winter storm occurrences:

- 14 insurance claims
- 6,845 acres impacted
- $73,303 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Haskell County**.

Table 4.189: Haskell County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	80
Average Number of Claims per Year	8
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	57,734
Average Number of Acres Damaged per Year	5,773
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$6,243,972
Average Crop Damage per Year	$624,397

Source: USDA

According to the USDA Risk Management Agency, Haskell County can expect on a yearly basis, relevant to winter storm occurrences:

- Eight insurance claims
- 5,773 acres impacted
- $624,397 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Hodgeman County**.

Table 4.190: Hodgeman County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	91
Average Number of Claims per Year	9
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	35,317
Average Number of Acres Damaged per Year	3,532
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$2,756,481
Average Crop Damage per Year	$275,648

Source: USDA

According to the USDA Risk Management Agency, Hodgeman County can expect on a yearly basis, relevant to winter storm occurrences:

- Nine insurance claims
- 3,532 acres impacted
- $275,648 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Lane County**.

Table 4.191: Lane County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	132
Average Number of Claims per Year	13
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	74,855
Average Number of Acres Damaged per Year	7,485
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$7,838,338
Average Crop Damage per Year	$783,834

Source: USDA

According to the USDA Risk Management Agency, Lane County can expect on a yearly basis, relevant to winter storm occurrences:

- 13 insurance claim
- 7,485 acres impacted
- $783,834 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Meade County**.

Table 4.192: Meade County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	59

Table 4.192: Meade County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
Average Number of Claims per Year	6
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	45,204
Average Number of Acres Damaged per Year	4,520
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$4,920,608
Average Crop Damage per Year	$492,061

Source: USDA

According to the USDA Risk Management Agency, Meade County can expect on a yearly basis, relevant to winter storm occurrences:

- Six insurance claims
- 4,520 acres impacted
- $492,061 in insurance claims

The following table summarizes USDA Risk Management Agency winter storm event data for **Seward County**.

Table 4.193: Seward County Winter Storm Probability Summary (Agricultural)

Data	Recorded Impact
USDA Farm Service Agency Number of Crop Damage Claims (2009-2018)	83
Average Number of Claims per Year	8
USDA Farm Service Agency Number of Acres Damaged (2009-2018)	38,149
Average Number of Acres Damaged per Year	3,815
USDA Farm Service Agency Crop Damage Claims Amount (2009-2018)	$4,886,540
Average Crop Damage per Year	$488,654

Source: USDA

According to the USDA Risk Management Agency, Seward County can expect on a yearly basis, relevant to winter storm occurrences:

- Eight insurance claims
- 3,815 acres impacted
- $488,654 in insurance claims

In addition, Kansas Region D has had seven Presidentially Declared Disasters relating to winter storms (and other concurrent events) in the last 20 years. This represents an average one declared winter storm related disaster per year.

4.22.4 – Vulnerability Analysis

For purposes of this assessment, all counties within the region were determined to be at equal risk to winter storm events. Counties with a higher or increasing population, and/or a high or increasing structural valuation are to be considered to have a potentially greater vulnerability.

The following table presents data from the NOAA NCEI and HAZUS concerning the value of structures and the percentage of structures for each Kansas Region D county (in total, due to the regional nature of both storms and NCEI reporting) incurring damage over the period 2010 to 2019 from winter storm events. The greater the percentage of structures damaged the greater overall vulnerability going forward.

Table 4.194: Kansas Region D Structural Vulnerability Data for Winter Storms, 2010-2019

County	HAZUS Building Valuation	NCEI Structure Damage	Percentage of Building Valuation Damaged
Regional Counties	$20,882,832,000	$0	0.00%

Source: NCEI and HAZUS

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to potential winter storm events. The following table indicates the total county population and registered growth over the period 2000 to 2018.

Table 4.195: Kansas Region D Population Vulnerability Data for Winter Storms

County	2018 Population	Percent Population Change 2000 to 2018
Clark	2,005	-16.1%
Finney	36,611	-9.7%
Ford	33,888	4.1%
Gray	6,033	2.2%
Haskell	3,997	-6.9%
Hodgeman	1,818	-12.8%
Lane	1,560	-27.6%
Meade	4,146	-10.5%
Seward	21,780	-3.2%

Source: US Census Bureau

The USDA 2017 Census of Agriculture (the latest available data) provides data on the crop exposure value, the total dollar value of all crops, for each Kansas Region D County. USDA Risk Management Agency crop loss data allows us to quantify the monetary impact of winter storms on the agricultural sector. The higher the percentage loss, the higher the potential vulnerability the county has to winter storm events.

Table 4.196: Winter Storm Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Clark	434,295	1,813	0.42%	$111,420,000	$179,341	0.16%
Finney	790,500	7,485	0.95%	$823,091,000	$783,834	0.10%
Ford	669,832	6,393	0.95%	$515,252,000	$632,188	0.12%
Gray	556,070	6,845	1.23%	$990,653,000	$73,303	0.01%
Haskell	363,751	5,773	1.59%	$1,159,098,000	$624,397	0.05%
Hodgeman	494,925	3,532	0.71%	$191,891,000	$275,648	0.14%
Lane	417,017	7,485	1.79%	$266,374,000	$783,834	0.29%

Table 4.196: Winter Storm Acres Impacted and Crop Insurance Paid per County from 2009-2018

County	Farm Acreage	Annualized Acres Impacted	Percentage of Total Acres Impacted Yearly	Market Value of Products Sold	Annualized Crop Insurance Paid	Percentage of Market Value Impacted Yearly
Meade	587,924	4,520	0.77%	$233,384,000	$492,061	0.21%
Seward	360,711	3,815	1.06%	$424,697,000	$488,654	0.12%

Source: USDA

4.22.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.197: Winter Storm Consequence Analysis

Subject	Impacts of Winter Storm
Health and Safety of the Public	Severity and location dependent. Impacts on persons in the areas of snow and ice are expected to be severe if caught without proper shelter.
Health and Safety of Responders	Impacts will be predicated on the severity of the event. Damaged infrastructure will likely result in hazards such as downed utility lines, main breakages and debris on roadways. .
Continuity of Operations	Temporary relocation may be necessary if government facilities experience damage. Services may be limited to essential tasks if utilities are impacted.
Property, Facilities, and Infrastructure	Impact to property, facilities, and infrastructure could be minimal to severe, depending on the location and structural capacity of the facility. Loss of structural integrity of buildings and infrastructure could occur. Utility lines, roads, residential and business properties will be affected.
Environment	Impact could be severe for the immediate impacted area, depending on the size of the event. Impact will lessen as distance increases from the immediate incident area
Economic Conditions	Impacts to the economy will be dependent severity of the event and the impact on structures and infrastructure. Impacts could be severe if roads/utilities are affected.
Public Confidence in the Jurisdiction's Governance	Response and recovery will be in question if not timely and effective. The timeliness warnings could be questioned.

4.23 – Civil Disorder

Civil disorder is a term that generally refers to a public disturbance by three or more people involving acts of violence that cause immediate danger, damage, or injury to others or their property. However, it is important to remember that gatherings in protest are recognized rights of any person or group, and this right is protected under the United States Constitution.

4.23.1 – Location and Extent

Historically civil disorder has been most commonly associated with urban areas and college campuses. And while the entire planning area may be affected by civil disorder, with its generally small population and low population density, the magnitude of such an event would likely be limited to the major cities within the region.

In general, civil unrest usually accompanies, or is started by, a gathering of people for an event. And while most events occur with no violence, violence can occur with little warning or cause. Unfortunately, large crowds can be subject to control by skillful troublemakers who are often able to incite behavior from members of the crowd that they usually would not consider. When a crowd begins to exhibit signs of disorder, it can be categorized in three categories:

- **Public disorder:** Public disorder is a basic breach of civic order. Individuals or small groups assembling have a tendency to disrupt the normal flow of things around them.
- **Public disturbance:** Public disturbance is designed to cause turmoil on top of the disruption. Individuals and groups assembling into a crowd begin chanting, yelling, singing, and voicing individual or collective opinions.
- **Riot:** A riot is a disturbance that turns violent. Assembled crowds become a mob that violently expresses itself by destroying property, assaulting others, and creating an extremely volatile environment.

While civil disorder is not an everyday occurrence in the planning area, when they do occur they are extremely disruptive and difficult to control. Should a civil disorder event occur in the planning area the result could be measured in loss of life, economic upheaval, and destruction of property.

4.23.2 – Previous Occurrences

There have been no documented cases of civil unrest of disorder in Kansas Region D during the past ten years.

4.23.3 – Hazard Probability Analysis

By nature, acts of civil disorder are difficult to foresee. However, the probability of a major civil disorder event in Kansas Region D is considered very low due the lack of any recent documented historical events. Again, it is worth noting that no previous occurrences in no way guarantees no future occurrences.

4.23.4 Vulnerability Analysis

Due to the unknown location and nature of civil disorder, all participating jurisdictions with Kansas Region D are vulnerable. Additionally, and again related to the capricious nature of civil disorder, all buildings and citizens are vulnerable.

Economic impacts and human injury or death are the primary concern with civil disorder. Increases in population or the hosting of major political, economic or social events could increase the likelihood and severity of a civil disturbance.

It is difficult to quantify potential losses of Civil Disorder due to the many variables and human elements and lack of historical precedence. Therefore, for the purposes of this plan, a **hypothetical scenario** is included for illustrative purposes only.

> **Event:** City organizers set up a two-block long fan zone near the local community sports field for an important sporting event. The population density in the fan zone is 6,000 people, with at least five persons per 25 square feet.
>
> **Riot:** The riot began to take shape as the game came to a close, with some spectators throwing bottles and other objects. Small fires were started and soon some rioters overturned a vehicle and set it alight. Fist fights broke out and in a nearby parking lot and two police cars were also set on fire. Riot police eventually managed to disperse the rioters and all fires were extinguished.
>
> **Results:** The following table presents potential event results:

Table 4.198: Hypothetical Riot Outcomes

Category	Result
Total Traumatic Injuries	250 persons
Total Urgent Care Injuries	1,000 persons
Injuries not Requiring Hospitalization	2,500 persons
Damage to Vehicles	Glass replacement cost for approximately 200 vehicles: $ 8,000 Repair / repainting cost for approximately 200 vehicles: $800,000
Damage to Buildings	Window replacement cost for approximately 50 buildings: $80,000

Source: Kansas State Hazard Mitigation Plan

4.23.5 – Impact and Consequence Analysis

As per EMAP standards, the following table provides the consequence analysis for drought conditions.

Table 4.199: Civil Disorder Consequence Analysis

Subject	Potential Impacts
Health and Safety of the Public	Impact could be severe for persons in the incident area.
Health and Safety of Responders	Impact to responders could be severe if not trained and properly equipped. Responders that are properly trained and equipped will have a low to moderate impact.

Table 4.199: Civil Disorder Consequence Analysis

Subject	Potential Impacts
Continuity of Operations	Depending on damage to facilities/personnel in the incident area, re-location may be necessary and lines of succession execution (minimal to severe).
Property, Facilities, and Infrastructure	Impact within the incident area could be severe, depending on the extent of the event. (minimal to severe)
Environment	Localized impact within the incident area could be severe depending on the type of human caused incident.
Economic Conditions	Economic conditions could be adversely affected and dependent upon time and length of clean up and investigation (minimal to severe).
Public Confidence in the Jurisdiction's Governance	Impact will be dependent on whether or not the incident could have been avoided by government or non-government entities, clean-up and investigation times, and outcomes. (minimal to severe)

4.24 – Hazardous Materials

Hazardous materials (HazMat) are any substances that pose a risk to health, life, or property when released or improperly handled. Generally, the term refers to materials with hazardous chemical or physical properties, though sometimes biological agents can fall under this category. The basic types of hazardous materials may be categorized according to more than six different systems; but the categories of U.S. Emergency Planning and Community Right-to-Know Act (42 U.S.C. 11002) provide a general guide to hazardous materials:

- ***Extremely Hazardous Substances:*** Materials that have acutely toxic chemical or physical properties and may cause irreversible damage or death to people or harm the environment if released or used outside their intended use.
- ***Hazardous Substances:*** Materials posing a threat to human health and/or the environment, or any substance designated by the EPA to be reported if a designated quantity of the substance is spilled into waterways, aquifers, or water supplies or is otherwise released into the environment.

4.24.1 – Location and Extent

In Kansas Region D, HazMat incidents are generally classified as:

- **Fixed Facility Incidents:** Commercial Facilities and Superfund Sites
- **Transportation Incidents:** Highway, Railway, Pipeline, Air, and Water

Fixed Facilities

When facilities have hazardous materials in quantities at or above the threshold planning quantity, they must submit Tier II information to appropriate federal and state agencies to facilitate emergency planning in accordance with the Community Right to Know Act. The forms are known as Tier II reports and the facilities included are referred to as Tier II facilities. According to data provided by KDEM, there are 3,424 Tier II Facilities housing hazardous chemicals in Kansas Region D. The following table details the number of Tier II facilities by county.

Table 4.200: Kansas Region D Tier II Facilities by County

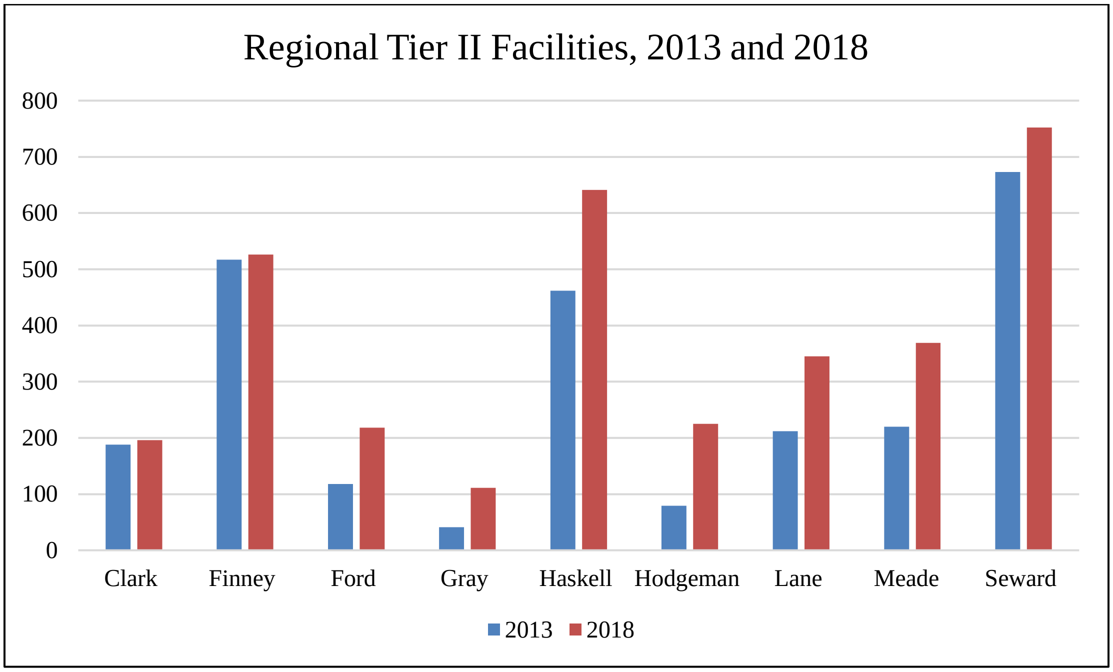
County	Tier II Facilities
Clark	196
Finney	526
Ford	218
Gray	111
Haskell	641
Hodgeman	225
Lane	345

Table 4.200: Kansas Region D Tier II Facilities by County

County	Tier II Facilities
Meade	369
Seward	752

Source: KDEM

As illustrated in the following graph, the number of Tier II facilities has increased for the region, primarily to due to an extensive outreach effort by KDHE to facilities that house hazardous chemicals.



The National Priorities List (NPL) is a published list of hazardous waste sites in the country that are eligible for extensive, long-term cleanup under the Superfund program. A Superfund site is an uncontrolled or abandoned location where hazardous waste is located which may affect local ecosystems and/or people. The EPA has indicated the following Superfund site is located within Kansas Region D.

- The Wright Ground Water Contamination site, in Ford County was identified in 1988 following the collection and analysis of a groundwater sample from a private well being tested for real estate purposes. Volatile organic compounds (VOCs) were detected in the groundwater samples and the KDHE was notified. In 1989, KDHE collected groundwater samples from several wells throughout Wright and confirmed that the groundwater was contaminated. VOCs were detected in 16 private wells; pesticides and heavy metals were also detected in several wells. Wright did not have a municipal water supply; residents received water from private wells. However, in 1997, a municipal water line was provided to the citizens of Wright through an EPA removal action. A system of groundwater monitoring wells is being used to track the contaminant levels, the location of the plume, and the rate at which monitored natural attenuation is occuring. Groundwater monitoring is completed annually.

Transportation

The following table, from Kansas Department of Transportation (KDOT), presents total roadway mileage by county.

Table 4.201: Kansas Region D Total Roadway Mileage by County

County	Roadways (Miles)
Clark	766
Finney	1,579
Ford	1,844
Gray	1,324
Haskell	925
Hodgeman	1,101
Lane	771
Meade	1,113
Seward	930

Source: KDOT

Kansas Region D is served by numerous railroad companies. Railroads are generally defined by three classes, predicated on revenue and size, with Class I (Freight) being the largest. Class I railroads are of the greatest concern due to the type of freight carried, with categories including There are three Class I railroads in Kansas Region D providing service with long-haul deliveries to national market areas and intermodal rail/truck service providers:

- Burlington Northern and Santa Fe Railway
- Cimarron Valley Railway
- Kansas & Oklahoma Railroad

The following table, with information from KDOT, provides the total railroad track mileage of for each county within Kansas Region D.

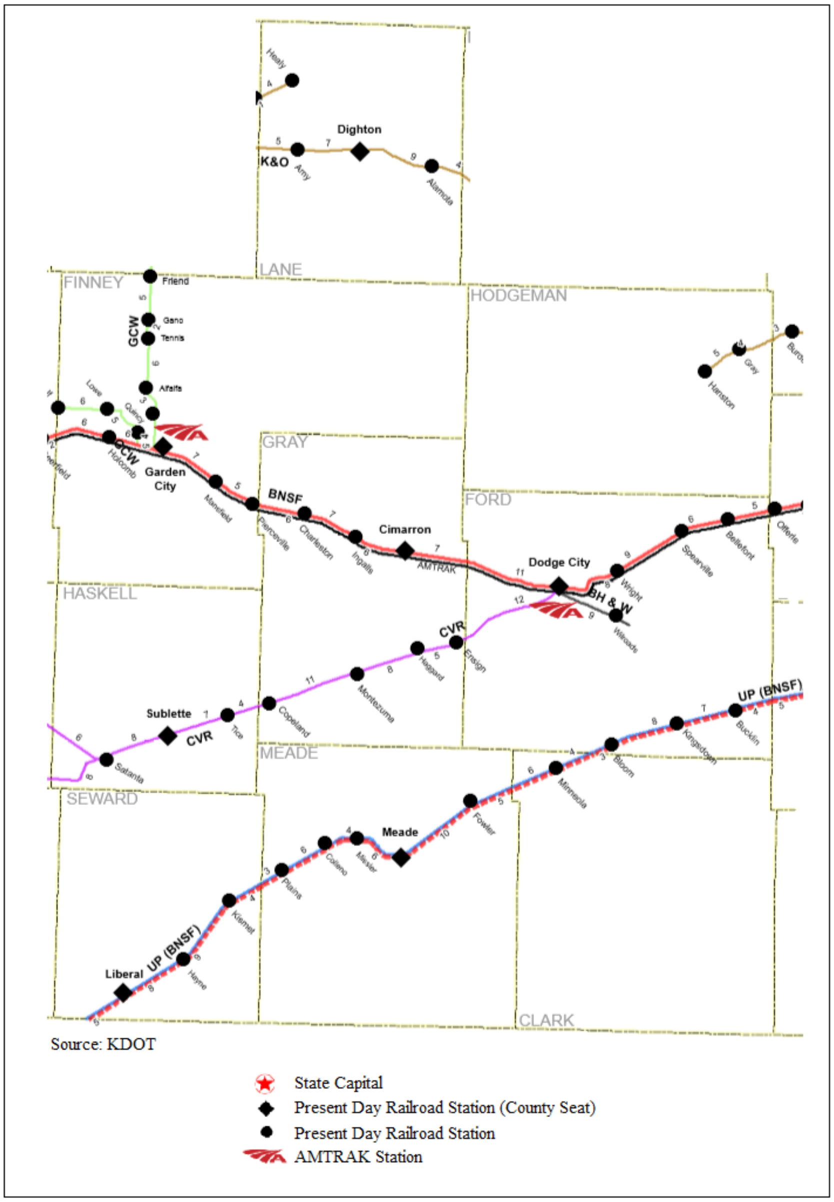
Table 4.202: Kansas Region D Total Class I Railroad Mileage by County

County	Rail Lines (Miles)
Clark	10
Finney	62
Ford	82
Gray	51
Haskell	33
Hodgeman	9
Lane	29
Meade	34
Seward	26

Source: KDOT

The following map, from KDOT, shows Class I track locations in Kansas Region D.

Regional Class I Railway Lines



Source: KDOT

Pipelines

The following data, provided by KDEM and the United States Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA), indicates the total number of gas and liquid pipeline mileage per county.

Table 4.203: PHMSA Pipeline Mileage by County

County	Gas (miles)	Liquid (miles)
Clark	326	178
Finney	157	57
Ford	458	34
Gray	110	23
Haskell	114	61
Hodgeman	68	68
Lane	58	104
Meade	394	131
Seward	237	180

Source: KDEM and PHMSA

4.24.2 – Previous Occurrences

The following table, with data from KDEM, lists the number of hazardous materials incidents, injuries, fatalities and people evacuated from the public and facilities for each Kansas Region D county over the ten-year period 2016-2018 (the latest available data).

Table 4.204: Kansas Region D HazMat KDEM Reported Incidents, 2016-2018

Jurisdiction	Incidents	Injuries	Fatalities	People Evacuated
Clark	0	0	0	0
Finney	5	0	0	0
Ford	22	0	0	365
Gray	3	0	0	0
Haskell	2	1	0	0
Hodgeman	0	0	0	0
Lane	1	0	0	0
Meade	2	1	0	0
Seward	2	0	0	0

Source: KDEM

Hazardous Materials Regulations (49 CFR Parts 171-180) require certain types of HazMat incidents be reported, with data tracked by PHMSA's Office of Hazardous Materials Safety (OHMS) by transportation category type (Air, Highway, Rail and Water). The OHMS Incident Report Database from 2010 to 2018 indicated 2,153 reported incidents within Kansas Region D for the period 2000 through 2018. The following charts detail the number of events per year per transportation category.

Table 4.205: Kansas Region D OHMS HazMat Incidents, 2000-2018

Jurisdiction	Highway	Air	Rail	Damages	Injuries	Deaths
Clark County						
Ashland	1	0	0	$0	0	0
Finney County						
Holcomb	3	0	0	$54,305	0	0
Garden City	11	0	0	$32,840	0	0
Ford County						
Bucklin	1	0	12	$1,413	0	0

Table 4.205: Kansas Region D OHMS HazMat Incidents, 2000-2018

Jurisdiction	Highway	Air	Rail	Damages	Injuries	Deaths
Dodge City	6	0	12	$4,484	0	0
Gray County						
Cimarron	1	0	0	$55,453	0	0
Haskell County						
Santanta	3	0	0	$1,437	0	0
Sublette	2	0	0	$0	0	0
Lane County						
Dighton	2	0	0	$2,000	0	0
Meade County						
Kismet	1	0	0	$19,863	0	0
Plains	2	0	0	$4,000	0	0
Seward County						
Liberal	7	0	0	$1,000	0	0

Source: PHMSA OHMS
-: No reported events

Data from PHMSA provides significant incident reports for the pipeline systems in Kansas Region D. Data from the period 2013 to 2017 indicate that there were four pipeline incidents that no fatalities, no injuries and $216,213 in damages. The following table details reported pipeline incident details for each county with a reported event.

Table 4.206: Kansas Region D PHMSA Reported Pipeline Incidents by County, 2013 to 2017

County	Number of Incidents	Fatalities	Injuries	Total Damage	Gross Barrels Spilled
Clark	1	0	0	$105,005	0
Finney	0	0	0	$0	0
Ford	0	0	0	$0	0
Gray	0	0	0	$0	0
Haskell	0	0	0	$0	0
Hodgeman	1	0	0	$30,344	40
Lane	0	0	0	$0	0
Meade	2	0	0	$80,864	21
Seward	0	0	0	$0	0

Source: PHMSA

4.24.3 – Hazard Probability Analysis

HazMat incidents are not predictable. However, probabilities can be estimated using past occurrence data as a guide.

The following tables summarize occurrence data and probability for all related HazMat events for **Clark County** using data from KDEM.

Table 4.207: Clark County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2016-2018)	0
Average Events per Year	0
Number of Reported Deaths (2016-2018)	0
Average Deaths per Year	0
Number of Reported Injuries (2016-2018)	0
Average Injuries per Year	0
Number of Reported Evacuations (2016-2018)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Clark County can expect on a yearly basis, relevant to HazMat events:

- No events
- No deaths
- No injuries
- No evacuations

The following tables summarize occurrence data and probability for all related HazMat events for **Finney County** using data from KDEM.

Table 4.208: Finney County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2016-2018)	5
Average Events per Year	1
Number of Reported Deaths (2016-2018)	0
Average Deaths per Year	0
Number of Reported Injuries (2016-2018)	0
Average Injuries per Year	0
Number of Reported Evacuations (2016-2018)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Finney County can expect on a yearly basis, relevant to HazMat events:

- One event
- No deaths
- No injuries
- No evacuations

The following tables summarize occurrence data and probability for all related HazMat events for **Ford County** using data from KDEM.

Table 4.209: Ford County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2016-2018)	22
Average Events per Year	11
Number of Reported Deaths (2016-2018)	0
Average Deaths per Year	0
Number of Reported Injuries (2016-2018)	0
Average Injuries per Year	0
Number of Reported Evacuations (2016-2018)	365
Average Evacuations per Year	122

Source: KDEM

Data indicates that Ford County can expect on a yearly basis, relevant to HazMat events:

- Eleven events
- No deaths
- No injuries
- 122 evacuations

The following tables summarize occurrence data and probability for all related HazMat events for **Gray County** using data from KDEM.

Table 4.210: Gray County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2016-2018)	3
Average Events per Year	1
Number of Reported Deaths (2016-2018)	0
Average Deaths per Year	0
Number of Reported Injuries (2016-2018)	0
Average Injuries per Year	0
Number of Reported Evacuations (2016-2018)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Gray County can expect on a yearly basis, relevant to HazMat events:

- One event
- No deaths
- No injuries
- No evacuations

The following tables summarize occurrence data and probability for all related HazMat events for **Haskell County** using data from KDEM.

Table 4.211: Haskell County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2016-2018)	2
Average Events per Year	1
Number of Reported Deaths (2016-2018)	0
Average Deaths per Year	0
Number of Reported Injuries (2016-2018)	1
Average Injuries per Year	<1
Number of Reported Evacuations (2016-2018)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Haskell County can expect on a yearly basis, relevant to HazMat events:

- One event
- No deaths
- <1 injury
- No evacuations

The following tables summarize occurrence data and probability for all related HazMat events for **Hodgeman County** using data from KDEM.

Table 4.212: Hodgeman County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2016-2018)	0
Average Events per Year	0
Number of Reported Deaths (2016-2018)	0
Average Deaths per Year	0
Number of Reported Injuries (2016-2018)	0
Average Injuries per Year	0
Number of Reported Evacuations (2016-2018)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Hodgeman County can expect on a yearly basis, relevant to HazMat events:

- No events
- No deaths
- No injuries
- No evacuations

The following tables summarize occurrence data and probability for all related HazMat events for **Lane County** using data from KDEM.

Table 4.213: Lane County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2016-2018)	1
Average Events per Year	<1
Number of Reported Deaths (2016-2018)	0
Average Deaths per Year	0
Number of Reported Injuries (2016-2018)	0
Average Injuries per Year	0
Number of Reported Evacuations (2016-2018)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Lane County can expect on a yearly basis, relevant to HazMat events:

- <1 event
- No deaths
- No injuries
- No evacuations

The following tables summarize occurrence data and probability for all related HazMat events for **Meade County** using data from KDEM.

Table 4.214: Meade County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2016-2018)	2
Average Events per Year	1
Number of Reported Deaths (2016-2018)	0
Average Deaths per Year	0
Number of Reported Injuries (2016-2018)	1
Average Injuries per Year	<1
Number of Reported Evacuations (2016-2018)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Meade County can expect on a yearly basis, relevant to HazMat events:

- One event
- No deaths
- <1 injury
- No evacuations

The following tables summarize occurrence data and probability for all related HazMat events for **Seward County** using data from KDEM.

Table 4.215: Seward County HazMat Incident Probability Summary

Data	Recorded Impact
Number of Reported Events (2016-2018)	2
Average Events per Year	1
Number of Reported Deaths (2016-2018)	0
Average Deaths per Year	0
Number of Reported Injuries (2016-2018)	0
Average Injuries per Year	0
Number of Reported Evacuations (2016-2018)	0
Average Evacuations per Year	0

Source: KDEM

Data indicates that Seward County can expect on a yearly basis, relevant to HazMat events:

- One event
- No deaths
- No injuries
- No evacuations

4.24.4 – Vulnerability Analysis

Special populations are particularly vulnerable to the impacts of a hazardous materials incident because of the potential difficulties involved in the evacuation. The following table details the number of special population facilities in each Kansas Region D county located within ½ mile of a chemical facility. The locations of colleges, educational and correctional institution facilities is from the Kansas Data Access & Support Center, health facilities data is from HAZUS, aging facilities is from KDEM and childcare facilities is from KDHE.

Table 4.216: Kansas Region D Special Population Facilities Within 0.5 Miles of a Chemical Facility

County	Health Facilities	Colleges	Educational Facilities	Aging Facilities	Child Care	Correctional Institutions
Clark	2	0	6	3	4	1
Finney	1	1	24	6	121	2
Ford	2	0	14	6	61	1
Gray	0	0	9	1	6	0
Haskell	0	0	3	0	6	1
Hodgeman	0	0	3	0	6	1
Lane	1	0	4	2	4	1
Meade	1	0	6	2	12	1
Seward	0	0	12	0	27	1

Source: KDEM

Counties with a higher identified population are to be considered to have a potentially greater vulnerability to potential HazMat events. The following table indicates the total county population and registered growth over the period 2000 to 2018.

Table 4.217: Kansas Region D Population Vulnerability Data for HazMat

County	2018 Population	Percent Population Change 2000 to 2018
Clark	2,005	-16.1%
Finney	36,611	-9.7%
Ford	33,888	4.1%
Gray	6,033	2.2%
Haskell	3,997	-6.9%
Hodgeman	1,818	-12.8%
Lane	1,560	-27.6%
Meade	4,146	-10.5%
Seward	21,780	-3.2%

Source: US Census Bureau

4.24.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.218: HazMat Incident Consequence Analysis

Subject	Impacts of Hazardous Materials Incident
Health and Safety of Persons in the Area of the Incident	Impact in the immediate area could be severe and long lasting.
Responders	Impact to responders is expected to be moderate to severe, potentially even with required safety equipment.
Continuity of Operations	Long term relocation may be necessary if government facilities experience contamination or damage.
Property, Facilities, and Infrastructure	Localized impact could be severe in the incident area. Facilities may need to be abandoned and razed. Large areas may become inaccessible.
Environment	Impact could be severe for the immediate area. Impact will lessen with distance. The proximity of open bodies of water could compound the impact.
Economic Conditions	Local economy and finances may be adversely affected, depending on the nature, extent and duration of the event.
Public Confidence in Governance	Response and recovery will be in question if not timely and effective. Warning systems and the timeliness of those warnings could be questioned.

4.25 – Major Disease

For this plan, major disease is classified as infectious diseases caused by microscopic agents, including viruses, bacteria, parasites, and fungi or by their toxins, that may impact humans. They may be spread by direct contact with an infected person or animal, ingesting contaminated food or water, vectors such as mosquitoes or ticks, contact with contaminated surroundings such as animal droppings, infected droplets, or by aerosolization.

4.25.1 – Location and Extent

Human transmissible disease and infectious diseases are illnesses caused by microscopic agents, including viruses, bacteria, parasites, and fungi or by their toxins. They may be spread by direct contact with an infected person or animal, ingesting contaminated food or water, vectors such as mosquitoes or ticks, contact with contaminated surroundings such as animal droppings, infected droplets, or by aerosolization.

The entire planning area is susceptible to a transmissible disease outbreak. However, more densely populated areas may be more susceptible.

4.25.2 – Previous Occurrences

The KDHE was contacted concerning the epidemiological tracking of contagious and/or human transmissible diseases. Data was solicited concerning the following diseases of concern:

- Haemophilus Influenzae Invasive Disease
- Measles (Rubeola)
- Meningococcal Infections
- Mumps
- Pertussis
- Streptococcus pneumoniae, Invasive
- West Nile Virus
- Zika Virus

A review of available data indicates there have been no unusual or concerning spikes in these diseases.

Coronavirus disease 2019

As of this plan, the World Health Organization, the Center for Disease Control (CDC) and KDHE is responding to a pandemic outbreak of respiratory illness caused by a novel coronavirus, SARs COV-2, which causes the respiratory illness Coronavirus disease 2019 (COVID-19). The outbreak first started in Wuhan, China, but cases have been identified in a growing number national and international locations, including Kansas. COVID-19 is currently spreading rapidly, and is thought to spread mainly between people who are in close contact with one another (within about 6 feet) through respiratory droplets produced when an infected person coughs or sneezes. It also may be possible that transmission is occurring through touching a surface or object that has the virus on it and then touching your mouth, nose, or possibly their eyes

Risk of infection is higher for people who are close contacts of someone known to have COVID-19, for example healthcare workers, or household members. Other people at higher risk for infection are those who live in or have recently been in an area with ongoing spread of COVID-19.

Patients with COVID-19 have had mild to severe respiratory illness with symptoms of fever, cough and shortness of breath. Some patients have pneumonia in both lungs, multi-organ failure and in some cases death.

There is currently no vaccine to protect against COVID-19. The best way to prevent infection is to take everyday preventive actions, like avoiding close contact with people who are sick and washing your hands often. There is no specific antiviral treatment for COVID-19. People with COVID-19 can seek medical care to help relieve symptoms.

This is a rapidly emerging situation, and any further data considered for inclusion in this plan would likely be out of date. Up to date information may be found at the following CDC website:

- https://www.cdc.gov/coronavirus/2019-ncov/index.html

4.25.3 – Hazard Probability Analysis

Data from the CDC indicates that COVID-19 is a concern for the state of Kansas and Kansas Region D. Based on this emerging threat, Kansas Region D is currently at risk to a large-scale major disease outbreak.

4.25.4 – Vulnerability Analysis

For purposes of this assessment, no facilities or agricultural commodities are considered vulnerable to the major disease hazard.

Due to the person to person transmission of many diseases of concern counties with a higher identified population are to be considered to have a potentially greater vulnerability. The following table indicates the total county population and registered growth over the period 2000 to 2018.

Table 4.219: Kansas Region D Population Vulnerability Data for Major Disease

County	2018 Population	Percent Population Change 2000 to 2018
Clark	2,005	-16.1%
Finney	36,611	-9.7%
Ford	33,888	4.1%
Gray	6,033	2.2%
Haskell	3,997	-6.9%
Hodgeman	1,818	-12.8%
Lane	1,560	-27.6%
Meade	4,146	-10.5%
Seward	21,780	-3.2%

Source: US Census Bureau

Additionally, there is an increased likelihood of mortality for very young and very old populations due to transmissible disease. The following table indicates the percentage of the total county population that may be considered especially vulnerable to a major disease.

Table 4.220: Kansas Region D Vulnerable Population Vulnerability Data for Major Disease

County	Percentage of Population 5 and Under (2018)	Percentage of Population 65+ (2018)
Clark	5.30%	21.90%
Finney	8.70%	11.00%
Ford	8.90%	11.20%
Gray	7.60%	15.10%
Haskell	7.00%	14.80%
Hodgeman	6.40%	24.00%
Lane	5.70%	23.50%
Meade	6.60%	19.30%
Seward	9.20%	9.80%

Source: US Census Bureau

4.25.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.221: Major Disease Consequence Analysis

Subject	Impacts of Major Disease Outbreak
Health and Safety of Persons in the Area of the Incident	Impact over a widespread area could be severe depending on type of outbreak and whether it is a communicable disease. Casualties are dependent on warning systems, warning times and the availability of vaccines, antidotes, and medical svc.
Responders	Impact to responders could be severe, especially if they reside in the area and or their type of exposure during response. With proper precautions and safety nets in place the impact is lessened.
Continuity of Operations	Continuity of Operations will be greatly dependent on availability of healthy individuals. COOP is not expected to be exercised.
Property, Facilities, and Infrastructure	Access to facilities and infrastructure could be affected until decontamination is completed
Environment	Impact could be severe for the immediate impacted area depending on the source of the outbreak. Impact could have far-reaching implications if disease is transferable between humans and animals or to wildlife.
Economic Conditions	Impacts to the economy could be severe if the disease is communicable. Loss of tourism, revenue, and business as usual will greatly affect the local economy and the state as a whole.
Public Confidence in Governance	Response and recovery will be in question if not timely and effective. Availability of medical supplies, vaccines, and treatments will come into question.

4.26 – Radiological Incident

For purposes of this plan, a radiological incident is considered an accident involving a release of radioactive materials from a nuclear reactor. Radiological accidents could cause injury or death, contaminate property and valuable environmental resources, as well as disrupt the functioning of communities and their economies. Since 1980, each utility that owns a commercial nuclear power plant in the United States has been required to have both an onsite and offsite emergency response plan as a condition of obtaining and maintaining a license to operate that plant. Onsite emergency response plans are approved by the U.S. Nuclear Regulatory Commission (NRC).

4.26.1 – Location and Extent

The only active commercial nuclear reactor within the State of Kansas is the Wolf Creek Nuclear Power Plant (Wolf Creek) in Coffey County. Kansas Region D is well outside of both the 10-mile 50-mile emergency planning zones for Wolf Creek. The entire planning region is at risk from a radiological event due to transportation accidents.

4.26.2 – Previous Occurrences

There have been no reported major radiological events recorded in Kansas Region D

4.26.3 – Hazard Probability Analysis

There have been no reported nuclear failure and/or release events in Kansas Region D.

4.26.4 – Vulnerability Assessment

The major usage of radioactive materials in the region are for medical diagnostics and therapy, soil density testing in the construction industry, and in radiography cameras in pipeline construction and repair. During all lawful operations of radioactive materials, the licensee is responsible for ensuring that the area around the source material is cordoned off or shielding is used to prevent unnecessary exposures. Inspections of practices and security measures are regularly conducted to ensure compliance and conformity to regulations in order to protect the public. The frequency of inspections can be adjusted in response to perceived risk. Public risk can be reduced by minimizing the duration of exposure, shielding the source material and maximizing the distance from the source.

It is common for materials, including pharmaceuticals, industrial sources and nuclear fuel rods destined to nuclear reactors, to be transported via highways and railroads. Areas near interstates and major highways have an increased risk of transportation accidents. Remote areas also have to account for long response times from hazardous materials and health physics personnel.

4.26.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.222: Radiological Incident Consequence Analysis

Subject	Impacts of Nuclear Incident
Health and Safety of Persons in the Area of the Incident	Impact in the immediate area could be severe and long lasting.
Responders	Impact to responders is expected to be severe, potentially even with required safety equipment.
Continuity of Operations	Long term relocation may be necessary if government facilities experience contamination.
Property, Facilities, and Infrastructure	Localized impact could be severe in the incident area. Facilities may need to be abandoned and razed. Large areas may become inaccessible.
Environment	Impact could be severe for the immediate area. Impact will lessen with distance.
Economic Conditions	Local economy and finances may be adversely affected, depending on the nature, extent and duration of the event.
Public Confidence in Governance	Response and recovery will be in question if not timely and effective. Warning systems and the timeliness of those warnings could be questioned.

4.27 – Terrorism

The United States does not have a standardized definition of terrorism that is agreed upon by all agencies. The Federal Bureau of Investigation generally defines terrorism 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 political or social objectives."

4.27.1 – Location and Extent

Kansas is home to a wide variety of criminal extremist groups. The Southern Poverty Law Center reported that in 2018 there were three active hate groups in Kansas: one neo-Nazi group, the National Socialist Movement in Lansing, one racist skinhead group, the Midland Hammerskins in Seward, and one anti-homosexual group, the Westboro Baptist Church in Topeka. Other groups, such as the Animal Liberation Front, Earth Liberation Front, and People for the Ethical Treatment of Animals may have sympathizers in the region. Although no major terrorist acts have been attributed to any of these latter groups, their involvement in violent acts is meant to disrupt governmental functions and cannot be discounted.

4.27.2 – Previous Occurrences

Kansas Region D has been fortunate to escape a major terrorist incident.

4.27.3 – Hazard Probability Analysis

By nature, acts of terrorism are difficult to foresee. However, the probability of a major terrorist event in Kansas Region D is considered very low due the lack of any documented historical events. Again, it is worth noting that no previous occurrences in no way guarantees no future occurrences.

4.27.4 – Vulnerability Analysis

For purposes of this assessment, data is not available to quantify vulnerability or estimated losses as a result of terrorism incidents that might impact state-owned facilities.

For this assessment, it is not possible to calculate a specific vulnerability for each county or participating jurisdiction. However, because of the desire for publicity following attacks, it is more likely that counties and jurisdictions with greater population densities and /or larger evet venues have a greater risk.

It is difficult to quantify potential losses of terrorism due to the many variables and human elements and lack of historical precedence. Therefore, for the purposes of this plan, the loss estimates will take into account three hypothetical scenarios. The estimated impact of each event was calculated using the Electronic Mass Casualty Assessment and Planning Scenarios developed by Johns Hopkins University.

Please note that the hypothetical scenarios are included for illustrative purposes only.

Scenario #1: Mustard Gas Release

Event: Mustard gas is released from a light aircraft onto the stadium during a home football game. The agent directly contaminates the stadium and the immediate surrounding area. This attack would cause harm to humans and could render portions of the stadium unusable for a short time period in order to allow for a costly clean-up. There might also be a fear by the public of long-term contamination of the stadium and subsequent boycott of games resulting in a loss of revenue and tourism dollars.

Event Assumptions: For this scenario the number of people in the stadium is 50,000 with an additional 5,000 persons remain outside the stadium in the adjacent parking areas. The agent used, mustard gas, is extremely toxic and may damage eyes, skin and respiratory tract with death sometimes resulting from secondary respiratory infections. Death rate from exposure estimated to be 3%. The estimated decontamination cost is $12 person. For this scenario it is assumed that all persons with skin injuries will require decontamination.

Results: The following table presents the estimated human and economic impacts of the scenario.

Table 4.223: Estimated Impact of Scenario #1, Mustard Gas Release

Impact	Post Exposure Onset Time	Effect
Severe Eye Injuries (1-2 hours)	1 -2 Hours	41,250 persons
Severe Airway Injuries (1-2 hours)	1 - 2 Hours	41,250 persons
Severe Skin Injuries (2 hours to days)	2 Hours to Days	49,500 persons
Deaths	Immediate to Days	1,100 persons
Cost of Decontamination	N/A	$594,000

Source: Electronic Mass Casualty Assessment and Planning Scenarios by Johns Hopkins University

Scenario #2: Pneumonic Plague

Event: Four Canisters containing aerosolized pneumonic plague bacteria are opened in public bathrooms of heavily populated buildings (airports, stadiums, etc.). Each release location will directly infect 110 people; hence, the number of release locations dictates the initial infected population. The secondary infection rate is used to calculate the total infected population. This attack method would not cause damages to buildings or other infrastructure, only to human populations.

Event Assumptions: Each canister contains 650 milliliters of pneumonic plague bacteria. The type of infectious agent used is identified on Day 4. After identification, the fatality rate is 10% for new cases. Pneumonic plague has a 1-15 percent mortality rate in treated cases and a 40-60 percent mortality rate in untreated cases.

Results: The following table presents the estimated human impacts of the scenario.

Table 4.224: Estimated Impact of Scenario #2, Pneumonic Plague Release

Impact	Effect
Initial Infected Population	440 persons
Secondary Infected Population	883 persons
Deaths (7% of Infected)	62

Source: Electronic Mass Casualty Assessment and Planning Scenarios by Johns Hopkins University

Scenario #3: Improvised Explosive Device

Event: An improvised explosive device utilizing an ammonium nitrate/fuel oil mixture is carried in a panel van to a parking area during a time when stadium patrons are leaving their cars and entering the stadium and detonated. Potential losses with this type of scenario include both human and structural assets.

Event Assumptions: The quantity of ammonium nitrate/fuel oil mixture used is 4,000 pounds. The population density of the lot is assumed to be 1 person per every 25 square feet for a pre-game crowd. The Lethal Air Blast Range for such a vehicle is estimated to be 50 feet according to the Bureau of Alcohol, Tobacco, Firearms and Explosives Standards. The Falling Glass Hazard distance is estimated at 600 feet according to Bureau of Alcohol, Tobacco, Firearms and Explosives Explosive Standards. In this event, damage would occur to vehicles, and depending on the proximity of other structures, damages would occur to the stadium complex itself. The exact amount of these damages is difficult to predict because of the large numbers of factors, including the type of structures nearby and the amount of insurance held by vehicle owners. It is estimated that the average replacement cost for a vehicle is $20,000 and the average repair cost for damaged vehicles would be $4,000.

Results: The following table presents the estimated human impacts of the scenario.

Table 4.225: Estimated Impact of Scenario #3, Improvised Explosive Device

Impact	Effect
Deaths	1,391 persons
Trauma Injuries	2,438 persons
Urgent Care Injuries	11,935
Injuries not Requiring Hospitalization	4,467
Repair Costs for 100 Vehicles	$400,000
Replacement Costs for 50 Vehicles	$1,000,000

Source: Electronic Mass Casualty Assessment and Planning Scenarios by Johns Hopkins University

4.27.5 – Impact and Consequence Analysis

There is no consensus on estimates of potential fatalities and injuries for terrorism events. Injury and death tolls would be dependent on the type, size and weapon used. Areas with higher population densities would likely result in a greater number of casualties.

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.226: Terrorism Consequence Analysis

Subject	Impacts of Terrorism
Health and Safety of Persons in the Area of the Incident	Impact could be severe for persons in the incident area.
Responders	Impact to responders could be severe if not trained and properly equipped. Responders that are properly trained and equipped will have a low to moderate impact.
Continuity of Operations	Depending on damage to facilities/personnel in the incident area, relocation may be necessary and lines of succession execution.
Property, Facilities, and Infrastructure	Impact within the incident area could be severe for explosion, moderate to low for Hazmat.
Environment	Localized impact within the incident area could be severe depending on the type of incident.
Economic Conditions	Economic conditions could be adversely affected and dependent upon time and length of clean up and investigation.
Public Confidence in Governance	Impact dependent on if the incident could have been avoided by government entities, clean-up, investigation times and outcomes.

4.28 – Utility/Infrastructure Failure

Critical infrastructure involves several different types of facilities and systems including:

- Electric power
- Transportation routes
- Natural gas and oil pipelines
- Water and sewer systems, storage networks
- Internet/telecommunications systems

Failure of utilities or infrastructure components in south-southwest Kansas can seriously impact public health, functioning of communities and the region's economy. Disruptions to utilities can occur from many of the hazards detailed in this plan, but the most likely causes include:

- Floods
- Lightning
- Tornados and Windstorms
- Winter Storms

In addition to being impacted by another listed hazard, utilities and infrastructure can fail as a result of faulty equipment, lack of maintenance, degradation over time, or accidental damage.

4.28.1 – Location and Extent

All of Kansas Region D is at risk for utility and/or infrastructure failure. The following sections discuss the major utilities in further detail.

Electric Power

The most common hazards analyzed in this plan that may disrupt the power supply are flood, lightning, tornado, windstorm, and winter weather. In addition, extreme heat can disrupt power supply when air conditioning use spikes during heat waves resulting in brownouts or rolling blackouts.

In general, electricity in Kansas Region D is provided by either investor-owned utilities or rural electric cooperatives (RECs). RECs are not-for-profit, member-owned electric utilities. Kansas RECs are governed by a board of trustees elected from the membership. Most Kansas RECs were set up under the Kansas Electric Cooperative Act, which, together with the federal Rural Electrification Act of 1934, made electric power available to rural customers. Information on regional electrical suppliers may be found at www.kec.org/servicearea_map.html. Additionally, locations of electric certified areas and transmission lines may be found at www.kcc.state.ks.us/maps/ks_electric_certified_areas.pdf.

Transportation Routes

Transportation routes can also be impacted by many of the hazards discussed in this plan. The primary hazards that impact transportation are flood, hazardous materials, and winter weather. Flood events can make roads and bridges impassible due to high water. Flood waters can also erode or scour roadbeds and bridge abutments. Highway and railroad accidents that involve hazardous materials can impact transportation routes through closures and/or evacuations. Winter weather frequently impacts transportation as roads become treacherous or impassible due to ice and snow. Other hazards that impact transportation routes include dam and levee failures if routes are in inundation areas, extreme temperatures that can cause damage to pavement, land subsidence that can damage roads/railroads, landslides that can cause debris and rock falls onto roadways, terrorism that can target routes, tornados that can directly damage infrastructure or deposit debris in routes, wildfires that can cause decreased visibility on transportation routes due to smoke, and windstorms that can cause vehicle accidents or overturning.

Pipelines Systems

Hazards that can impact natural gas and oil pipelines include earthquakes, expansive soils, land subsidence, landslide, and terrorism

Water and Sewer Systems

The primary hazards that can impact water supply systems include drought, floods, hazardous materials, and terrorism. Water district boundary maps are available for review at https://krwa.net/ONLINE-RESOURCES/RWD-Maps.

Internet and Telecommunications

Internet and telecommunications infrastructure can be impacted by floods, lightning, tornados, windstorms, and winter weather. Land line phone lines often utilize the same poles as electric lines, so when weather events such as windstorm or winter weather cause lines to break both electricity and telephone services may experience outages. With the increasing utilization of cellular phones, hazard events such as tornado that can damage cellular repeaters can cause outages. In addition, during any hazard event, internet and telecommunications systems can become overwhelmed due to the surge in call and usage volume. A map indicating telephone service providers in Kansas Region D is available at www.kcc.state.ks.us/maps /ks_telephone_certified_areas.pdf.

4.28.2 – Previous Occurrences

Each year disruptions to utility services ranging from minor to serious are a secondary result of other hazard events including drought, flood, tornado, windstorm, winter storm, lightning, and extreme heat.

4.28.3 – Hazard Probability Analysis

Minor utility failures occur annually across the region, with larger failures usually tied to other disaster events such as tornados, winter storms and windstorms. As discussed throughout this plan, these concurrent events occur regularly. As such, it is expected that occasional, and largely concurrent utility failure events will occur.

4.28.4 – Vulnerability Assessment

Regionally, smaller utility suppliers generally have limited resources for mitigation. Thus, the large number of small utility service providers could mean greater vulnerability in the event of a major, widespread disaster, such as a major flood, severe winter storm or ice storm.

In recent years, regional electric power grid system failures in the western and east-central United States have demonstrated that similar failures could happen in Kansas Region D. This vulnerability is most appropriately addressed on a multi-state regional or national basis.

Since utility/infrastructure failure is generally a secondary or cascading impact of other hazards, it is not possible to quantify estimated potential losses specific to this hazard due to the variables associated with affected population, duration of outages, etc.

Although the limitless variables make it difficult to estimate future losses on a statewide basis, FEMA has developed standard loss of use estimates in conjunction with their Benefit-Cost Analysis methodologies to estimate the cost of lost utilities on a per-person, per-use basis.

Table 4.227: FEMA Benefit-Cost Analysis

Loss of Electric Power	Cost of Complete Loss of Service
Total Economic Impact	$131 per person per day
Loss of Potable Water Service	Cost of Complete Loss of Service
Total Economic Impact	$103 per person per day
Loss of Wastewater Service	Cost of Complete Loss of Service
Total Economic Impact	$45 per person per day
Loss of Road/Bridge Service	Cost of Complete Loss of Service
Vehicle Delay Detour Time	$29.63 per vehicle per hour (one-way trips)
Vehicle Delay Mileage	$0.54 per mile (or current federal mileage rate)

Source: FEMA BCA Reference Guide, June 2009, Appendix C

4.28.5 – Impact and Consequence Analysis

As per EMAP requirements, the following table provides the Consequence Analysis.

Table 4.228: Utility/Infrastructure Failure Consequence Analysis

Subject	Impacts of Utility/Infrastructure Incident
Health and Safety of Persons in the Area of the Incident	Localized impact will be moderate to severe for persons with functional and access needs, and the elderly, depending on length of failure and time of year.
Responders	Impact to responders will be minimal if properly trained and equipped.
Continuity of Operations	Due to the nature of the hazard, the COOP plan is not expected to be activated, however, if the recovery time is excessive than temporary relocation may become necessary (minimal).
Property, Facilities, and Infrastructure	Impact is dependent on the nature of the incident, e.g., electric, water, sewage, gas, communication disruptions). (Minimal)
Environment	Impact, depending on the nature of the incident, should be minimal.
Economic Conditions	Economic conditions could be adversely affected depending on damages suffered, extent of damages, etc. (minimal)

Table 4.228: Utility/Infrastructure Failure Consequence Analysis

Subject	Impacts of Utility/Infrastructure Incident
Public Confidence in Governance	Impact will be dependent on whether or not the government or non-government entities response, recovery, and planning were not timely and effective (minimal).

5.0 Capability Assessment

5.1 – Introduction

44 CFR 201.6 does not require a capability assessment to be completed for local hazard mitigation plans. However, 201.6(c)(3) states "A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools."

This section of the plan discusses the current capacity of regional communities to mitigate the effects of identified hazards. A capability assessment is conducted to determine the ability of a jurisdiction to execute a comprehensive mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

A capability assessment helps to determine which mitigation actions are practical based on a jurisdiction's fiscal, staffing and political resources. A capability assessment consists of:

- An inventory of relevant plans, ordinances, or programs already in place
- An analysis capacity to carry them out.

A thoughtful review of jurisdictional capabilities will assist in determining gaps that could limit current or proposed mitigation activities, or potentially aggravate a jurisdictions vulnerability to an identified hazard. Additionally, a capability assessment can detail current successful mitigation actions that should continue to receive support.

For this plan each participating jurisdiction was given an opportunity to present their capability assessment information.

5.2 – Granted Authority

In implementing a mitigation plan or specific action, a local jurisdiction may utilize any or all of the four broad types of government authority granted by the State of Kansas. The four types of authority are defined as:

- Regulation
- Acquisition
- Taxation
- Spending

Regulation

The scope of this local authority is subject to constraints, however, as all of Kansas' political subdivisions must not act without proper delegation from the State. Under a principle known as "Dillon's Rule," all power is vested in the State and can only be exercised by local governments to the extent it is delegated.

Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazard-proofing" a particular piece of property or area is to acquire the property, thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Kansas legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain (County Home Rule Powers, K.S.A. 19-101, 19-101a, 19-212).

Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Kansas law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood control within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development. Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development.

Spending

The Kansas General Assembly allocated the ability to local governments to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption of annual budgets and a Capital Improvement Plan. A Capital Improvement Plan is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent. In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A Capital Improvement Plan that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the Capital Improvement Plan is effective in directing growth away from environmentally sensitive or high hazard areas.

5.3 – Governance

All counties within Kansas Region D operate under a county commissioner form of governance, with the elected board of commissioners overseeing county operations.

Table 5.1: County Governance

Jurisdiction	Government Structure	Number of Commissioners
Clark County	Commission	3
Finney County	Commission	3
Ford County	Commission	3
Gray County	Commission	3
Haskell County	Commission	3
Hodgeman County	Commission	3
Lane County	Commission	3
Meade County	Commission	3
Seward County	Commission	3

In general, the participating towns and cities in Kansas Region D operate either under a Mayoral form of governance or an elected city council form of governance.

5.4 – Jurisdictional Capabilities

Information as to the current capacity of participating jurisdictions is summarized in the following sections and tables. All capability information was provided by jurisdictional officials through the above referenced questions and through outreach from the MPC.

The ability of a local government to develop and implement mitigation projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability can be evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability for the implementation and success of proposed mitigation activities.

Many smaller jurisdictions have very limited to no planning, management, response or mitigation capabilities. Often these jurisdictions rely on the county or nearby larger municipalities for assistance. This lack of capabilities is reflected in the following tables. Additionally, many very small or extremely limited participating small jurisdictions, largely townships, are not listed on the capability list. This in no way diminishes the participation in the process of these jurisdictions. Finally, special district capabilities are included in their overarching jurisdiction.

5.4.1 – Planning Capabilities

The planning capability assessment is designed to provide a general overview of the key planning and regulatory tools or programs in place or under development. This information helps identify opportunities to address existing planning gaps and provides an opportunity to review areas that mitigation planning actions can be utilized with existing plans. Jurisdictions were asked if they had completed the following:

> ***Comprehensive Plan:*** A comprehensive plan establishes the overall vision for a jurisdiction and serves as a guide to decision making, and generally contains information on demographics, land use, transportation, and facilities. As a comprehensive plan is broad in scope the integration of hazard mitigation measures can enhance the likelihood of achieving risk reduction goals.
>
> ***Critical Facilities Plan:*** A critical facilities plan is used to identify a jurisdiction's critical facilities, including fire stations, police stations, hospitals, schools, day care centers, senior care facilities, major roads and bridges, critical utility sites, and hazardous material storage areas. Additionally, this plan may be used to determine methods to mitigate damage to these facilities.
>
> ***Debris Management Plan:*** A debris management plan covers the response and recovery from debris-causing incidents such as tornados or floods. Planning considerations include debris removal and disposal, disposal locations, equipment availability, and personnel training.
>
> ***Emergency Operations Plan:*** An emergency operations plan outlines responsibility, means and methods by which resources are deployed during and following an emergency or disaster.
>
> ***Evacuation Plan:*** A plan that outlines routes and methods by which populations are evacuated during and following an emergency or disaster.
>
> ***Fire Mitigation Plan:*** A fire mitigation plan is used to mitigate a jurisdictions wildfire risk and vulnerability. The plan documents areas with an elevated risk of wildfires, and identifies the actions taken to decrease the risk. A fire mitigaion plan can influence and prioritize future funding for hazardous fuel reduction projects, including where and how federal agencies implement fuel reduction projects on federal lands.
>
> ***Flood Mitigation Assistance Plan:*** The purpose of the flood mitigation assistance plan is to reduce or eliminate the long-term risk of flood damage to buildings and other structures insured under the NFIP.
>
> ***Recovery Plan:*** A disaster recovery plan guides the recovery and reconstruction process following a disaster. Hazard mitigation principles should be incorporated into disaster recovery plans to assist in breaking the cycle of disaster loss.
>
> ***Vulnerable Population Plan and/or Inventory:*** A vulnerable populations plan is used to develop a strategic approach for support to persons with functional or special needs before, during and following a disaster.

The table below summarizes relevant jurisdictional planning capabilities.

Table 5.2: Jurisdictional Planning Capabilities

Jurisdiction	Comprehensive Plan	Critical Facilities Plan	Debris Management Plan	Emergency Operations Plan	Evacuation Plan	Firewise or other Fire Mitigation Plan	Flood Mitigation Assistance Plan	Recovery Plan	Vulnerable Population Plan and/or Inventory
Clark County		x		x					
City of Ashland				x					
City of Englewood				x					
City of Minneola				x					
Finney County	x	x		x			x	x	
City of Garden City	x			x			x	x	
City of Holcomb	x	x		x			x		
Ford County	x	x	x	x					
City of Bucklin			x	x					
City of Dodge City	x		x	x		x	x		
City of Ford			x	x					
City of Spearville				x					
Gray County				x				x	
City of Cimarron				x					
City of Copeland				x					
City of Ensign		x		x					
City of Ingalls				x					
City of Montezuma	x			x					
Haskell County			x	x					
City of Satanta			x	x					
City of Sublette			x	x					
Hodgeman County				x					
City of Hanston				x					
City of Jetmore				x					
Lane County		x		x			x		
City of Dighton		x		x					
Meade County			x	x					
City of Fowler				x					
City of Meade				x					
City of Plains				x					

Table 5.2: Jurisdictional Planning Capabilities

Jurisdiction	Comprehensive Plan	Critical Facilities Plan	Debris Management Plan	Emergency Operations Plan	Evacuation Plan	Firewise or other Fire Mitigation Plan	Flood Mitigation Assistance Plan	Recovery Plan	Vulnerable Population Plan and/or Inventory
Seward County	x	x	x	x				x	
City of Kismet	x			x					
City of Liberal	x			x			x		

5.4.2 – Policies and Ordinances

Participating jurisdictions were asked if the following policies and ordinances and plans were established and enforced:

Building Code: Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through the building code.

Floodplain Ordinance: In general, floodplain ordinances are used to:

- Minimize the extent of floods by preventing obstructions that inhibit water flow and increase flood height and damage.
- Prevent and minimize loss of life, injuries, and property damage in flood hazard areas.
- Promote the public health, safety and welfare of citizens in flood hazard areas.

Floodplain ordinances may allow jurisdictions to:

- Manage planned growth
- Adopt local ordinances to regulate uses in flood hazard areas
- Enforce those ordinances
- Grant permits for use in flood hazard areas that are consistent with the ordinance

These ordinances can also help ensure meeting the minimum requirements of participation in the NFIP. The incentive for local governments adopting such ordinances is that they will afford their residents the ability to purchase flood insurance through the NFIP.

Stormwater Ordinance: The purpose of a stormwater ordinance is to protect the quality and quantity of local, regional and state waters from the potential harm of unmanaged stormwater. Stormwater ordinances include protection from activities that result in the degradation of properties, water quality, stream channels, and other natural resources.

Nuisance Ordinance: Local governments may use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard.

Zoning: Zoning is the traditional and most common tool available to local jurisdictions to control the use of land. Zoning is used to promote health, safety, and the general welfare of the community. Zoning is used to dictate the type of land use and to set minimum specifications for use such as lot size, building height and setbacks, and density of population. Local governments are authorized to divide their jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, special use districts or conditional use districts. Zoning ordinances consist of maps and written text.

The table below summarizes relevant jurisdictional policies and ordinances.

Table 5.3: Jurisdictional Policies and Ordinances

Jurisdiction	Building Code	Floodplain Ordinance	Nuisance Ordinance	Storm Water Ordinance	Zoning Ordinance
Clark County					
City of Ashland		x	x		
City of Englewood		x	x		
City of Minneola		x	x		
Finney County	x		x	x	x
City of Garden City	x	x	x	x	x
City of Holcomb	x	x	x	x	x
Ford County		x			x
City of Bucklin		x	x		x
City of Dodge City	x	x	x	x	x
City of Ford		x			
City of Spearville		x	x		x
Gray County					x
City of Cimarron	x	x	x	x	x
City of Copeland	x	x	x		x
City of Ensign		x	x		
City of Ingalls		x	x		
City of Montezuma	x		x		x
Haskell County			x		x
City of Satanta		x	x		x
City of Sublette			x		x
Hodgeman County					x
City of Hanston		x	x		
City of Jetmore		x	x		x
Lane County	x	x			x
City of Dighton	x	x	x		x
Meade County					
City of Fowler	x	x	x		
City of Meade		x	x		
City of Plains			x		
Seward County	x	x	x		x
City of Kismet	x	x	x		x
City of Liberal	x	x	x		x

5.4.3 – Programs

This part of the capability's assessment includes the identification and evaluation of existing programs for each participating jurisdiction:

> ***Community Rating System program under the National Flood Insurance Program:*** The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Participants are offered flood insurance premium rates at a discount to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS. These goals are the reduction of flood damage to insurable property, the strengthening and support of insurance aspects of the NFIP, and the encouragement of a comprehensive approach to floodplain management.
>
> ***Firewise Community Certification:*** The Firewise Communities Program encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire. Firewise is a key component of Fire Adapted Communities, a collaborative approach that connects all those who play a role in wildfire education, planning and action with comprehensive resources to help reduce risk. The program is co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters.
>
> ***ISO Fire Rating:*** This assessment also includes the identification and evaluation of existing ISO fire ratings. The Fire Suppression Rating Schedule is a manual containing the criteria ISO uses in reviewing the fire prevention and fire suppression capabilities of individual communities or fire protection areas. The schedule measures the major elements of a community's fire protection system and develops a numerical grading called a Public Protection Classification.
>
> ***National Flood Insurance Program:*** In 1968, Congress created the NFIP to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding.
>
> ***National Weather Service StormReady Program*:** StormReady uses a grassroots approach to help communities develop plans to handle all types of severe weather. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations

The table below summarizes relevant local programs.

Table 5.4: Jurisdictional Programs

Jurisdiction	Community Rating System program	Firewise Community Certification	ISO Fire Rating	National Flood Insurance Program	National Weather Service Storm Ready Certification
Clark County					
City of Ashland			8	x	
City of Englewood			10	x	
City of Minneola			6	x	
Finney County					x
City of Garden City			3	x	
City of Holcomb				x	
Ford County				x	x
City of Bucklin				x	x
City of Dodge City			5	x	x
City of Ford				x	x
City of Spearville			7	x	x
Gray County			9		
City of Cimarron			6	x	
City of Copeland			6	x	
City of Ensign			9	x	
City of Ingalls			6	x	
City of Montezuma			6		
Haskell County					
City of Satanta				x	
City of Sublette					
Hodgeman County			9		
City of Hanston			7	x	
City of Jetmore			6	x	
Lane County			7	x	x
City of Dighton			6	x	
Meade County			10		
City of Fowler			5	x	
City of Meade			6	x	
City of Plains			6		
Seward County			x	x	x
City of Kismet			x	x	x

Table 5.4: Jurisdictional Programs

Jurisdiction	Community Rating System program	Firewise Community Certification	ISO Fire Rating	National Flood Insurance Program	National Weather Service Storm Ready Certification
City of Liberal			x	x	x

In addition, participating jurisdictions operate with mutual aid agreements. These are understandings among localities to lend assistance across jurisdictional boundaries. Mutual aid may be requested only when an emergency occurs that exceeds local resources.

5.4.4 – Staffing and Departmental Capabilities

A comprehensive mitigation program relies on many skilled professionals. These professionals include:

- Planners
- Emergency managers
- Floodplain managers
- GIS personnel

While exact responsibilities differ from jurisdiction to jurisdiction, the general duties of applicable departments are described below:

Building Official: Building officials are generally the jurisdictional administrator of building and construction codes, engineering calculation supervision, permits, facilities management, and accepted construction procedures. They may also inspect structures to ensure compliance with the plans and to check workmanship as well as code compliance.

Emergency Management Coordinator: The Emergency Management office is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and man-made disaster events. The formation of an emergency management department in each county is mandated under Kansas General Statutes.

Local Emergency Planning Committee: Local Emergency Planning Committees are generally housed at the county or municipal level. They do not function in actual emergency situations, but attempt to identify and catalogue potential hazards, identify available resources, mitigate hazards when feasible, and write emergency plans. The role of the LEPC is to anticipate and plan the initial response for foreseeable disasters in their jurisdiction.

Mapping Specialist: A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data. A GIS mapping specialist uses this data to create county maps, including flood plain, fire hazard, drought and other mitigation maps.

NFIP Floodplain Administrator: The NFIP floodplain administrator ensures a jurisdiction is meeting the minimum requirements of participation in the NFIP, and often is tasked with applying for funding or grants.

Planning Department: A planning department usually provides management and oversight of development through the application of codes, ordinances, building regulations and public input.

Public Works Official: Public works officials usually provide management and oversight of infrastructure projects such as public buildings (municipal buildings, schools, hospitals), transport infrastructure (roads, railroads, bridges, pipelines, airports), public spaces (public squares, parks), public services (water supply, sewage, electrical grid, dams), and other physical assets and facilities.

The table below summarizes relevant local staffing and departmental capabilities.

Table 5.5: Staffing and Departmental Capabilities

Jurisdiction	Building Code Official or Inspector	Emergency Management Coordinator	Local Emergency Planning Committee	Mapping Specialist	NFIP Floodplain Administrator	Planning Department	Public Works Official
Clark County		x	x	x			x
City of Ashland					x		x
City of Englewood					x		x
City of Minneola					x		x
Finney County	x	x	x	x		x	x
City of Garden City	x			x	x	x	x
City of Holcomb	x				x		x
Ford County		x	x	x	x	x	x
City of Bucklin					x		x
City of Dodge City	x			x	x	x	x
City of Ford					x		x
City of Spearville	x				x		x
Gray County		x	x				x
City of Cimarron	x				x		x
City of Copeland					x		x
City of Ensign					x		x
City of Ingalls					x		x
City of Montezuma	x						x

Table 5.5: Staffing and Departmental Capabilities

Jurisdiction	Building Code Official or Inspector	Emergency Management Coordinator	Local Emergency Planning Committee	Mapping Specialist	NFIP Floodplain Administrator	Planning Department	Public Works Official
Haskell County		x	x			x	x
City of Satanta					x	x	x
City of Sublette						x	x
Hodgeman County		x	x	x			x
City of Hanston					x		x
City of Jetmore					x		x
Lane County	x	x	x	x	x		x
City of Dighton	x				x		x
Meade County		x	x				x
City of Fowler					x		x
City of Meade					x		x
City of Plains							x
Seward County	x	x	x	x	x		x
City of Kismet	x				x		x
City of Liberal	x				x		x

5.4.5 – Non-Governmental Organizations Capabilities

Non-Governmental Organizations (NGOs) are legally constituted corporations that operate independently from any form of government and are not conventional for-profit businesses. In the cases in which NGOs are funded totally or partially by a government agency, the NGO maintains its non-governmental status by excluding government representatives from membership in the organization. The following is a brief discussion of both the American Red Cross and the Salvation Army, both of which provide regional operations and coverage.

> ***American Red Cross:*** The American Red Cross is a humanitarian organization that provides emergency assistance, disaster relief and education. In addition, they offers services in five other areas: community services that help the needy; communications services and comfort for military members and their family members; the collection, processing and distribution of blood and blood products; educational programs on preparedness, health, and safety; and international relief and development programs.
>
> ***Salvation Army:*** The Salvation Army is a Christian denomination and international charitable organization. In addition to being among the first to arrive with help after natural or man-made disasters, the Salvation Army runs charity shops and operates shelters for the homeless.

5.4.6 – Fiscal Capabilities

In general, the jurisdictions of the Kansas Region D receive the majority of their revenue through state and local sales tax and federal and state pass through dollars. Based on available revenue information, and given that both the state and counties are experiencing budget deficits, funding for mitigation programs and disaster response is at a premium. Adding to the budget crunch is the increased reliance on local accountability by the federal government.

The following provide brief definitions of applicable fiscal programs:

> ***Application and Management of Grant Funding:*** The jurisdiction has the staffing and capabilities to apply for grant funding and oversee all necessary provisions of the funding.
>
> ***Authority to Levy Taxes:*** The authority to levy taxes would allow the jurisdiction to tax its population base.
>
> ***Authority to Withhold Spending in Hazard Prone Areas:*** The ability of a jurisdiction to not provide funding for activities or actions in an area that is known to be prone to specific hazards.
>
> ***Incur Debt through General Obligation Bonds:*** General obligation bonds are issued with the belief that a municipality will be able to repay its debt obligation through taxation or revenue from projects. General obligation bonds can be used to generate funds for mitigation projects.
>
> ***Usage of Capital Improvement Funding for Mitigation Projects:*** Capital improvement allows for spending on identified capital projects and for equipment purchases, in this context related to mitigation projects.

The following table highlights each jurisdiction's fiscal capabilities.

Table 5.6: Jurisdictional Financial Capabilities

Jurisdiction	Apply for and Manage Grant Funding	Authority to levy taxes for specific purposes	Authority to Withhold spending in hazard prone areas	Incur Debt through General Obligation Bonds	Usage of Capital Improvement Funding for Mitigation Projects
Clark County	x	x		x	x
City of Ashland	x	x		x	x
City of Englewood	x	x		x	x
City of Minneola	x	x		x	x
Finney County	x	x		x	x
City of Garden City	x	x		x	x
City of Holcomb	x	x	x	x	x

Table 5.6: Jurisdictional Financial Capabilities

Jurisdiction	Apply for and Manage Grant Funding	Authority to levy taxes for specific purposes	Authority to Withhold spending in hazard prone areas	Incur Debt through General Obligation Bonds	Usage of Capital Improvement Funding for Mitigation Projects
Ford County	x	x	x	x	x
City of Bucklin	x	x	x	x	x
City of Dodge City	x	x	x	x	x
City of Ford	x	x	x	x	x
City of Spearville	x	x	x	x	x
Gray County	x	x	x	x	x
City of Cimarron	x	x	x	x	x
City of Copeland	x	x		x	x
City of Ensign	x	x		x	x
City of Ingalls	x	x		x	x
City of Montezuma	x	x	x	x	x
Haskell County	x	x		x	x
City of Satanta	x	x		x	x
City of Sublette	x	x		x	x
Hodgeman County	x	x		x	x
City of Hanston	x	x		x	x
City of Jetmore	x	x		x	x
Lane County	x	x	x	x	x
City of Dighton	x	x		x	x
Meade County	x	x		x	x
City of Fowler	x	x		x	x
City of Meade	x	x		x	x
City of Plains	x	x		x	x
Seward County	x	x	x	x	x
City of Kismet	x	x		x	x
City of Liberal	x	x		x	x

5.4.7 – School Capability Assessment

Participating school districts were provided with a different set of questions that participating governmental jurisdictions. These questions were asked to ascertain the level of preparedness of the institution.

The following provides brief definitions of terms used in the capability assessment of schools. Please note that some definitions have been provided in previous sections.

Access to Local, Regional and State Funds: The ability to use local, regional and state funding on school activities and improvements.

Active Shooter Plan: An active shooter plan outlines responsibility, means and methods by which resources are deployed during an active shooter scenario.

Capital Improvement Plan: A capital improvement plan guides scheduling of, and spending on, school improvements. A capital improvement plan can guide future development away from identified hazard areas, an incorporate identified mitigation strategies.

District Master Plan: A master plan establishes the overall vision and serves as a guide to decision making. A master plan generally contains information on demographics, land use, transportation, and facilities. As a master plan is broad in scope the integration of hazard mitigation measures can enhance the likelihood of achieving risk reduction goals.

Emergency Operations Plan/Evacuation Plan: An emergency operations plan outlines responsibility, means and methods by which resources are deployed during and following an emergency or disaster. Often included in these plans are detailed evacuation procedures and policies.

Incur Debt through General Obligation Bonds: General obligation bonds are issued with the belief that an entity will be able to repay its debt obligation through taxation or revenue from projects. General obligation bonds can be used to generate funds for mitigation projects.

School Safety or Resource Officer: A person with overall responsibility for safety of the school, students and staff.

Information as to the current capacity of participating schools, colleges and universities is summarized in the following table.

Table 5.7: College, Unified School District or University Capabilities

Jurisdiction	Access to Local, Regional and State funds	Active Shooter Plan or Policy	Capital Improvement Plan	District Master Plan	School Emergency and Evacuation Plans	School Safety or Resource Officers or Dedicated Law Enforcement
Clark County						
USD #219 - Minneola	x	x	x	x	x	

Table 5.7: College, Unified School District or University Capabilities

Jurisdiction	Access to Local, Regional and State funds	Active Shooter Plan or Policy	Capital Improvement Plan	District Master Plan	School Emergency and Evacuation Plans	School Safety or Resource Officers or Dedicated Law Enforcement
USD #220 - Ashland	x	x	x	x	x	
Finney County						
Garden City Community College	x	x				
USD #363 – Holcomb	x	x	x	x	x	
USD #457 – Garden City	x	x	x	x	x	
Ford County						
Dodge City Community College	x	x	x			
USD #381 - Spearville	x	x	x	x	x	
UDS #443 – Dodge City	x	x	x	x	x	x
USD #459 - Bucklin	x	x	x	x	x	
Gray County						
USD #102 - Cimarron	x	x	x		x	
USD #371 - Montezuma	x	x	x		x	
USD #476 – Copeland / South Gray	x	x	x		x	
USD #477 - Ingalls	x	x	x		x	
Haskell County						
USD #374 - Sublette	x	x	x		x	
USD #507 - Satanta	x	x	x		x	
Hodgeman County						
USD #227 – Hodgeman County	x	x	x		x	
Lane County						
USD #468 – Healy Public Schools	x	x	x	x	x	
USD #482- Dighton	x	x	x	x	x	
Meade County						
USD #225 – Fowler	x	x		x	x	
USD #226 - Meade	x	x	x		x	
USD #483 – Kismet / Plains	x	x	x	x	x	
Seward County						
Seward Community College	x	x	x			
USD #480 - Liberal	x	x	x	x	x	
USD #483 – Kismet / Plains	x	x	x	x	x	

Additionally, under K.S.A. 72-5457 (General Provisions for the Issuance of Bonds), all Kansas USDs may issue general obligation bonds to:

- Purchase or improve any site or sites necessary for school district purposes including housing and boarding pupils enrolled in an area vocational school
- Acquire, construct, equip, furnish, repair, remodel or make additions to buildings including housing and boarding pupils enrolled in an area vocational school operated under the board of education of a school district

5.5 – Opportunities for Capability Improvement

As part of this plan update, the MPC identified the following opportunities for improvement across the Region concerning current capabilities:

- **Local Funding**
    - Integration of mitigation plans with other local plans and programs, such as capital improvement plans
    - Adoption of cost-effective mitigation measures when developing capital improvement projects

- **Public Education and Outreach**
    - Regular deployment of hazard awareness campaigns to enhance public awareness

- **Land Use Planning and Regulations**
    - Continued encouragement of using land use planning to identify areas at risk to natural hazards
    - Stormwater retention/detention projects to reduce flooding
    - Locally funded buyouts of hazard prone properties

.

- **Floodplain Management**
    - Encourage and support new participation in the NFIP and in the CRS
    - Continue the promotion and enforcement of NFIP and CRS floodplain management programs

6.0 Mitigation Strategy

6.1 – Introduction

As part of this planning effort, Kansas Region D and its participating jurisdictions worked to minimize the risk of future impacts from identified hazards to all citizens. In an attempt to shape future regulations, ordinances and policy decisions, the MPC reviewed and developed a hazard mitigation strategy. This comprehensive strategy includes:

- The consistent review and revision, as necessary, of obtainable goals and objectives
- The consistent review, revision and development of a comprehensive list of potential hazard mitigation actions

The development of a robust mitigation strategy allows for:

- The ability to effectively direct limited resources for maximum benefit
- The ability to prioritize identified hazard mitigation projects to maximize positive outcomes
- The increase in public and private level participation in hazard mitigation through transparency and awareness
- The potential direction of future policy decisions through awareness and education
- The achievement of the ultimate goal of a safer Region Dor all our citizens

Considering the factors listed above, the MPC continues to implement the following mitigation strategy:

- **Implement** the recommendations of this plan.
- **Utilize** existing regulations, policies, programs, procedures, and plans already in place.
- **Share** information on Funding opportunities.
- **Communicate** the information contained in this plan so all jurisdictions and citizens have a clearer understanding of the hazards facing the region and what can be done to mitigate their impacts.
- **Publicize** the success stories that have been achieved through the region's ongoing mitigation efforts.

6.2 – Emergency Management Accreditation Program Integration

As per requirements, in identifying and reviewing mitigation actions the following activities recommended by the EMAP were considered:

- The use of applicable building construction standards
- Hazard avoidance through appropriate land-use practices
- Relocation, retrofitting, or removal of structures at risk
- Removal or elimination of the hazard
- Reduction or limitation of the amount or size of the hazard
- Segregation of the hazard from that which is to be protected
- Modification of the basic characteristics of the hazard
- Control of the rate of release of the hazard
- Provision of protective systems or equipment for both cyber and physical risks

- Establishment of hazard warning and communication procedures
- Redundancy or duplication of essential personnel, critical systems, equipment, and information materials.

6.3 – Problem Statements

Based on the regionally identified hazards, problem statements have been developed to detail identified major concerns that can potentially be addressed through proposed mitigation actions. Problems statements were developed using the following inputs:

- Identify a key point of concern
- Is the problem getting worse, better, or staying the same?
- What are the identified or potential impacts?

The following table present regional problem statements to be utilized in informing the review, modification and development of hazard mitigation actions.

Table 6.1: Kansas Region D Problem Statements

Identified Hazard	Problem Statement
Tornado/Windstorm	The number of community shelters is inadequate to protect all populations, especially in smaller communities

County specific problem statements were generated through discussions with participating jurisdictions within that county, to be utilized in informing the review, modification and development of hazard mitigation actions. Additionally, problem statements from the public survey are incorporated to provide a community wide view. Problems statements were developed using the following inputs:

- Location
- Identified hazard
- Key point of concern

The following table present problem statements for each county

Table 6.2: Kansas Region D Community Problem Statements

Jurisdiction	Identified Hazard	Problem Statement
Clark County	All Hazards	Public outreach and education efforts need to be increased
Clark County	Utility Failure	County does not have an adequate number of generators for critical facilities.
Finney County	Tornado, Severe Storms	Public outreach initiatives need to be expanded, including public weather spotting classes.
Finney County	Tornado, Severe Storms	Public outreach initiatives need to be expanded, including public weather spotting classes.
Ford County	All Hazards	Areas of county are underserved by warning sirens.
Ford County	Flood	Repeat flood areas are of concern to the county.

Table 6.2: Kansas Region D Community Problem Statements

Jurisdiction	Identified Hazard	Problem Statement
Gray County	All Hazards	County population would be well served by having weather radios available.
Gray County	Utility Failure	Power infrastructure is above ground and subject to a range of hazards. Tree trimming program would help alleviate problem
Haskell County	Utility Failure	County does not have an adequate number of generators for critical facilities.
Haskell County	Wildfire	Potential wildfires are a concern to county communities.
Hodgeman County	All Hazards	Public outreach and education efforts need to be increased
Hodgeman County	All Hazards	Weather radios should be made available to county residents.
Lane County	All Hazards	Areas of county are underserved by warning sirens.
Lane County	Flood	Repeat flood areas are of concern to the county.
Meade County	All Hazards	Public outreach and education efforts need to be increased
Meade County	Tornado, Severe Storms	Public outreach initiatives need to be expanded, including public weather spotting classes.
Seward County	All Hazards	Public outreach and education efforts need to be increased
Seward County	Flood	Repeat flood areas are of concern to the county.

6.4 – Identification of Goals

44 CFR 201.6 (c)(3)(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Through thorough discussions at stakeholder meetings, the MPC determined that the four previously identified primary hazard mitigation goals remained relevant and applicable. This was because the priorities of Kansas Region D in relation to hazard mitigation planning have not changed during the five-year planning cycle. These goals were reviewed through a well-established consideration process, instituted by the MPC during previous plan updates, which consisted of:

- A review of previously identified hazard mitigation goals
- A review of demographic and built environment data
- A review of identified hazards, hazard events, and vulnerabilities
- A review all identified hazard mitigation actions

The following goals represent the Kansas Region D vision for hazard mitigation and disaster resilience.

- **Goal 1:** Reduce or eliminate risk to the people and property of Kansas Region D from the impacts of the identified hazards in this plan.
- **Goal 2:** Strive to protect all vulnerable populations, structures, and critical facilities in Kansas Region D from the impacts of the identified hazards.
- **Goal 3:** Improve public outreach initiatives to include education, awareness and partnerships with all entities in order to enhance understanding of the risk Kansas Region D faces due to the impacts of the identified hazards.

- **Goal 4:** Enhance communication and coordination among all agencies and between agencies and the public.

6.5 – Completed Mitigation Actions

Sine the completion of the previous HMP, each jurisdiction has been tracking the completion status of all identified hazard mitigation actions. Each of the following completed actions should be viewed as a testament to the effectiveness of the HMP and a positive step in creating safer and more resilient communities.

Table 6.3: Region D Participating Jurisdictions Completed Hazard Mitigation Actions

Jurisdiction	Action Description
Ford County	Research funding, purchase and install, new or enhance early warning response systems
Bucklin (Ford County)	Identify funding sources, procure and install new warning sirens.
Cimarron (Gray County)	Seek funding for the construction of a tornado safe room for the Shepherd's Center nursing home.
Lane County	Purchase and Permanently install power generator for EOC.
USD #482 (Lane County)	Develop and seek funding for mitigation projects for the construction of tornado safe rooms for USD #482 schools.
Fowler (Meade County)	Purchase emergency generators to support continuation of critical function at the Fowler water plant.
Fowler (Meade County)	Pursue funding for the construction of storm shelters for vulnerable populations and residents at large.
Fowler (Meade County)	Purchase backup generators for all city critical facilities.

Kansas Region D remains committed to investigating and obtaining all available Clark funding for the completion of hazard mitigation projects.

6.6 – Review and Addition of Mitigation Actions

For this plan update, members of the MPC and participating jurisdictions were asked to complete a thorough review of all not completed mitigation actions. Additionally, MPC members and participating jurisdictions were provided with the opportunity to identify and incorporate newly identified actions based on:

- Hazard events that have occurred since the last plan revision
- Updated risk assessments
- Identified goals and objectives
- Changing local capabilities
- New vulnerabilities.

In identifying new, or reviewing existing mitigation actions, the following general categories were considered:

Local Plans and Regulations: Actions that influence the way land and buildings are developed or constructed. Actions may include:

- Revision or institution planning and zoning ordinances
- Revision or institution of building codes
- Open space preservation
- Revision or institution floodplain regulations
- Revision or institution stormwater management regulations
- Drainage system maintenance
- Requirements for riverine setbacks

Structure and Infrastructure Projects: Actions that involve the modification of existing structures to protect, or remove from, a hazard or hazard area., such as:

- Acquisition of hazard prone properties
- Relocation of hazard prone properties
- Revision or institution of building elevation requirements
- Critical facilities protection
- Installation or retrofitting of community safe rooms
- Requiring insurance
- Installation or update of warning systems

Natural Systems Protection: Actions that minimize hazard losses to natural systems. Actions may include:

- Mandatory floodplain area protection
- Revision or institution of comprehensive watershed management programs
- Requirements for riparian buffers
- Requirements for forest and shrub management
- Revision or institution of erosion and sediment control
- Wetland preservation and restoration
- Slope stabilization programs

Education and Awareness Programs: Actions to inform and educate about potential hazards and actions to mitigate against them. Actions may include:

- Educational outreach programs
- Speaker and/ or demonstration events
- Notifying citizens on where to get information
- School educational and event programs

Each action was reviewed using the following metrics, asking if it was:

- **Specific** – The action addresses a hazard or need
- **Measurable** – Achievement or progress can be measured
- **Attainable** – Accepted by those responsible for achieving it
- **Relevant –** Substantively addresses the problem
- **Time-bound** – Time period for achievement is clearly stated

Additionally, the MPC and each jurisdiction was instructed to provide a brief summary regarding the status of each of these actions using the following:

- **Not Started:** Action will provide reason(s) for lack of progress, which may include lack of Funding, differing priorities, changes in political climate, lack of technical skills, etc.
- **In progress:** Action will provide a summary, and if applicable, a of percentage work completed to date.
- **Deleted:** Actions deemed no longer viable were marked for deletion from the plan. These actions are detailed in the next section.

6.7 – Prioritization of Mitigation Actions

44 CFR 201.6 (c)(3)(iii) An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section 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.

All participating jurisdictions worked together to review and prioritize both previously identified and newly created hazard mitigation actions, with a self-analysis method used for prioritization. This methodology takes all considerations into account to ensure that, based on capabilities, funding, public wishes, political climate, and legal framework and context, reasonable actions are determined. Major determining factors included the potential effects on the overall risk to life and property, ease of implementation, community and agency support, consistency with mitigation goals, and the availability of Funding.

Of major concern was the potential cost of each action. In general, identified actions were proposed to reduce future damages. As such, it is critical that selected and implemented actions provide a greater saving over the life of the action than the initial cost. For structural and property protection actions cost effectiveness is primarily assessed on:

- Likelihood of damages occurring
- Severity of the damages
- Potential effectiveness

For all other type of actions, including legislative actions, codes and ordinances, maintenance and education, cost effectiveness is primarily assessed on likely future benefits as these actions may not easily result in a quantifiable reduction in damage.

Based on this review, both previously identified and new action items were prioritized as per the following:

High priority:
- Actions that should be implemented as soon as possible
- Actions deemed most critical to achieve the identified mitigation goals

Medium priority:
- Actions that should be implemented in the long-term
- Actions deemed important to meet identified mitigation goals

Low priority
- Actions that should be implemented if Funding becomes available
- Actions that have lowest impact toward achieving mitigation goals

6.8 – Jurisdictional Mitigation Actions

44 CFR 201.6 (c)(3)(ii): 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.

44 CFR 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.

The following tables identify mitigation action items for each participating jurisdiction, along with the following information:

- Hazard addressed
- Responsible party
- Overall priority
- Goal(s) addressed
- Estimated cost
- Potential Funding source
- Proposed completion timeframe
- Current status
- New actions that have been added to this plan update are identified as such.
- Actions that are in support of NFIP compliance are identified with a bold type **NFIP**

6.8.1 – Clark County Mitigation Actions

Table 6.4: Clark County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Clark County-1	Repair spillway at Clark County State Lake	Dam and Levee Failure, Flood	Emergency Manager	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
Clark County-2	Update Local Emergency Operations Plan	All Hazards	Emergency Manager	High	1,2	Staff Time	Local	Three years	Not started, lack of staff
Clark County-3	Continue to develop/update Immunization Action Plan	Major Disease Outbreak	Director County Health	High	1,2	Staff Time	Local	Three years	Not started, lack of staff
Clark County-4	Purchase thermal imagers.	All Hazards	Emergency Manager	High	1,2	$30,000	Local, State, Federal	Five years	Not started, lack of funding
Clark County-5	Purchase and install back-up generators for critical facilities.	Utility/ Infrastructure Failure	Fire Chief, Emergency Manager	High	1,2	$500,000	Local, state, federal	Five years	Not started, lack of funding
Clark County-6	Construct safe rooms and storm shelters in rural and underserved areas of the county.	Tornado, Windstorm	Emergency Manager	High	1,2	$1,000,000 per shelter	Local, State, Federal	Five years	Not started, lack of funding
Clark County-7	Install/upgrade radios in all emergency vehicles	All Hazards	Emergency Manager	High	1,2,4	$15,000	Local, State, Federal	Five years	Not started, lack of funding
Clark County-8	Improve public awareness of hazard risks	All Hazards	Emergency Manager	Medium	3	Staff Time	Local	Continuous	In progress
Clark County-9	Participate in the State of Kansas residential safe room reimbursement program	High Winds, Tornado	Emergency Manager	High	1,2,3	Staff Time	Local	Continuous	New
Ashland-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Ashland-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Ashland-3	Construct FEMA approved community shelters.	Tornado, Windstorm	City Manager	High	1,2	$400,000	Local, State, Federal	Four years	Not started, lack of funding

Table 6.4: Clark County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Ashland-4	Purchase and install a security camera system.	Terrorism, Civil Disorder	AHC Emergency Manager	High	1,2	$85,000	Local, State, Federal	Four years	Not started, lack of funding
Englewood-1	Purchase fire equipment to augment wildfire and event response capabilities.	Wildfire, All Hazards	Fire Chief, City Manager	High	1,2	$48,000	Local, State, Federal	Five years	On-going, lack of funding
Minneola-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Minneola-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Minneola-3	Install/Upgrade Culverts to prevent flooding.	Flood	City Manager	High	1,2	$25,000	Local, State, Federal	Five years	Not started, lack of funding
Minneola-4	Purchase and install backup generator in critical facilities.	Utility/ Infrastructure Failure	City Manager	High	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
Minneola-5	Fund and construct FEMA approved community shelters	Tornado, Windstorm	City Manager	High	1,2	$400,000	Local, State, Federal	Five years	Not started, lack of funding
USD #219-1	Fund and construct FEMA approved safe rooms in each school building.	Tornado, Windstorm	Superintendent	High	1,2	$2,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #219-2	Purchase and install an audio emergency communication system.	All Hazards	Superintendent	Low	1,2	$20,000	Local, State, Federal	Five years	Not started, lack of funding
USD #219-3	Purchase and install a video surveillance system/security system.	Terrorism, Civil Disorder	Superintendent	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
USD #220-1	Fund and construct FEMA approved safe rooms in each school building.	Tornado, Windstorm	Superintendent	High	1,2	$2,000,000	Local, State, Federal	Five years	Not started, lack of funding
Ashland Health Center-1	Develop and fund construction of safe rooms for all facilities.	Tornado, Windstorm	President	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.4: Clark County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
CMS Electrical COOP-1	Enhance and upgrade all power lines within the County to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$10,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Minneola District Hospital-1	Purchase and install a backup generator to run hospital, clinic, and nursing home.	Utility/ Infrastructure Failure	MDH Emergency Manager	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
Minneola District Hospital-2	Construct a safe room to protect its patients, staff, and visitors.	Tornado, Windstorm	MDH Emergency Manager	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
Minneola District Hospital-3	Purchase and install a security system - with card access.	Terrorism, Civil Disorder	MDH Emergency Manager	High	1,2	$20,000	Local, State, Federal	Five years	Not started, lack of funding
Southern Pioneer COOP-1	Complete inspection and retreatment of all poles within the county	Utility/ Infrastructure Failure	Director	Medium	1,2	$3,400,000	Local, State, Federal	Ten years	Not started, lack of funding
Southern Pioneer COOP-2	Replace 30’ poles with 40’ poles, and include raptor protections, for greater vertical clearance to reduce potential damage by farm equipment.	Utility/ Infrastructure Failure	Director	High	1,2	$56,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Southern Pioneer COOP-3	Replace #4 ACSR conductor.	Utility/ Infrastructure Failure	Director	Medium	1,2	$44,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Southern Pioneer COOP-4	Conduct oil testing on all transformers.	Utility/ Infrastructure Failure	Director	Medium	1,2	$512.50 per unit	Local, State, Federal	Five years	In progress
Southern Pioneer COOP-5	Install security cameras at all substations.	Terrorism, Civil Disorder	Director	Medium	1,2	$3,400,000	Local, State, Federal	Five years	In progress

6.8.2 – Finney County Mitigation Actions

Table 6.5: Finney County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Finney County-1	Build community storm shelters around the county to be prepared for all hazard events.	All Hazards	Emergency Manager	High	1,2	$200,000 - $500,000 per shelter	HMGP, PDM, Local	Five years	Not started, lack of funding
Finney County-2	Purchase and install generators for critical facilities.	Utility/ Infrastructure Failure	Emergency Manager	High	1,2	$20,000	Local, State, Federal	Five years	Not started, lack of funding
Finney County-3	Host a severe weather warning training session on an annual basis.	All Hazards	Emergency Manager	High	1,2,3	$1,000 per session	Local, NWS Federal	One year	Not started, lack of funding
Finney County-4	Conduct county-wide tree-trimming program to cut down branches and trees away from power lines and drainage areas.	All Hazards	Emergency Manager, REC Directors	High	1,2	Staff Time and Equipment Use	HMGP, PDM, Local	Three years	On-going, no progress made
Finney County-5	Purchase and install outdoor weather warning sirens in underserved areas.	All Hazards	Emergency Manager	High	1,2	$75,000	Local, State, Federal	Five years	Not started, lack of funding
Finney County-6	Collect educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited city and county offices	All Hazards	Emergency Manager	Medium	3	Staff Time	Local	Continuous	In progress
Finney County-7	Annually host a public hazards workshop in combination public county event.	All Hazards	Emergency Manager	Medium	3	$1,000 per workshop	Local	Annual	On-going, lack of staff
Finney County-8	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues and develop and implement plans to address these issues.	Terrorism, Civil Disorder	Director County Health Department, Extension, Emergency Manager, Local Producers	Medium	3	$2,000	Local, State, Federal	Annual	On-going, lack of staff
Finney County-9	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief	Medium	3	Staff Time	Local	Five years	On-going, lack of staff

Table 6.5: Finney County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Finney County-10	Relocate facilities identified within the floodplain that store hazardous materials.	Flood, Hazardous Material	County administrator, County Planner	Medium	1,2	Dependent on number of facilities	Local, State, Federal	Five years	Not started, lack of funding
Finney County-11	Seek funding and purchase/install a mass notification system for the citizens of Finney County.	All Hazards	Emergency Manager	Medium	1,2	$70,000	Local, State, Federal	Five years	Not started, lack of funding
Finney County-12	Develop a plan for supporting medically fragile and special needs students at each school site during emergency events.	All Hazards	Emergency Manager	Medium	1,2	$25,000	Local, State, Federal	Five years	Not started, lack of funding
Finney County-13	Identify and clearly mark evacuation routes.	All Hazards	Emergency Manager	Medium	1,2	$4,000	Local, State, Federal	Five years	Not started, lack of funding
Finney County-11	Participate in the State of Kansas residential safe room reimbursement program	High Winds, Tornado	Emergency Manager	High	1,2,3	Staff Time	Local	Continuous	New
Garden City-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Garden City-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Garden City-3	Regularly calculate and document the amount of flood prone property that is preserved as open space to reduce flood insurance burden. **(NFIP)**	Flood	City Manager	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Garden City-4	Assess flood prone areas and recommend floodplain ordinance updates to city planners. **(NFIP)**	Flood	City Planner, City Manager	High	1,2,4	Staff Time	Local	12/31/2020	Not started, lack of funding
Garden City-5	Develop a program to acquire and preserve parcels of land subject to flooding from willing and voluntary property owners. **(NFIP)**	Flood	City Planner, City Manager	High	1,2,3	Dependent on fair market value	Local, State, Federal	Ten years	Not started, lack of funding
Garden City-6	Construct community safe rooms to protect the citizens.	Tornado, Windstorm	City Administrator	High	3,4	$500,000 per saferoom	Local	Five years	Not started, lack of funding
Garden City-7	Purchase and install permanent standalone generators at two locations in Sandhills Well field.	Utility/ Infrastructure Failure	Water Manager	High	1,2	$325,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.5: Finney County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Garden City-8	Seek grant funding for drainage ditch maintenance and upkeep.	Flood	Director DD No. 1, City Manager	High	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
Holcomb-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Holcomb-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	Not started, lack of funding
Holcomb-3	Research and pursue funding for the development and implementing a plan for emergency preparedness in the event of a disaster which effects Holcomb citywide.	All Hazards	City Manager	High	1,2	$15,000	Local, State, Federal	Five years	Not started, lack of funding
Holcomb-4	Construct community safe rooms to protect the citizens.	Tornado, Windstorm	City Administrator	High	3,4	$500,000 per saferoom	Local	Five years	Not started, lack of funding
GCCC-1	Develop and fund construction of safe rooms for Garden City Community College facilities.	Tornado, Windstorm	President	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
GCCC-2	Purchase and install for a mass notification system	All Hazards	President	High	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
GCCC-3	Purchase and install backup power sources for all buildings considered as critical facilities.	Utility/ Infrastructure Failure	President	Medium	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
USD #363-1	Develop and fund construction of safe rooms for USD #363 district schools.	Tornado, Windstorm	Superintendent	Low	1,2	$1,500,000	Local, State, Federal	Five years	Not started, lack of funding
USD #457-1	Develop and fund construction of safe rooms for USD #457 district schools.	Tornado, Windstorm	Superintendent	Low	1,2	$1,500,000	Local, State, Federal	Five years	Not started, lack of funding
Lane-Scott Electrical COOP-1	Enhance and upgrade all power lines within the County to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$20,000,000	Local, State, Federal	Ten years	Not started, lack of funding

Table 6.5: Finney County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
PWJD81-1	Rehabilitate existing watershed flood control dams and farm pond dams to ensure their integrity and extend their life.	Flood, Dam and Levee Failure	Director	High	1,2	$15,000,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-2	Provide education programs for flood safety, dam safety, and dam failure.	Flood, Dam and Levee Failure	Director	High	3	$2,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-3	Assist local producers in building new detention ponds to collect storm water runoff to protect property from flooding as well as keep silt from filling streams and lakes.	Flood, Dam and Levee Failure	Director	High	1,2,3	$5,000,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-4	Assist all counties in the Pawnee Watershed District in updating and/or implementing zoning regulation to keep houses and other structures from being built or upgraded in the breach path below flood control dams.	Flood, Dam and Levee Failure	Director	High	1,2	Staff Time	Local, State, Federal	Continuous	In progress
PWJD81-5	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during potential flood events or dam failure.	Flood, Dam and Levee Failure	Director	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
Pioneer COOP-1	Complete inspection and retreatment of all power poles.	Utility/ Infrastructure Failure	Director	High	1,2	$3,400,000	Local, State, Federal	Continuous	Not started, lack of funding
Pioneer COOP-2	Replace 30' poles with 40' poles, and include raptor protections, for greater vertical clearance to reduce potential damage by farm equipment.	Utility/ Infrastructure Failure	Director	High	1,2	$56,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Pioneer COOP-3	Replace #4 ACSR conductor.	Utility/ Infrastructure Failure	Director	Medium	1,2	$44,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Pioneer COOP-4	Conduct oil testing on all transformers.	Utility/ Infrastructure Failure	Director	Medium	1,2	$513 per unit	Local, State, Federal	Continuous	In progress

Table 6.5: Finney County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Pioneer COOP-5	Install security cameras at all substations.	Terrorism	Director	Medium	1,2	$3,400,000	Local, State, Federal	Four years	In progress
Sunflower Electric COOP-1	Enhance and upgrade all power lines within the county to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$10,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Victory Electric COOP-1	Enhance and upgrade all power lines within the county to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$20,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Wheatland REC-1	Enhance and upgrade all power lines within the county to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$20,000,000	Local, State, Federal	Ten years	Not started, lack of funding

6.8.3 – Ford County Mitigation Actions

Table 6.6: Ford County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Ford County-1	Continued participation and compliance with the **NFIP**.	Flood	Emergency Manager	High	1,2	Staff Time	Local	Continuous	In progress
Ford County-2	Educate and promote local jurisdictional participation in the **NFIP**.	Flood	Emergency Manager	High	1,2,3,4	Staff Time	Local	Continuous	In progress
Ford County-3	Develop a program to acquire and preserve parcels of land subject to repetitive flooding from willing and voluntary property owners. **(NFIP)**	Flood	NFIP Administrator, County Planners	High	1,2	Staff time, acquisition cost property dependent	Local, State, Federal, Clarks	Four years	Not started, lack of funding
Ford County-4	Seek funding options to complete a stormwater drainage study and plan for the county that will lead to a stormwater management ordinance. **(NFIP)**	Flood	Mitigation Officer, Floodplain Manager	High	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
Ford County-5	Build drainage culverts based on the stormwater drainage study. **(NFIP)**	Flood	Director Public Works, Floodplain Manager	High	1,2	Dependent on Stormwater drainage study	Local, State, Federal	Five years	Not started, lack of funding
Ford County-6	Seek funding options to complete a stormwater drainage study and plan for the county that will lead to a stormwater management ordinance. **(NFIP)**	Flood	Mitigation Officer, Floodplain Manager	High	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
Ford County-7	Identify flash-flood prone areas and complete projects to minimize flooding. **(NFIP)**	Flood	Mitigation Officer, Floodplain Manager	High	1,2	Staff Time and project dependent	Local, State, Federal	Five years	Not started, lack of funding
Ford County-8	Collect educational materials on individual preparedness and display at routinely visited jurisdiction offices.	All Hazard	Emergency Manager	High	3	Staff Time	Local	Continuous	In progress
Ford County-9	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues	Terrorism	Emergency Manager	High	3	Staff Time	Local	Annual	In progress

Table 6.6: Ford County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Ford County-10	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	3	$2,000	Local	Annual	Not started, lack of staff
Ford County-11	Incorporate the inspection, management and maintenance of trees that may pose a threat to utility infrastructure.	All Hazard	Director of County Public Works	Medium	1,2	$5,000	Local	Continuous	On-going, no reportable progress made
Ford County-12	Research, purchase, and install emergency generators and/or transfer switches to provide backup power for critical facilities.	Utility/ Infrastructure Failure	Emergency Manager	Medium	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
Ford County-13	Research, purchase, and implement and upgrade current communications equipment	All Hazard	Emergency Manager	Medium	1,2,4	$50,000	Local, State, Federal	Five years	In progress, initial stages
Ford County-14	Research funding options for dam and levee development, certification, maintenance, and inspection programs	Dam and Levee Failure	Floodplain Manager	Medium	1,2	Dependent on maintenance requirements	Local, State, Federal	Five years	Not started, lack of funding
Ford County-15	Conduct an engineering study of select bridges in the county for possible improvements.	Flood, Infrastructure Failure	County Engineer, Director Public Works, Mitigation Officer	Medium	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
Ford County-16	Participate in the State of Kansas residential safe room reimbursement program	High Winds, Tornado	Emergency Manager	High	1,2,3	Staff Time	Local	Continuous	New
Bucklin-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Bucklin-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Bucklin-3	Construct a community safe room to protect the citizens.	Tornado, Windstorm	City Administrator	High	3,4	$150,000	Local	Five years	Not started, lack of funding

Table 6.6: Ford County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Bucklin-4	Purchase emergency generators and/or transfer switches to provide backup power for critical facilities.	Utility/ Infrastructure Failure	City Administrator	Medium	1,2	$200,000	Local, State, Federal	Five years	Not started, lack of funding
Dodge City-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Dodge City-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Dodge City-3	Seek funding for the construction of community safe rooms	Tornado, Windstorm	City Manager, Director of Dev Services	High	1,2,3	$1,000,000	Local	Five years	Not started, lack of funding
Dodge City-4	Seek funding options to develop new or enhance the existing early warning response systems and plans	All Hazard	City Manager	Medium	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
Dodge City-5	Purchase emergency generators and/or transfer switches to provide backup power for critical facilities, including Dodge City's City Hall, Police Station, and Fire Station.	Utility/ Infrastructure Failure	Director of Engineering Department	Medium	1,2	$150,000	Local, State, Federal	Five years	Not started, lack of funding
Dodge City-6	Research funding options and consider the purchase of additional Public Works equipment to assist residents in the case of weather emergencies.	All Hazard	Director Public Works	Medium	1,2	$200,000	Local, State, Federal	Five years	Not started, lack of funding
Dodge City-7	Purchase equipment to upgrade current communications equipment	All Hazard	City Manager	Medium	4	$740,000	Local, State, Federal	Five years	Not started, lack of funding
Dodge City-8	Hire a dedicated city-based Emergency Manager.	All Hazard	City Manager	Medium	1,2	$75,000 per year	Local, State, Federal	Three years	Not started, lack of funding
Dodge City-9	Research the cost and funding options to purchase and install new surveillance cameras and building security components at the Dodge City Police Department.	Terrorism, Civil Disorder	Police Chief, City Manager	Medium	1,2	$8,000	Local, State, Federal	Five years	Not started, lack of funding
Dodge City-10	Research funding options for a preventative tree maintenance program along major traffic routes to reduce	All Hazard	Director of Parks and Rec	Medium	1,2	$10,000	Local	Five years	Not started, lack of funding

Table 6.6: Ford County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	falling debris and blocked roadways during storm events.								
Dodge City-11	Research funding options to dredge the Arkansas River in the area of the city-owned levee.	Flood	City Manager	Medium	1,2	$3,500,000	Local, State, Federal	Ten years	Not started, lack of funding
City of Ford-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
City of Ford-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
City of Ford-3	Construct a community safe room to protect the citizens.	Tornado, Windstorm	City Administrator	High	3,4	$150,000	Local	Five years	Not started, lack of funding
City of Ford-4	Identify funding sources, procure and install new warning sirens.	Tornado	City Administrator	Medium	1,2	$30,000	Local, State, Federal	Five years	Not started, lack of funding
City of Ford-5	Acquire backup generators at critical facilities.	Utility/ Infrastructure Failure	City Administrator	Medium	1,2	$200,000	Local, State, Federal	Five years	Not started, lack of funding
Spearville-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Spearville-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Spearville-3	Seek funding for the construction of a community safe room	Tornado, Windstorm	City Manager	High	1,2,3	$500,000	Local	Five years	Not started, lack of funding
Spearville-4	Seek funding to purchase, develop new, or enhance the existing early warning response systems and plans	All Hazard	City Manager	Medium	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
Spearville-5	Seek funding to purchase emergency generators and/or transfer switches to provide backup power for the Critical Facilities in the City of Spearville.	Utility/ Infrastructure Failure	City Manager	Medium	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
Spearville-6	Research funding options for additional street lighting for the City of Spearville.	Utility/ Infrastructure Failure	City Manager	Medium	1,2	$60,000	Local	Five years	Not started, lack of funding

Table 6.6: Ford County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
DCCC-1	Develop and fund construction of safe rooms for Dodge City Community College facilities.	Tornado, Windstorm	President	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
DCCC-2	Pursue funding for a mass notification system for inclement weather or other campus-wide emergencies.	All Hazards	President	High	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
DCCC-3	Seek funding for the purchase and installation of backup power source upgrades for Dodge City Community College buildings considered as critical facilities.	Utility/ Infrastructure Failure	President	Medium	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
USD #381-1	Develop and fund mitigation projects for the construction of tornado safe rooms for Unified School District #381 schools.	Tornado, Windstorm	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #381-2	Seek funding to purchase emergency generators and/or transfer switches to provide backup power for the school buildings and supporting facilities throughout USD #381.	Utility/ Infrastructure Failure	Superintendent	Medium	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
USD #443-1	Develop and fund mitigation projects for the construction of tornado safe rooms for USD #443 schools.	Tornado, Windstorm	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	In progress, initial stages
USD #443-2	Seek funding to upgrade current communications equipment	All Hazard	Superintendent	Medium	1,2	$45,000	Local, State, Federal	Five years	Not started, lack of funding
USD #443-3	Seek funding to purchase emergency generators and/or transfer switches to provide backup power for the school buildings and supporting facilities throughout USD #443 and the Didge City Civic Center.	Utility/ Infrastructure Failure	Superintendent	Medium	1,2	$45,000	Local, State, Federal	Five years	Not started, lack of funding
USD #443-4	Seek funding to identify and purchase safety equipment for severe weather emergencies.	All Hazard	Superintendent	Medium	1,2	$15,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.6: Ford County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
USD #443-5	Seek funding to retain a professional school safety and security firm to review and update the school's Security Plan for domestic acts of terrorism, building security, and contagious disease response. It is anticipated that this may include the purchase and installation of new surveillance cameras and the development of crisis kits, as well as additional building security components for the school facilities.	Terrorism, Civil Disorder	Superintendent	Medium	1,2	$150,000	Local, State, Federal	Five years	Not started, lack of funding
USD #443-6	Research funding options to purchase severe weather protection, including lightning protection systems, for the school buildings of USD 443.	All Hazard	Superintendent	Medium	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
USD #443-7	Assess elevations and water flow in the area of Beeson Elementary School and Wilroads Gardens Elementary to qualify the benefit of flood control projects.	Flood	Superintendent	Medium	1,2	$20,000	Local, State, Federal	Five years	Not started, lack of funding
USD #459-1	Develop and fund mitigation projects for the construction of tornado safe rooms for Unified School District 459 schools.	Tornado, Windstorm	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #459-2	Purchase emergency generators and/or transfer switches to provide backup power for the school buildings and supporting facilities throughout USD 459.	Utility/ Infrastructure Failure	Superintendent	Medium	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
Bucklin Hospital District-1	Develop and fund construction of safe rooms for facilities.	Tornado, Windstorm	President	High	1,2	$1,000,000 per room	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-1	Rehabilitate existing watershed flood control dams and farm pond dams to ensure their integrity and extend their life.	Flood, Dam and Levee Failure	Director	High	1,2	$15,000,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.6: Ford County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
PWJD81-2	Conduct education classes for flood safety, dam safety, and dam failure.	Flood, Dam and Levee Failure	Director	High	3	$2,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-3	Assist local producers in building new detention ponds to collect storm water runoff to protect property from flooding as well as keep silt from filling streams and lakes.	Flood, Dam and Levee Failure	Director	High	1,2,3	$5,000,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-4	Assist the city in the Pawnee Watershed District in updating and/or implementing zoning regulation to keep houses and other structures from being built or upgraded in the breach path below flood control dams.	Flood, Dam and Levee Failure	Director	High	1,2	Staff Time	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-5	Pursue funding for the installation of alternative forms of public warning and mass notification systems during potential flood events or dam failure.	Flood, Dam and Levee Failure	Director	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
Sunflower Electrical COOP-1	Enhance and upgrade all power lines within the county to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$20,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Victory Electric COOP-1	Enhance and upgrade all power lines within the county to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$20,000,000	Local, State, Federal	Ten years	Not started, lack of funding

6.8.4 – Gray County Mitigation Actions

Table 6.7: Gray County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Gray County-1	Construct safe rooms and storm shelters in underserved areas of the county.	Flood	Emergency Manager	High	3,4	$750,000 per shelter	Local	Five years	Not started, lack of funding
Gray County-2	Install outdoor warning systems and other early warning devices in underserved areas of the county.	All Hazards	Emergency Manager	High	1,2	$250,000	Local, State, Federal	Five years	Not started, lack of funding
Gray County-3	Provide a NOAA weather radio to all residents in the county.	All Hazards	Emergency Manager	High	1,2	$20,000	HMGP, PDM, Local, Other Clarks	Five years	Gray County promotes weather app on cell phones
Gray County-4	Promote and educate the public and private sectors on potential agricultural issues that can severely impact the county and regional economies and develop and implement plans to address these issues.	Agricultural Infestation, Terrorism	Extension Agent, Emergency Manager	Medium	3	Staff Time	Local, State	Five years	Not started, lack of staff
Gray County-5	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	3	$1,000 per workshop	Local	Five years	Working with KFS on prevention of wildfires in Gray County
Gray County-6	Conduct county-wide tree-trimming program to cut down branches and trees away from power lines and drainage.	All Hazards	Emergency Manager, REC Directors	High	1,2	Staff Time, Equipment Use	HMGP, PDM, Local	Three years	On-going, no progress made
Gray County-7	Seek funding to construct a safe room at the Gray County Fairgrounds.	Tornados, Windstorm	Emergency Manager	High	1,2	$130,000	Local, State, Federal	Five years	Not started, lack of funding
Gray County-8	Collect educational materials on individual preparedness and display at routinely visited jurisdiction offices.	All Hazard	Emergency Manager	High	3	Staff Time	Local	Five years	In progress

Table 6.7: Gray County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Gray County-9	Participate in the State of Kansas residential safe room reimbursement program	High Winds, Tornado	Emergency Manager	High	1,2,3	Staff Time	Local	Continuous	New
Cimarron-1	Continued participation and compliance with the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Cimarron-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Cimarron-3	Seek funding for the construction of a community safe room	Tornados, Windstorm	City Administrator	High	1,2,3	200,000	Local	Continuous	On-going, no reportable progress made
Cimarron-4	Seek funding for the purchase and installation of backup power generators for well houses.	Utility / Infrastructure Failure	City Administrator	Medium	1,2	$30,000	Local, State, Federal	Five years	Not started, lack of funding
Cimarron-5	Purchase and install generators for the city's critical facilities and infrastructure.	Utility / Infrastructure Failure	City Administrator	Medium	1,2	$160,000	Local, State, Federal	Five years	Not started, lack of funding
Cimarron-6	Purchase utility poles.	Utility / Infrastructure Failure	City Administrator	Medium	1,2	$30,000	Local, State, Federal	Five years	In progress, initial stages
Copeland-1	Continued participation and compliance with the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Copeland-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Copeland-3	Purchase and install generators at the critical facilities in the city.	Utility / Infrastructure Failure	City Manager	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
Copeland-4	Seek funding to construct a safe room.	Tornados, Windstorm	City Manager	high	1,2	$150,000	Local, State, Federal	Five years	Not started, lack of funding
Ensign-1	Seek funding for the construction of a community safe room	Tornados, Windstorm	City Clerk	High	1,2,3	$500,000	Local	Five years	Not started, lack of funding

Table 6.7: Gray County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Ensign-2	Seek funding to purchase and install outdoor warning siren for the North Side of the city.	Tornados, Windstorm	City Clerk	high	1,2	$20,000	Local, State, Federal	Five years	Not started, lack of funding
Ensign-3	Acquire outdoor natural gas operated generators to protect critical facilities.	Utility / Infrastructure Failure	City Clerk	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
Ensign-4	Seek funding to construct a community safe room.	Tornados, Windstorm	City Clerk	high	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
Ensign-5	Seek funding to subsidize purchase and distribution of weather radios.	All Hazards	City Clerk	Medium	1,2,3	$1,000	Local, State, Federal	Five years	Promoting cell phone weather app
Ingalls-1	Purchase and install generators at the critical facilities in the city.	Utility / Infrastructure Failure	City Clerk	High	1,2	$100,000	Local, State, Federal	Five years	1 generator installed for city hall, lack of funding on rest
Ingalls-2	Seek funding to construct a safe room.	Tornados, Windstorm	City Clerk	high	1,2	$150,000	Local, State, Federal	Five years	Not started, lack of funding
Montezuma-1	Seek funding for the construction of a community safe room	Tornados, Windstorm	City Manager	High	1,2,3	$500,000	Local	Five years	Not started, lack of funding
Montezuma-2	Purchase and install generators for the city's critical facilities and infrastructure.	Utility / Infrastructure Failure	City Clerk	High	1,2	$51,000	Local, State, Federal	Five years	1 installed in Montezuma, lack of funding for rest
Montezuma-3	Purchase power poles to have ready in the event of disaster.	Utility / Infrastructure Failure	City Clerk	high	1,2	$10,000	Local	Five years	Some utility poles purchased to have on hand

Table 6.7: Gray County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
USD #102-1	Develop and fund mitigation projects for the construction of tornado safe rooms for USD #102 schools.	Tornados, Windstorm	Superintendent	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #102-2	Seek funding for the purchase and installation of permanent generators in USD #102 facilities.	Utility / Infrastructure Failure	Superintendent	Low	1,2	$50,000 each	Local, State, Federal	Five years	Not started, lack of funding
USD #371-1	Develop and fund mitigation projects for the construction of tornado safe rooms for USD #371 schools.	Tornados, Windstorm	Superintendent	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #371-2	Seek funding for the purchase and installation of permanent generators in USD #371 facilities.	Utility / Infrastructure Failure	Superintendent	Low	1,2	$50,000 each	Local, State, Federal	Five years	Not started, lack of funding
USD #476-1	Develop and fund mitigation projects for the construction of tornado safe rooms for USD #476 schools.	Tornados, Windstorm	Superintendent	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #476-2	Seek funding for the purchase and installation of permanent generators in USD #476 facilities.	Utility / Infrastructure Failure	Superintendent	Low	1,2	$50,000 each	Local, State, Federal	Five years	Not started, lack of funding
USD #477-1	Develop and fund mitigation projects for the construction of tornado safe rooms for USD #477 schools.	Tornados, Windstorm	Superintendent	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #477-2	Seek funding for the purchase and installation of permanent generators in USD #477 facilities.	Utility / Infrastructure Failure	Superintendent	Low	1,2	$50,000 each	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-1	Rehabilitate existing watershed flood control dams and farm pond dams to ensure their integrity and extend their life.	Flood, Dam and Levee Failure	Director	High	1,2	$15,000,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-2	Provide education programs for flood safety, dam safety, and dam failure.	Flood, Dam and Levee Failure	Director	High	3	$2,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-3	Assist local producers in building new detention ponds to collect storm water runoff to protect property from flooding as well as keep silt from filling streams and lakes.	Flood, Dam and Levee Failure	Director	High	1,2,3	$5,000,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.7: Gray County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
PWJD81-4	Assist all counties in the Pawnee Watershed District in updating and/or implementing zoning regulation to keep houses and other structures from being built or upgraded in the breach path below flood control dams.	Flood, Dam and Levee Failure	Director	High	1,2	Staff Time	Local, State, Federal	Continuous	In progress
PWJD81-5	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during potential flood events or dam failure.	Flood, Dam and Levee Failure	Director	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
CMS Electrical COOP-1	Enhance and upgrade all power lines within the County to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$20,000,000	Local, State, Federal	Ten years	Contractor has been selected to start project
Pioneer COOP-1	Complete inspection and retreatment of all power poles.	Utility/ Infrastructure Failure	Director	High	1,2	$3,400,000	Local, State, Federal	Continuous	10% done each year
Pioneer COOP-2	Replace 30' poles with 40' poles, and include raptor protections, for greater vertical clearance to reduce potential damage by farm equipment.	Utility/ Infrastructure Failure	Director	High	1,2	$56,000,000	Local, State, Federal	Ten years	Upgraded as needed or replaced
Pioneer COOP-3	Replace #4 ACSR conductor.	Utility/ Infrastructure Failure	Director	Medium	1,2	$44,000,000	Local, State, Federal	Ten years	On-going, some have been replaced
Pioneer COOP-4	Conduct oil testing on all transformers.	Utility/ Infrastructure Failure	Director	Medium	1,2	$513 per unit	Local, State, Federal	Continuous	In progress
Pioneer COOP-5	Install security cameras at all substations.	Terrorism	Director	Medium	1,2	$3,400,000	Local, State, Federal	Four years	Not started, low priority
Victory Electric COOP-1	Enhance and upgrade all power lines within the County to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$20,000,000	Local, State, Federal	Ten years	Built sub-station and upgraded feeders

Table 6.7: Gray County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Wheatland Electric COOP-1	Enhance and upgrade all power lines within the County to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$20,000,000	Local, State, Federal	Ten years	Built sub-station and upgraded feeders

6.8.5 – Haskell County Mitigation Actions

Table 6.8: Haskell County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Haskell County-1	Install outdoor warning systems and other early warning devices in underserved areas of the county.	All Hazards	Emergency Manager	High	1,2	$200,000	Local, State, Federal	Five years	Not started, lack of funding
Haskell County-2	Construct safe rooms and storm shelters in underserved areas of the county.	Flood	Emergency Manager	High	3,4	$1,000,000 per shelter	Local	Five years	Not started, lack of funding
Haskell County-3	Provide a NOAA weather radio to all residents in the county.	All Hazards	Emergency Manager	High	1,2	$15,000	HMGP, PDM, Local, Other Clarks	Five years	Not started, lack of funding
Haskell County-4	Conduct county-wide tree-trimming program to cut down branches and trees away from power lines and drainage.	All Hazards	Emergency Manager, Public Works Director, REC Directors	High	1,2	Staff Time, Equipment Use	HMGP, PDM, Local	Three years	On-going, no progress made
Haskell County-5	Promote and educate the public and private sectors on potential agricultural issues that can severely impact the county and regional economies and develop and implement plans to address these issues.	Agricultural Infestation, Terrorism	Extension Agent, Emergency Manager	Medium	3	Staff Time	Local, State	Annual	Not started, lack of staff
Haskell County-6	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chiefs, Emergency Manager	Medium	3	$1,000 per workshop	Local	Two years	Not started, lack of staff and funding
Haskell County-7	Research and develop a Comprehensive Land Use Plan for Haskell County.	Flood	Mitigation Officer, Emergency Manager	Medium	1,2	$15,000	Local	Five years	Not started, lack of funding
Haskell County-8	Develop cross-departmental information collection capabilities, and incorporate data utilizing GIS	All Hazards	County Appraiser, Emergency Manager	Medium	4	$8,000	Local, State, Federal	Five years	Not started, lack of staff and funding
Haskell County-9	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chiefs, Emergency Manager	Medium	3	$3,000 per workshop	Local	Five years	Not started, lack of staff and funding

Table 6.8: Haskell County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Haskell County-10	Participate in the State of Kansas residential safe room reimbursement program	High Winds, Tornado	Emergency Manager	High	1,2,3	Staff Time	Local	Continuous	New
Satanta-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Satanta-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Satanta-3	Seek funding for the construction of a community safe room.	Tornados, Windstorms	City Administrator	High	1,2,3	$250,000	Local, State, Federal	Five years	Not started, lack of funding
Santanta-4	Seek funding to design and construct a community tornado shelter for Satanta District Hospital.	Tornados, Windstorms	City Manager	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
Sublette-1	Seek funding for the construction of a community safe room.	Tornados, Windstorms	City Administrator	High	3,4	$350,000	Local	Five years	Not started, lack of funding
Sublette-2	Seek funding for the purchase of backup generators for critical facilities.	Utility / Infrastructure Failure	City Administrator	Medium	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
USD #374-1	Develop and fund mitigation projects for the construction of safe rooms in USD #374 schools.	Tornados, Windstorms	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #374-2	Seek funding for the purchase and installation of permanent generators in USD #374 facilities.	Utility/ Infrastructure Failure	Superintendent	Low	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
USD #507-1	Develop and fund mitigation projects for the construction of tornado safe rooms in USD #507 schools.	Tornados, Windstorms	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
Pioneer COOP-1	Complete inspection and retreatment of all power poles.	Utility/ Infrastructure Failure	Director	High	1,2	$3,400,000	Local, State, Federal	Continuous	Not started, lack of funding
Pioneer COOP-2	Replace 30' poles with 40' poles, and include raptor protections, for greater vertical clearance to reduce potential damage by farm equipment.	Utility/ Infrastructure Failure	Director	High	1,2	$56,000,000	Local, State, Federal	Ten years	Not started, lack of funding

Table 6.8: Haskell County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Pioneer COOP-3	Replace #4 ACSR conductor.	Utility/ Infrastructure Failure	Director	Medium	1,2	$44,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Pioneer COOP-4	Conduct oil testing on all transformers.	Utility/ Infrastructure Failure	Director	Medium	1,2	$513 per unit	Local, State, Federal	Continuous	In progress
Pioneer COOP-5	Install security cameras at all substations.	Terrorism	Director	Medium	1,2	$3,400,000	Local, State, Federal	Four years	In progress
Southern Pioneer COOP-1	Complete inspection and retreatment of all power poles.	Utility/ Infrastructure Failure	Director	High	1,2	$3,400,000	Local, State, Federal	Continuous	Not started, lack of funding
Southern Pioneer COOP-2	Replace 30’ poles with 40’ poles, and include raptor protections, for greater vertical clearance to reduce potential damage by farm equipment.	Utility/ Infrastructure Failure	Director	High	1,2	$56,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Southern Pioneer COOP-3	Replace #4 ACSR conductor.	Utility/ Infrastructure Failure	Director	Medium	1,2	$44,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Southern Pioneer COOP-4	Conduct oil testing on all transformers.	Utility/ Infrastructure Failure	Director	Medium	1,2	$513 per unit	Local, State, Federal	Continuous	In progress
Southern Pioneer COOP-5	Install security cameras at all substations.	Terrorism	Director	Medium	1,2	$3,400,000	Local, State, Federal	Four years	In progress
Sunflower Electrical COOP-1	Enhance and upgrade all power lines within the county to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$5,000,000	Local, State, Federal	Ten years	Not started, lack of funding

6.8.6 – Hodgeman County Mitigation Actions

Table 6.9: Hodgeman County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Hodgeman County-1	Construct safe rooms and storm shelters in underserved areas of the county.	Flood	Emergency Manager	High	3,4	$750,000 per shelter	Local	Five years	Not started, lack of funding
Hodgeman County-2	Install outdoor warning systems and other early warning devices in underserved areas of the county.	All Hazards	Emergency Manager	High	1,2	$250,000	Local, State, Federal	Five years	Not started, lack of funding
Hodgeman County-3	Pursue funding, procure and install an alternative form of public warning and mass notification system.	All Hazards	Emergency Manager	High	1,2	$150,000	Local, State, Federal	Five years	Not started, lack of funding
Hodgeman County-4	Purchase and install generators at designated community shelter, and critical facilities.	Utility/ Infrastructure Failure	Emergency Manager	High	1,2	$150,000	Local, State, Federal	Five years	Not started, lack of funding
Hodgeman County-5	Purchase educational materials on individual and family preparedness / mitigation measures for property owners, and display at both the library and routinely visited offices.	All Hazards	Emergency Manager	High	3	Staff Time and $200	Local	Five years	Not started, lack of staff
Hodgeman County-6	Conduct an inventory/survey for the emergency response services to identify any existing needs or shortfalls and purchase equipment and/or systems to meet identified needs.	All Hazards	Emergency Manager	High	1,2	Staff Time, equipment purchase cost	Local, State	Five years	Not started, lack of funding
Hodgeman County-7	Identify the County's most at-risk critical facilities	All Hazards	Emergency Manager	Medium	1,2	Staff Time	Local	Annual	In progress
Hodgeman County-8	Annually host a public hazards workshop in combination with public county events.	All Hazards	Emergency Manager	Medium	3	$1,000 per workshop	Local	Annual	Not started, lack of funding
Hodgeman County-9	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storm	Emergency Manager	Medium	3	Staff Time	Local	Two years	Not started, lack of staff
Hodgeman County-10	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues	Terrorism, Civil Disorder	Director County Health Department, Emergency	Medium	3	$4,000	Local, State, Federal	Two years	Not started, lack of staff and funding

Table 6.9: Hodgeman County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
			Manager, County Extension Officer, Local Producers						
Hodgeman County-11	Research and develop a comprehensive land use plan for Hodgeman County.	Flood	County Planner	Medium	1,2	$40,000	Local	Five years	Not started, lack of funding
Hodgeman County-12	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	3	$8,000	Local	Five years	Not started, lack of staff and funding
Hodgeman County-13	Research and recommend completion of an application packet for admittance to the NFIP.	Flood	County Planner	Medium	1,2	Staff Time	Local	Five years	Not started, lack of staff
Hodgeman County-14	Participate in the State of Kansas residential safe room reimbursement program	High Winds, Tornado	Emergency Manager	High	1,2,3	Staff Time	Local	Continuous	New
Hanston-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Hanston-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Hanston-3	Seek funding for the construction of a community safe room.	Tornados, Windstorms	Mayor	High	1,2,3	$300,000	Local, State, Federal	Five years	Not started, lack of funding
Hanston-4	Procure and install emergency generators for water wells and sewer pumps.	Utility / Infrastructure Failure	Mayor	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
Hanston-5	Seek funding for GIS mapping of the city.	All Hazards	County Appraiser, Mayor	Medium	1,2	$10,000	Local	Five years	Not started, lack of funding
Hanston-6	Purchase and replace/install pits around city water meters.	Utility / Infrastructure Failure	Mayor	Medium	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
Jetmore-1	Seek funding for the construction of a community safe room.	Tornados, Windstorms	City Administrator	High	1,2,3	$250,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.9: Hodgeman County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Jetmore-2	Replace water lines in jeopardy of being damaged due to age. Assess vulnerability of critical infrastructure and lifeline utilities, including water distribution systems, to id and prioritize projects for risk reduction.	Utility / Infrastructure Failure	City Administrator	High	1,2	$10,000,000	Local, State, Federal	Five years	Not started, lack of funding
Jetmore-3	Acquire a series of variable speed pumps/drives to assure the ability of the city to supply water during natural and man-made disasters.	Utility / Infrastructure Failure	City Administrator	High	1,2	$30,000	Local, State, Federal	Five years	Not started, lack of funding
Jetmore-4	Replace existing overhead primary electric lines to underground.	Utility / Infrastructure Failure	City Administrator	High	1,2	$4,000,000	Local, State, Federal	Five years	Not started, lack of funding
Jetmore-5	Retrofit/upgrade power lines, including trimming trees, pole replacement, and upgrades and enhancements to withstand ice and wind conditions. Provide back-up power between substations.	Utility / Infrastructure Failure	City Administrator	Medium	1,2	$4,000,000	Local, State, Federal	Five years	Not started, lack of funding
Jetmore-6	Acquire permanent back-up generator for the city water wells and lift stations. In addition, acquire generators for buildings prioritized on building usage.	Utility / Infrastructure Failure	City Administrator	High	1,2	$250,000	Local, State, Federal	Five years	Not started, lack of funding
Jetmore-7	Improve coordination, planning, and investment in long-term water supplies to meet demands of on-going growth and development.	Utility / Infrastructure Failure	City Administrator	High	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
Jetmore-8	Acquire and install warning sirens for the city.	Tornados, Windstorms	City Administrator	Medium	1,2	$60,000	Local, State, Federal	Five years	Not started, lack of funding
Jetmore-9	Identify and mark evacuation routes.	All Hazards	City Administrator	Medium	1,2	$10,000	Local, State, Federal	Five years	Not started, lack of funding
Jetmore-10	Upgrade/expand/improve stormwater management systems.	Utility / Infrastructure Failure	City Administrator	Medium	1,2	$500,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.9: Hodgeman County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
USD #227-1	Purchase and install backup generators for USD #227 facilities.	Utility / Infrastructure Failure	Superintendent	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
USD #227-3	Construct tornado safe room in USD #227 schools	Tornados, Windstorms	Superintendent	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #227-3	Educate USD #227 students about driving in winter storms and handling winter-related health effects.	Winter Storm	Superintendent	High	3	Staff Time	Local	Two years	On-going, no reportable progress made
Hodgeman Hospital-1	Install protective film over all windows to prevent shattering in high winds, tornados and when struck by debris.	Tornados, Windstorms	President	High	1,2	$50,000	Local, State, Federal	Three Years	New
Horse Thief Reservoir District-1	Purchase and provide adequate communications system(s) for staff, campers, and event participants at HorseThief Reservoir	Multi-Hazard	Director	High	1,2	$500,000	Local, State, Federal	Five years	Not started, lack of funding
Horse Thief Reservoir District-2	Construct safe rooms and/or shelters for campers and staff	Multi-Hazard	Director	High	3	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
Lane-Scott Electrical COOP-1	Enhance and upgrade all power lines within the county.	Utility / Infrastructure Failure	Director	High	1,2	$8,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Mid-West Energy-1	Enhance and upgrade all power lines within the county.	Utility / Infrastructure Failure	Director	High	1,2	$8,000,000	Local, State, Federal	Ten years	Not started, lack of funding
PWJD81-1	Rehabilitate existing watershed flood control dams and farm pond dams to ensure their integrity and extend their life.	Flood, Dam and Levee Failure	Director	High	1,2	$15,000,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-2	Provide education programs for flood safety, dam safety, and dam failure.	Flood, Dam and Levee Failure	Director	High	3	$2,000	Local, State, Federal	Five years	Not started, lack of funding

Table 6.9: Hodgeman County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
PWJD81-3	Assist local producers in building new detention ponds to collect storm water runoff to protect property from flooding as well as keep silt from filling streams and lakes.	Flood, Dam and Levee Failure	Director	High	1,2,3	$5,000,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-4	Assist all counties in the Pawnee Watershed District in updating and/or implementing zoning regulation to keep houses and other structures from being built or upgraded in the breach path below flood control dams.	Flood, Dam and Levee Failure	Director	High	1,2	Staff Time	Local, State, Federal	Continuous	In progress
PWJD81-5	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during potential flood events or dam failure.	Flood, Dam and Levee Failure	Director	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-6	Rehabilitate existing watershed flood control dams and farm pond dams to ensure their integrity and extend their life.	Flood, Dam and Levee Failure	Director	High	1,2	$15,000,000	Local, State, Federal	Five years	Not started, lack of funding
Victory Electric COOP-1	Enhance and upgrade all power lines within the county.	Utility / Infrastructure Failure	Director	High	1,2	$8,000,000	Local, State, Federal	Ten years	Not started, lack of funding

6.8.7 – Lane County and Participating Jurisdictions Mitigation Actions

Table 6.10: Lane County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Lane County-1	Continued participation and compliance with the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Lane County-2	Purchase and demolish properties located in the floodplains in the county. **(NFIP)**	Flood	NFIP Administrator	High	1,2	$100,000 per property	HMGP, PDM, Local	Five years	On-going, lack of funding
Lane County-3	Conduct NFIP community workshops to provide information and incentives for property owners to acquire flood insurance. **(NFIP)**	Flood	NFIP Administrator	High	1,2,3	Staff Time	Local	Continuous	New
Lane County-4	Construct safe rooms in underserved areas for the protection of the citizens.	Tornado, Windstorm	Emergency Manager	High	3,4	$350,000	Local	Five years	Not started, lack of funding
Lane County-5	Purchase and install emergency generators for critical facilities	Utility/ Infrastructure Failure	Emergency manager	High	1,2	$50,000	Local, State, Federal	Five years	Preliminary stages
Lane County-6	Install outdoor warning systems and other early warning devices in underserved areas of the county.	All Hazards	Emergency Manager	High	1,2	$250,000	Local, State, Federal	Five years	Not started, lack of funding
Lane County-7	Provide a NOAA weather radio to all residents in the county.	All Hazards	Emergency Manager	High	1,2	$20,000	HMGP, PDM, Local, Other Clarks	Five years	Not started, lack of funding
Lane County-8	Develop and enhance education campaigns related to preparedness.	All Hazards	Emergency Manager, Library	Medium	1,2	Staff Time	Local	Continuous	In progress
Lane County-9	Rural Water District (RWD) No. 1 will continue to assess the impact of natural hazards on water distribution lines, systems, and equipment. The Water District will also seek funding sources to mitigate damage to critical infrastructure, and seek funding for various water main improvement projects.	Utility/ Infrastructure Failure	Director RWD No. 1	Medium	1,2	Varies by damages that could be sustained.	Local, State, Federal	Five years	Not started, lack of funding

Table 6.10: Lane County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Lane County-10	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	3	$5,000	Local	12/31/2020	In progress
Lane County-11	Participate in the State of Kansas residential safe room reimbursement program	High Winds, Tornado	Emergency Manager	High	1,2,3	Staff Time	Local	Continuous	New
Dighton-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Dighton-2	Continued enforcement of floodplain ordinance. **(NFIP)**	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Dighton-3	Seek funding to purchase and install new warning sirens	Tornados, Windstorms	City Administrator	Medium	1,2	$30,000	Local, State, Federal	Five years	Not started, lack of funding
Dighton-4	Seek funding for the construction of a community safe room.	Tornados, Windstorms	City Administrator	High	3,4	$350,000	Local	Five years	Not started, lack of funding
Dighton-5	Seek funding for the purchase of backup generators for Dighton's critical facilities.	Utility / Infrastructure Failure	City Administrator	Medium	1,2	$40,000	Local, State, Federal	Five years	In progress
Dighton-6	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems.	All Hazards	City Administrator	Low	1,2	$50,000	Local, State, Federal	Five years	Not started, lack of funding
USD #468-1	Develop and seek funding for mitigation projects for the construction of tornado safe rooms for USD #468 schools.	Tornados, Windstorms	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #482-1	Review and update all school drills and emergency plans for fire, terrorism, and severe weather events.	All Hazards	Superintendent	High	1,2	$20,000	Local	Five years	In progress
Lane-Scott Electrical COOP-1	Enhance and upgrade all power lines within the county.	Utility / Infrastructure Failure	Director	High	1,2	$8,000,000	Local, State, Federal	Ten years	In progress
Mid-West Energy-1	Enhance and upgrade all natural gas lines within the county.	Utility / Infrastructure Failure	Director	High	1,2	$8,000,000	Local, State, Federal	Ten years	Not started, lack of funding

Table 6.10: Lane County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
PWJD81-1	Provide education programs for flood safety, dam safety, and dam failure.	Flood, Dam and Levee Failure	Director	High	3	$2,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-2	Assist local producers in building new detention ponds to collect storm water runoff to protect property from flooding as well as keep silt from filling streams and lakes.	Flood, Dam and Levee Failure	Director	High	1,2,3	$5,000,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-3	Assist all counties in the Pawnee Watershed District in updating and/or implementing zoning regulation to keep houses and other structures from being built or upgraded in the breach path below flood control dams.	Flood, Dam and Levee Failure	Director	High	1,2	Staff Time	Local, State, Federal	Continuous	In progress
PWJD81-4	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during potential flood events or dam failure.	Flood, Dam and Levee Failure	Director	High	1,2	$100,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-5	Rehabilitate existing watershed flood control dams and farm pond dams to ensure their integrity and extend their life.	Flood, Dam and Levee Failure	Director	High	1,2	$15,000,000	Local, State, Federal	Five years	Not started, lack of funding
PWJD81-6	Provide education programs for flood safety, dam safety, and dam failure.	Flood, Dam and Levee Failure	Director	High	3	$2,000	Local, State, Federal	Five years	Not started, lack of funding
S&T Telephone-1	Research and purchase a system to protect phone and internet systems from lightning.	Lightning	Director	High	1,2	$400,000	Local, State, Federal	Five years	Not started, lack of funding
S&T Telephone-1	Purchase and install all necessary equipment for a power upgrade to all booster stations within the county.	Multi-Hazard	Director	High	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding

6.8.8 – Meade County and Participating Jurisdictions Mitigation Actions

Table 6.11: Meade County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Meade County-1	Purchase and install generators at the critical facilities in Meade County.	Utility/ Infrastructure Failure	Emergency Manager	High	1,2	$150,000	Local, State, Federal	Five years	2 installed in Fowler, lack of funding for rest.
Meade County-2	Enhance GIS program to improve capabilities in mitigation, preparedness, and response for all hazards.	All Hazards	Emergency Manager	High	1,2,4	$50,000	Local, State, Federal	Five years	Not started, lack of funding
Meade County-3	Construct safe rooms in all county critical facilities.	All Hazards	Emergency Manager	High	1,2,4	$1,000,000 per site	Local, State, Federal	Five years	Not started, lack of funding
Meade County-4	Identify special needs population and transportation needs during an emergency.	All Hazards	County Health Department Director, District Hospital Director, Emergency Manager	High	2	Staff Time	Local	Two years	On-going, signed MOU's for use of school buses
Meade County-5	Maintain existing outdoor warning systems. Seek funding for additional warning systems at the State Park.	All Hazards	Emergency Manager	High	1,2	$50,000	Local, State, Federal	Five years	Purchased Alert system IPAWS capable
Meade County-6	Seek funding to purchase and install a reverse emergency callback system (reverse 911).	All Hazards	Sheriff	High	1,2	$17,500 each	Local, State, Federal	Five years	Not started, lack of funding
Meade County-7	Promote awareness and training session focused on special needs population (education and awareness)	All Hazards	Emergency Manager	High	3	Staff Time	Local	Two years	On-going, Social media posts for each season, booths at events
Meade County-8	Promote annual storm spotting class with the public to increase attendance and awareness.	Tornados, Windstorm	Emergency Manager	High	3,4	Staff Time	Local	Two years	On-going, Storm spotter done every spring

Table 6.11: Meade County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Meade County-9	Promote the use of weather radios in residential, commercial, and public buildings.	All Hazards	Emergency Manager	High	1,2	Staff Time	Local	Two years	Not started, Promoting alerts on cell phones
Meade County-10	Pursue funding for the construction of storm shelters for vulnerable populations and residents at large and seek code implementation to ensure that safe rooms are included in all future buildings built in the county, or as retrofits.	Tornados, Windstorm	Emergency Manager	High	1,2	$500,000	Local, State, Federal	Five years	Not started, lack of funding
Meade County-11	Provide educational materials about natural hazards and risks in Meade County.	All Hazards	Emergency Manager	High	1,2,3	$500	Local	Two years	On-going, Social media posts for each season, booths at events
Meade County-12	Develop an educational awareness plan to educate citizens about the naturally occurring diseases, and vaccine-preventable diseases.	Major Disease Outbreak	Director County Health Department	High	1,2,3	Staff Time	Local	Two years	Posts to social media/flyers
Meade County-13	Purchase and install generators at the critical facilities in Meade County.	Utility/ Infrastructure Failure	Emergency Manager	High	1,2	$150,000	Local, State, Federal	Five years	2 installed in Fowler, tuned down for HMGP 2020 for more.
Meade County-14	Enhance GIS program to improve capabilities in mitigation, preparedness, and response for all hazards.	All Hazards	Emergency Manager	High	1,2,4	$50,000	Local, State, Federal	Five years	Same as #2
Meade County-15	Construct safe rooms in all county critical facilities.	All Hazards	Emergency Manager	High	1,2,4	$1,000,000 per site	Local, State, Federal	Five years	Not started, lack of funding
Meade County-16	Advocate support and funding for the state's Tamarisk and Russian Olive control and eradication programs	Agricultural Infestation	Emergency Manager	Medium	1,2,3	Staff Time	Local	Two years	On-going, Weed Dept. booth at

Table 6.11: Meade County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	through information sharing and awareness.								state fair/flyers
Meade County-17	Implement a collaborative system for tracking and documenting disaster impacts for the purpose of recording repetitive losses affecting all participating municipalities and special districts.	All Hazards	Emergency Manager	Low	1,2,4	Staff Time	Local	Two years	On-going, no reportable progress made
Meade County-18	Participate in the State of Kansas residential safe room reimbursement program	High Winds, Tornado	Emergency Manager	High	1,2,3	Staff Time	Local	Continuous	New
Fowler-1	Construct safe rooms in all city critical facilities.	All Hazards	Emergency Manager	High	1,2,4	$1,000,000 per site	Local, State, Federal	Five years	Not started, lack of funding
City of Meade-1	Pursue funding for the construction of storm shelters for vulnerable populations and residents at large.	Tornados, Windstorm	City Administrator	High	1,2	$500,000	Local, State, Federal	Five years	Not started, lack of funding
City of Meade-2	Seek funding for additional warning systems in the city.	All Hazards	City Administrator	High	1,2	$50,000	Local, State, Federal	Five years	All systems functioning properly, lack of funding for additional
City of Meade-3	Construct safe rooms in all city critical facilities.	All Hazards	Emergency Manager	High	1,2,4	$1,000,000 per site	Local, State, Federal	Five years	Not started, lack of funding
City of Meade-4	Purchase backup generators for all city critical facilities.	All Hazards	Emergency Manager	High	1,2,4	$100,000 per unit	Local, State, Federal	Five years	Not started, lack of funding
Plains-1	Pursue funding for the construction of storm shelters for vulnerable populations and residents at large.	Tornados, Windstorm	City Administrator	High	1,2	$500,000	Local, State, Federal	Five years	Not started, lack of funding
Plains-2	Maintain existing outdoor warning systems. Seek funding for additional warning systems in the city.	All Hazards	City Administrator	High	1,2	$50,000	Local, State, Federal	Five years	All systems functioning properly, lack of

Table 6.11: Meade County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
									funding for additional
Plains-3	Construct safe rooms in all city critical facilities.	All Hazards	Emergency Manager	High	1,2,4	$1,000,000 per site	Local, State, Federal	Five years	Not started, lack of funding
Plains-4	Purchase backup generators for all city critical facilities.	All Hazards	Emergency Manager	High	1,2,4	$100,000 per unit	Local, State, Federal	Five years	Not started,, tuned down for HMGP 2020
USD #225-1	Promote and implement proactive immunization and awareness program.	Major Disease Outbreak	Superintendent	High	1,2	Staff Time	Local	Two years	Health Dept sends letters to parents
USD #225-2	Integrate hazard mitigation into future updates of school safety plans.	All Hazards	Superintendent	High	1,2	Staff Time	Local	Two years	On-going, no reportable progress made
USD #225-3	Develop and seek funding for mitigation projects for the construction of tornado safe rooms for USD #225 schools.	Tornados, Windstorms	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Shelter built 2011
USD #226-1	Develop and seek funding for mitigation projects for the construction of tornado safe rooms for USD #226 schools.	Tornados, Windstorms	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #226-2	Promote and implement proactive immunization and awareness program.	Major Disease Outbreak	Superintendent	High	1,2	Staff Time	Local	Two years	Health Dept sends letters to parents
USD #226-3	Integrate hazard mitigation into future updates of school safety plans.	All Hazards	Superintendent	High	1,2	Staff Time	Local	Two years	On-going, no reportable progress made
USD #483-1	Promote and implement proactive immunization and awareness program.	Major Disease Outbreak	Superintendent	High	1,2	Staff Time	Local	Two years	Health Dept sends letters to parents

Table 6.11: Meade County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
USD #483-2	Develop and seek funding for mitigation projects for the construction of tornado safe rooms for USD #483 schools.	Tornados, Windstorms	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #483-3	Integrate hazard mitigation into future updates of school safety plans.	All Hazards	Superintendent	High	1,2	Staff Time	Local	Two years	On-going, no reportable progress made
Artesian Valley Health Systems-1	Construction of safe rooms at all facilities.	Tornados, Windstorms	Director	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
CMS Electrical COOP-1	Enhance and upgrade all power lines within the county.	Utility / Infrastructure Failure	Director	High	1,2	$5,000,000	Local, State, Federal	Ten years	Contractors' been selected to start project
Southern Pioneer COOP-1	Complete inspection and retreatment of all power poles.	Utility/ Infrastructure Failure	Director	High	1,2	$3,400,000	Local, State, Federal	Continuous	10% done each year
Southern Pioneer COOP-2	Replace 30' poles with 40' poles, and include raptor protections, for greater vertical clearance to reduce potential damage by farm equipment.	Utility/ Infrastructure Failure	Director	High	1,2	$56,000,000	Local, State, Federal	Ten years	Upgraded as needed or replaced
Southern Pioneer COOP-3	Replace #4 ACSR conductor.	Utility/ Infrastructure Failure	Director	Medium	1,2	$44,000,000	Local, State, Federal	Ten years	On-going, some have been replaced
Southern Pioneer COOP-4	Conduct oil testing on all transformers.	Utility/ Infrastructure Failure	Director	Medium	1,2	$513 per unit	Local, State, Federal	Continuous	In progress
Southern Pioneer COOP-5	Install security cameras at all substations.	Terrorism	Director	Medium	1,2	$3,400,000	Local, State, Federal	Four years	Not started, low priority

6.8.9 – Seward County and Participating Jurisdictions Mitigation Actions

Table 6.12: Seward County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Seward County-1	Continued participation and compliance with the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Seward County-2	Purchase and demolish properties located in the floodplains in the county. (**NFIP**)	Flood	NFIP Administrator	High	1,2	$100,000 per property	HMGP, PDM, Local	Five years	On-going, lack of funding
Seward County-3	Conduct NFIP community workshops to provide information and incentives for property owners to acquire flood insurance. (**NFIP**)	Flood	NFIP Administrator	High	1,2,3	Staff Time	Local	Continuous	New
Seward County-4	Provide educational materials about regional natural hazards and risks.	All Hazards	Emergency Manager	High	1,2,3	$500	Local	Two years	On-going, no reportable progress made
Seward County-5	Construct safe rooms in all county critical facilities, including, but not limited to the courthouse, New Administration Building, and Seward County Historical Society building.	All Hazards	Emergency Manager	High	1,2,4	$1,000,000 per site	Local, State, Federal	Five years	Not started, lack of funding
Seward County-6	Educate residents about driving in winter storms and handling winter-related health effects.	Winter Storms	Emergency Manager	High	3	Staff Time	Local	Continuous	On-going, no reportable progress made
Seward County-7	Promote and educate the jurisdiction's public and private sectors on potential agricultural terrorism and bio-terrorism issues	Terrorism, Civil Disorder	Director County Health Department, Emergency Manager, Local Producers	Medium	3	$5,000	Local, State, Federal	Continuous	On-going, no reportable progress made
Seward County-8	Encourage the repositioning of as many utility lines as possible underground.	Utility/ Infrastructure Failure	Director of Road and Bridges, Directors of Utility Providers	Medium	1	Staff Time	Local	Five years	Not started, lack of staff

Table 6.12: Seward County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Seward County-9	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	3	$3,000	Local	Two years	Not started, lack of staff and funding
Seward County-10	Seek funding to purchase and install warning sirens in underserved areas of the county.	Tornados, Windstorm	Emergency Manager	Medium	1,2	$75,000	Local, State, Federal	Five years	Not started, lack of funding
Seward County-11	Complete necessary steps to have a Community Wildfire Protection Plan (CWPP).	Wildfire	Fire Chief, Emergency Manager	Medium	1,2,3,4	$3,000	Local, State, Federal	Three years	Not started, lack of staff and funding
Seward County-12	Map suspected hazardous wildfire areas in the county.	Wildfire	Fire Chief, Emergency Manager	Medium	4	$5,000	Local, State, Federal	Three years	Not started, lack of staff and funding
Seward County-13	Participate in the State of Kansas residential safe room reimbursement program	High Winds, Tornado	Emergency Manager	High	1,2,3	Staff Time	Local	Continuous	New
Kismet-1	Continued participation in the NFIP.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Kismet-2	Continued enforcement of floodplain ordinance. (**NFIP**)	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Kismet-3	Expand the storm resistance capabilities of the sewage lagoons by increasing capacity/freeboard. (**NFIP**)	Flood	City Manager	High	1,2	$300,000	Local, State, Federal	Five years	Not started, lack of funding
Kismet-4	Assess identified flood prone areas and recommend flood reduction measures to city planners.	Flood	Floodplain Manager	High	1,2	Staff Time	Local	Two years	On-going, no reportable progress made
Kismet-5	Seek funding for the construction of a community safe room.	Tornados, Windstorm	City Manager	High	1,2	$350,000	Local	Five years	Not started, lack of funding
Kismet-6	Seek funding to engineer and reconstruct the Road T bridge to handle all traffic; present load limits prevent use by fire apparatus.	Wildfire	City Manager	Low	1,2	$500,000	Local, State, Federal	Five years	Not started, lack of funding
Liberal-1	Continued participation in the **NFIP**.	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress

Table 6.12: Seward County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Liberal-2	Continued enforcement of floodplain ordinance. (**NFIP**)	Flood	NFIP Administrator	High	1,2	Staff Time	Local	Continuous	In progress
Liberal-7	Assess identified flood prone areas and recommend flood reduction measures to city planners. (**NFIP**)	Flood	Floodplain Manager	Medium	1,2	Staff Time	Local	Two years	On-going, no reportable progress made
Liberal-5	Develop and fund a mitigation project for the construction of a community safe room in the Fire Station on 15th and N. Grant in Liberal.	Tornados, Windstorm	Fire Chief	Medium	1,2	$200,000	Local, State, Federal	Five years	Not started, lack of funding
Liberal-6	Upgrade waste treatment plant to UV technology to avoid the use of chlorine gas as a disinfectant.	Utility/ Infrastructure Failure	City Manager	Low	1,2	$300,000	Local, State, Federal	Five years	Not started, lack of funding
SCCC -1	Develop and fund mitigation projects for the construction of tornado safe rooms on the Seward County Community College / Area Technical School campus.	Tornados, Windstorm	Director	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #480-1	Develop and fund mitigation projects for the construction of tornado safe rooms in USD #480 schools.	Tornados, Windstorm	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
USD #480-2	Conduct an engineering study to determine PM 361 wind design requirements for the gym roofs and seek funding to upgrade facility roof systems where necessary.	Tornados, Windstorm	Superintendent	Medium	1,2	$500,000	Local, State, Federal	Five years	Not started, lack of funding
USD #480-3	Assess elevations and water flow in the district to qualify the benefit of flood control projects in the district.	Flood	Superintendent	Medium	1,2	$40,000	Local, State, Federal	Five years	Not started, lack of funding
USD #483-1	Develop and fund mitigation projects for the construction of tornado safe rooms in USD #483 schools.	Tornados, Windstorm	Superintendent	Low	1,2	$1,000,000	Local, State, Federal	Five years	Not started, lack of funding
CMS Electrical COOP-1	Enhance and upgrade all power lines within the County to better withstand all hazard events.	Utility / Infrastructure Failure	Director	High	1,2	$20,000,00 0	Local, State, Federal	Ten years	Not started, lack of funding

Table 6.12: Seward County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Pioneer COOP-1	Complete inspection and retreatment of all power poles.	Utility/ Infrastructure Failure	Director	High	1,2	$3,400,000	Local, State, Federal	Continuous	Not started, lack of funding
Pioneer COOP-2	Replace 30' poles with 40' poles, and include raptor protections, for greater vertical clearance to reduce potential damage by farm equipment.	Utility/ Infrastructure Failure	Director	High	1,2	$56,000,00 0	Local, State, Federal	Ten years	Not started, lack of funding
Pioneer COOP-3	Replace #4 ACSR conductor.	Utility/ Infrastructure Failure	Director	Medium	1,2	$44,000,00 0	Local, State, Federal	Ten years	Not started, lack of funding
Pioneer COOP-4	Conduct oil testing on all transformers.	Utility/ Infrastructure Failure	Director	Medium	1,2	$513 per unit	Local, State, Federal	Continuous	In progress
Pioneer COOP-5	Install security cameras at all substations.	Terrorism	Director	Medium	1,2	$3,400,000	Local, State, Federal	Four years	In progress
Southern Pioneer COOP-1	Complete inspection and retreatment of all power poles.	Utility/ Infrastructure Failure	Director	High	1,2	$3,400,000	Local, State, Federal	Continuous	Not started, lack of funding
Southern Pioneer COOP-2	Replace 30' poles with 40' poles, and include raptor protections, for greater vertical clearance to reduce potential damage by farm equipment.	Utility/ Infrastructure Failure	Director	High	1,2	$56,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Southern Pioneer COOP-3	Replace #4 ACSR conductor.	Utility/ Infrastructure Failure	Director	Medium	1,2	$44,000,000	Local, State, Federal	Ten years	Not started, lack of funding
Southern Pioneer COOP-4	Conduct oil testing on all transformers.	Utility/ Infrastructure Failure	Director	Medium	1,2	$513 per unit	Local, State, Federal	Continuous	In progress
Southern Pioneer COOP-5	Install security cameras at all substations.	Terrorism	Director	Medium	1,2	$3,400,000	Local, State, Federal	Four years	In progress

6.9 –Mitigation Actions No Longer Under Consideration

For this plan update, members of the MPC and participating jurisdictions were asked to consider if all previous mitigation actions were still viable. Due to the thorough nature of the review, and the comprehensive updating of mitigation actions to meet both the needs of the participating jurisdictions and FEMA planning requirements, many actions were either modified or removed from consideration. A full comparison of jurisdictional actions may be completed by comparing the actions detailed in this plan against the actions from the 2015 regional hazard mitigation plan.

6.10 – Action Implementation and Monitoring

44 CFR 201.6 (c)(3)(iii) An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section 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.

Kansas Region D and relevant participating jurisdictions are responsible for implementing their identified mitigation action(s). To foster accountability and increase the likelihood that actions will be implemented, every proposed action is assigned to an action champion. In general:

- The identified champion will be responsible for tracking and reporting on action status.
- The identified champion will provide input on whether the action as implemented is successful in reducing vulnerability.
- If the action is unsuccessful in reducing vulnerability, the identified champion will be tasked with identifying deficiencies and additional required actions.

Additionally, each action has been assigned a proposed completion timeframe to assist in tracking the continued viability of the action if not completed, and to assist participating jurisdictions in potentially programming Funding to complete the actions.

In general, each participating jurisdiction, along with the MPC, is responsible for monitoring the progress of mitigation activities and projects. To facilitate the tracking of mitigation actions the Kansas Region D MPC and KDEM, in conjunction with participating jurisdictions, will compile a list of projects funded and completed. Additionally, the MPC and participating jurisdictions will be solicited annually to provide information on any other mitigation projects that were not funded through hazard mitigation Clarks for tracking and update purposes.

To track mitigation projects from initiation to closeout, participating jurisdictions will use a project tracking methodology that includes, at a minimum, the following information:

- Applicant data
- Clark identifier
- Award date

- Awarded contractor
- Period of Performance
- Total project cost, including local share of project
- Quarterly Reports

Upon completion of a project the awarded participating jurisdiction will conduct a closeout site visit to:

- Review all project documents
- Review all procurement documents and contracts
- Photograph completed project

Project closeout packages will generally be submitted no more than 90 days after a project has been completed, and should include the following:

- All available documentation
- Photographs of completed project
- Materials, labor and equipment documentation
- Close-out certification

6.11 – Jurisdictional Compliance with NFIP

44 CFR 201.6 (c)(3)(ii) All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

Participating jurisdictions are committed to continued involvement and compliance with the **NFIP**. To help facilitate compliance, each participating jurisdiction:

- Adopts Floodplain regulations through local ordinance
- Enforces floodplain ordinances through building restrictions as detailed in relevant ordinance
- Regulates new construction in Special Flood Hazard Areas as outlined in their floodplain ordinance
- Utilizes FEMA FIRMs
- Monitors floodplain activities

Key to achieving across the board reduction in flood damages is a robust community assistance, education and awareness program. As such, Kansas Region D and its participating jurisdictions will continue to develop both electronic (including social media) and in person outreach activities.

Specific mitigation actions supporting regional commitment to both the NFIP and potential CRS application and compliance were identified above with a bold type **NFIP** in the subsequent mitigation action sections.

6.12 –Primary Mitigation Action Funding Sources

It is generally recognized that mitigation actions help communities realize long term savings by preventing future losses due to hazard events. However, many mitigation actions are beyond the budgetary capabilities a jurisdiction and Funding assistance, often in the form of Clarks, may be required. This following table provides a general description of some of the primary avenues available to jurisdictions to defray the cost of implementing mitigation actions.

Table 6.13: Primary Hazard Mitigation Funding Mechanisms

Program	Funding Agency	Funding Match Requirement	Program Description
Community Development Block Clark Program	Department of Housing and Urban Development	N/A	Program is a competitive Clark process through which about half of the Funding goes to support the development of community facilities and water and sewer projects. Clarks in four categories, community improvement, urgent need, Kansas Small Towns Environment Program and economic development.
Federal Public Assistance	FEMA	Varied	Provides Funding used to restore the parts of a structure that was damaged during a disaster. The restoration must provide protection from subsequent events.
Federal Individual Assistance	FEMA	Varied	Provides assistance for qualified homeowners/renters whose primary residence was damaged or destroyed in a declared designated area.
Flood Mitigation Assistance	FEMA	Varied	Program provides funding to States, Territories, federally recognized tribes and local communities for projects and planning that reduces or eliminates long-term risk of flood damage to structures insured under the NFIP. Funding is also available for management costs.
Hazard Mitigation Clark Program	FEMA	25%	Program is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. Funding is available, when authorized under the Presidential Major Disaster Declaration, in the areas of the state requested by the governor. The amount of Funding available to the applicant is based upon the total federal assistance provided by FEMA for disaster recovery under the major disaster declaration.
Pre-Disaster Mitigation Program	FEMA	25%	Program is designed to assist states, territories, Indian tribal governments, and local communities to implement a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on federal Funding from future major disaster declarations.

6.13 – Additional Hazard Mitigation Funding Mechanisms

A wide variety of federal and state agencies offer mechanisms for funding mitigation projects. A thorough, but by no means complete, list of potential mitigaion funding sources are detailed in the following table along with a brief program description.

Table 6.13: Additional Potential Hazard Mitigation Funding Mechanisms

Department	Program	Program Description
FEMA	Fire Management Assistance Clark Program	Provides for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands. The process is initiated when the state requests federal assistance for an event where the threat of major disaster exists for either single fires or numerous small fires.
FEMA	Risk Mapping, Assessment, and Planning (Risk Map)	The Risk MAP strategy incorporates floodplain management with hazard mitigation by using tools such as DFIRMs, HAZUS reports, and risk assessment data to deliver quality data that increases public awareness and leads to action to reduce risk to life and property.
National Oceanic and Atmospheric Administration National Weather Service (NOAA NWS)	StormReady Program	StormReady is a voluntary program that was developed by NOAA NWS to help communities better prepare for and mitigate effects of all types of severe weather from tornadoes to flooding. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.
Mutual Aid	Kansas Water, Wastewater, Gas and Electric Utility Mutual Aid Program (KSMAP)	KSMAP has been developed to serve as the mutual aid program for Kansas utilities to help with provision of equipment, materials and personnel to assist in the restoration and continuation of utility service for those utilities needing assistance. The project is a joint effort of Kansas Municipal Utilities, Kansas Rural Water Association, the Kansas Section – American Water Works Association, the Kansas Water Environment Association, Kansas Corporation Commission, Kansas Department of Health & Environment and the Kansas Division of Emergency Management.
FEMA	Individual & Households, Other Needs Assistance (ONA) Program	The ONA program provides financial assistance to individuals or households who sustain damage or develop serious needs because of a natural or man-made disaster. The funding share is 75% federal funds and 25% state funds. The program gives funds for disaster-related necessary expenses and serious needs, including personal property, transportation, medical and dental, funeral, essential tools, flood insurance, and moving and storage. The current maximum allowable amount for any one disaster to individuals or families is $25,000.
Kansas Department of Agriculture – Division of Conservation (KDA-DoC)	Multipurpose Small Lakes Program	Provides state cost-share assistance to a government entity for the construction or renovation of a dam for flood control and water supply and/or recreational purposes. It requires a general plan of works and a local nonpoint source pollution control plan. https://agriculture.ks.gov/divisions-programs/division-of-conservation/flood-control-and-lakes-programs
(KDA-DoC)	State Assistance to Watershed Dam Construction	Provides state cost-share assistance to a government entity for the construction or renovation of a dam for flood control and water supply and/or recreational purposes. It requires a general plan of works and a local nonpoint source pollution control plan.
(KDA-DoC)	State Assistance to Watershed Dam Construction	Provides cost-share assistance to organized watershed districts and other special purpose districts for the implementation of structural and nonstructural practices that reduce flood damage. Structural

Table 6.13: Additional Potential Hazard Mitigation Funding Mechanisms

Department	Program	Program Description
		practices must be approved by the chief engineer of the Division of Water Resources. https://agriculture.ks.gov/divisions-programs/division-of-conservation/flood-control-and-lakes-programs
(KDA-DoC)	Water Resources Cost Share Program	Provides state cost-share assistance to landowners for the establishment of enduring water conservation practices to protect and improve the quality and quantity of Kansas water resources. https://agriculture.ks.gov/divisions-programs/division-of-conservation/financial-assistance
(KDA-DoC)	Water Conservation Program	Provides financial incentives for voluntary retirements of private water rights in high priority areas. For more information about WRAP enrollment opportunities, please contact
Kansas Department of Agriculture – Division of Water Resources (KDA-DWR)	Community Assistance Program State Support Services Element	This program enhances the State's capability to provide floodplain management information and technical assistance to help local officials in NFIP and CRS participating communities. It also encourages nonparticipating communities to join the NFIP and CRS.
KDA-DWR	Floodplain Management Program	Program provides technical assistance for local, state and federal floodplain management, including managing the NFIP and floodplain ordinances and regulations adopted by city and county governments. https://agriculture.ks.gov/divisions-programs/dwr/floodplain/flood-safety-2
Kansas Department of Commerce (KDC)	Community Service Tax Credit	Program offers Kansas tax credits to for nonprofit organizations for contributions to approved projects. Projects eligible for tax credit awards include community service, crime prevention and health care https://www.kansascommerce.gov/programs-services/community-development-assistance/community-service-tax-credit-program/
Kansas Department of Health and Environment—Bureau of Environmental Remediation (KDHE-BER)	Abandoned Mine Land Program	Program provides for the remediation of sites that are an immediate threat to the health and safety of the public. http://www.kdheks.gov/mining/abandoned_mineland.htm
Kansas Department of Commerce (KDC)	CDBG Urgent Need Clark Abandoned Mine Land Program	This funding is intended to resolve emergency issues created by a severe disaster that pose a threat to the health and safety of citizens. https://www.kansascommercce.gov/programs-services/community-development-assistance/community-development-block-Clark-program/urgent-need/
KDHE-BER	Kansas Brownfields Program	Programs to assist communities with the redevelopment of brownfields properties http://www.kdheks.gov/brownfields/index.html
KDHE-BER	State Water Plan Contamination Remediation Orphan Sites Program	Program provides Funding for the evaluation, monitoring, and remediation of contaminated groundwater or surface water sites and provides Funding to supply alternate water sources as an emergency http://www.kdheks.gov/ars/swp/index.html
Kansas Department of Transportation	Transportation Alternative Program	This is an annual competitive Federal Transportation Alternatives program that can be used for transportation enhancement activities that include: Vegetation Management - improvement of roadway safety; prevention of invasive species; providing erosion control.

Table 6.13: Additional Potential Hazard Mitigation Funding Mechanisms

Department	Program	Program Description
		Stormwater Mitigation - pollution prevention and abatement activities to address stormwater management; water pollution prevention related to highway construction or due to highway runoff. Wildlife Management - reduction of vehicle-caused wildlife mortality; restoration and maintenance of connectivity among terrestrial or aquatic habitats. http://www.ksdot.org/bureaus/burtransplan/TransAlt.asp
Kansas Forest Service (KFS)	Community Forestry Program	Program provides assistance, education, and support to communities and municipalities in organizing urban and community forestry programs, identifying resource needs, setting priorities of work, and training city employees. https://www.kansasforests.org/community_forestry/
KFS	Rural Forestry Program	Professional foresters provide on-site forest management and agro-forestry analysis and recommendations through inventory of forests, woodlands and windbreaks. https://www.kansasforests.org/rural_forestry/
KFS	Firewise Program	The Kansas Firewise program offers prevention materials for homeowners to reduce the threat of wildland fire in rural and high-risk areas. https://www.kansasforests.org/fire_management/fireprevention.html
KFS	Forest Health Program	Program monitors the impacts of insects, diseases, drought, flooding and other health issues in forests, woodlands, windbreaks and conservation tree plantings by providing diagnosis and control recommendations and mitigation and planning for Emerald Ash Borer, Asian Bush Honeysuckles and other invasive species. https://www.kansasforests.org/forest_health/
KFS	Landowner Education	Provides information and education to farmers regarding the benefits of good forest management. This includes information about federal cost share practices including the Environmental Quality Incentives Program, Conservation Reserve Program, and the Riparian and Wetland Protection Program. https://www.kansasforests.org/forest_health/
KFS	Rural Fire Protection	Program provides fire support services to rural fire departments, including wildfire training, Smokey Bear fire prevention materials, and the acquisition and distribution of excess military vehicles for conversion to firefighting units.
Kansas Highway Patrol	Federal Preparedness Clark Program	Through this program, the Department of Homeland Security/FEMA provides Funding to states to prevent, respond to, and recover from acts of terrorism by enhancing and sustaining capabilities. https://www.kansashighwaypatrol.org/
Kansas State Fire Marshal’s Office	Fire Prevention Program	Program focuses on structural inspection to ensure compliance with the Kansas Fire Prevention Code.
Kansas State Fire Marshal’s Office	Hazardous Materials Program	Program provides training, planning, and analysis related to hazardous materials accidents/incidents and WMD events to help local facilities and local, state, and federal agencies before an event occurs.

Table 6.13: Additional Potential Hazard Mitigation Funding Mechanisms

Department	Program	Program Description
Kansas Water Office (KWO)	Public Information and Education	This public education program provides information on water resource issues to the general public through publication of articles, pamphlets, news reports, etc. It also provides support for environmental education and local leadership development programs. https://www.kwo.ks.gov/
KWO	Stream Gauging Program	State financial assistance is provided for the operation of selected gauging stations operated by the U.S. Geological Survey. https://www.kwo.ks.gov/projects/stream-gaging-network
KWO	Technical Assistance to Water Users	Program provides technical assistance to municipalities, irrigators, and other groups to assist in the reduction of water use and improve water use efficiency. (For assistance contact KWO at 785-296-3185.
KWO	Water Resource Planning	As the water planning, policy, coordination and marketing agency for the state the Kansas Water Office works to maintain a comprehensive State Water Plan for the management, conservation and development of the water resources of the state. This includes the collection and compilation of information pertaining to climate, water and soil as related to the usage of water for agricultural, industrial and municipal purposes and the availability of water supplies in the several watersheds of the state; development of a state plan of water resources management, conservation and development for water planning areas; the development and maintenance of guidelines for water conservation plans and practices; and The establishment of guidelines as to when conditions indicative of drought exist. https://www.kwo.ks.gov/about-the-kwo/kwo

7.0 Plan Maintenance

7.1 – Hazard Mitigation Plan Monitoring and Evaluation

44 CFR 201.6 (c)(4) A plan maintenance process that includes: (i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

The Kansas Region D Hazard Mitigation Plan will be updated then approved by FEMA every five years. During the five-year cycle, the plan will undergo continuous monitoring and evaluation to ensure that the policies, procedures, priorities, and state environment established in the plan reflect current conditions.

To achieve this, the MPC will meet annually after plan approval. If needed, additional meetings will take place during this timeframe. The State of Kansas State Hazard Mitigation Officer will determine the meeting dates and location and is responsible for sending invitations.

During the five-year evaluation phase, the MPC is responsible for assessing the effectiveness of the plan by:

- Reviewing the hazards and determining if any of them have changed
- Determining if there are new hazards that pose a risk to the state
- Ensuring goals and objectives are still relevant
- Determining if any actions have been completed or are deemed irrelevant
- Determining if new actions should be added
- Determining if capabilities have changed

In addition to these meetings, the MPC will monitor and evaluate the progress of mitigation projects via regular reports, site visits, and correspondence. Progress and viability of identified mitigation actions will be measured based on the following variables:

- The number of projects successfully implemented
- The breadth of disbursement of mitigation grant funds
- The disaster losses avoided over time
- Public awareness
- Success of completed mitigation projects in helping address and achieve identified goals and objectives
- Have the completed mitigation actions resulted in a safer Kansas Region D

In order to monitor the implementation of plan actions and the overall progress of plan goals, MPC members will report on the following information:

- How the actions from the mitigation strategy are being pursued and completed
- Are actions being prioritized
- How the plan goals and objectives are being carried out
- How mitigation funding mechanisms are being utilized
- How participating jurisdictions are receiving technical assistance

7.2 – Jurisdictional Maintenance Requirements

Kansas Region D and all participating jurisdictions will be tasked with plan monitoring, evaluation, and maintenance. All participating jurisdictions, led by MPC, will:

- Regularly monitor and evaluate the implementation of the plan
- When applicable, after a disaster event, evaluate the effectiveness of the plan
- Act as a think tank for all issues related to hazard mitigation planning
- Act as a clearinghouse for hazard mitigation ideas and activities
- Assist with the implementation of all identified actions with available resources
- Monitor all available funding opportunities for mitigation actions
- Coordinate the cycle for the revision and update of the mitigation plan
- Report on plan progress and recommended changes to the relevant governing bodies
- Inform and solicit input from the public

Each participating jurisdiction will also be responsible for promoting the integration of the hazard mitigation plan into all relevant plans, policies, procedures and ordinances.

7.3 – Plan Maintenance and Update Process

44 CFR 201.6 (c)(4) A plan maintenance process that includes: (i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle."

Kansas Region D, the State of Kansas, and the MPC will facilitate a yearly plan review and the subsequent hazard mitigation plan revision and re-adoption process within the required five-year period.

Information from the annual meetings will be incorporated into the plan update. Starting in calendar year 2022, the formal update process will begin. A thorough review and revision of the plan will take place, following all requirements detailed in 44 CFR 201.4, FEMA guidance documents, and DMA 2000. The following represents a general timeline for the next required plan revision.

- **Three years before plan expiration, Spring:** The MPC will begin updating the plan risk assessment. Hazards will be analyzed for continued relevancy and a review will be conducted to determine and new potential hazards.
- **Three years before plan expiration, Fall:** The MPC will begin updating the vulnerability assessment. Data will be gathered on jurisdictional assets, critical facilities, building stock values, crop losses, jurisdictional damages, etc.
- **Two years before plan expiration, Spring:** The MPC will review all information from previous meetings and determine if hazard mitigation goals and objectives are still relevant. Actions will be reviewed for currency and applicability. Work will begin on HMP revision.
- **Two years before plan expiration, Fall:** The MPC will evaluate the policies, programs, capabilities, and funding sources from the previous plan and plan revision to determine if they are still accurate and determine if additions are required.

- **One year before plan expiration:** Work will begin on the revision of the 2019 HMP.
- **Six months before plan expiration:** The MPC will review the final draft copy of the mitigation plan and make comments and updates if necessary. All participating jurisdictions and the public will be given an opportunity to review and comment on draft HMP.
- **Two months before plan expiration:** Formal submittal to FEMA for re-approval.

As part of the plan maintenance process, and consistently during the five-year HMP approval period, the MPC will continually monitor all elements of the plan, including:

- The incorporation of the HMP into other planning mechanisms
- All revisions and updates to the HMP
- Continued public participation

This monitoring will be done through outreach efforts to include:

- Email communication
- Phone communication
- In person communication at meetings, relevant conferences, and local planning events

Through consistent monitoring the MPC will then be able to efficiently incorporate these elements into the next plan revision.

Upon each successive revision, the plan will need to be re-adopted by all participating jurisdictions. Circumstances, including a major disaster or a change in regulations or laws, may modify the required five-year planning cycle.

7.4 – Post-Disaster Declaration Procedures

Following a disaster, each participating jurisdiction and the MPC may review the plan to determine if any additional actions need to be identified, additional funding has become available, or any identified actions need to be re-prioritized.

7.5 – Incorporation of HMP into Other Planning Mechanisms

44 CFR 201.6 (c)(4)(ii) 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.

The hazard mitigation plan is an overarching document that is both comprised of, and contributes to, various county and local plans. Under the leadership of the MPC, it is hoped that when each of these other plans is updated, they will be measured against the contents of this HMP.

Below is a list of the various jurisdictional planning efforts, either solely or jointly administered, and relevant planning documents. While each plan can stand alone, each participating jurisdiction, under the leadership of their MPC member, will actively work to incorporate relevant parts of this hazard mitigation plan into the following:

- All participating jurisdictions Codes and Ordinances
- All participating jurisdictions Comprehensive Plans
- All participating jurisdictions Critical Facilities Plans
- All participating jurisdictions Economic Development Strategic Plans
- All participating jurisdictions Emergency Operations Plans
- All participating jurisdictions Flood Mitigation Assistance Plan
- All participating jurisdiction Land-Use Plans
- Community Wildfire Protection Plans

Additionally, in cooperation with the MPC, each participating jurisdiction will be actively courted on incorporating elements of this hazard mitigation plan for any relevant plan, code or ordinance revision or creation.

Finally, each participating jurisdiction has committed to actively encourage all departments to implement actions that minimize loss of life and property damage. Whenever possible, each participating jurisdiction will use existing plans, policies, procedures and programs to aid in the implementation of identified hazard mitigation actions. Potential avenues for implementation may include:

- Budget revisions or adoptions
- Capital improvement plans
- General or master plans
- Hiring of staff
- Land use planning
- Operation plans
- Ordinances
- Stormwater planning

Participating jurisdictions are encouraged to utilize all available budget avenues for the completion of hazard mitigation items. Budgetary options may include:

- Annual budgets
- Application for grant funding
- Departmental budgets
- In-kind donations

Where appropriate, the MPC will take the lead in integrating this HMP into overarching, countywide plans, code, ordinances and any other relevant documents, policies or procedures.

7.6 – Continued Public Involvement

44 CFR 201.6 (c)(4)(iii) Discussion on how the community will continue public participation in the plan maintenance process.

Public participation is an important part of the continued mitigation planning process. Every effort will be made to keep the public informed on both relevant mitigation issues and the five-year plan revision cycle. Strategies for continued public involvement may include:

- Postings on electronic media, to include websites
- Notifications, when possible, in local media
- Making plans available for review in public locations
- A review of local mitigation strategies and goals
- A review completed and remaining hazard mitigation actions

Appendix A

Adoption Resolutions

Model Resolution

Resolution # _________: **Adopting the Kansas Homeland Security Region D Hazard Mitigation Plan**

Whereas, the (Name of Government/District/Organization) recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency (FEMA) pre- and post-disaster mitigation grant programs; and

Whereas, the (Name of Government/District/Organization) fully participated in the FEMA prescribed mitigation planning process to prepare this Multi-Hazard Mitigation Plan; and

Whereas, the Kansas Division of Emergency Management and FEMA Region VII officials have reviewed the Kansas Homeland Security Region D Hazard Mitigation Plan, and approved it contingent upon this official adoption of the participating governing body; and

Whereas, the (Name of Government/District/Organization) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Kansas Homeland Security Region D Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the (Name of Government/District/Organization) demonstrates the jurisdictions' commitment to fulfilling the mitigation goals and objectives outlined in this plan, and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

Now, therefore, be it resolved, that the (Name of Government/District/Organization) adopts the Kansas Homeland Security Region D Hazard Mitigation Plan as an official plan; and

Be it further resolved, the (Name of Government/District/Organization) will submit this Adoption Resolution to the Kansas Division of Emergency Management and FEMA Region VII officials to enable the plan's final approval.

________________:Date ______________________: Approved by

Appendix B

FEMA Approval Documents

Appendix C

Meeting Minutes and Sign-In Sheets

To	**Region "D" Hazard Mitigation Planning Committee**
Through	**Jeanne Bunting, Mitigation Planner** **Kansas Division of Emergency Management (KDEM)**
From Tel / E-mail	**Matt Eyer** **Blue Umbrella Co**
Date	**November 5, 2019**
Subject	**Minutes from the Region "D" Mitigation Planning Meeting held on 5 November 2019 in Finney County, KS @ 0930**

This document is a record of attendance and a summary of the issues discussed during the above Kickoff meeting. Topics covered during the meeting included: (1) an introduction to the purpose of hazard mitigation planning, (2) the benefits of a multi-jurisdictional approach, (3) the reasons for the regional mitigation planning process, (4) grant programs linked to an approved plan and (5) action items in the previous county hazard mitigation plans. The hazard mitigation planning process was reviewed to include requirements for public involvement and the use of data collection guides, and the new action criteria. The planning committee reviewed the list of hazards to be used as a part of the regional plan. The group discussed mitigation actions and the availability of grant programs during the meeting. The meeting concluded with a discussion of the next steps in the planning process. The formal presentation portion of the meeting began at 0930 CDT and concluded at 1100 CDT.

Attendees

See attached sign in sheet

Introductions

Jeanne Bunting with KDEM began the meeting by welcoming and thanking the attendees. Participants introduced themselves and identified what jurisdiction they represented.

Introduction to Hazard Mitigation Planning

Matt Eyer, the plan author contractor, presented information on the purpose and requirements of the Disaster Mitigation Act of 2000. The attendees were reminded that this is a regional planning effort which will update the current Region D mitigation plan. The plan includes: Clark, Finney, Ford, Gray, Haskell, Hodgeman, Lane, Meade, and Seward counties. The presentation also addressed the benefits for jurisdictions participating in this mitigation plan update, including eligibility for federal hazard mitigation assistance funding programs.

Matt Eyer described the benefits of participating in a multi-jurisdictional plan as improving coordination and communication among local jurisdictions and that these hazards do not stop at jurisdictional boundaries thus this multi-jurisdictional plan allows for a more comprehensive approach. The group also heard information regarding the significant cost savings being realized by the regional approach to planning. The regional approach now being used allows planning services to be provided to each county for the update at no cost to the county. Matt Eyer with Blue Umbrella will be completing the Region “D” mitigation plan for committee review.

Mr. Eyer also described the role of the Hazard Mitigation Planning Committee (HMPC).Each jurisdiction participating in development of the plan must meet the following minimum requirements:

- Designate a representative to serve on the Region “D” Hazard Mitigation Planning Committee, which will meet twice during the planning process, Emergency Managers will meet three times.
- Provide data for and assist in the development of the updated risk assessment that describes how various hazards impact your jurisdiction,
- Provide data to describe current capabilities,
- Develop/update mitigation actions (at least one) specific to your jurisdiction,
- Provide comments on plan drafts as requested,
- Inform the public, local officials, and other interested parties about the planning process and provide opportunities for them to comment on the plan, and
- Formally adopt the mitigation plan.

Planning for Public Involvement

The local/regional hazard mitigation plan requirements state that the public must have the opportunity to comment on the plan. The public will be given two opportunities to comment on the plan, once during the drafting stage and another when the plan is complete in the final draft stage. KDEM is planning to utilize a questionnaire on SurveyMonkey.com to ask the public’s opinion about hazards that affect them during the drafting stage.   The HMPC members in the county are also requested to post the SurveyMonkey.com link, once available, on their websites and newsletters to the public and to distribute the survey as widely as possible.

Data Collection Process

The participating jurisdictions at the meeting were provided hard copies of Data Collection Guides. Local County Emergency Management Agencies will follow-up with jurisdictions that were not in attendance at this meeting to provide an overview of the process being used and copies of data collection guides for completion. Mr. Eyer briefed on the Data Collection Guides, and reminded the attendees that they are specific for local units of government and schools. There are two different guides, one for local governments, and one for schools and universities. The jurisdictions were requested to provide data regarding hazards that had occurred in their jurisdiction since the last plan update (2015) for the 22 hazards that are in the Regional Plan. The Data Collection Guides were requested to be returned to Jeanne Bunting by 15 December 2019.

Plan Format/ Regional and Countywide Risk Assessment

The list of hazards in the State of Kansas plan is the list that is being used for the regional plans. All of the hazards included in the State Plan were included in the current plan for the counties in Region D.   Blue Umbrella staff will be updating the regional hazard ranking using the State Plan methodology for hazards in their current plan.

Hazard Mitigation Assistance Grants Available Linked to Approved Plan

The following four Hazard Mitigation Assistance grant programs were outlined, priority activities discussed, deadline of grants, and current funds available for:

- Hazard Mitigation Grant Program (HMGP)
- Pre-disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- POST HMGP Fire
- The BRIC program for 2020 was discussed at length.

Other state and federal grant programs for mitigation projects were also mentioned.

Mitigation Actions

The planning committee was provided an introduction to update and development of mitigation actions. Jurisdictional representatives were requested to provide updates as to: (1) action status – in a measureable format, i.e. 100% complete. They were also advised of the FEMA SMART action criteria and the four categories for actions. The group was reminded that each participating jurisdiction must have at least one action and that all NFIP jurisdictions must have at least two NFIP-related actions. The date for the final planning meeting will be sent to each agency. At that final meeting, the mitigation actions for the plan will be prioritized.

Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **December 15, 2019— Data Collection Guides Due to KDEM**
- **January 2020, TBD – Meeting #2 for Emergency Management Officials**
- **TBD (Beginning of March 2019) – Meeting #3 All Committee Members – Action Priorities**
- **May 2020 (beginning of) — Submit Plan to FEMA**

To	**Region "D" Hazard Mitigation Planning Committee**
Through	**Jeanne Bunting, Mitigation Planner** **Kansas Division of Emergency Management (KDEM)**
From Tel / E-mail	**Matt Eyer** **Blue Umbrella Co**
Date	**November 5, 2019**
Subject	**Minutes from the Region "D" Mitigation Planning Meeting held on 5 November 2019 in Ford County, KS @ 1300**

This document is a record of attendance and a summary of the issues discussed during the above Kickoff meeting. Topics covered during the meeting included: (1) an introduction to the purpose of hazard mitigation planning, (2) the benefits of a multi-jurisdictional approach, (3) the reasons for the regional mitigation planning process, (4) grant programs linked to an approved plan and (5) action items in the previous county hazard mitigation plans. The hazard mitigation planning process was reviewed to include requirements for public involvement and the use of data collection guides, and the new action criteria. The planning committee reviewed the list of hazards to be used as a part of the regional plan. The group discussed mitigation actions and the availability of grant programs during the meeting. The meeting concluded with a discussion of the next steps in the planning process. The formal presentation portion of the meeting began at 1300 CDT and concluded at 1430 CDT.

Attendees

See attached sign in sheet

Introductions

Jeanne Bunting with KDEM began the meeting by welcoming and thanking the attendees. Participants introduced themselves and identified what jurisdiction they represented.

Introduction to Hazard Mitigation Planning

Matt Eyer, the plan author contractor, presented information on the purpose and requirements of the Disaster Mitigation Act of 2000. The attendees were reminded that this is a regional planning effort which will update the current Region D mitigation plan. The plan includes: Clark, Finney, Ford, Gray, Haskell, Hodgeman, Lane, Meade, and Seward counties. The presentation also addressed the benefits for jurisdictions participating in this mitigation plan update, including eligibility for federal hazard mitigation assistance funding programs.

Matt Eyer described the benefits of participating in a multi-jurisdictional plan as improving coordination and communication among local jurisdictions and that these hazards do not stop at jurisdictional boundaries thus this multi-jurisdictional plan allows for a more comprehensive approach. The group also heard information regarding the significant cost savings being realized by the regional approach to planning. The regional approach now being used allows planning services to be provided to each county for the update at no cost to the county. Matt Eyer with Blue Umbrella will be completing the Region “D” mitigation plan for committee review.

Mr. Eyer also described the role of the Hazard Mitigation Planning Committee (HMPC).Each jurisdiction participating in development of the plan must meet the following minimum requirements:

- Designate a representative to serve on the Region “D” Hazard Mitigation Planning Committee, which will meet twice during the planning process, Emergency Managers will meet three times.
- Provide data for and assist in the development of the updated risk assessment that describes how various hazards impact your jurisdiction,
- Provide data to describe current capabilities,
- Develop/update mitigation actions (at least one) specific to your jurisdiction,
- Provide comments on plan drafts as requested,
- Inform the public, local officials, and other interested parties about the planning process and provide opportunities for them to comment on the plan, and
- Formally adopt the mitigation plan.

Planning for Public Involvement

The local/regional hazard mitigation plan requirements state that the public must have the opportunity to comment on the plan. The public will be given two opportunities to comment on the plan, once during the drafting stage and another when the plan is complete in the final draft stage. KDEM is planning to utilize a questionnaire on SurveyMonkey.com to ask the public’s opinion about hazards that affect them during the drafting stage.   The HMPC members in the county are also requested to post the SurveyMonkey.com link, once available, on their websites and newsletters to the public and to distribute the survey as widely as possible.

Data Collection Process

The participating jurisdictions at the meeting were provided hard copies of Data Collection Guides. Local County Emergency Management Agencies will follow-up with jurisdictions that were not in attendance at this meeting to provide an overview of the process being used and copies of data collection guides for completion. Mr. Eyer briefed on the Data Collection Guides, and reminded the attendees that they are specific for local units of government and schools. There are two different guides, one for local governments, and one for schools and universities. The jurisdictions were requested to provide data regarding hazards that had occurred in their jurisdiction since the last plan update (2015) for the 22 hazards that are in the Regional Plan. The Data Collection Guides were requested to be returned to Jeanne Bunting by 15 December 2019.

Plan Format/ Regional and Countywide Risk Assessment

The list of hazards in the State of Kansas plan is the list that is being used for the regional plans. All of the hazards included in the State Plan were included in the current plan for the counties in Region D.   Blue Umbrella staff will be updating the regional hazard ranking using the State Plan methodology for hazards in their current plan.

Hazard Mitigation Assistance Grants Available Linked to Approved Plan

The following four Hazard Mitigation Assistance grant programs were outlined, priority activities discussed, deadline of grants, and current funds available for:

- Hazard Mitigation Grant Program (HMGP)
- Pre-disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- POST HMGP Fire
- The BRIC program for 2020 was discussed at length.

Other state and federal grant programs for mitigation projects were also mentioned.

Mitigation Actions

The planning committee was provided an introduction to update and development of mitigation actions. Jurisdictional representatives were requested to provide updates as to: (1) action status – in a measureable format, i.e. 100% complete. They were also advised of the FEMA SMART action criteria and the four categories for actions. The group was reminded that each participating jurisdiction must have at least one action and that all NFIP jurisdictions must have at least two NFIP-related actions. The date for the final planning meeting will be sent to each agency. At that final meeting, the mitigation actions for the plan will be prioritized.

Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **December 15, 2019— Data Collection Guides Due to KDEM**
- **January 2020, TBD – Meeting #2 for Emergency Management Officials**
- **TBD (Beginning of March 2019) – Meeting #3 All Committee Members – Action Priorities**
- **May 2020 (beginning of) — Submit Plan to FEMA**

Finney Co. Region D

Name (Legibly!)	County/Organization (Legibly!)	Title (Legibly!)
Anthony Cruz	Finney County	Emergency Management
Billie Bennett	Lane County	Emergency Management
Arlene Doll	Lane County	Public Health Nurse / LEPC Chair
Shellie Barker	Haskell County	City Clerk Satanta
Kelly Kirk	City of Liberal	Fire Chief
Alicia Hidalgo	City of Liberal	City Clerk
Jesus Cardenas	City of Liberal	Street Dept. Direc.
Roger Scheib	Seward County ~~County~~ Community College	Director Facilities
Debra Brown	Haskell County EM	EM
Casey Standford	Seward County	EM
[illegible]	[illegible]	[illegible]
Dennis Mulanax	Liberal P.D.	Chief

Finney Region D

Name (Legibly!)	County/Organization (Legibly!)	Title (Legibly!)
Daylen Elsey	City of Sublette	City Superintendent
Skeety Poulton	LIBERAL FIRE DEPT	Deputy CHIEF
Wendell Wehmeyer	SCCC College	Security Supervisor
Brad Beer	City of Liberal	Public Grounds Dir.
Brian Fornwalt	City of Liberal	Airport Manager
Gregg Freelove	Southwest Medical Center	Safety Officer

FORD County Region D

Name (Legibly!)	County/Organization (Legibly!)	Title (Legibly!)
Rex Beemer	Ford Co EMA	EM
Ken Spencer	Dodge City Fire Dept	Chief
Lon Ruff	Marena Township. Hodgeman County	Trustee
Becca Wyatt	HorseThief Reservoir	Maintenance Specialist
JOSHUA HOBBS	HORSETHIEF RESERVOIR	MANAGER
Jeff Acton	City of Cimarron	City Admin
Shannon Hoskinson	City of Cimarron	City Super.
Shawn Lampe	USD 443, Dodge City	Safety/Security Director
Randy Still	Hodgeman Pawnee Watershed	Manager
ISAAC ABERSON	HODGEMAN PAWNEE WATERSHED	ASST. MANAGER
Cody Warden	City of Bucklin Fire	Chief
Jared Herl	Hodgeman County Health Center	Emergency Prep/Safety Officer
Michael Clark	The Victory Electric Coop	Manager of Plant
Darrin Boyer	Hodgeman Road Supervisor	Supervisor
Randy Blehm	Meade Co. Public Works	Administrator
Mike Burke	Hodgeman Co E.M.	Coordinator
Troy Blevins	Gray Co. E.M.	Coordinator
Chris O'Neal	Ford Co. R+B	Superintendent

Ford Region D

Name (Legibly!)	County/Organization (Legibly!)	Title (Legibly!)
Bryan Burgess	Meade County	Emergency Management
Larry Stembring	Hodgeman Co.	Maintenance Director
Miller Fudge	Clark County	Emergency Management
Michael Ort	Hodgeman Co./City of Jetmore	City Administrator
Abbey Martin	City of Dodge City	PIO
Don Lynn	Minneola Healthcare	Safety Mgr
Rob Boyd	FORD	Chief
Daryl Stegman	Ford / USD 381	Superintendent
Ernesto De La Rosa	City of Dodge City	Assistant City Manager
ALAN OCHS	Hodgeman Co	Commissioner
Corey Keller	City of DC	Public Works Director
Garry Seiler	City of Houston	Mayor
Randy Kuehlin	Ingalls USD 477	Superintendent
KATHY [illegible]	KAEM	SW REG COORD
KELLY LAMPE	BUCKLIN USD 459	SUPERINTENDENT

To	**Region "D" Hazard Mitigation Planning Committee**
Through	**Jenni Ellerman, Mitigation Planner** **Kansas Division of Emergency Management (KDEM)**
From Tel / E-mail	**Jeanne Bunting, State Hazard Mitigation Officer** **Kansas Division of Emergency Management (KDEM)**
Date	**12 February 2020**
Subject	**Minutes from the Region "D" Mitigation Planning Meeting held on 12 February 2020, at Garden City Emergency Management.**

This document is a record of attendance and a summary of the issues discussed during the above meeting. Topics covered during the meeting included: (1) Strategy, (2) Goals, and (3) actions, 4) final steps, 5) draft plan. The meeting concluded with a discussion of the next steps in the planning process and the necessity to open the plan for public comment.

Attendees

Name	Organization	County

See sign-in.

Agenda

The meeting was scheduled in order to finalize the draft plan of Region D. Of the 9 counties, 7 were represented. Matt Eyer, the plan author, reviewed the strategy, goals, and went in depth on the next steps, which include public comments.

Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **April 6th – Final Meeting**
- **May 1, 2020 – Submit plan to FEMA**

//s//
Jeanne Bunting, State Hazard Mitigation Officer, KDEM

			[illegible]
			Randy [illegible]
			[illegible]
			[illegible]
			Mike [illegible]
			[illegible] Butte
			[illegible]
			[illegible]
			Miller [illegible]
			[illegible]
			[illegible]
			[illegible]
			[illegible]
Jeann	Butis		[illegible]
[illegible]			[illegible]
Jenni	HERMAN		[illegible]
[illegible]			[illegible]
[illegible]	[illegible]		[illegible]

To	Region D Hazard Mitigation Planning Committee
Through	Jeanne Bunting, Mitigation Planner Kansas Division of Emergency Management (KDEM)
From	Jeanne Bunting, State Hazard Mitigation Officer
Tel / E-mail	Kansas Division of Emergency Management (KDEM)
Date	7 April 2020
Subject	Minutes from the Region D Final Mitigation Planning Meeting

This document is a record of attendance and a summary of the issues discussed during the above meeting. Topics covered during the meeting included: (1) Strategy, (2) Goals, and (3) actions, 4) final steps, 5) draft plan. The meeting concluded with a discussion of the next steps in the planning process and the necessity to open the plan for public comment.

Attendees

Meeting was conducted online due to pandemic. No attendance form was circulated.

Agenda

The meeting was scheduled in order to finalize the draft plan of Region D. Matt Eyer, the plan author, reviewed the strategy, goals, and went in depth on the next steps, which include public comments.

Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process as follows:

- **May 2020 – Submit Plan to FEMA**

//s//
Jeanne Bunting, State Hazard Mitigation Officer, KDEM

Appendix D

Critical Facilities

(Restricted, Not for Release)

Introduction to Critical Facilities

A critical facility is essential in providing utility or direction either during the response to an emergency or during the recovery operation, with facilities determined from jurisdictional feedback. The following are examples of critical facilities and assets:

- Communications facilities
- Emergency operations centers
- Fire stations
- Government buildings
- HazMat Facilities
- Hospitals and other medical facilities
- Police stations
- As deemed necessary by the jurisdiction

The information below is the inventory of critical facilities for all participating jurisdictions who elected to provide this information for this plan. All information was gathered from the Kansas Division of Emergency Management, participating jurisdictions, and prior plans.

Details concerning critical facilities have been deemed as sensitive information, and as such their specific information is not for release to the general public.

Clark County Critical Facilities

Clark County			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
Clark County Courthouse	Ashland	$5,230,619	-
Road & Bridge Street Shop	Ashland	$545,882	-
Clark County Fire Department – Ashland	Ashland	$543,128	-
Light Plant	Ashland	$8,866,594	-
Clark County District Hospital	Ashland	$10,500,00	-
Clark County Health Center	Ashland	$5,000,000	-
Clark County Elementary	Ashland	$2,000,000	-
Clark County High School	Ashland	$3,000,000	-
Clark County Health Department	Ashland	$5,230,619	-
Clark County Long Term Care Unit	Ashland	$10,500,00	-
Clark County Airport	Ashland	$15,250,000	-
Ventura Foods	-	$3,225,000	-
Clark County Post Office	Ashland	$200,000	-
D&B Pharmacy	Ashland	$125,264	-
Englewood City Hall	Englewood	$150,000	10
Englewood Fire Department	Englewood	$350,000	-
County Cooperative Elevator & Supply Company	Englewood	$2,000,000	100

Finney County Critical Facilities

Finney County			
Facility and/or Asset Name	**Number of Facilities**	**Replacement or Estimated Value**	**Occupancy**
Communications (radio, TV, similar)	6	$380,000	40
County Emergency Operations Center	1	$18,180,000	80
Fire / EMS Stations	1	$570,000	25
Hospital/Clinic	1	$69,300,000	350
Law Enforcement Center (Police/Sheriff/EOC)	5	$6,650,000	225
Emergency Shelters (schools, other)	24	$169,068,500	1,256
Major government buildings	6	$10,960,500	149
Major Hwy / roads (202 Mi)	0	$759,004,000	0
Bridges (62 ea.)	0	$36,549,000	0
Response Staging Areas	2	$0	39
Electric / Gas utilities	10	$645,133,197	185
Pumping stations	27	$5,400,000	0
Sewage treatment plants	2	$7,261,165	5
Transportation systems	5	$268,620,000	75
Water treatment plants	2	$24,159,266	6
Wells and storage tanks	30	$0	0
Fuel Storage Areas	2	$50,000	0
Senior Care Facilities	3	$6,896,980	95
GC Community College	16	$63,877,049	1,700

USD #457 - Garden City			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
Abe Hubert Elementary School	1205 A Street	$11,896,000	305
Alta Brown Elementary School	1110 E. Pine Street	$10,203,000	379
Buffalo Jones Elementary School	708 Taylor Avenue	$5,659,000	311
Edith Scheuerman Elementary School	1901 Wilcox Street	$5,260,000	238
Florence Wilson Elementary School	1709 Labrador Blvd.	$9,704,000	363
Georgia Matthews Elementary School	111 Johnson Street	$3,722,000	177
Gertrude Walker Elementary School	805 W. Fair Street	$4,901,000	278
Jennie Barker Elementary School	5585 N. Jennie Barker Rd.	$2,067,000	134
Jennie Wilson Elementary School	1401 Harding Avenue	$4,514,000	221
Plymell Elementary School	20 W. Plymell Road	$2,579,000	147
Victor Ornelas Elementary School	3401 E. Spruce Street	$9,084,000	418
Bernadine Sitts Intermediate Center	3101 Belmont Place	$10,158,000	479
Charles O. Stones Intermediate Center	401 Jennie Barker Road	$10,170,000	446
Horace J. Good Middle School	1412 N. Main Street	$31,103,000	772
Kenneth Henderson Middle School	2406 Fleming Street	$12,550,000	413
Garden City High School	2720 Buffalo Way Blvd.	$80,889,000	2,070
Garfield Early Childhood Center	121 W. Walnut Street	$7,253,000	474
Garden City Alternate Education Center	1312 N. 7th Street	$9,441,000	100
Educational Support Center	1205 Fleming Street	$3,198,000	90
Transportation Department	139 Clover Leaf	$1,668,000	-
Service Center	4665 E. Hwy US 50	$1,842,000	15 - 30

USD #363 - Holcomb			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
Holcomb High School	600 North Jones	$26,000,000	3,000
Holcomb Middle School	500 North Henderson	$13,500,000	1,336
Holcomb Elementary School	200 North Main	$11,000,000	1,712
Wiley Elementary School	200 South Henderson	$6,250,000	1,000
Central Office	305 Wiley Street	$1,250,000	200
Bus Barns	204 Wiley Street	$2,000,000	50

Ford Critical Facilities

Ford County			
Facility and/or Asset Name	**Number of Facilities**	**Replacement or Estimated Value**	**Occupancy**
Communications (radio, TV, similar)	8	$9,595,513	184
County Emergency Operations Center (EOC)	1	$2,023,680	0
Fire / EMS stations	10	$16,514,469	121
Hospitals	1	$10,302,330	295
Law Enforcement (Sheriff/Police Bldgs)	5	$6,227,190	99
Emergency shelters (schools, other)	42	$199,377,660	1802
Major government buildings	7	$4,674,200	176
Major roads (229 mi.)	0	$1,187,000,000	0
Bridges (52)	0	$46,800,000	0
Fuel storage areas	3	$3,219,530	15
Electric / Gas utilities	3	$135,860,000	131
Pumping stations	74	$11,800,000	29
Response staging areas	7	$49,329,190	27
Sewage treatment plants	3	$236,350,060	9
Transportation systems	6	$314,651,055	83
Wells and storage tanks	55	$7,900,000	15

USD #381 - Spearville			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
JH/SR High	305 E Ave B.	$20,310,145 (all district structures)	1,500
Middle School	305 E Ave B.	-	110
HS Wing/Classroom/Library	305 E Ave B.	-	110
Woods/Arts Bldg.	158 E Ave B.	-	50
Football Storage	305 E Ave B.	-	-
Bus Barn/Lockers	305 E Ave B.	-	50
Stadium Track	158 E Ave B.	-	-
Track Storage	158 E Ave B.	-	-
Football Restrooms	158 E Ave B.	-	-
District Office	207 E Pine St	-	3
Grade School	105 E Davis	-	200
Auditorium (old Gym)	305 E Ave B.	-	1,000

USD #443 - Dodge City			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
Central Administration	1000 2nd Avenue	$15,000,000	54
Beeson	1700 West Beeson	$7,700,000	405
Bright Beginnings/ Alternative Education	200 West Comanche	$6,600,000	493
Central Elementary	100 Central	$4,000,000	364
Civic Center	2100 1st Avenue	$7,500,000	3,000
Comanche Middle School	1601 1st Avenue	$32,000,000	386
Dodge City High School	2201 West Ross Boulevard	$50,000,000	1,793
Dodge City Middle School	2000 6th Avenue	$18,500,000	888
Family Resource Center	1900 1st Avenue	$100,000	100
Learning Center	208 West Frontview	$120,000	250
Linn Elementary	1900 Linn Avenue	$7,700,000	386
Maintenance	1800 1st Avenue	$7,500,000	100
Miller Elementary	1100 Avenue G	$6,000,000	395
Northwest Elementary	2100 6th Avenue	$6,000,000	373
Ross Elementary	6th Avenue	$6,000,000	507
Soule Elementary	401 Soule Street	$9,000,000	383
Sunnyside Elementary	511 Sunnyside	$7,000,000	378
Transportation	1900 Parkway Drive	$1,150,000	100
Wilroads Garden Elementary	11558 East Main Road	$2,500,000	124

Gray County Critical Facilities

Gray County			
Facility and/or Asset Name	**Number of Facilities**	**Replacement or Estimated Value**	**Occupancy**
Communications (radio, TV, similar)	0	$0	0
County Emergency Operations Center (EOC)	1	$950,000	4
Fire / EMS stations	2	$226,393	0
Hospital(s)	0	$0	0
Law Enforcement (Sheriff/Police Bldgs)	1	$1,330,000	16
Emergency shelters / Schools	5	$2,375,000	665
Major government buildings	11	$7,734,810	0
Major roads (142 Mi)	0	$565,756,645	0
Bridges (44 ea)	0	$14,571,560	0
Fuel storage areas	1	$139,810	0
Electric / Gas utilities	1	$37,586,000	0
Pumping stations	0	$0	0
Response staging areas	0	$0	0
Sewage treatment plants	0	$0	0
Transportation systems	5	$203,521,890	0
Water treatment plants	0	$0	0
Wells and storage tanks	0	$0	0

USD #102 - Cimarron/Ensign			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
High School Building	400 N. 5th Street	$23,000,000	400
Grade School Building	600 N. 2nd Street	$13,300,000	500
Old Gym	214 N. 1st Street	$5,770,000	500
Bus Barn	301 N. 2nd Street	$4,200,000	100
Kinder Prep	315 N. 2nd Street	$1,500,000	30
Maintenance Storage	314 N. 1st Street	$1,860,000	30
District Office	314 N. 1st Street	$1,360,000	30

USD #476 - Copeland/South Gray			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
Copeland Elementary / South Gray Junior High School Bldg./Swimming Pool/Gym / Auditorium	105 Thatcher Street	$13,460,000	1500
Bus Garage, Shop, Band Room	105 Thatcher Street	$275,178	75
Announcers Booth	105 Thatcher Street	$8,800	-
Concession Stand	105 Thatcher Street	$17,600	-
Roundtop Bus Barn	105 Thatcher Street	$52,833	-
Pumphouse / Pump	105 Thatcher Street	$70,145	-
District Owned Single Family Residence	300 Stanley Street	$237,032	-
District Owned Single Family Residence	307 Wellman St.	$352,250	-
District Owned Single Family Residence	209 Webb Ave.	$218,751	-
District Owned Single Family Residence	404 Gray St.	$237,122	-
District Owned Single Family Residence	102 Thatcher Street	$242,337	-

USD #471 - Montezuma			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
Montezuma Elementary / South Gray High School Bldg./ Gymnasiums	103 W. Sunnyside Street	$14,012,644	2000
Bus Garage	105 S. Escalante Street	$398,043	-
Old Grade School	101 S. Escalante	$1,856,115	400
Football field and facilities	101 S. Escalante	$629,583	2,000
Swimming Pool	200 W. Cortez	$105,819	150

USD #477 - Ingalls			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
School Building	100 Bulldog Drive	$13,000,000	400
Special Education Building	100 Bulldog Drive	$175,000	50
Bus Barn	100 Bulldog Drive	$150,000	-

Haskell Critical Facilities

Haskell County			
Facility and/or Asset Name	**Number of Facilities**	**Replacement or Estimated Value**	**Occupancy**
Communications (radio, TV, similar)	0	$0	0
County Emergency Operations Center (EOC)	0	$0	0
Fire / EMS stations	4	$800,000	22
Hospital(s)	0	$0	0
Law Enforcement (Sheriff/Police Bldgs)	1	$2,660,000	25
Emergency shelters	0	$0	0
Major government buildings	1	$759,180	0
Major roads (Mi)	110	$530,580,869	0
Bridges (No.)	2	$7,124,954	0
Fuel storage areas	2	$64,718	0
Electric / Gas utilities	5	$5,177,500	0
Pumping stations	0	$0	0
Response staging areas	0	$0	0
Sewage treatment plants	0	$0	0
Transportation systems	6	$208,224,000	0
Water treatment plants	0	$0	0
Wells and storage tanks	0	$0	0

Hodgeman County Critical Facilities

Hodgeman County			
Facility and/or Asset Name	**Number of Facilities**	**Replacement or Estimated Value**	**Occupancy**
Communications (radio, TV, similar)	2	$230,000	1
Fire / EMS stations	3	$1,710,000	5
Hospitals	1	$6,650,000	0
Law Enforcement (Sheriff/Police Bldgs)	1	$1,330,000	3
Emergency shelters	4	$1,900,000	340
Major government buildings	1	$1,100,000	22
Major roads (Miles)	300	$718,402,000	0
Bridges (No.)	90	$25,045,000	0
Fuel storage areas	2	$75,000	0
Electric / Gas utilities	3	$106,571,000	3
Sewage treatment plants	1	$126,540,000	1
Transportation systems	2	$57,236,000	5

Lane County Critical Facilities

Lane County			
Facility and/or Asset Name	**Number of Facilities**	**Replacement or Estimated Value**	**Occupancy**
Communications (radio, TV, similar)	0	$0	0
County Emergency Operations Center (EOC)	1	$60,000	6
Fire / EMS stations	8	$1,570,000	40
Hospital(s)	1	$7,325,000	40
Law Enforcement (Sheriff/Police Bldgs)	1	$1,500,000	10
Emergency shelters	4	$2,375,000	30
Major government buildings	3	$6,500,000	40
Major roads (Mi)	596	$600,302,678	0
Bridges (No.)	22	$10,764,000	0
Fuel storage areas	1	$100,000	2
Electric / Gas utilities	0	$0	0
Pumping stations	0	$0	0
Response staging areas	0	$0	0
Sewage treatment plants	1	$63,270,000	1
Transportation systems	3	$126,359,616	3
Water treatment plants	0	$0	0
Wells and storage tanks	0	$0	0

Meade County Critical Facilities

USD #225 - Fowler			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
Fowler Elementary	100 E. 8th	$4,982,259	760
Fowler JR/SR High	100 W. 8th	$4,113,404	892
Industrial Arts Building	808 Pine St.	$875,300	100
Bus Barn	100 E. 8th	$759,723	-
USD #226 - Meade			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
Meade High School	409 School Addition	$14,000,000	250
Meade Grade School	310 E. Grant	$11,500,000	400
Meade Learning Center	147 N. Fowler	$103,000	20
Bus Barn/Maintenance Shed	600 E Grant	$308,000	NA
USD #483 - Kismet/Plains			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
Kismet Grade School	505 Ks. Ave Kismet, KS	$4,236,434	-
Kismet Outbuildings	505 Ks. Ave Kismet,KS	$381,536	-
Plains Upper Grades	605 Mustang Plains, KS	$1,693,827	-
Plains Lower Grades	609 Quail Plains, KS	$3,178,533	-
Plains Bus Garage	813 Erie Plains, KS	$105,775	-
Plains Gymnasium	308 W. Jayhawk Plains, KS	$1,751,599	-
SWH JH/HS	17222 Mustang Rd. KismetKS	$21,272,644	-

Seward County Critical Facilities

Seward County			
Facility and/or Asset Name	**Number of Facilities**	**Replacement or Estimated Value**	**Occupancy**
Communications (radio, TV, similar)	4	$5,420,000	18
County Emergency Operations	1	$130,000	1
Fire / EMS stations	6	$3,790,000	11
Hospital	1	$70,000,000	210
Law Enforcement (Sheriff/Police Bldgs)	2	$12,660,000	210
Emergency shelters (schools)	14	$6,700,000	1800
Response staging areas	0	$0	0
Major government buildings	7	$15,500,000	130
Major roads (Mi)	136	$620,483,454	0
Major Hwy Bridges (No.)	11	$23,272,912	0
Fuel storage areas	5	$850,000	7
Electric / Gas utilities	19	$123,139,000	32
Pumping stations	4	$300,000	2
Transportation systems	4	$102,961,509	38
Water treatment plants	0	$0	0
Wells and storage tanks	24	$11,850,000	5

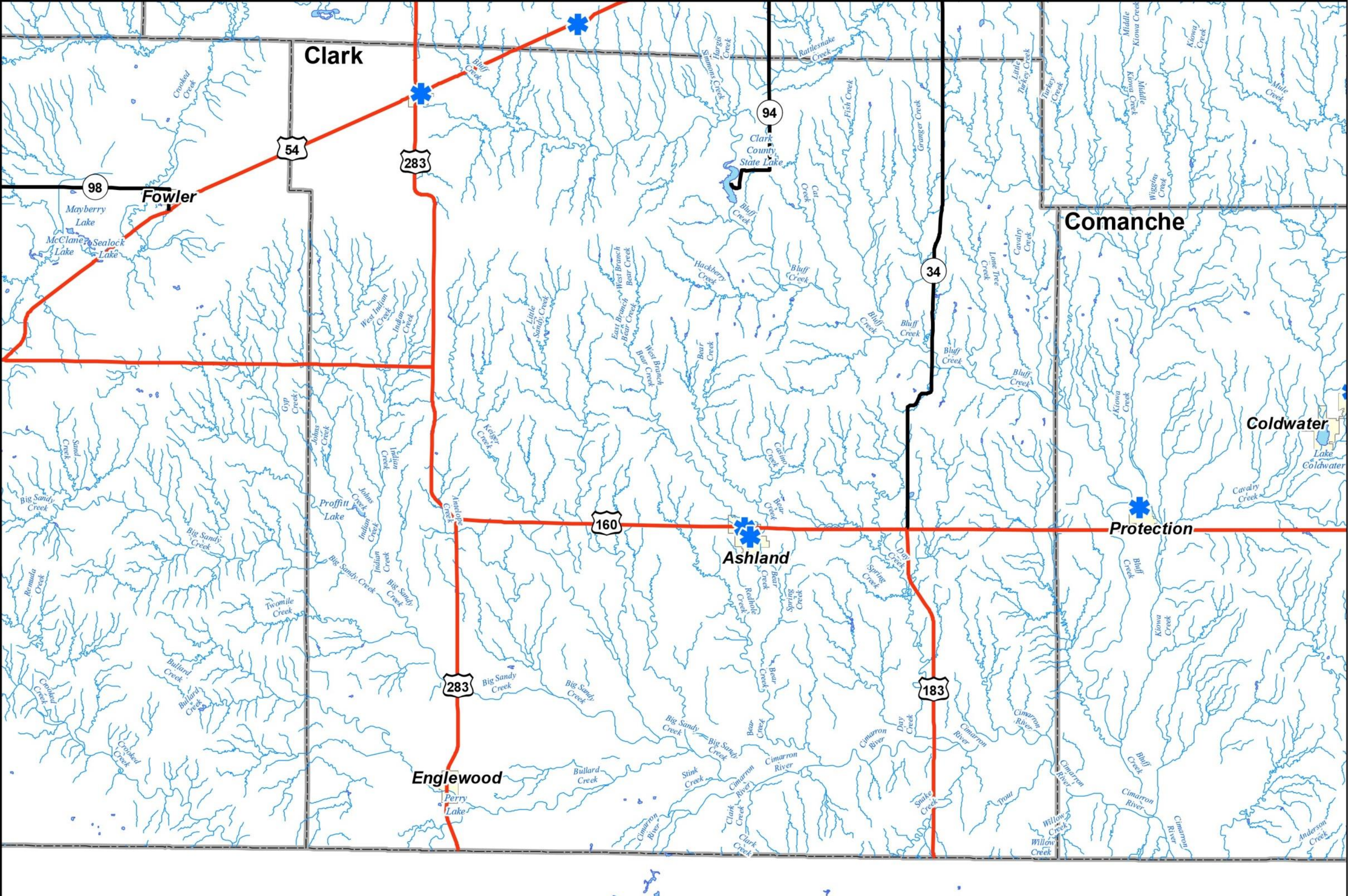
USD #483 - Kismet/Plains			
Facility and/or Asset Name	**Address**	**Replacement or Estimated Value**	**Occupancy**
Kismet Grade School	505 Ks. Ave Kismet, KS	$4,236,434	-
Kismet Outbuildings	505 Ks. Ave Kismet, KS	$381,536	-
Plains Upper Grades	605 Mustang Plains, KS	$1,693,827	-
Plains Lower Grades	609 Quail Plains, KS	$3,178,533	-
Plains Bus Garage	813 Erie Plains, KS	$105,775	-
Plains Gymnasium	308 W. Jayhawk Plains, KS	$1,751,599	-
SWH JH/HS	17222 Mustang Rd. Kismet, KS	$21,272,644	-

Critical Facilities in Flood Plains

The following county maps show critical facilities located in flood plains, if flood plain information was available for the county. If flood plain information was not available, the location of the facilities is shown in relation to streams and bodies of water. Identified critical facilities include:

- Schools
- Police Stations
- Fire Stations
- Hospitals (if information made available)
- Elderly care facilities (if information made available)

Please note that not all participating counties and/or jurisdictions had this data available.



EMS locations, and Floodplains
Clark County, KS

EMS
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)

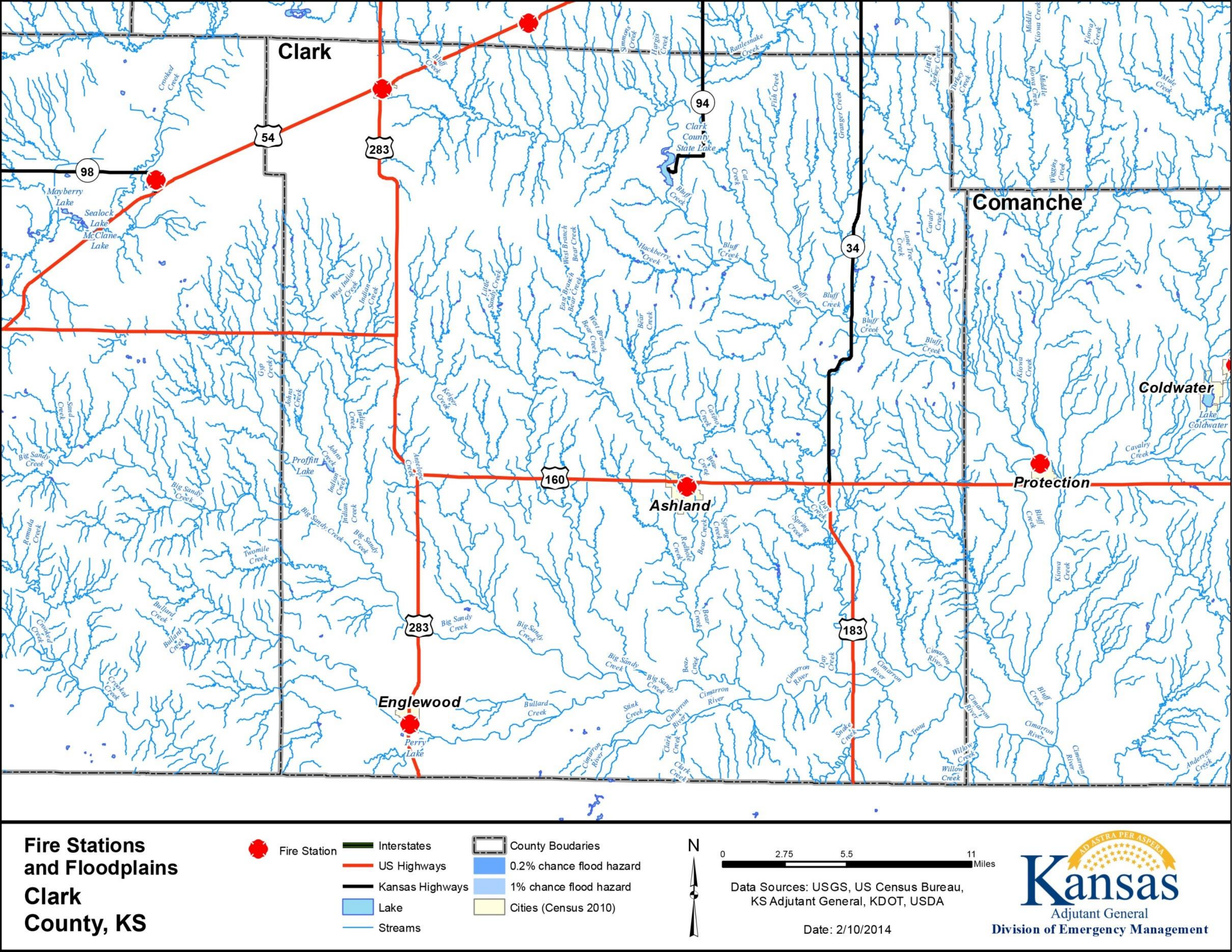
N

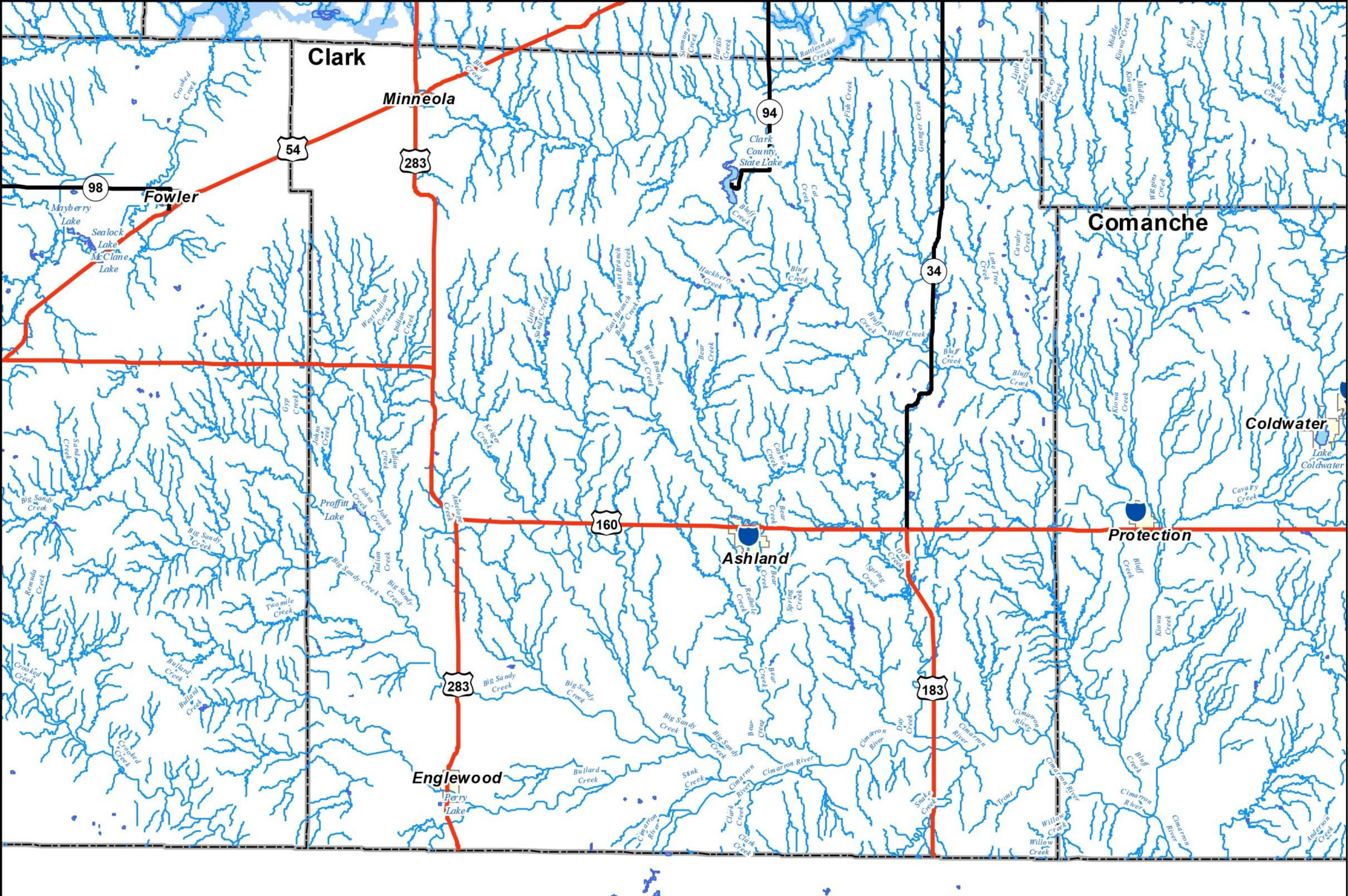
0 2.75 5.5 11 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 2/10/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management


Clark
Comanche
Coldwater
Protection
Ashland
Englewood
54
283
98
94
34
160
183
Fire Stations and Floodplains
Clark County, KS
Fire Station
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
N
0 2.75 5.5 11 Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
Kansas
Adjutant General
Division of Emergency Management



Law Enforcement and Floodplains Clark County, KS

Law Enforcement
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries

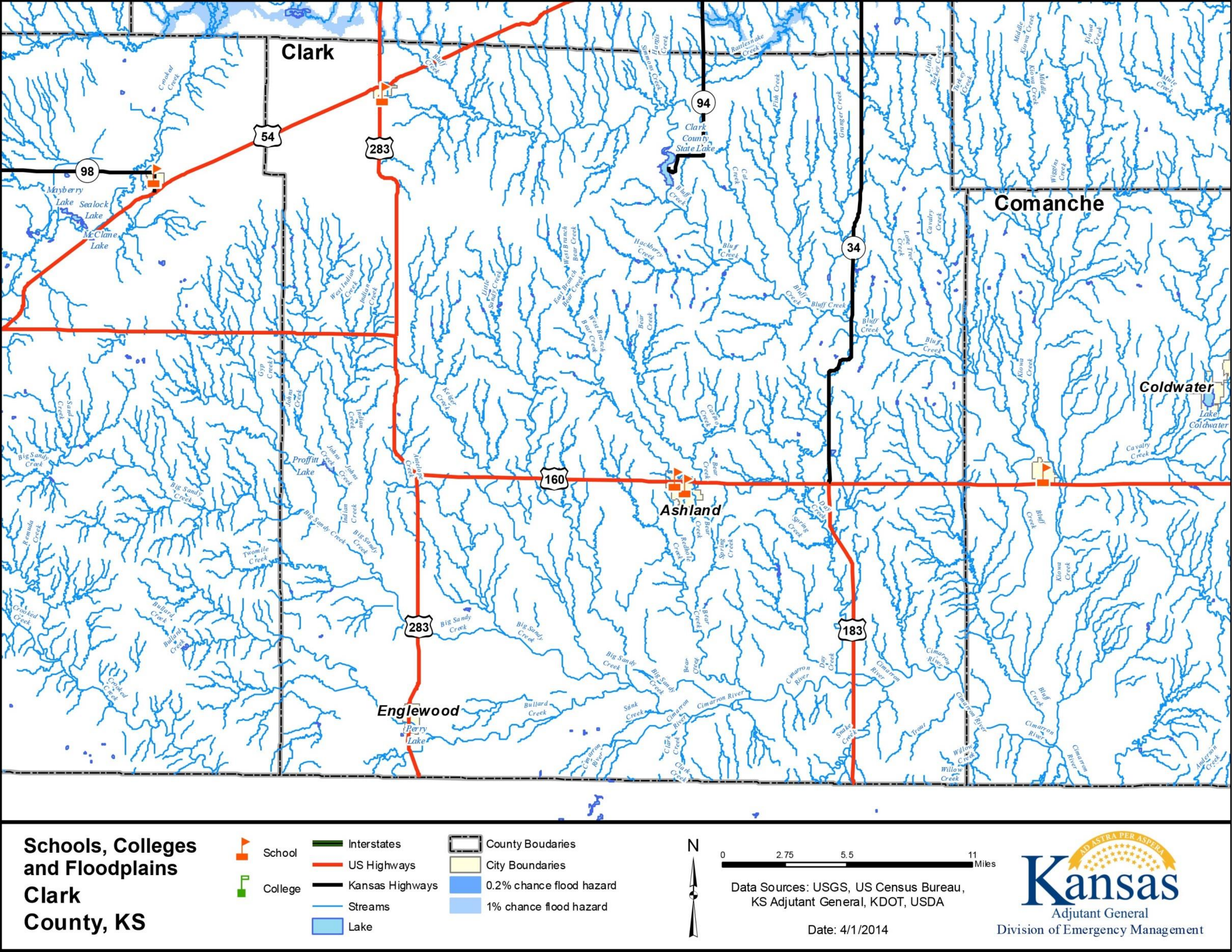
N

0 2.75 5.5 11 Miles

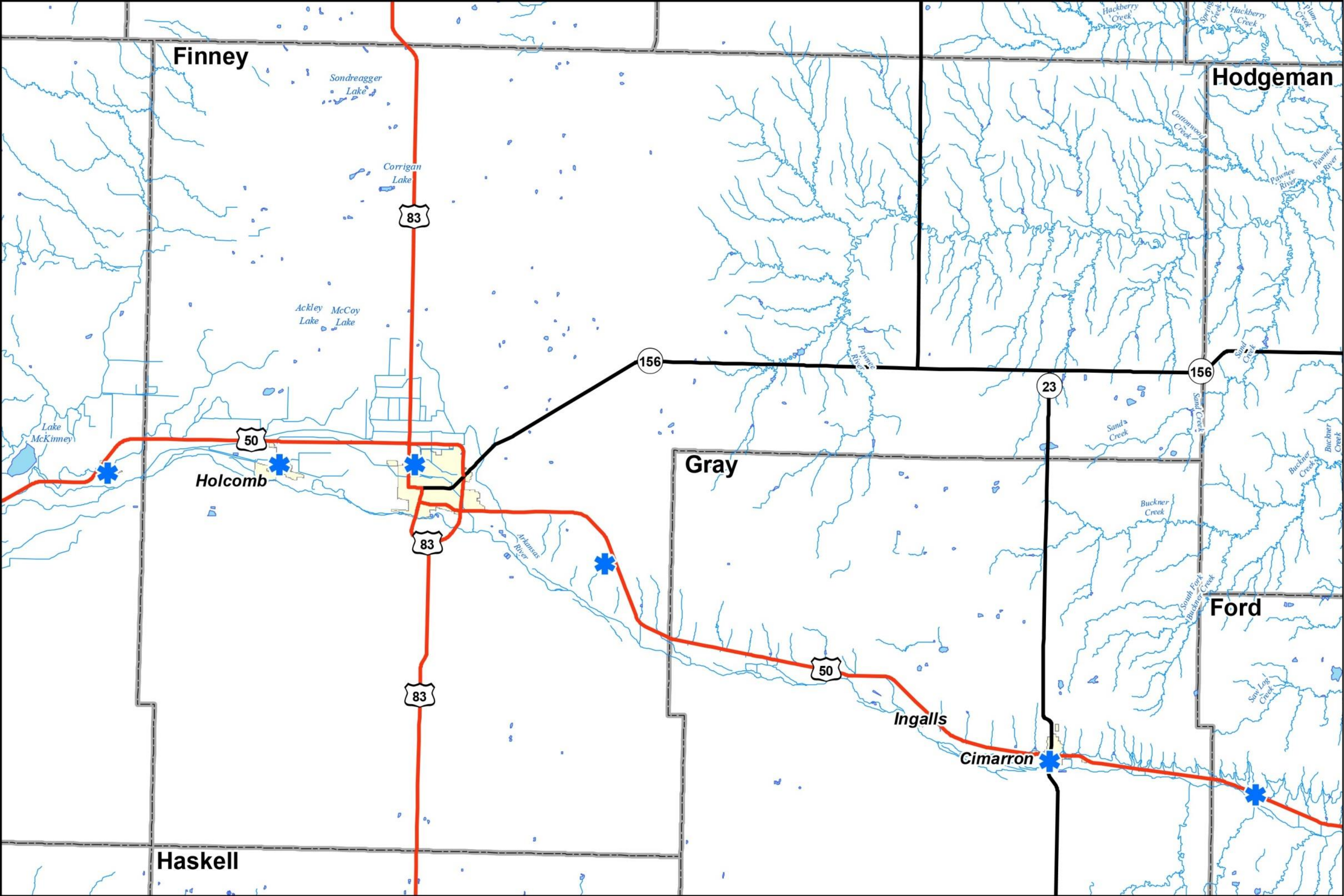
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 3/6/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Clark
Comanche
Ashland
Englewood
Coldwater
Clark County State Lake
Schools, Colleges and Floodplains
Clark County, KS
School
College
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries
0.2% chance flood hazard
1% chance flood hazard
N
0 2.75 5.5 11 Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 4/1/2014
AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



EMS locations, and Floodplains

Finney County, KS

EMS	
Interstates	County Boudaries
US Highways	0.2% chance flood hazard
Kansas Highways	1% chance flood hazard
Lake	Cities (Census 2010)
Streams	

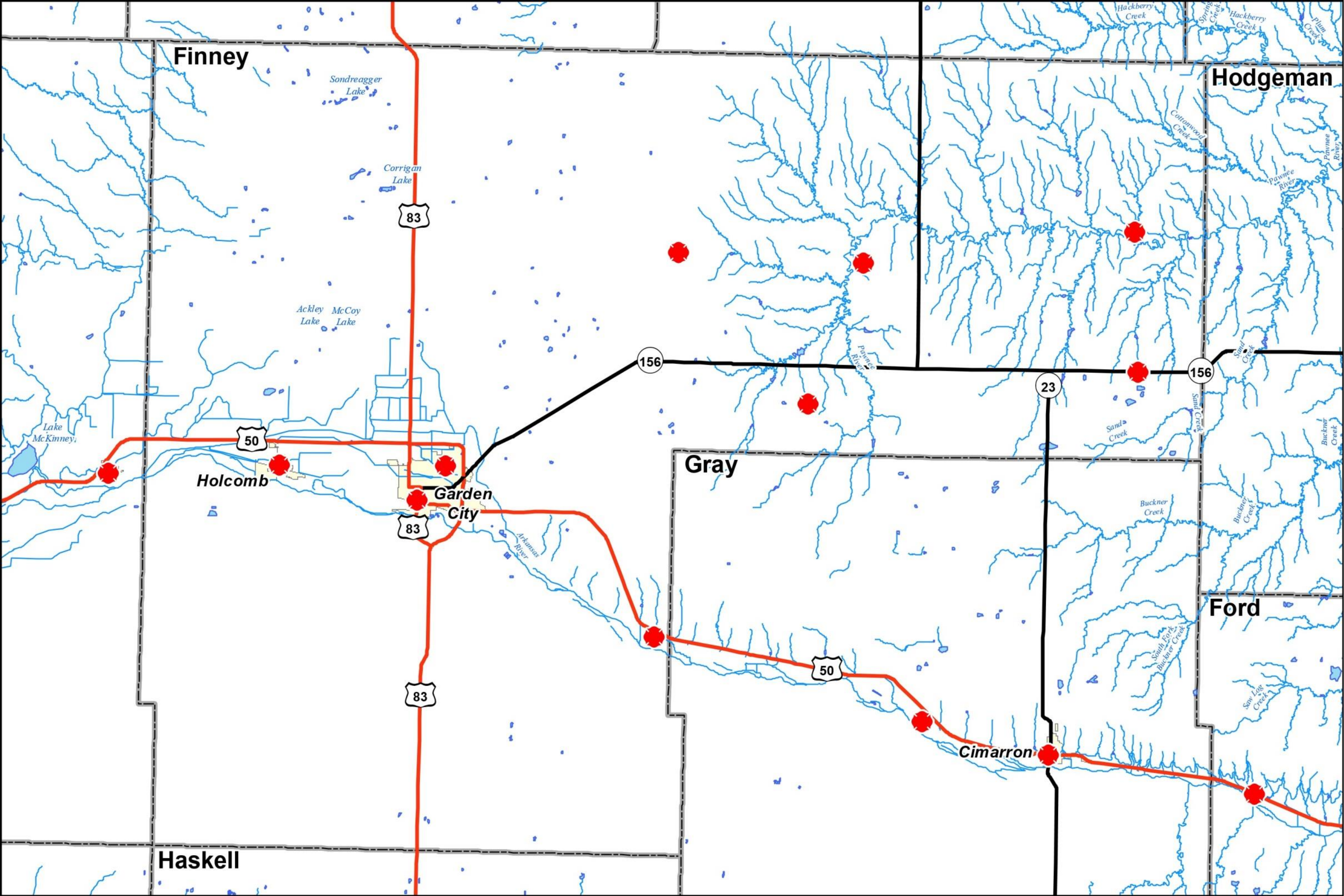
N

0 3 6 12 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 2/10/2014

AD ASTRA PER ASPERA Kansas Adjutant General Division of Emergency Management



Fire Stations and Floodplains

Finney County, KS

Fire Station

Interstates

US Highways

Kansas Highways

Lake

Streams

County Boudaries

0.2% chance flood hazard

1% chance flood hazard

Cities (Census 2010)

N

0 3 6 12 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

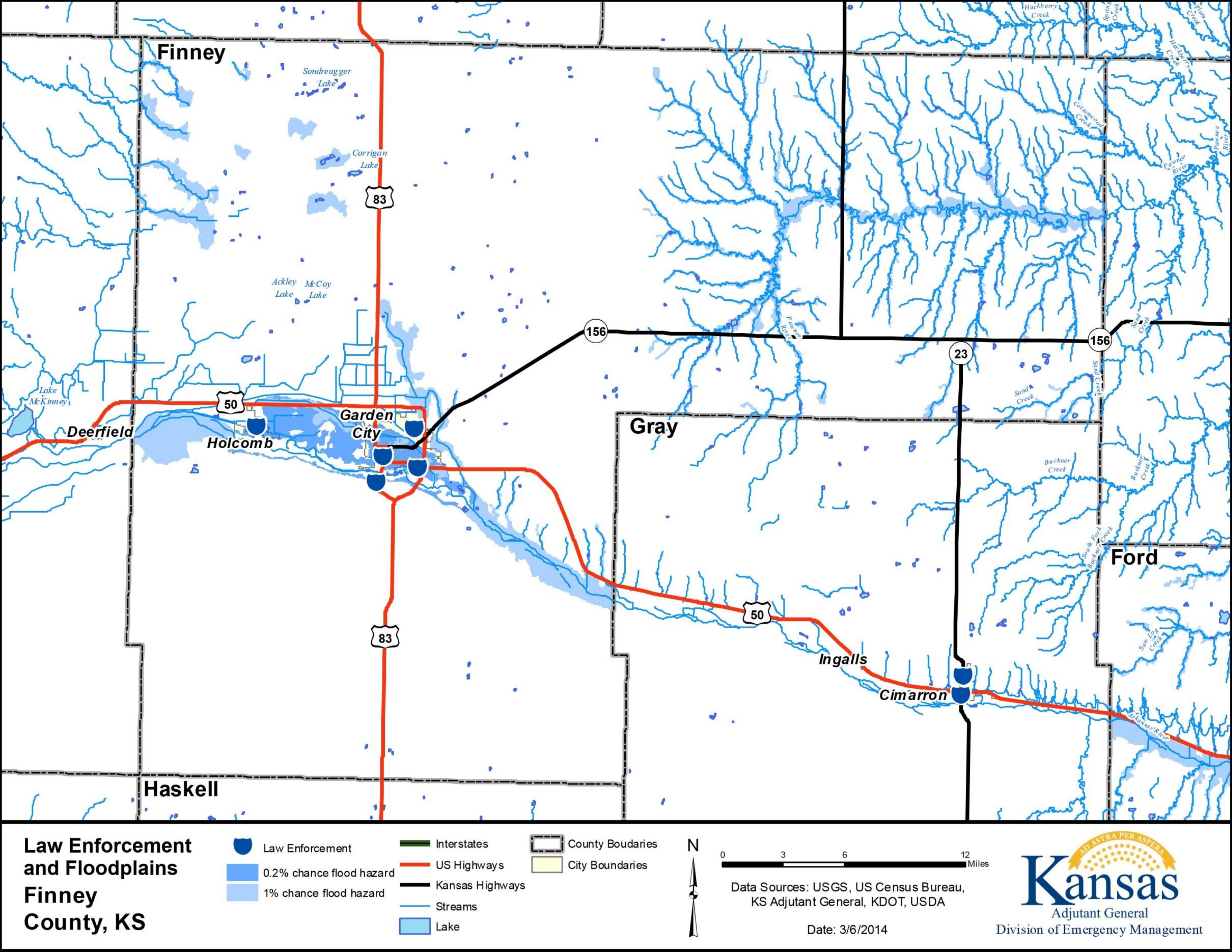
Date: 2/10/2014

AD ASTRA PER ASPERA

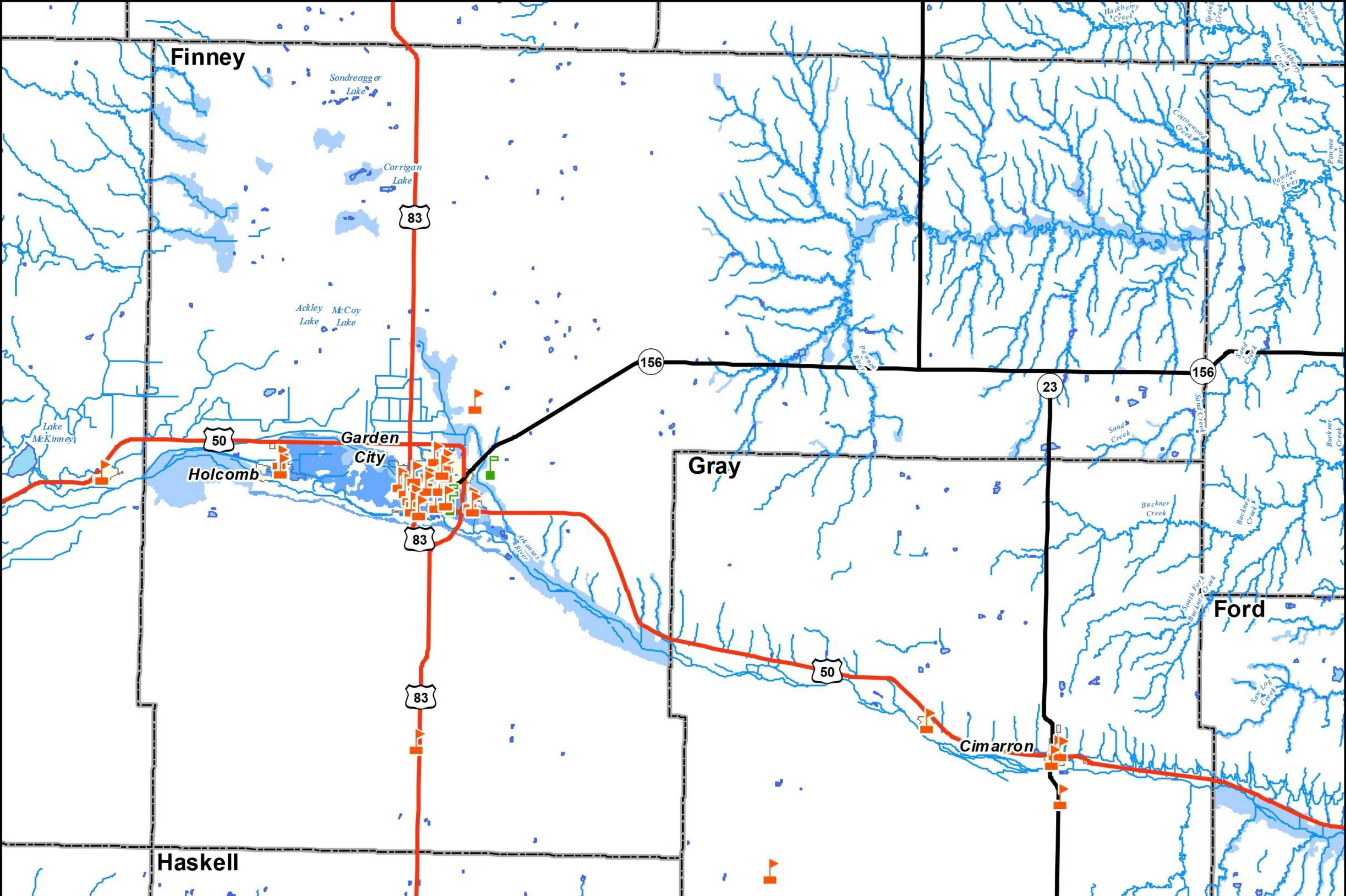
Kansas

Adjutant General

Division of Emergency Management



Finney
Gray
Haskell
Ford
Sondreagger Lake
Corrigan Lake
Ackley Lake
McCoy Lake
Lake McKinney
Deerfield
Holcomb
Garden City
Ingalls
Cimarron
83
50
156
23
Pawnee River
Hackberry Creek
Spring Creek
Plum Creek
Cottonwood Creek
Pawnee River
Sand Creek
Buckner Creek
South Fork Buckner Creek
Saw Log Creek
Arkansas River
Law Enforcement and Floodplains Finney County, KS
Law Enforcement
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries
N
0 3 6 12 Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 3/6/2014
AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Schools, Colleges and Floodplains Finney County, KS

School

College

Interstates

US Highways

Kansas Highways

Streams

Lake

County Boudaries

City Boundaries

0.2% chance flood hazard

1% chance flood hazard

N

0 3 6 12 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

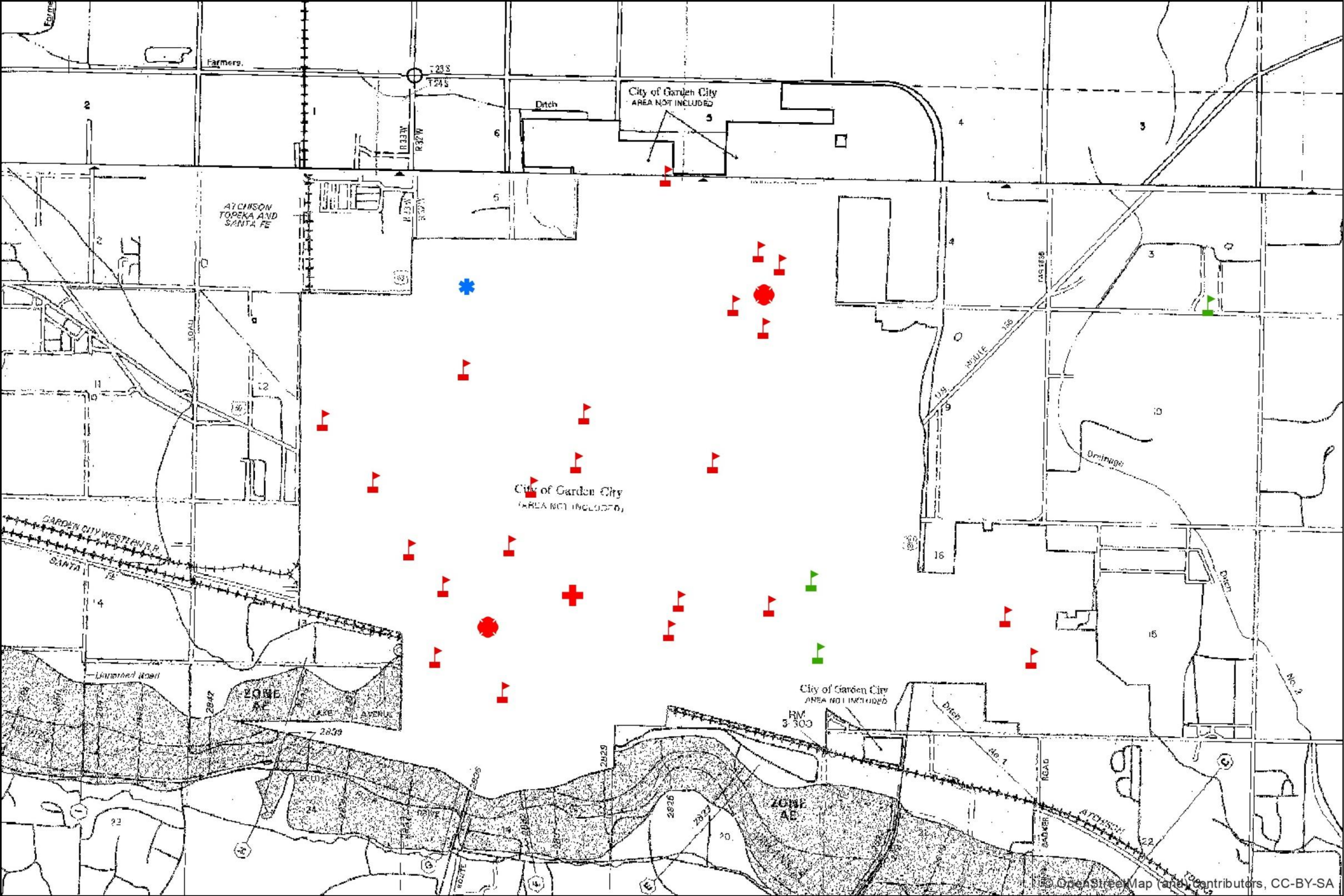
Date: 4/1/2014

AD ASTRA PER ASPERA

Kansas

Adjutant General

Division of Emergency Management



Dam
Levee
Hospital
School
College
EMS
Fire Station

Flood Zone

0.2% Chance Annual Flood
A
AE
Floodway

Flood Hazard Areas Critical Infrastructure City of Garden City Finney County, KS

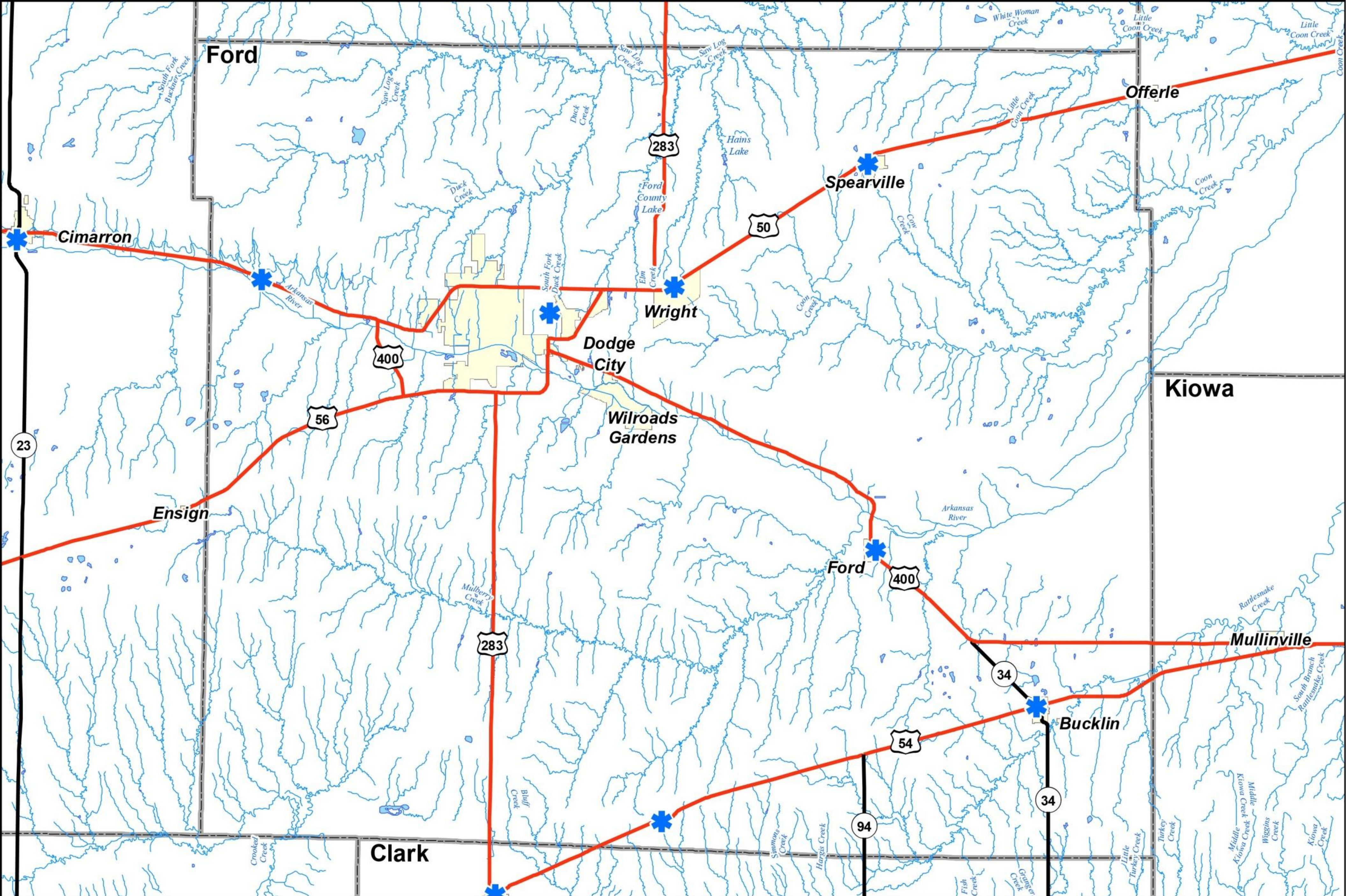
N

0 0.325 0.65 1.3 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA, KDA, KDHE

Date: 7/31/2014

Kansas Adjutant General Division of Emergency Management



EMS locations, and Floodplains Ford County, KS

EMS	
Interstates	County Boudaries
US Highways	0.2% chance flood hazard
Kansas Highways	1% chance flood hazard
Lake	Cities (Census 2010)
Streams	

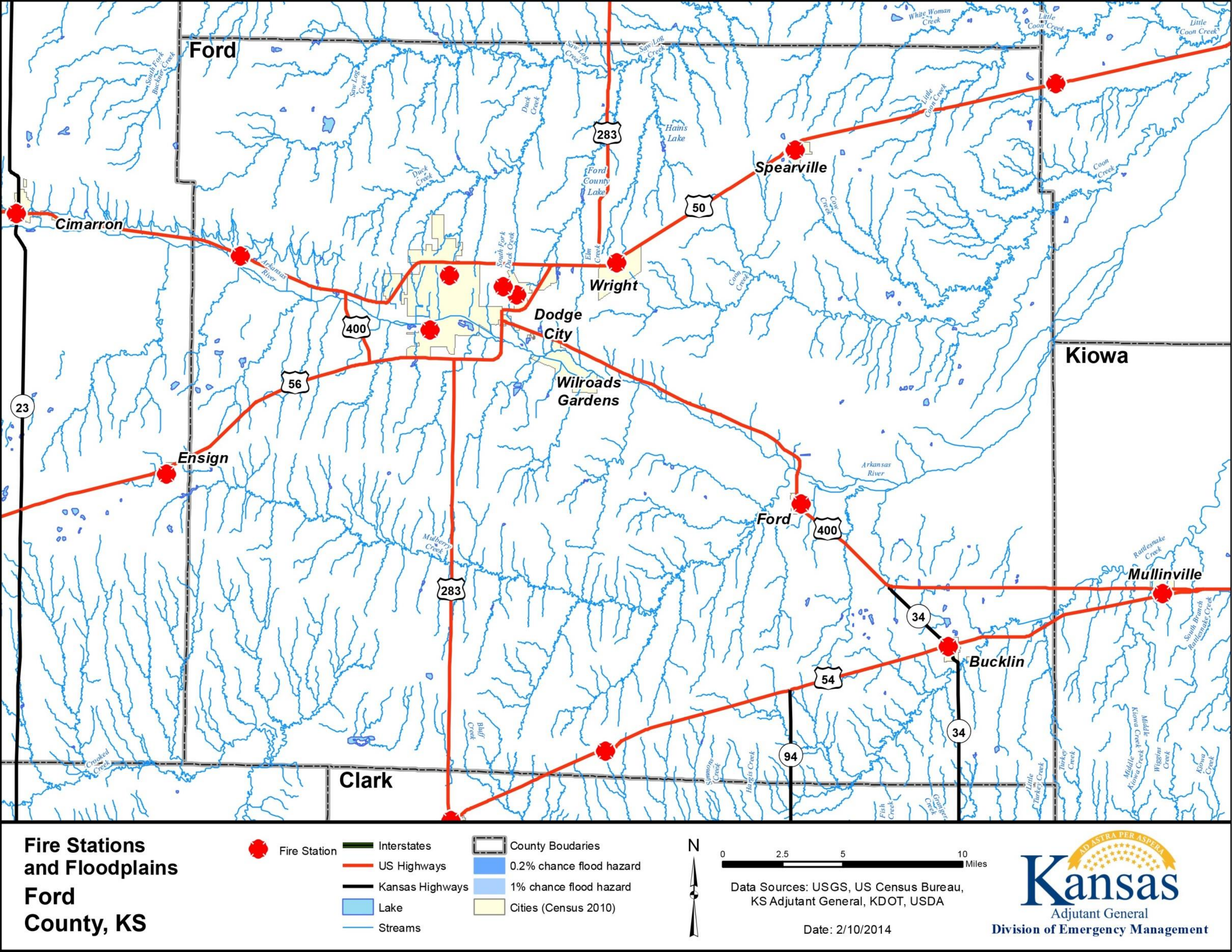
N

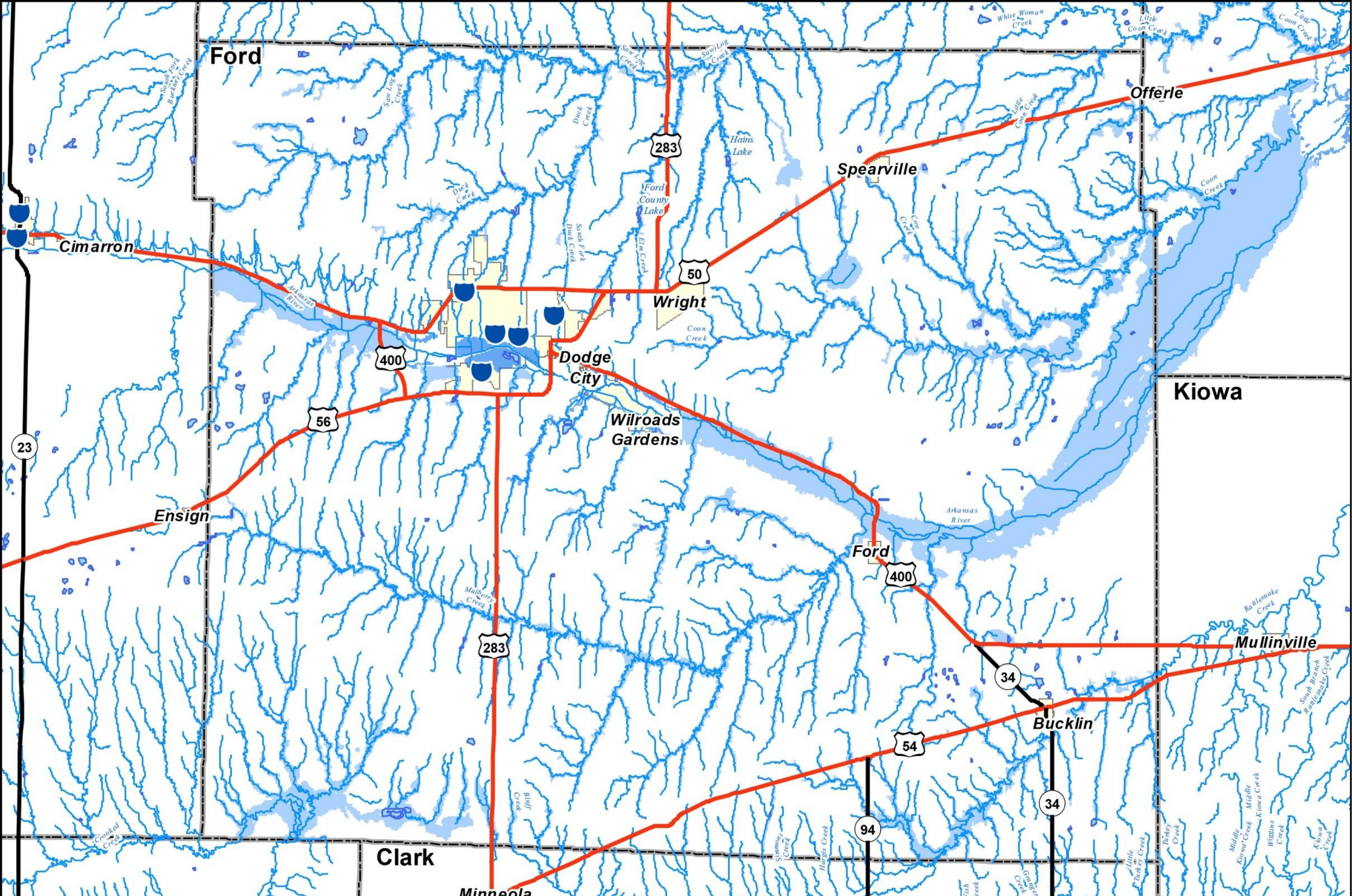
0 2.5 5 10 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 2/10/2014

Kansas Adjutant General
Division of Emergency Management


Fire Stations and Floodplains
Ford County, KS
Ford
Kiowa
Clark
Cimarron
Spearville
Wright
Dodge City
Wilroads Gardens
Ensign
Ford
Mullinville
Bucklin
283
50
400
56
23
34
54
94
Arkansas River
Duck Creek
Saw Log Creek
South Fork Duck Creek
Elm Creek
Ford County Lake
Hains Lake
Coon Creek
Little Coon Creek
Cow Creek
White Woman Creek
South Fork Buckner Creek
Mulberry Creek
Bluff Creek
Crooked Creek
Simmons Creek
Hargis Creek
Fish Creek
Granger Creek
Little Turkey Creek
Turkey Creek
Middle Kiowa Creek
Wiggins Creek
Kiowa Creek
Rattlesnake Creek
South Branch Rattlesnake Creek
Fire Station
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
N
0 2.5 5 10 Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Law Enforcement and Floodplains Ford County, KS

- Law Enforcement
- 0.2% chance flood hazard
- 1% chance flood hazard
- Interstates
- US Highways
- Kansas Highways
- Streams
- Lake
- County Boudaries
- City Boundaries

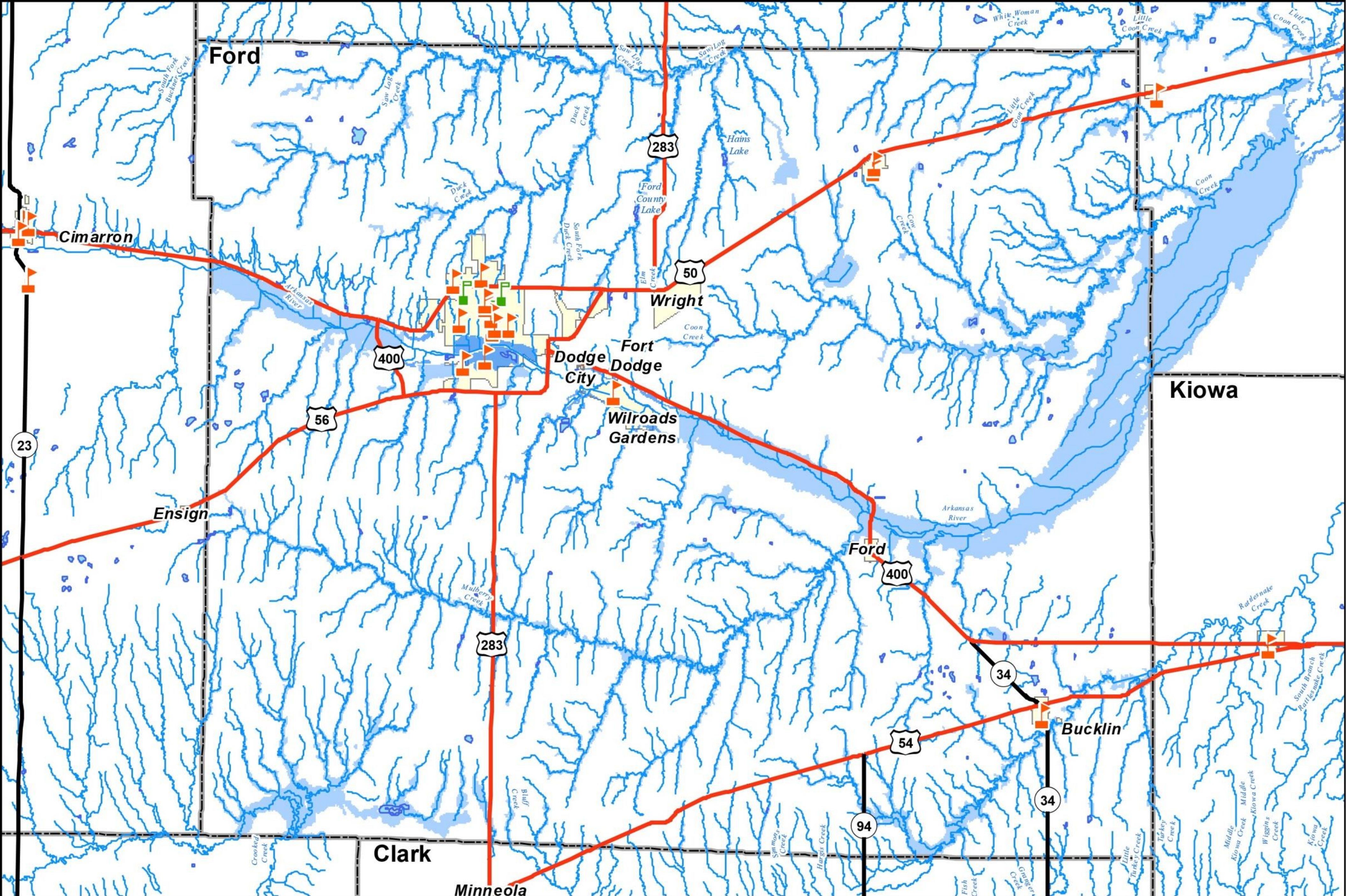
N

0 2.5 5 10 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 3/6/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Schools, Colleges and Floodplains Ford County, KS

School

College

Interstates

US Highways

Kansas Highways

Streams

Lake

County Boudaries

City Boundaries

0.2% chance flood hazard

1% chance flood hazard

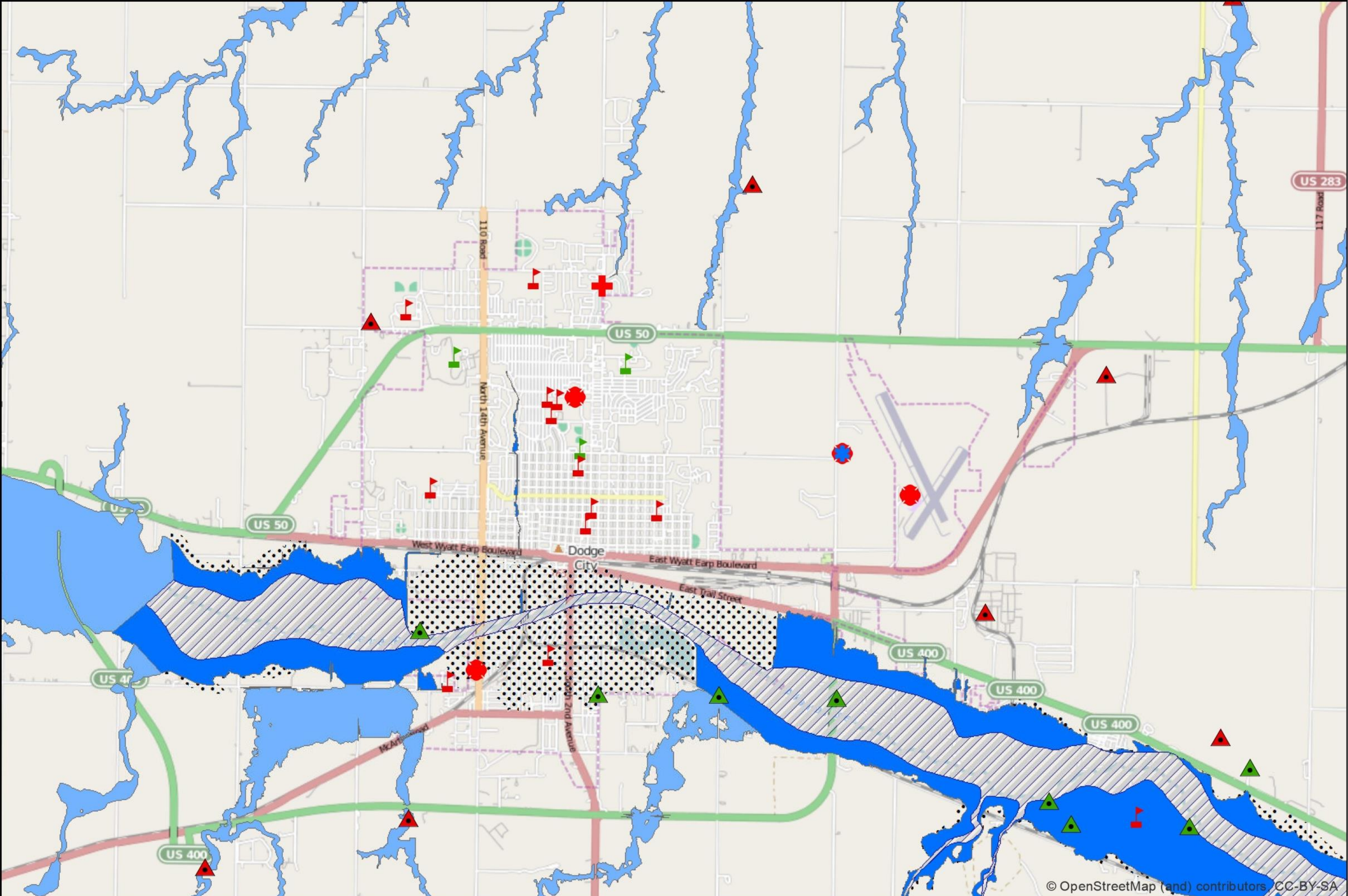
N

0 2.5 5 10 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 4/1/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management

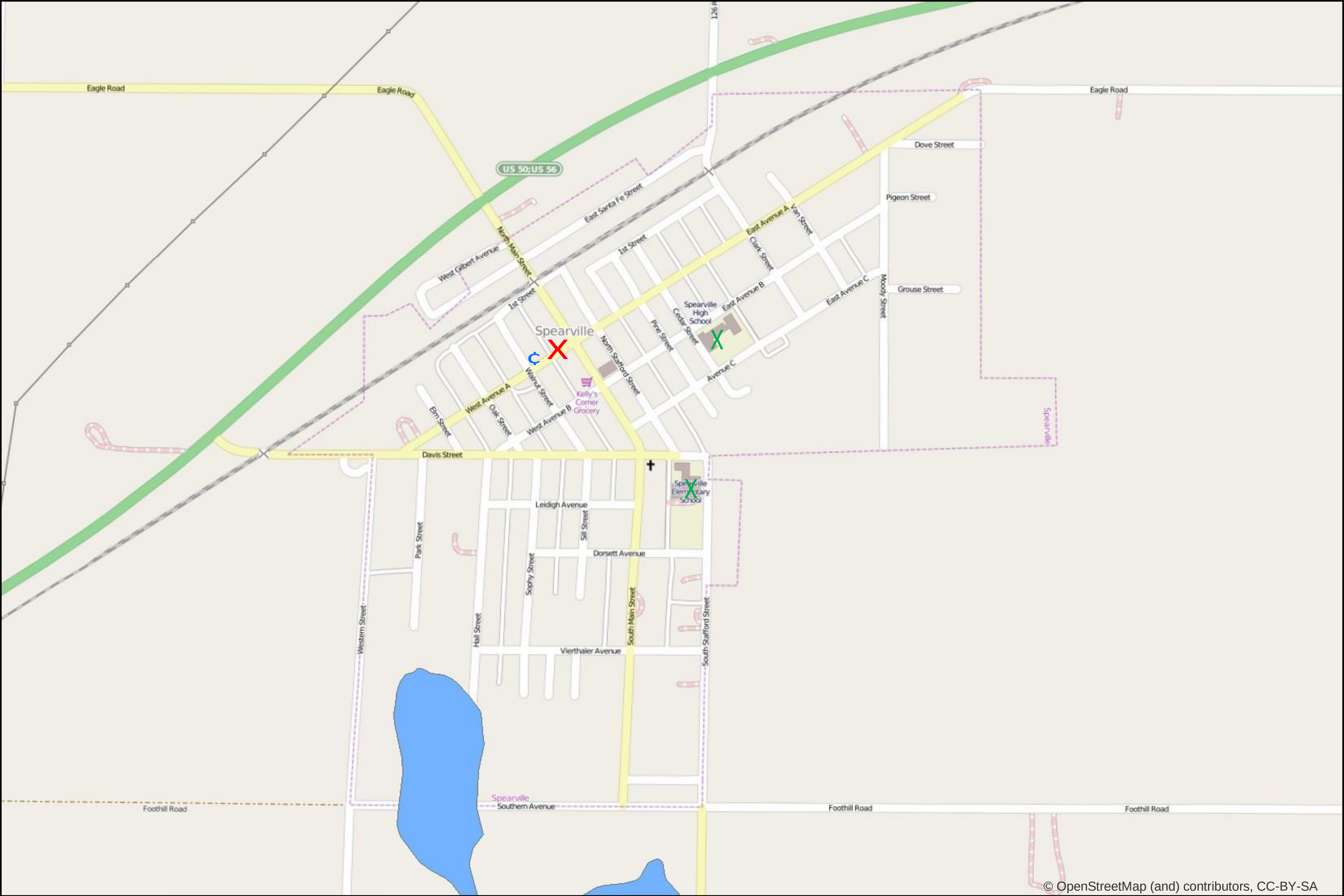


Flood Hazard Areas Critical Infrastructure City of Dodge City Ford County, KS

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA, KDA, KDHE

Date: 7/31/2014

Kansas Adjutant General Division of Emergency Management



X School
Ç EMS
X Fire Station

Flood Zone

- 0.2% Chance Annual Flood
- A
- AE
- Floodway

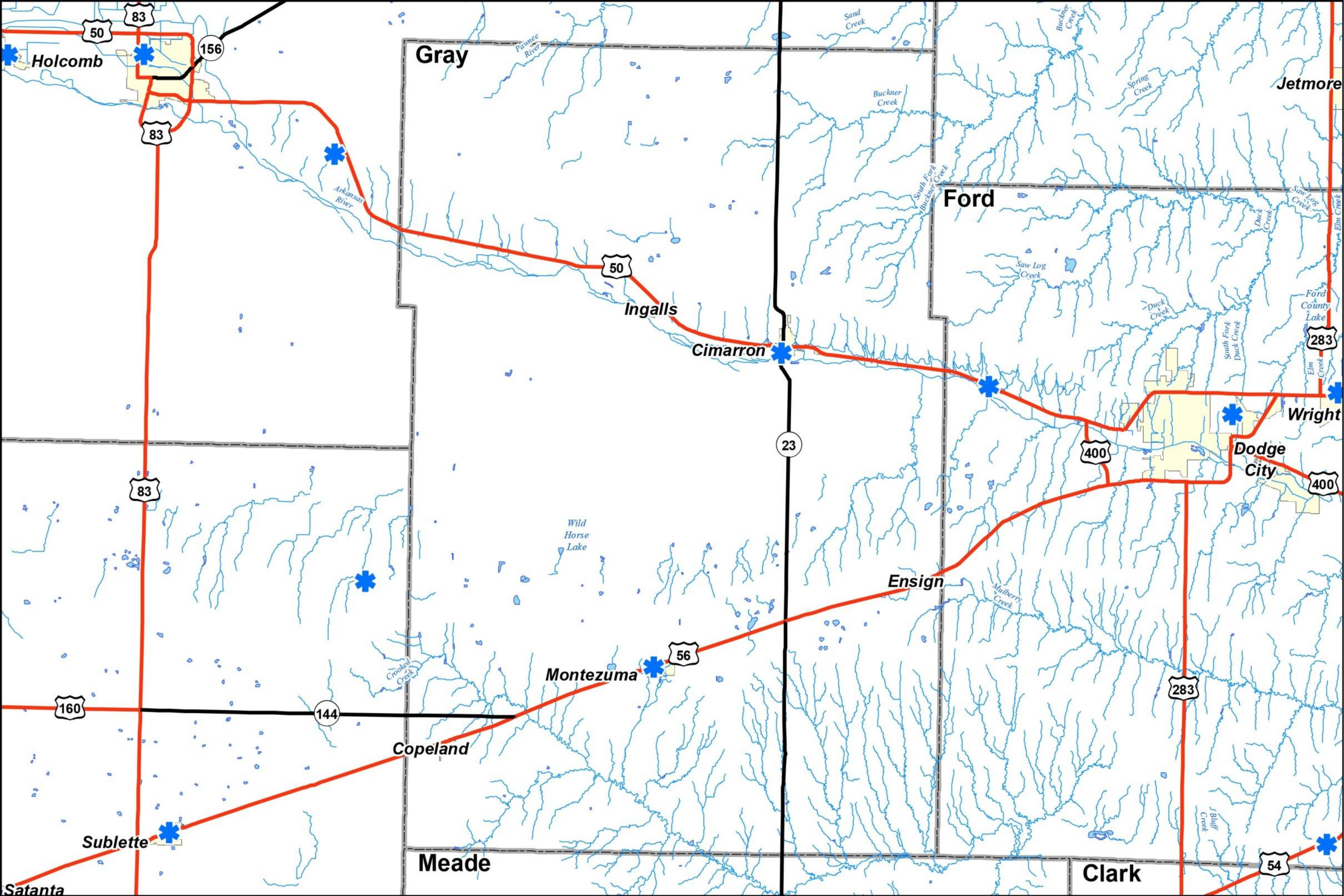
Flood Hazard Areas
Critical Infrastructure
City of Spearville
Ford
County, KS

0 0.075 0.15 0.3 Miles

Data Sources: USGS, US Census Bureau,
KS Adjutant General, KDOT, USDA, KDA, KDHE

Date: 7/31/2014

Kansas Adjutant General
Division of Emergency Management



EMS locations, and Floodplains

Gray County, KS

EMS

Interstates

US Highways

Kansas Highways

Lake

Streams

County Boudaries

0.2% chance flood hazard

1% chance flood hazard

Cities (Census 2010)

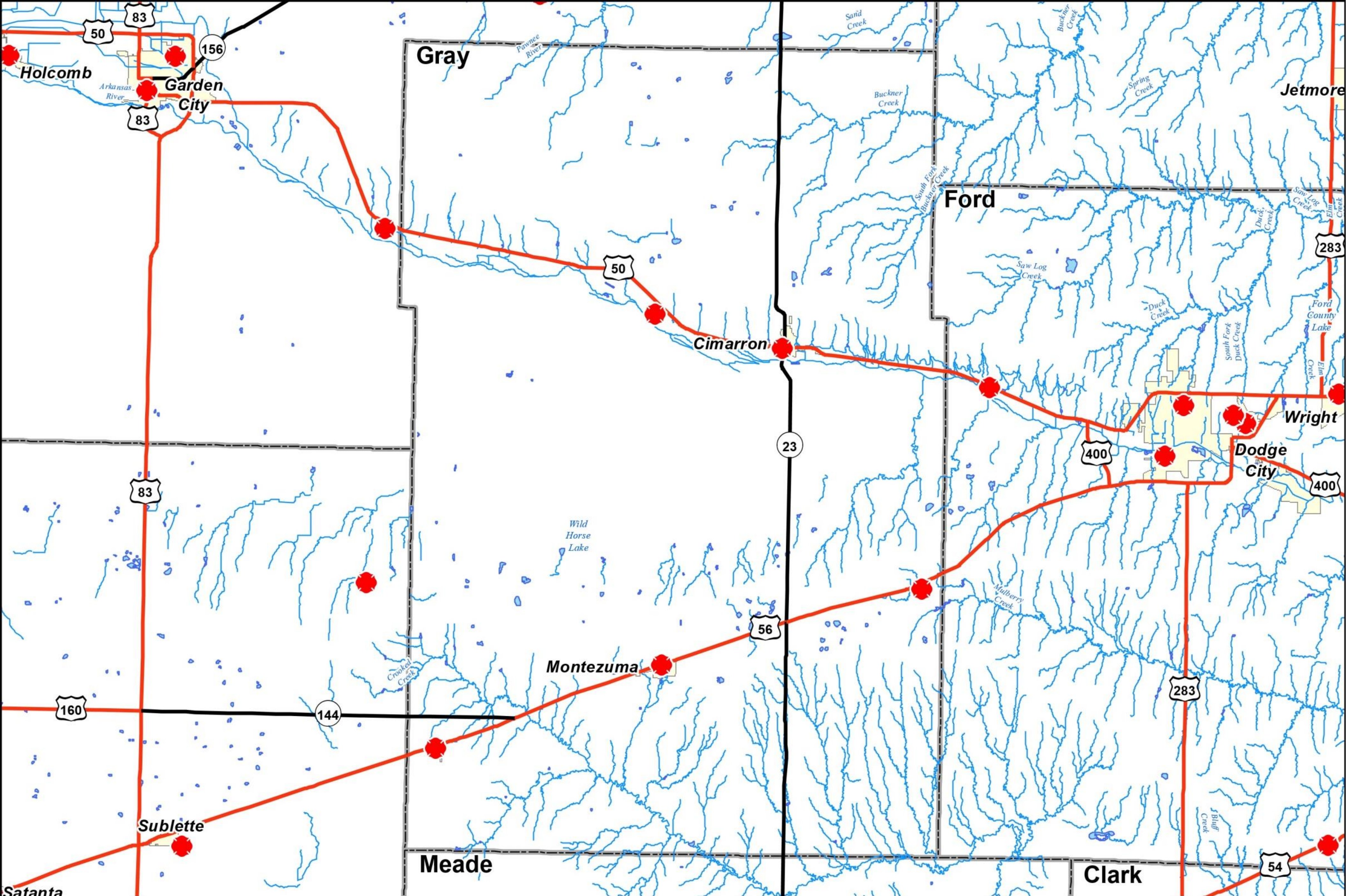
N

0 3 6 12 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 2/10/2014

Kansas Adjutant General Division of Emergency Management



Fire Stations and Floodplains

Gray County, KS

Fire Station

Interstates

US Highways

Kansas Highways

Lake

Streams

County Boudaries

0.2% chance flood hazard

1% chance flood hazard

Cities (Census 2010)

N

0 3 6 12 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

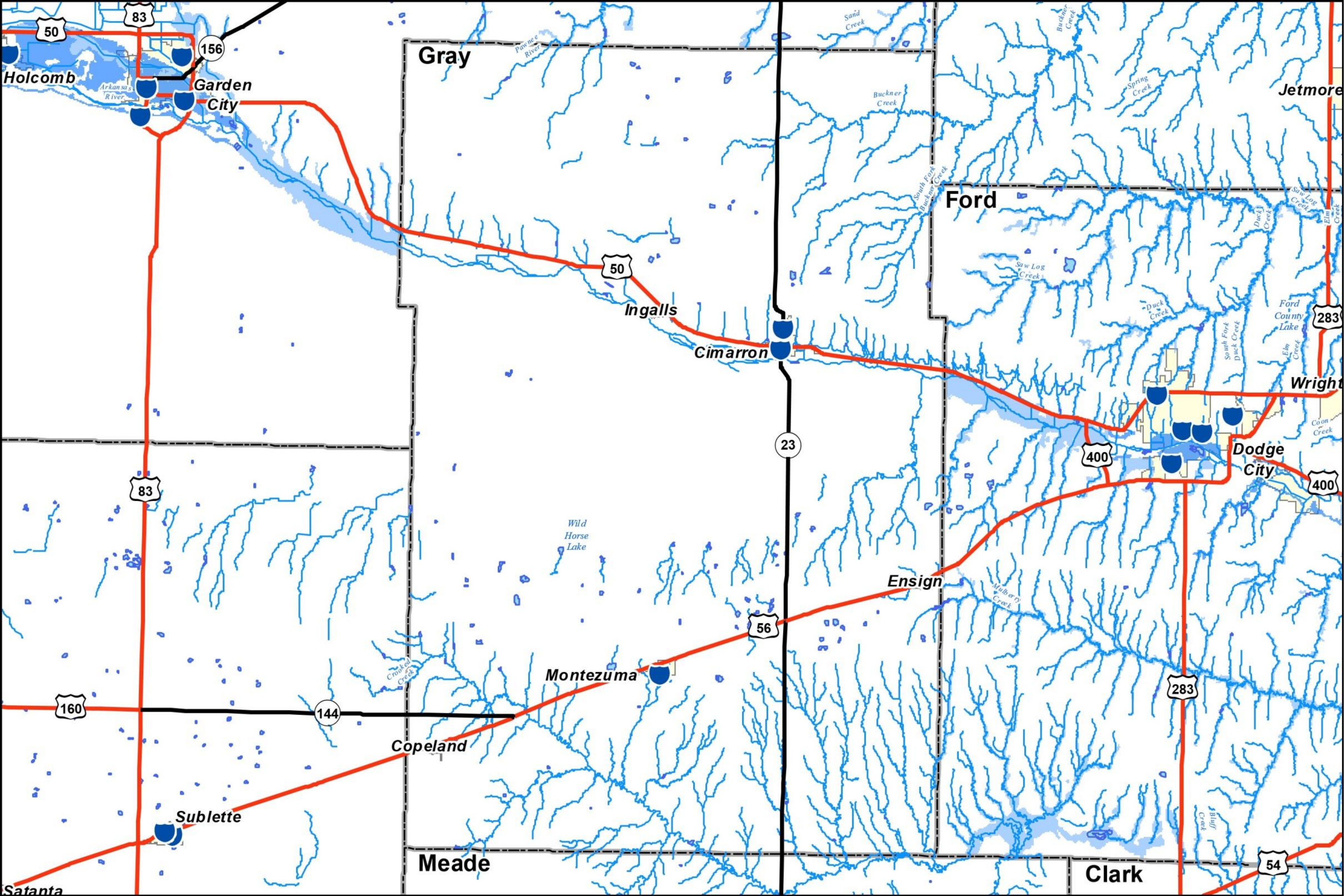
Date: 2/10/2014

AD ASTRA PER ASPERA

Kansas

Adjutant General

Division of Emergency Management



Law Enforcement and Floodplains
Gray County, KS

Law Enforcement
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries

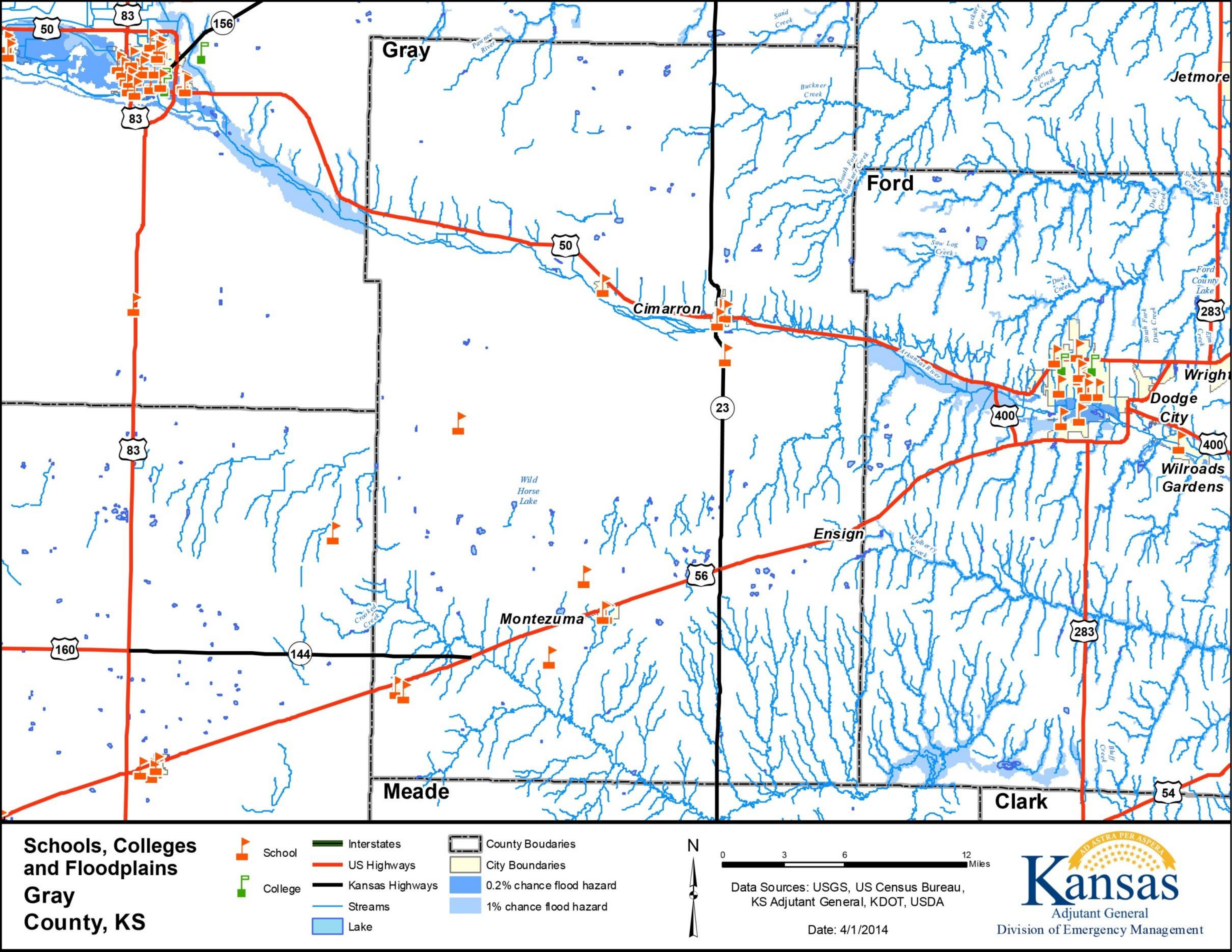
N

0 3 6 12 Miles

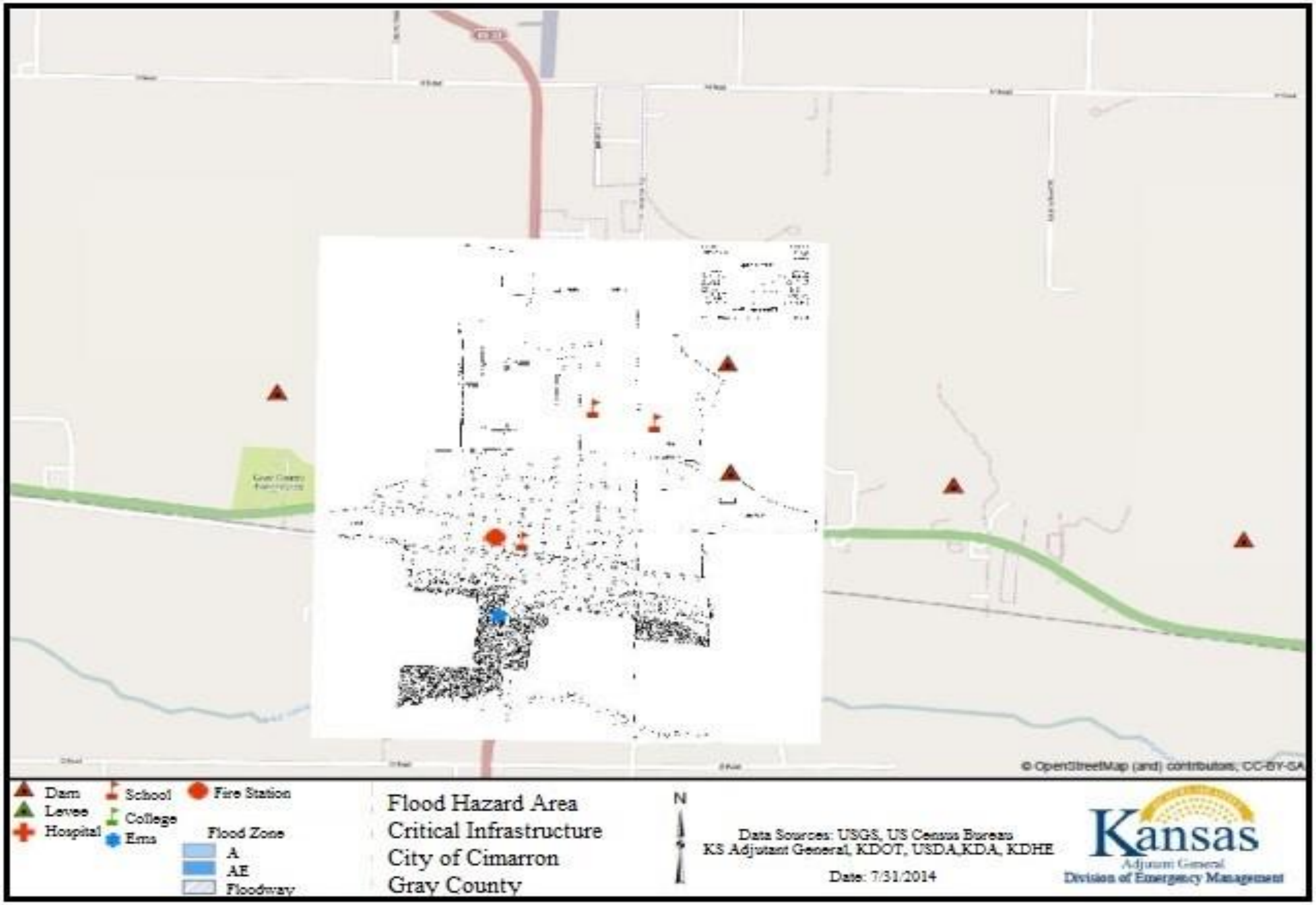
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 3/6/2014

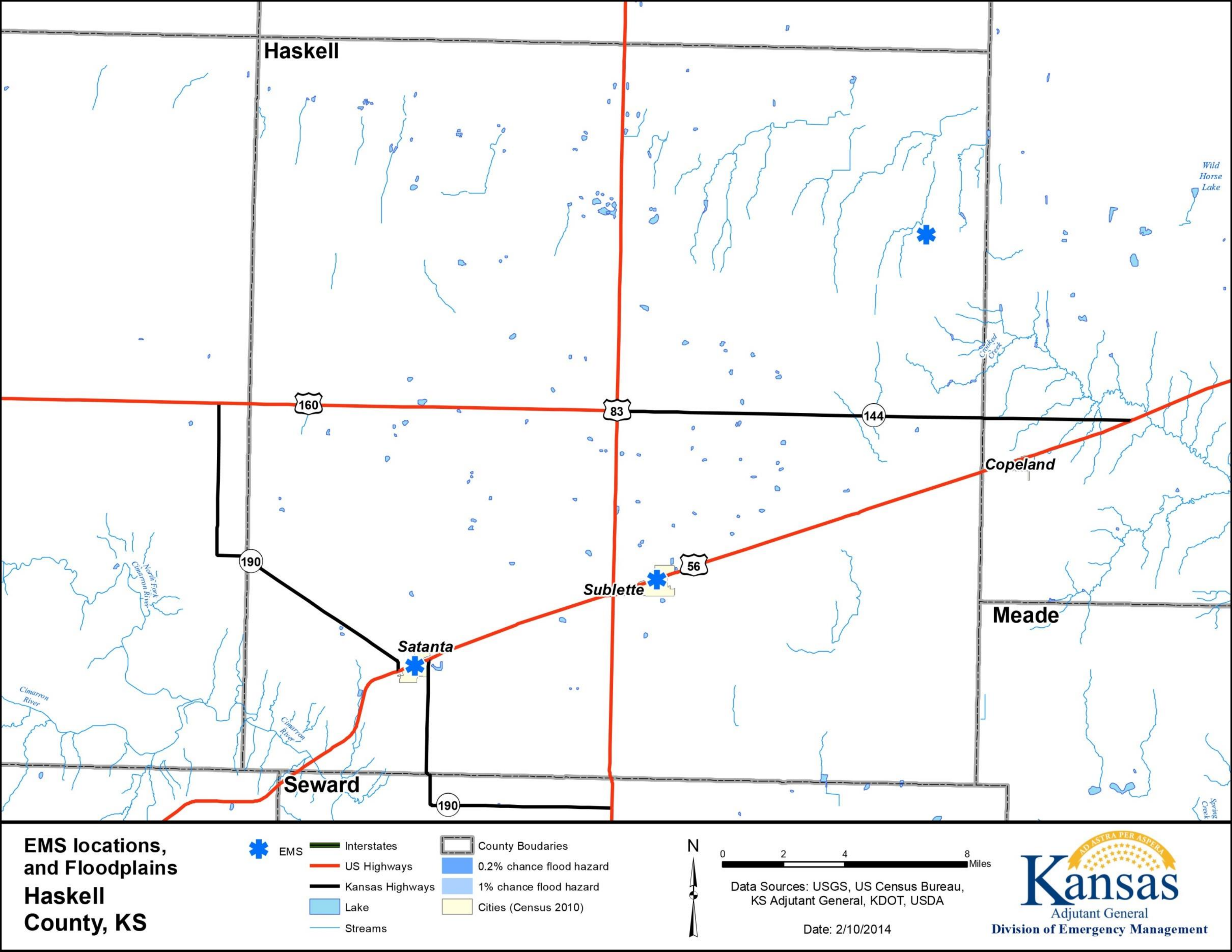
AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



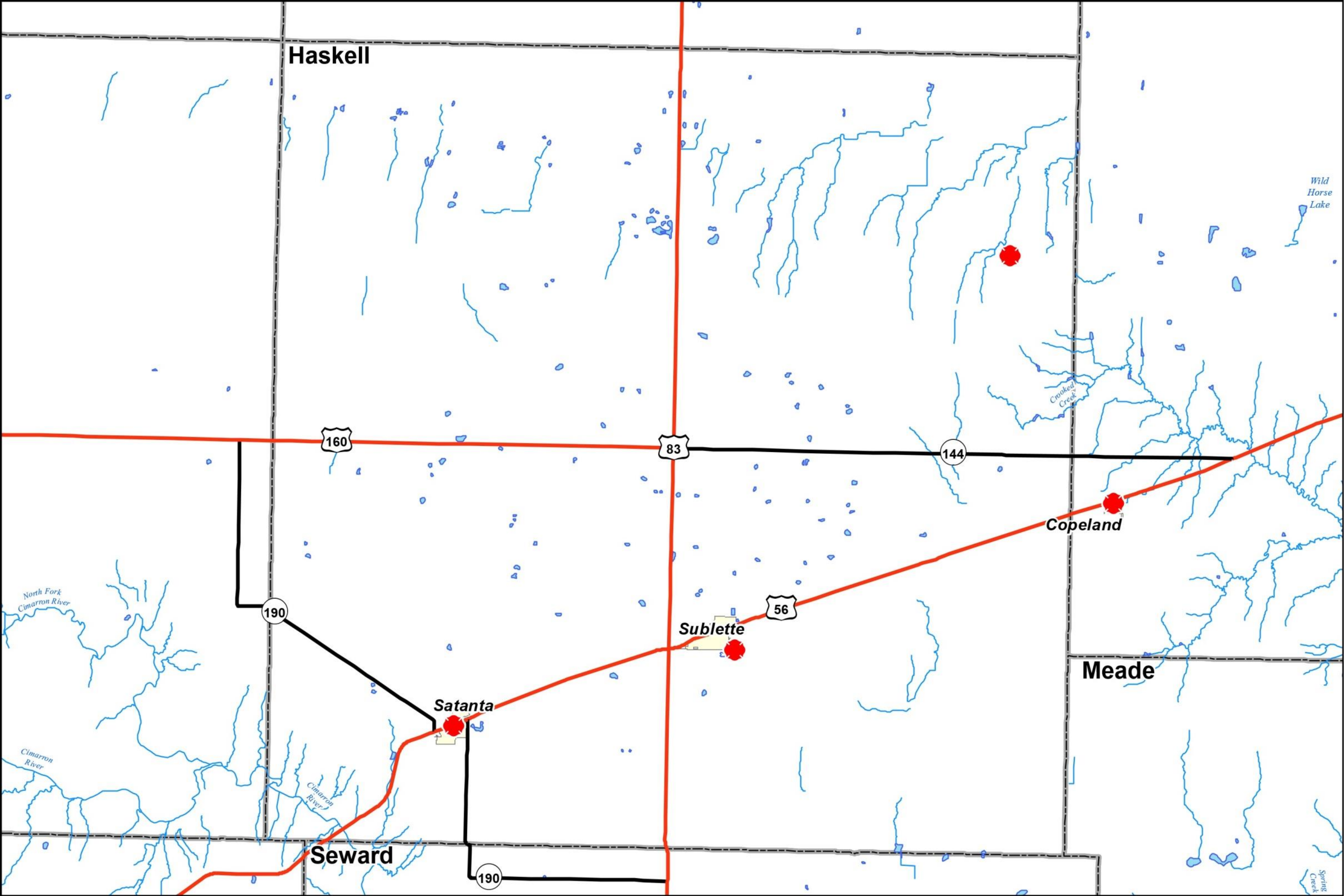
Schools, Colleges and Floodplains Gray County, KS



Dam
Levee
Hospital
School
College
Ems
Fire Station
Flood Zone
A
AE
Floodway
Flood Hazard Area
Critical Infrastructure
City of Cimarron
Gray County
N
Data Sources: USGS, US Census Bureau
KS Adjutant General, KDOT, USDA,KDA, KDHE
Date: 7/31/2014
Kansas
Adjutant General
Division of Emergency Management
© OpenStreetMap (and) contributors, CC-BY-SA



Haskell
Meade
Seward
Wild Horse Lake
Crooked Creek
North Fork Cimarron River
Cimarron River
Cimarron River
Spring Creek
Copeland
Sublette
Satanta
160
83
144
190
56
190
EMS locations, and Floodplains
Haskell County, KS
EMS
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)
N
0
2
4
8
Miles
Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA
Date: 2/10/2014
AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Fire Stations and Floodplains

Haskell County, KS

Fire Station

Interstates

US Highways

Kansas Highways

Lake

Streams

County Boudaries

0.2% chance flood hazard

1% chance flood hazard

Cities (Census 2010)

N

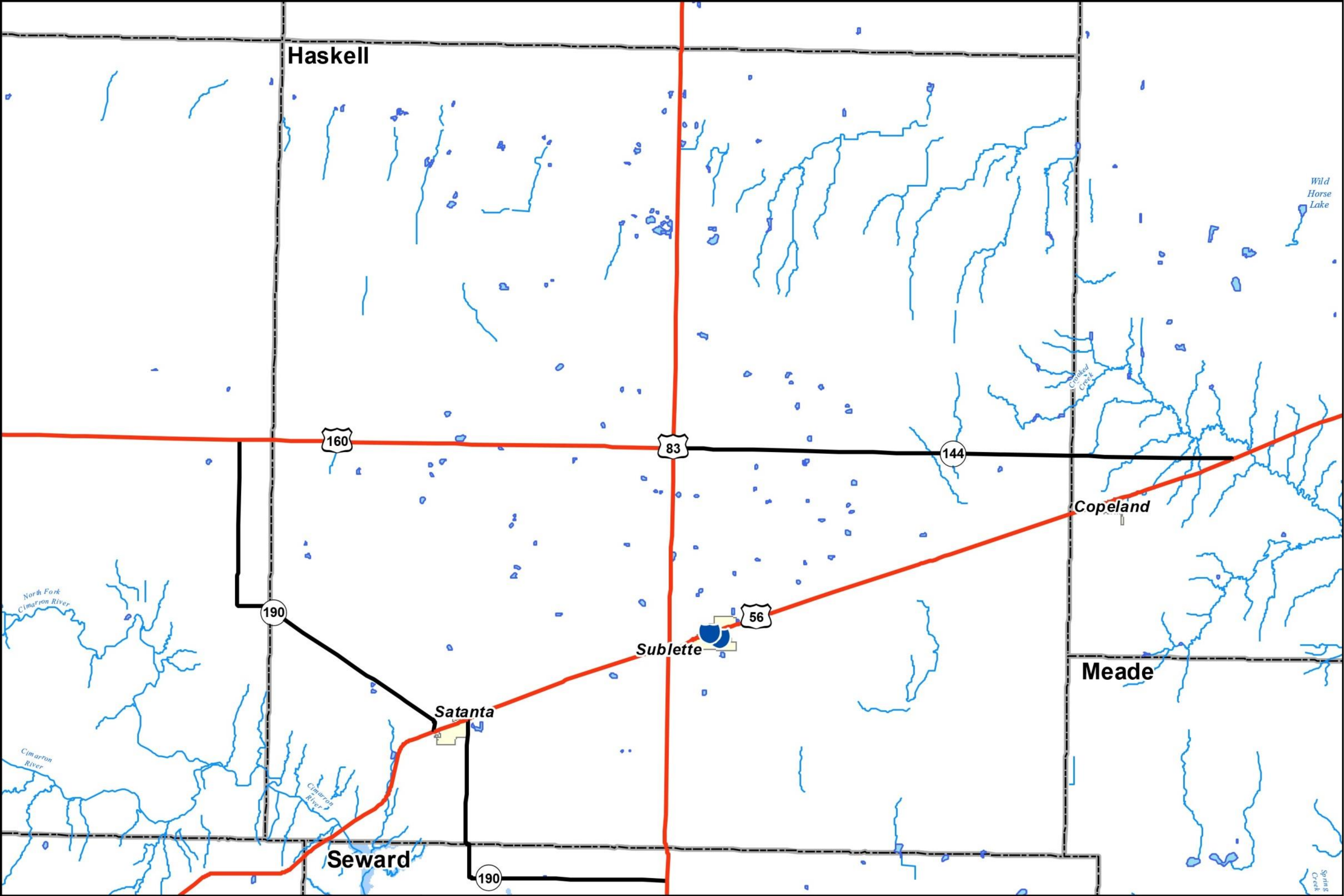
0 2 4 8 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 2/10/2014

Kansas Adjutant General

Division of Emergency Management



Law Enforcement and Floodplains Haskell County, KS

Law Enforcement
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries

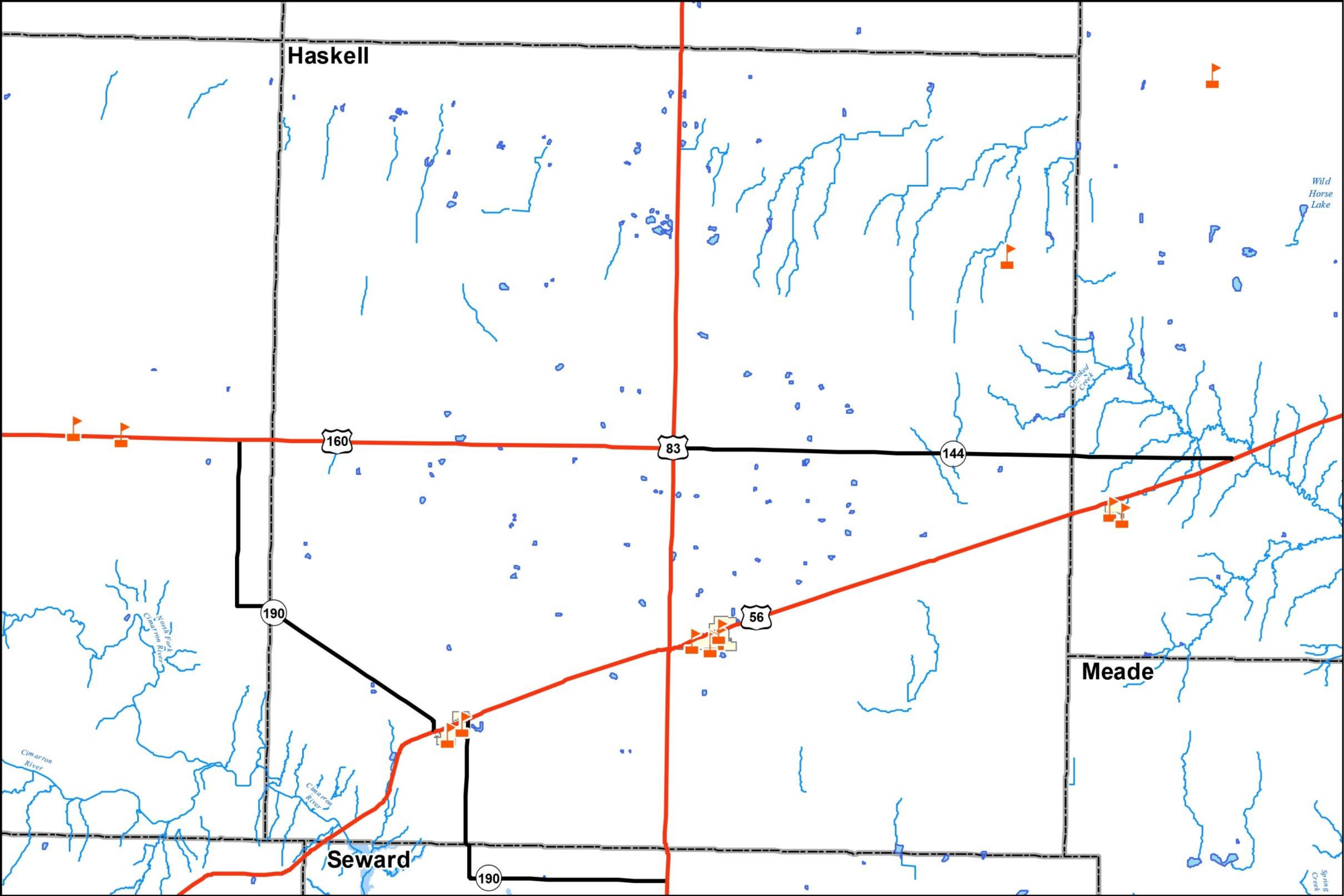
N

0 2 4 8 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 3/6/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Schools, Colleges and Floodplains Haskell County, KS

School
College
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries
0.2% chance flood hazard
1% chance flood hazard

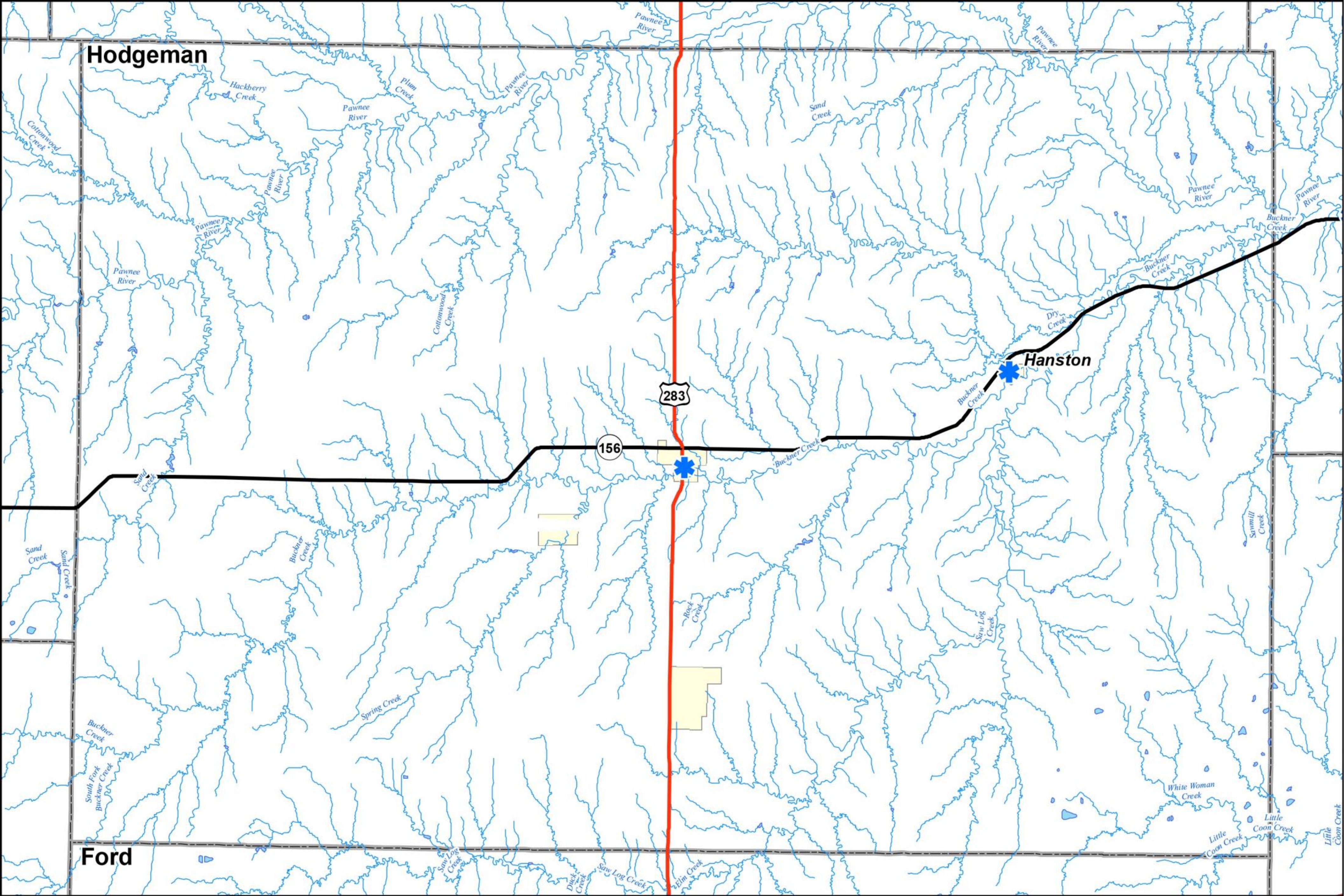
N

0 2 4 8 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 4/1/2014

Kansas Adjutant General
Division of Emergency Management



EMS locations, and Floodplains

Hodgeman County, KS

EMS

Interstates

US Highways

Kansas Highways

Lake

Streams

County Boudaries

0.2% chance flood hazard

1% chance flood hazard

Cities (Census 2010)

N

0 2 4 8 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

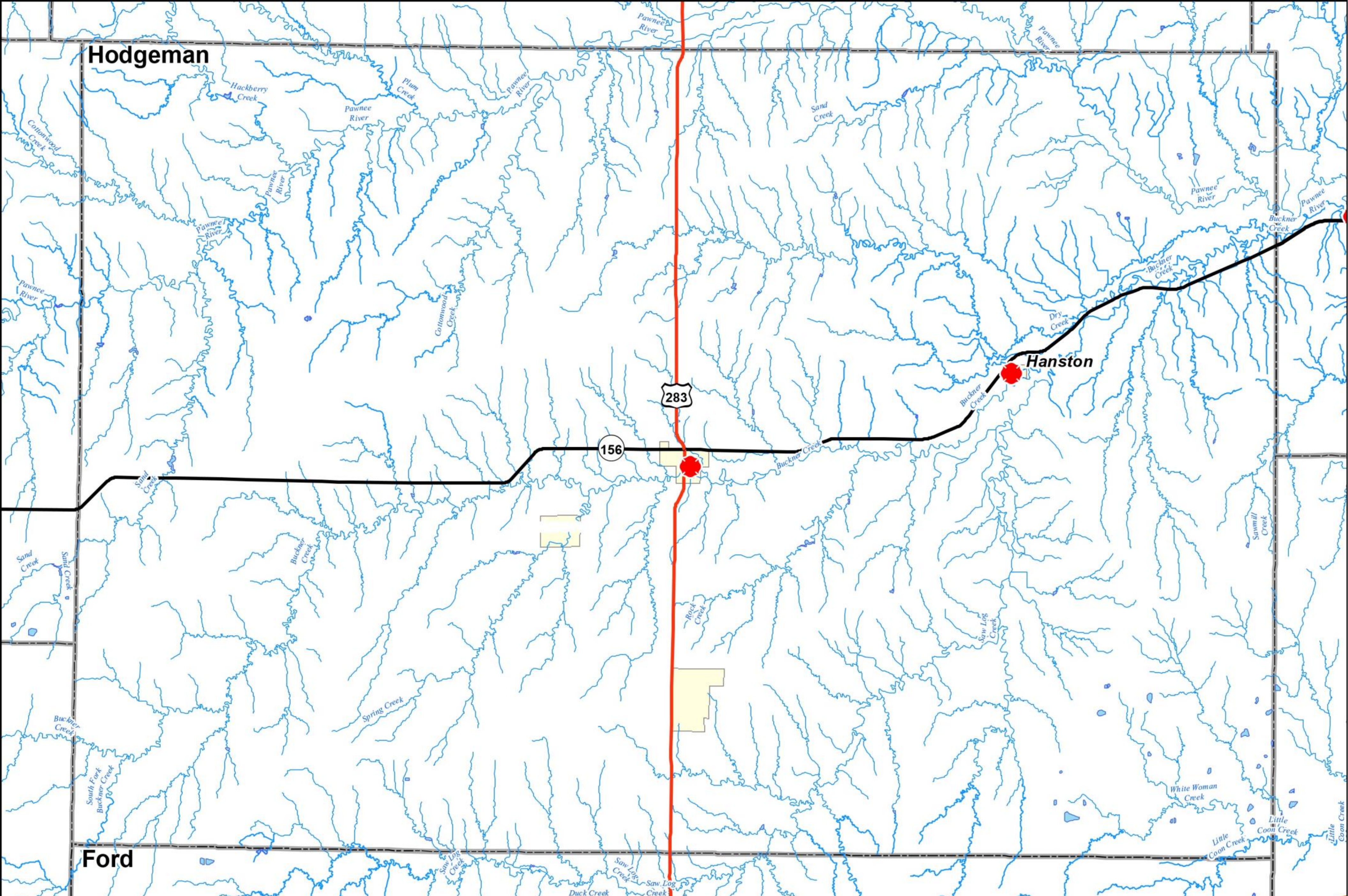
Date: 2/10/2014

AD ASTRA PER ASPERA

Kansas

Adjutant General

Division of Emergency Management



Fire Stations and Floodplains

Hodgeman County, KS

Fire Station	Interstates
US Highways	Kansas Highways
Lake	Streams
County Boudaries	0.2% chance flood hazard
1% chance flood hazard	Cities (Census 2010)

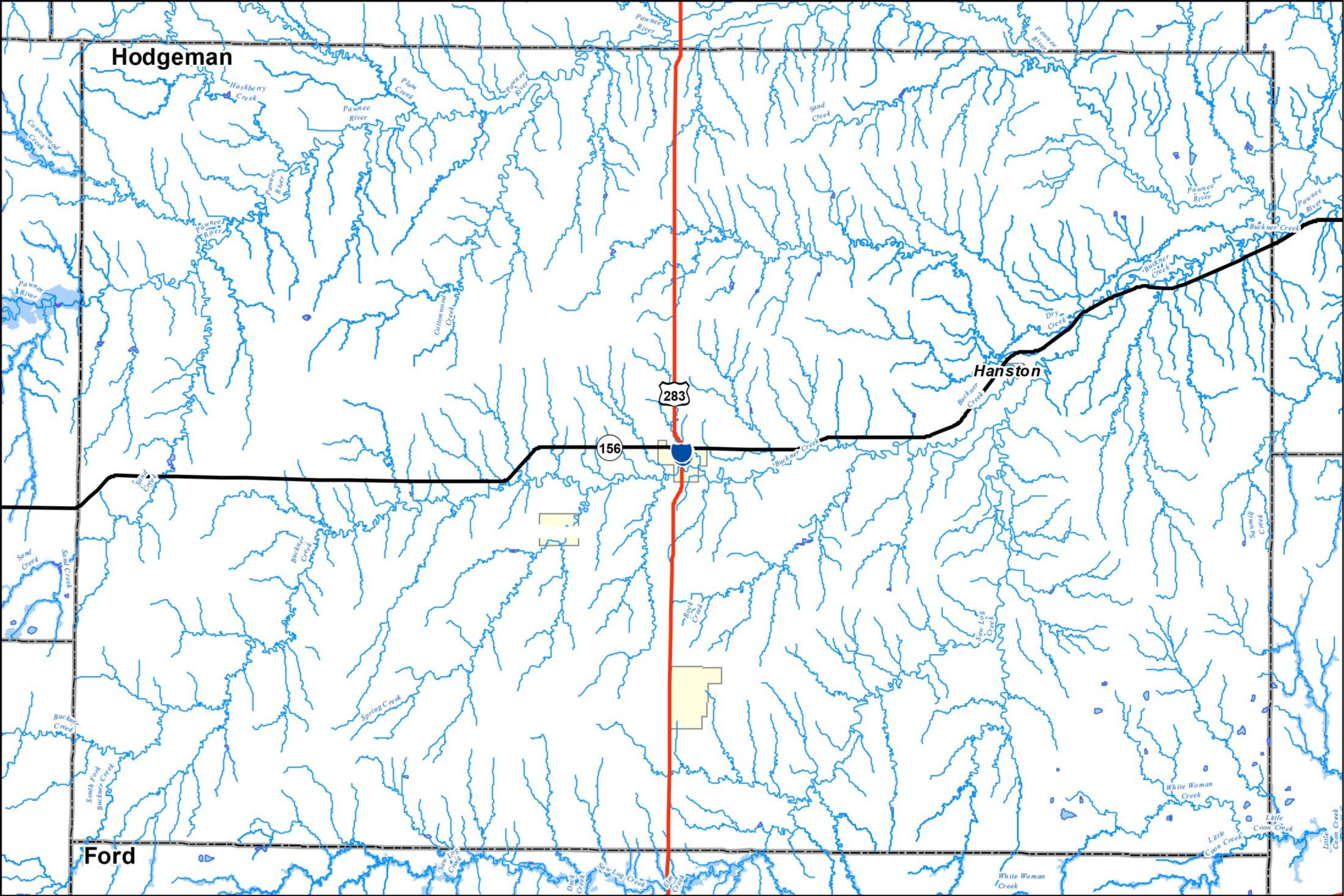
N

0 2 4 8 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 2/10/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Law Enforcement and Floodplains Hodgeman County, KS

Law Enforcement
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries

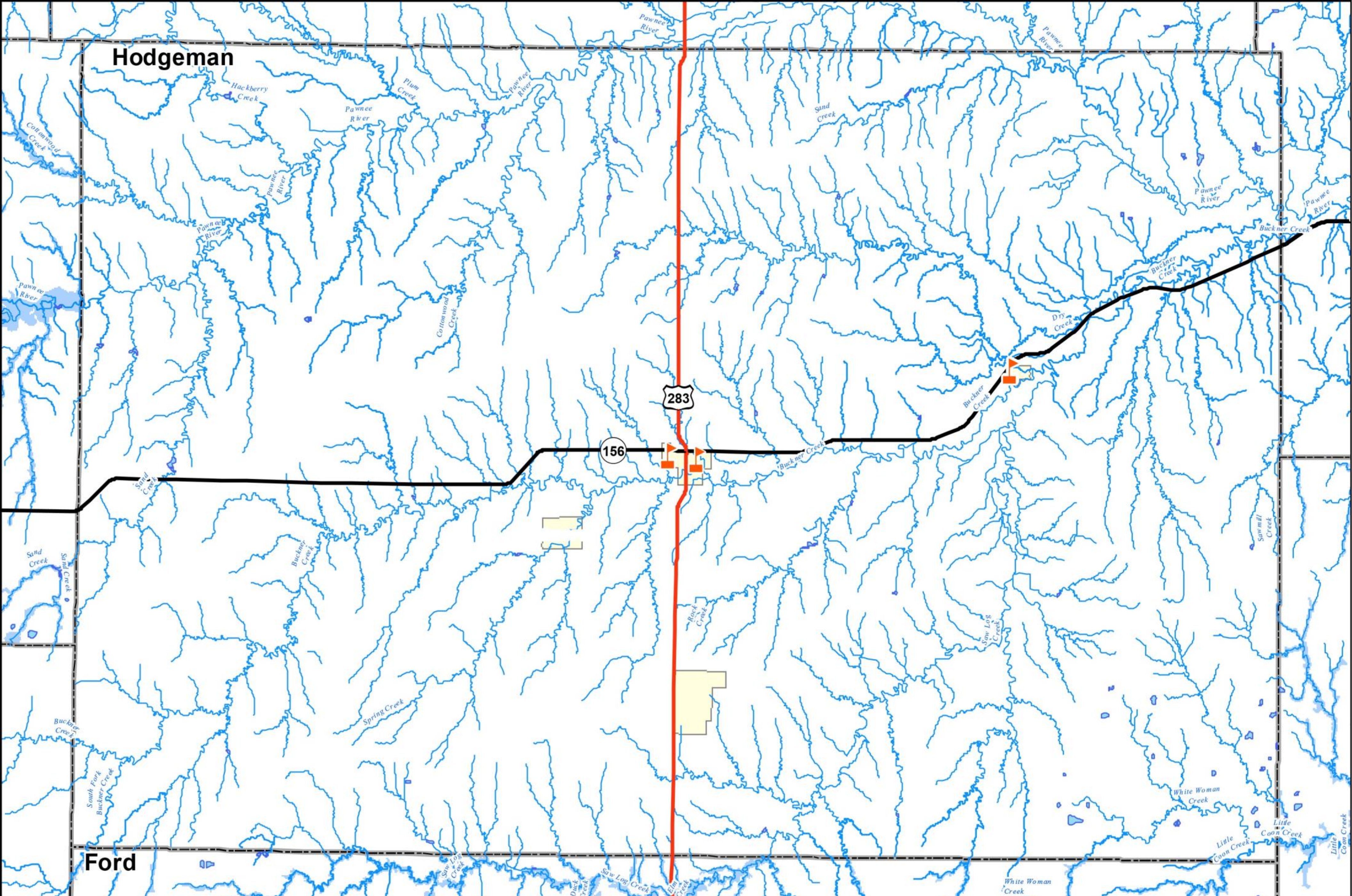
N

0 2 4 8 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 3/6/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Schools, Colleges and Floodplains Hodgeman County, KS

School

College

Interstates

US Highways

Kansas Highways

Streams

Lake

County Boudaries

City Boundaries

0.2% chance flood hazard

1% chance flood hazard

N

0 2 4 8 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

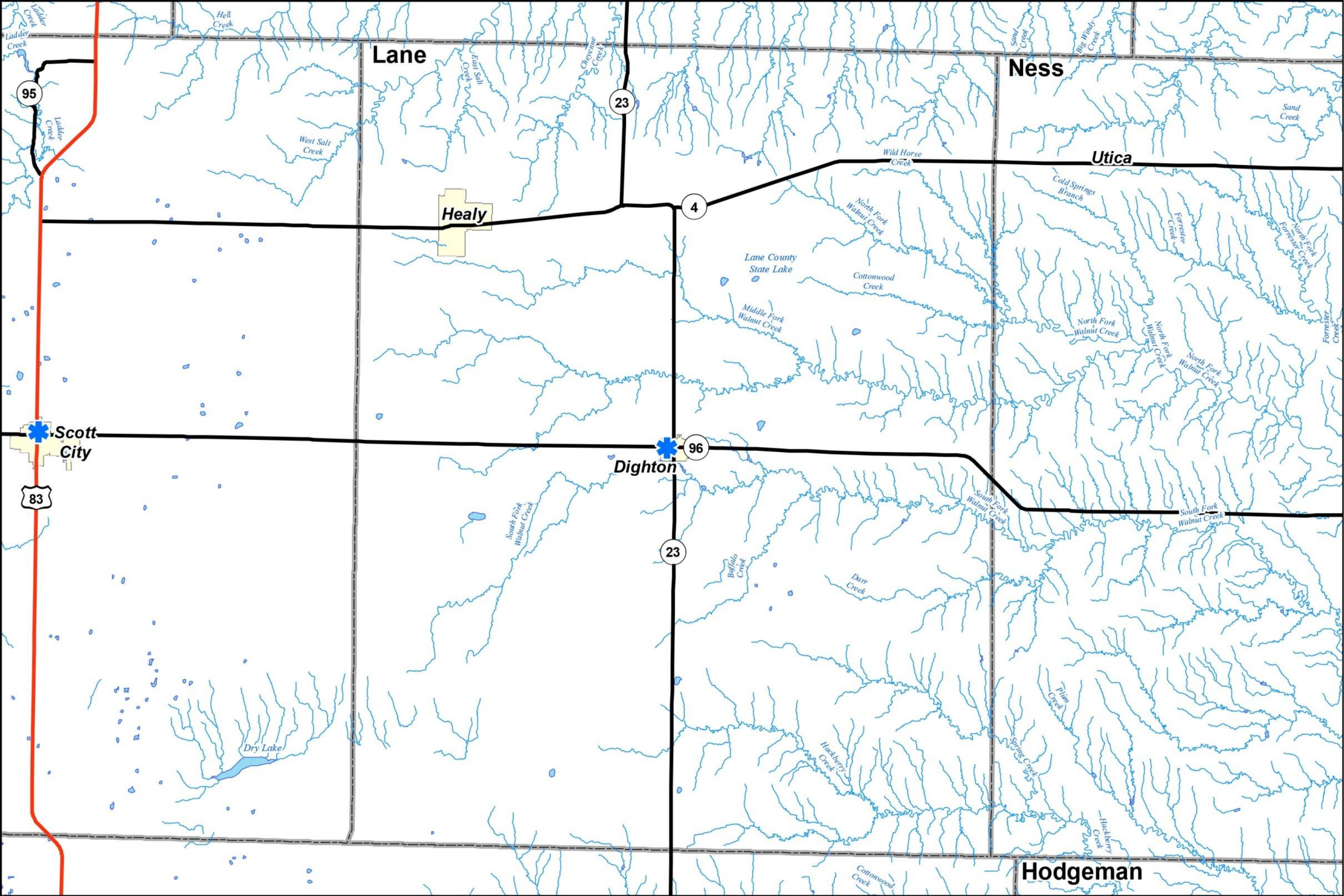
Date: 4/1/2014

AD ASTRA PER ASPERA

Kansas

Adjutant General

Division of Emergency Management



EMS locations, and Floodplains

Lane County, KS

EMS

Interstates

US Highways

Kansas Highways

Lake

Streams

County Boudaries

0.2% chance flood hazard

1% chance flood hazard

Cities (Census 2010)

N

0 2.5 5 10 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

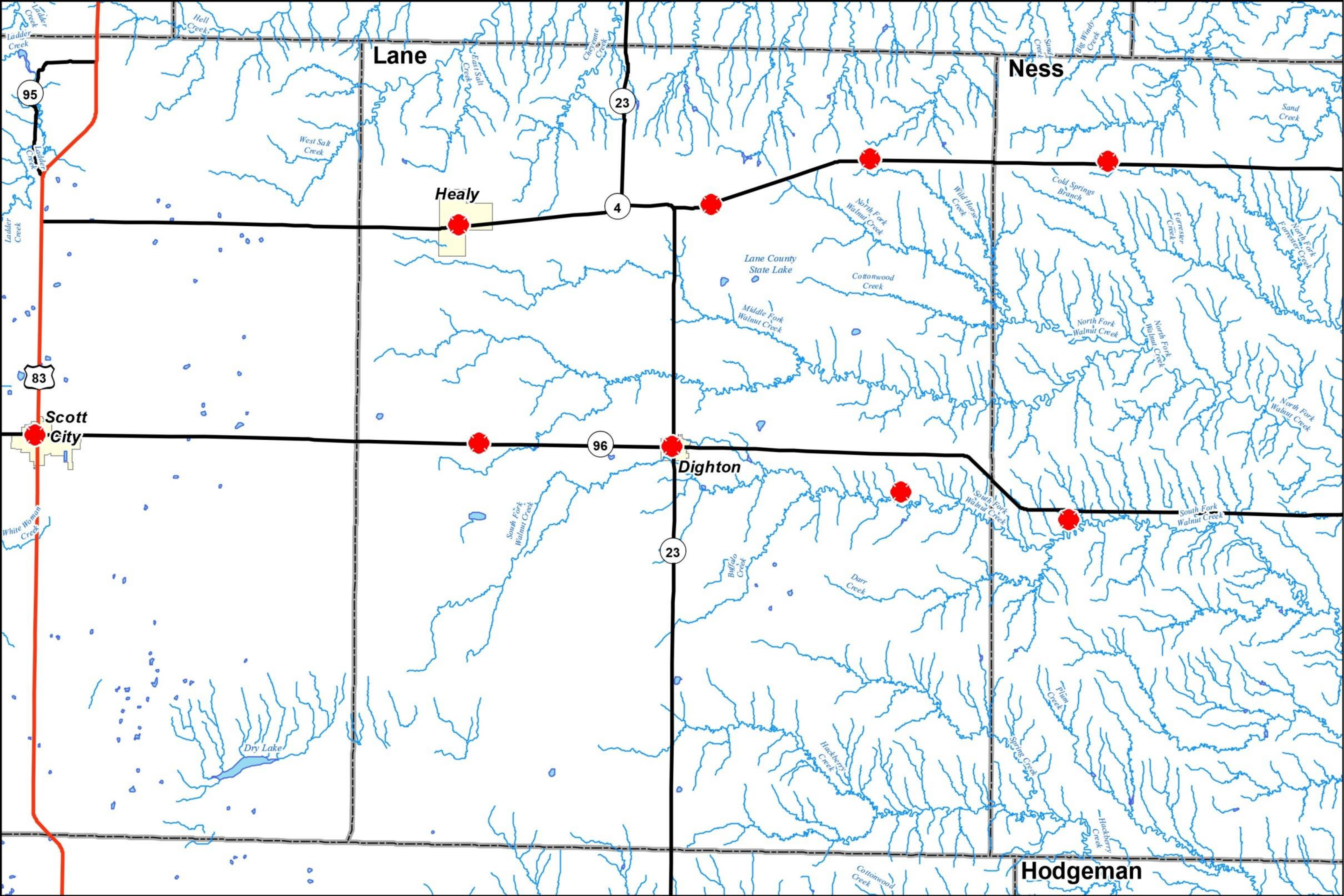
Date: 2/10/2014

AD ASTRA PER ASPERA

Kansas

Adjutant General

Division of Emergency Management



Fire Stations and Floodplains

Lane County, KS

Fire Station

Interstates

US Highways

Kansas Highways

Lake

Streams

County Boudaries

0.2% chance flood hazard

1% chance flood hazard

Cities (Census 2010)

N

0 2.5 5 10 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

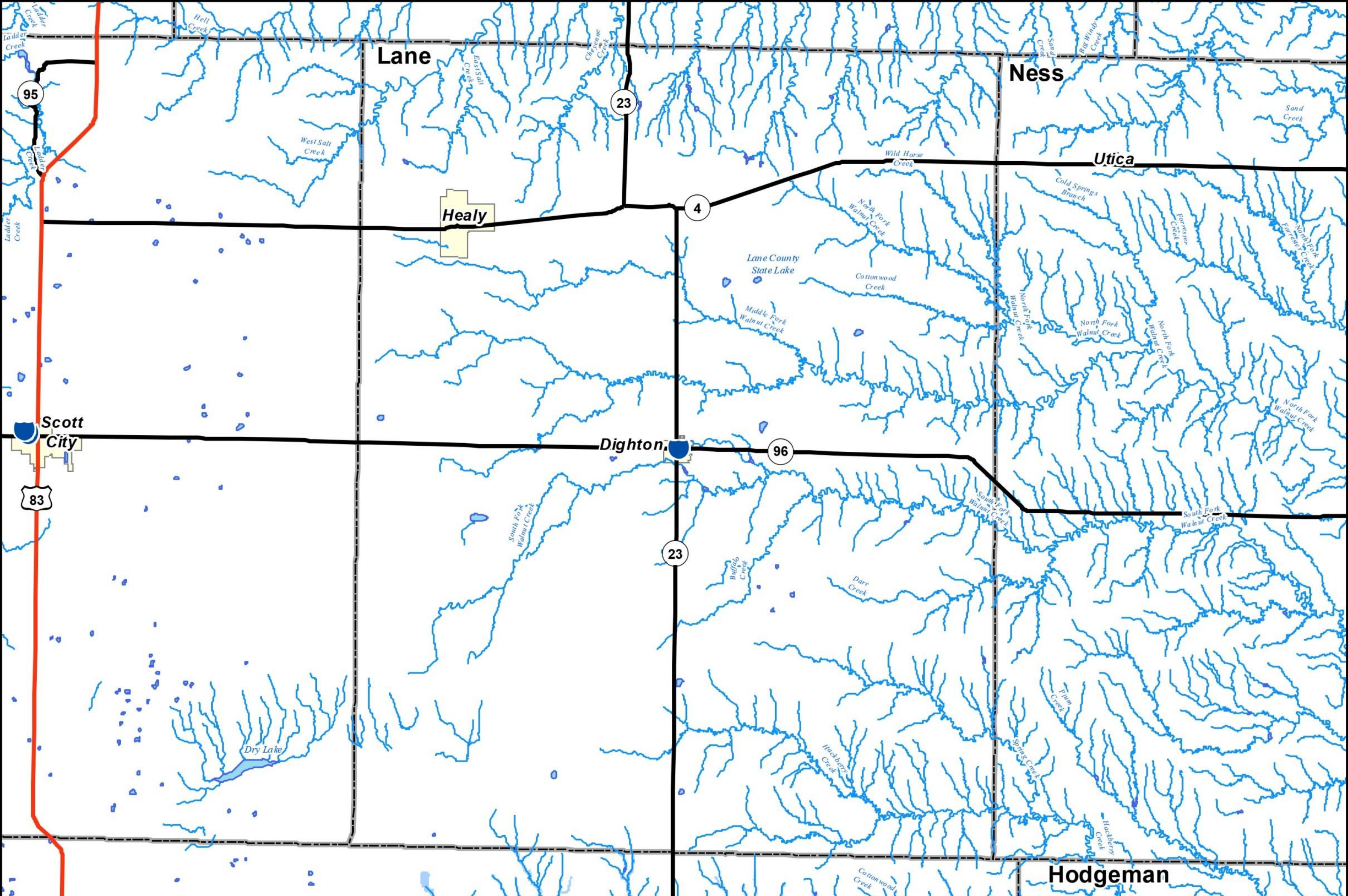
Date: 2/10/2014

AD ASTRA PER ASPERA

Kansas

Adjutant General

Division of Emergency Management



Law Enforcement and Floodplains Lane County, KS

Law Enforcement
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries

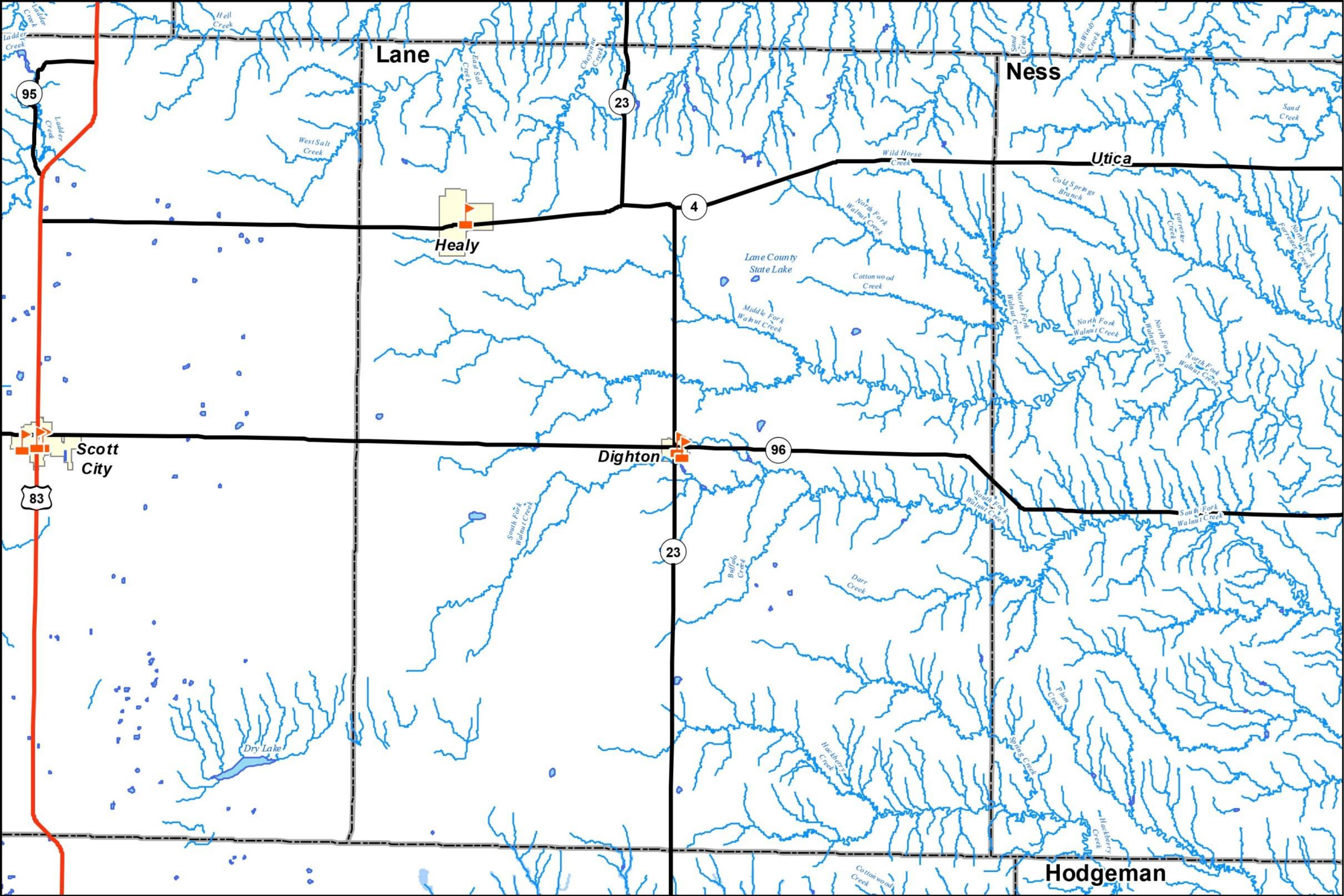
N

0 2.5 5 10 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 3/6/2014

Kansas Adjutant General
Division of Emergency Management



Schools, Colleges and Floodplains
Lane County, KS

School
College
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries
0.2% chance flood hazard
1% chance flood hazard

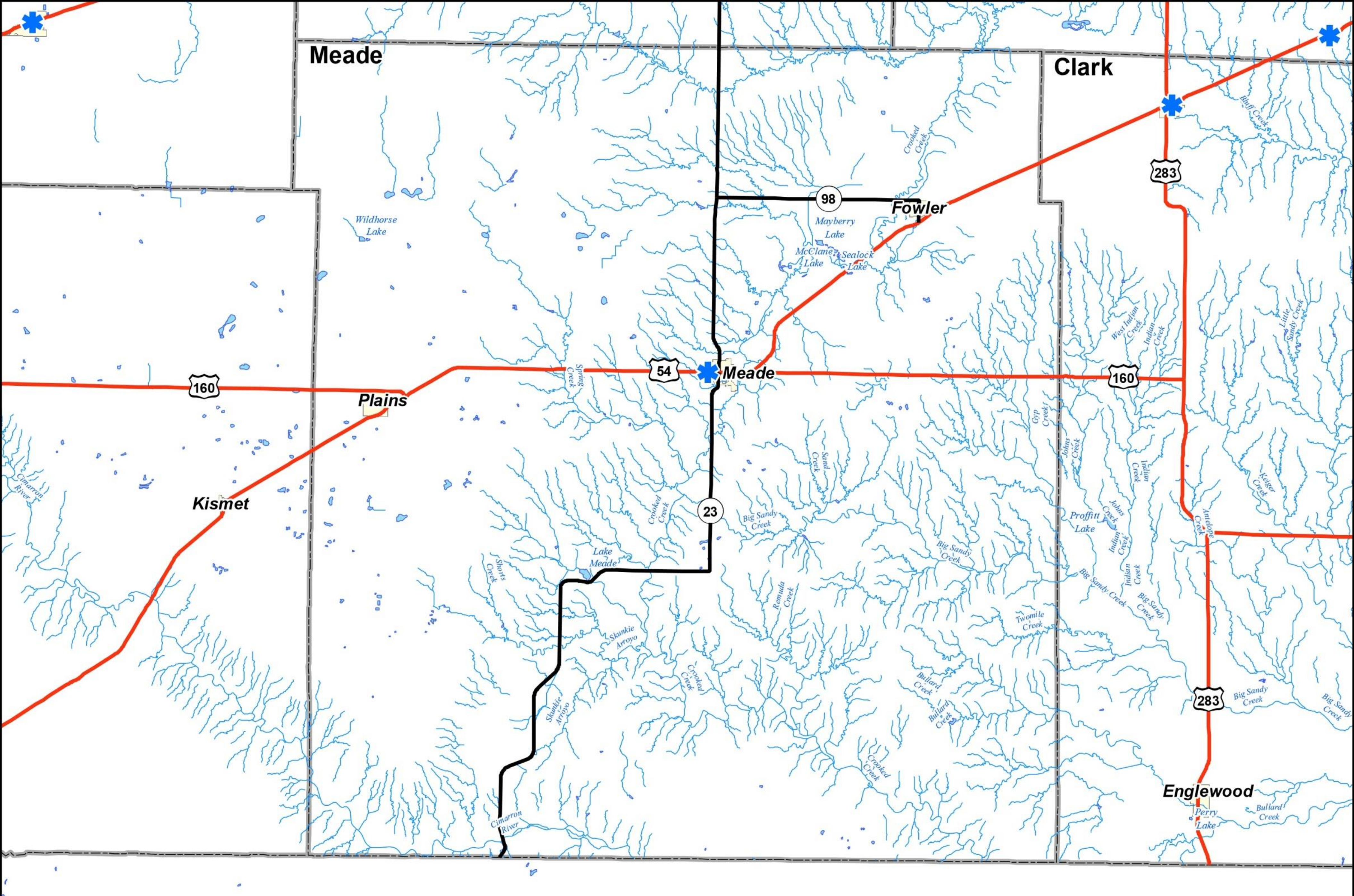
N

0 2.5 5 10 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 4/1/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



EMS locations, and Floodplains

Meade County, KS

EMS	
Interstates	County Boudaries
US Highways	0.2% chance flood hazard
Kansas Highways	1% chance flood hazard
Lake	Cities (Census 2010)
Streams	

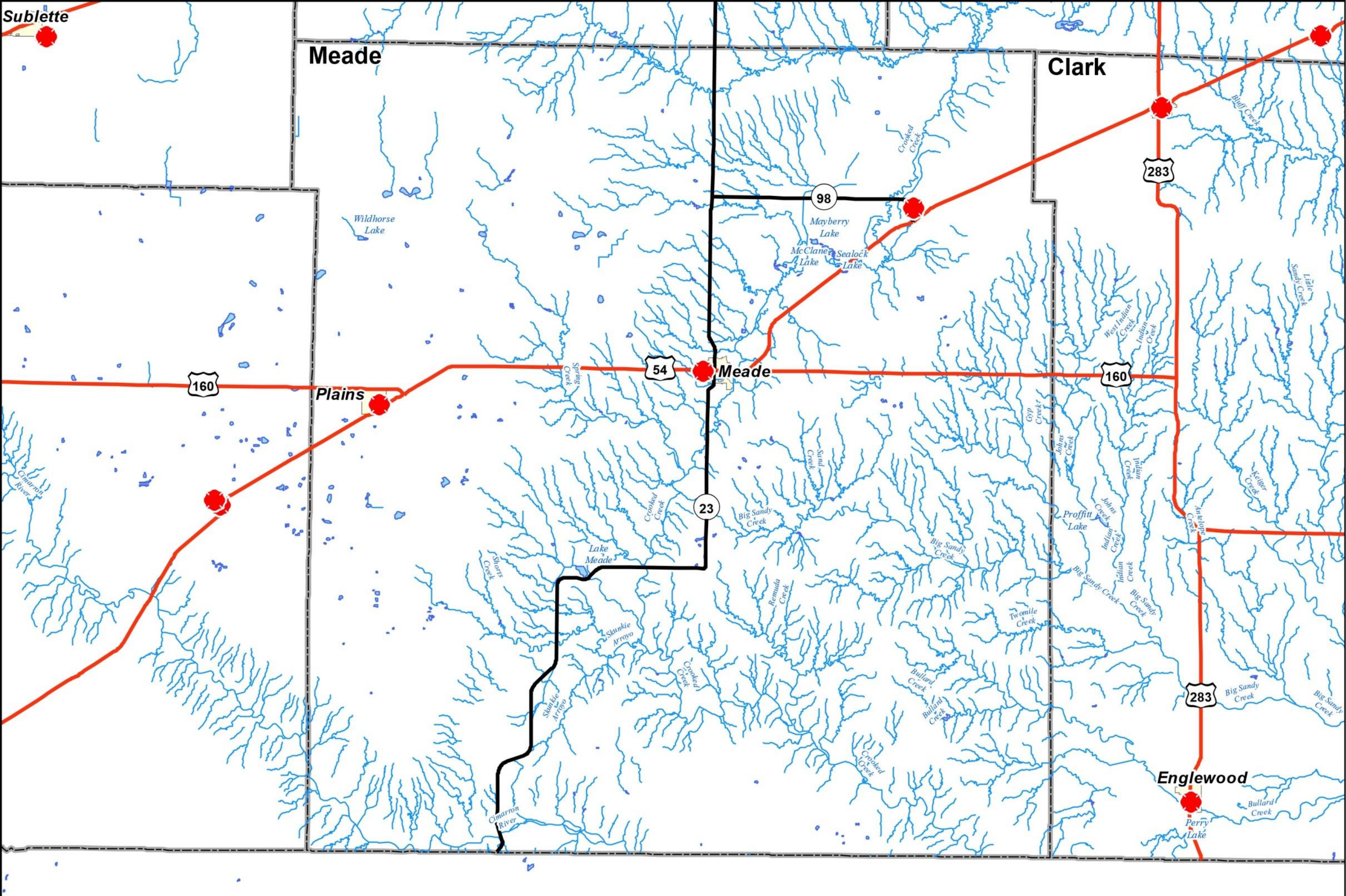
N

0 2.75 5.5 11 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 2/10/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Fire Stations and Floodplains

Meade County, KS

Fire Station

Interstates

US Highways

Kansas Highways

Lake

Streams

County Boudaries

0.2% chance flood hazard

1% chance flood hazard

Cities (Census 2010)

N

0 2.75 5.5 11 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

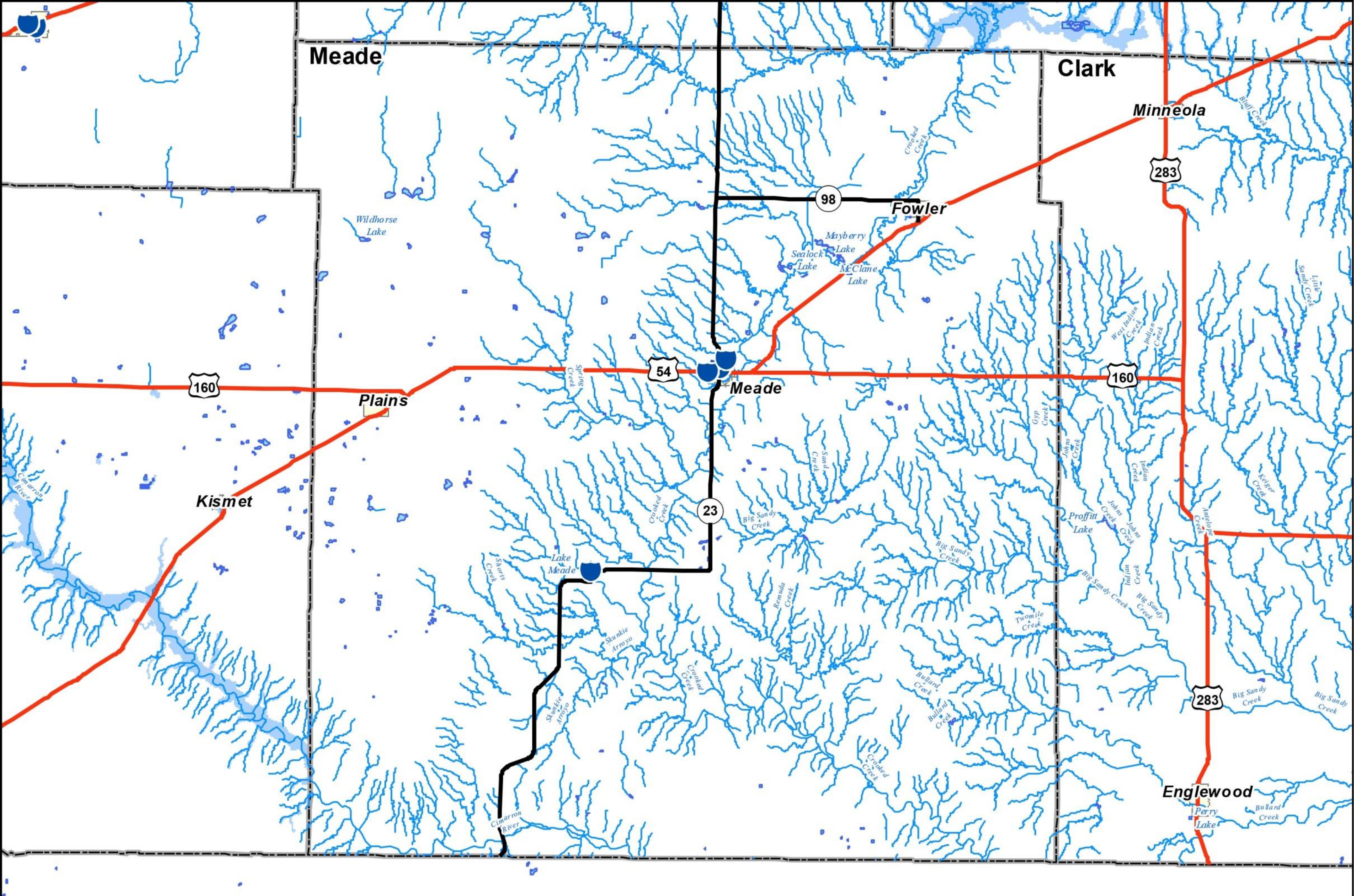
Date: 2/10/2014

AD ASTRA PER ASPERA

Kansas

Adjutant General

Division of Emergency Management



Law Enforcement and Floodplains Meade County, KS

Law Enforcement
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries

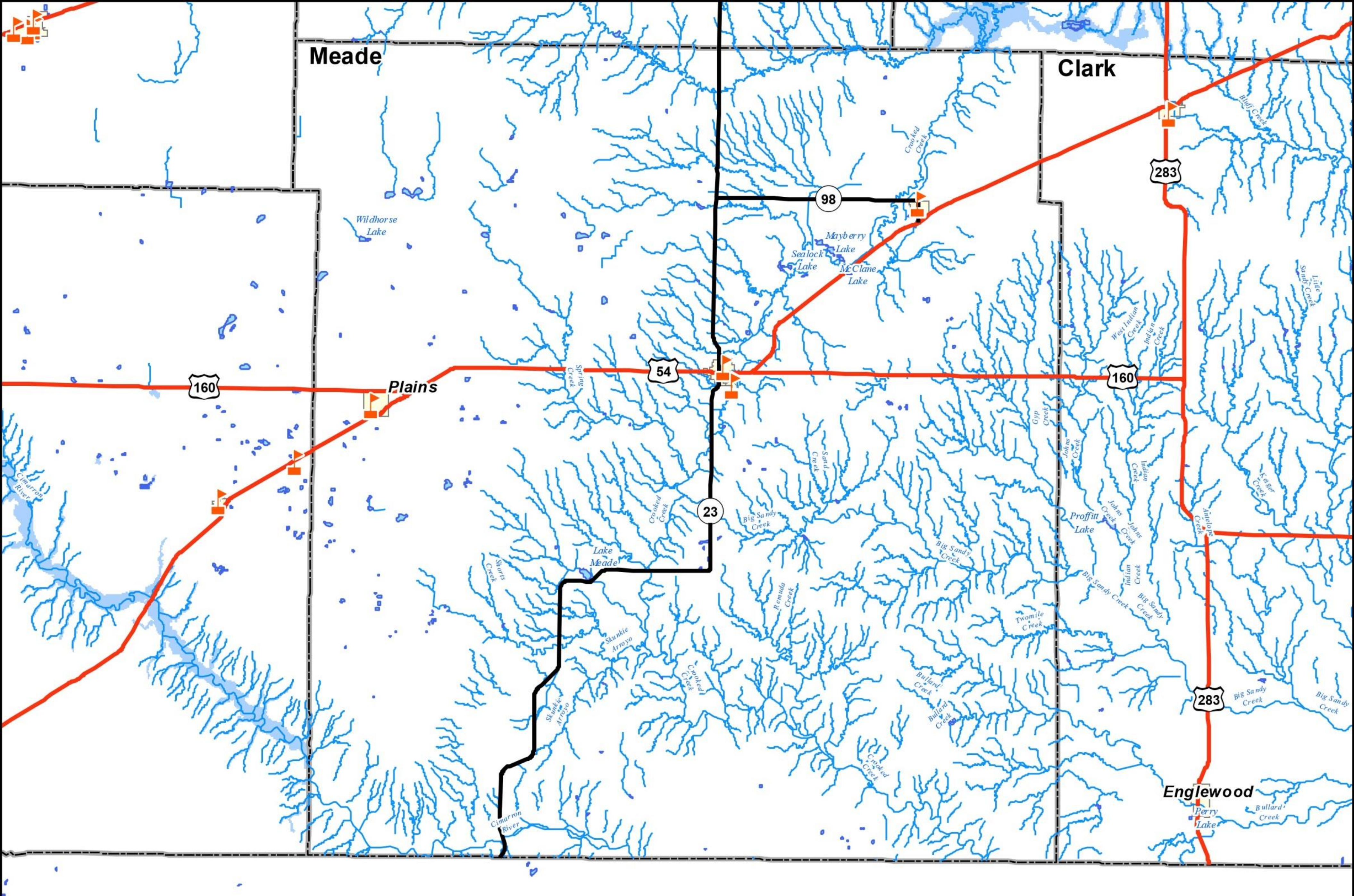
N

0 2.75 5.5 11 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 3/6/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Schools, Colleges and Floodplains Meade County, KS

School

College

Interstates

US Highways

Kansas Highways

Streams

Lake

County Boudaries

City Boundaries

0.2% chance flood hazard

1% chance flood hazard

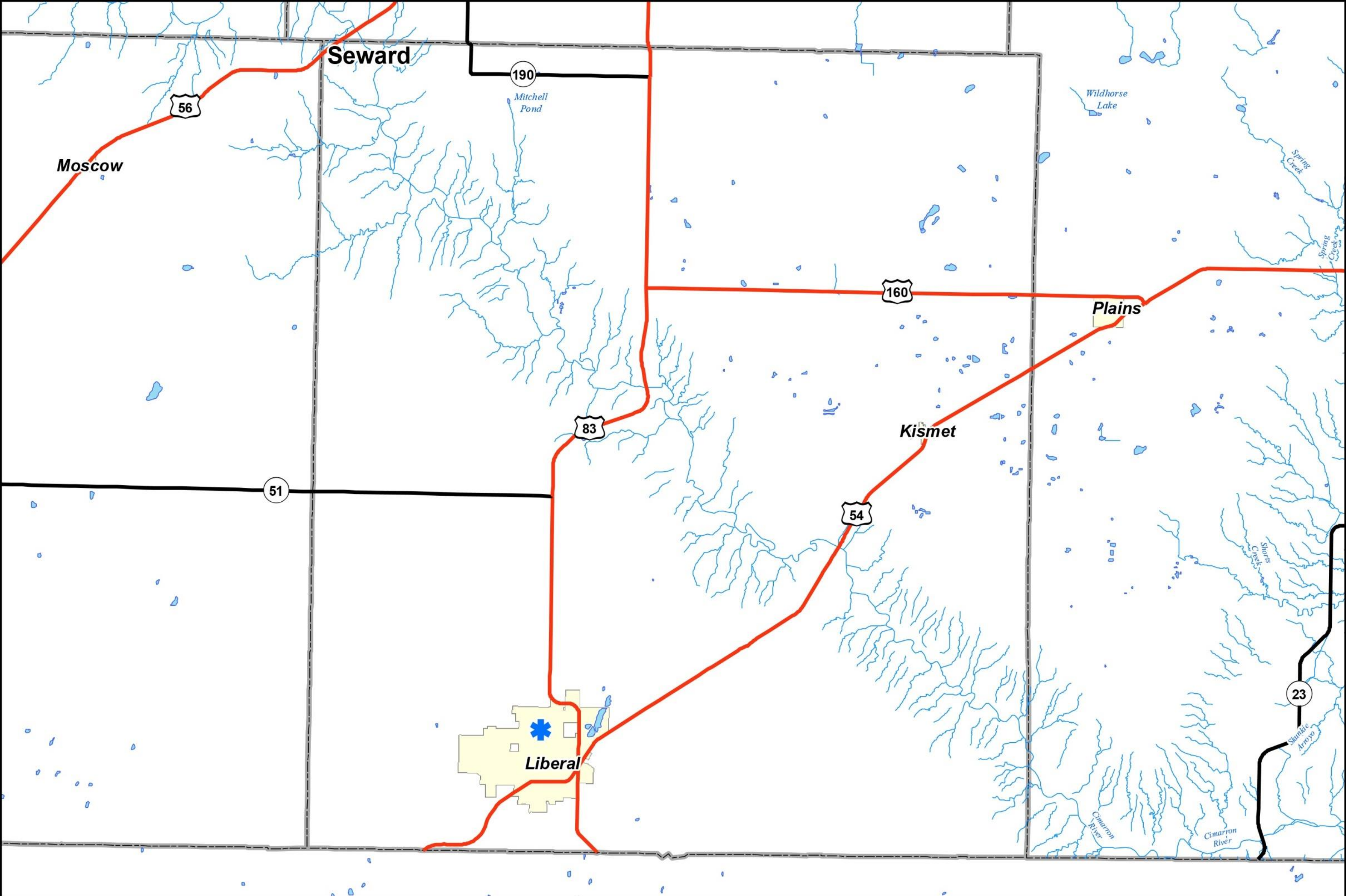
N

0 2.75 5.5 11 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 4/1/2014

Kansas Adjutant General Division of Emergency Management



EMS locations, and Floodplains

Seward County, KS

EMS

Interstates

US Highways

Kansas Highways

Lake

Streams

County Boudaries

0.2% chance flood hazard

1% chance flood hazard

Cities (Census 2010)

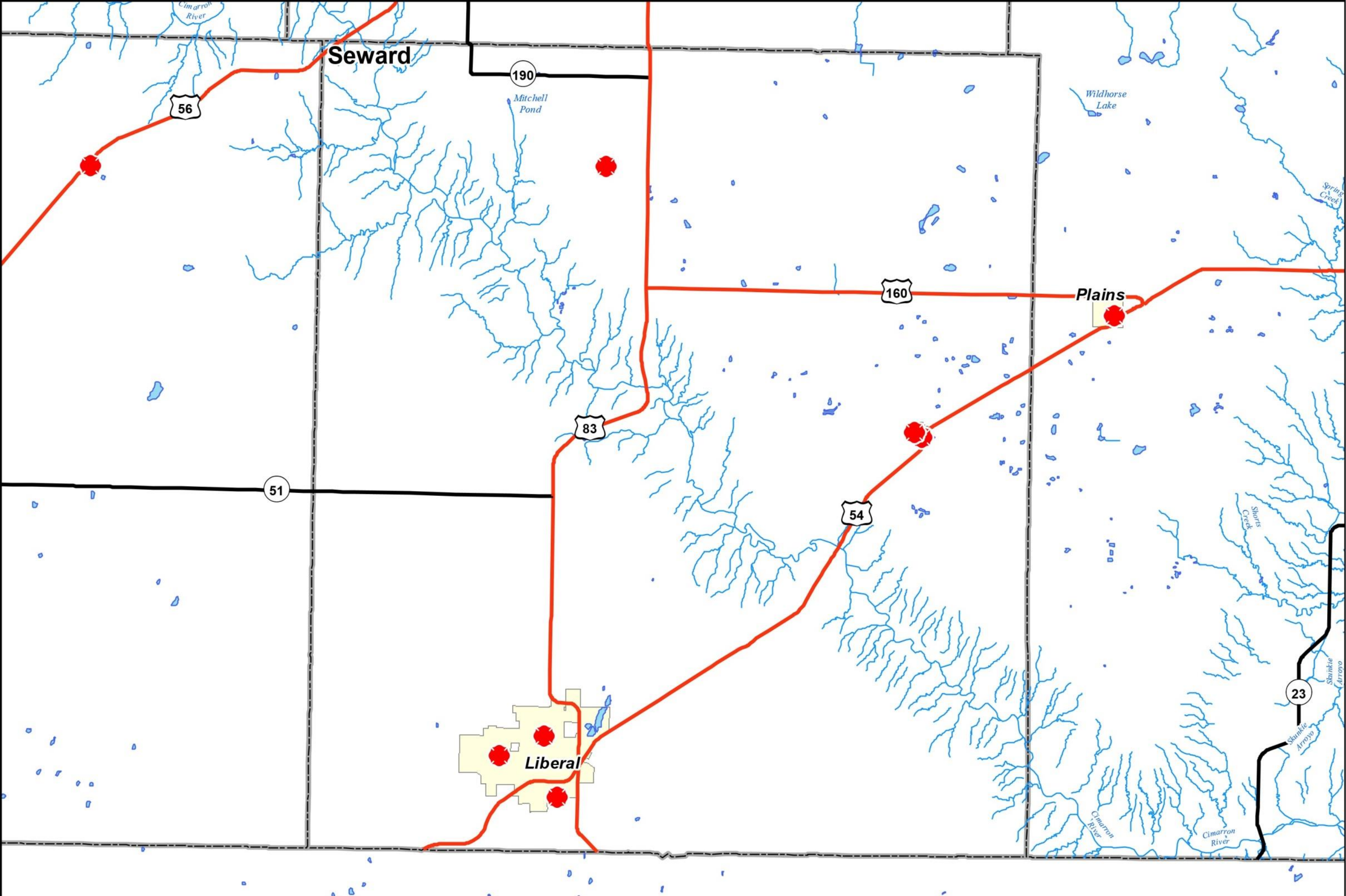
N

0 2.25 4.5 9 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 2/10/2014

Kansas Adjutant General Division of Emergency Management



Fire Stations and Floodplains

Seward County, KS

Fire Station
Interstates
US Highways
Kansas Highways
Lake
Streams
County Boudaries
0.2% chance flood hazard
1% chance flood hazard
Cities (Census 2010)

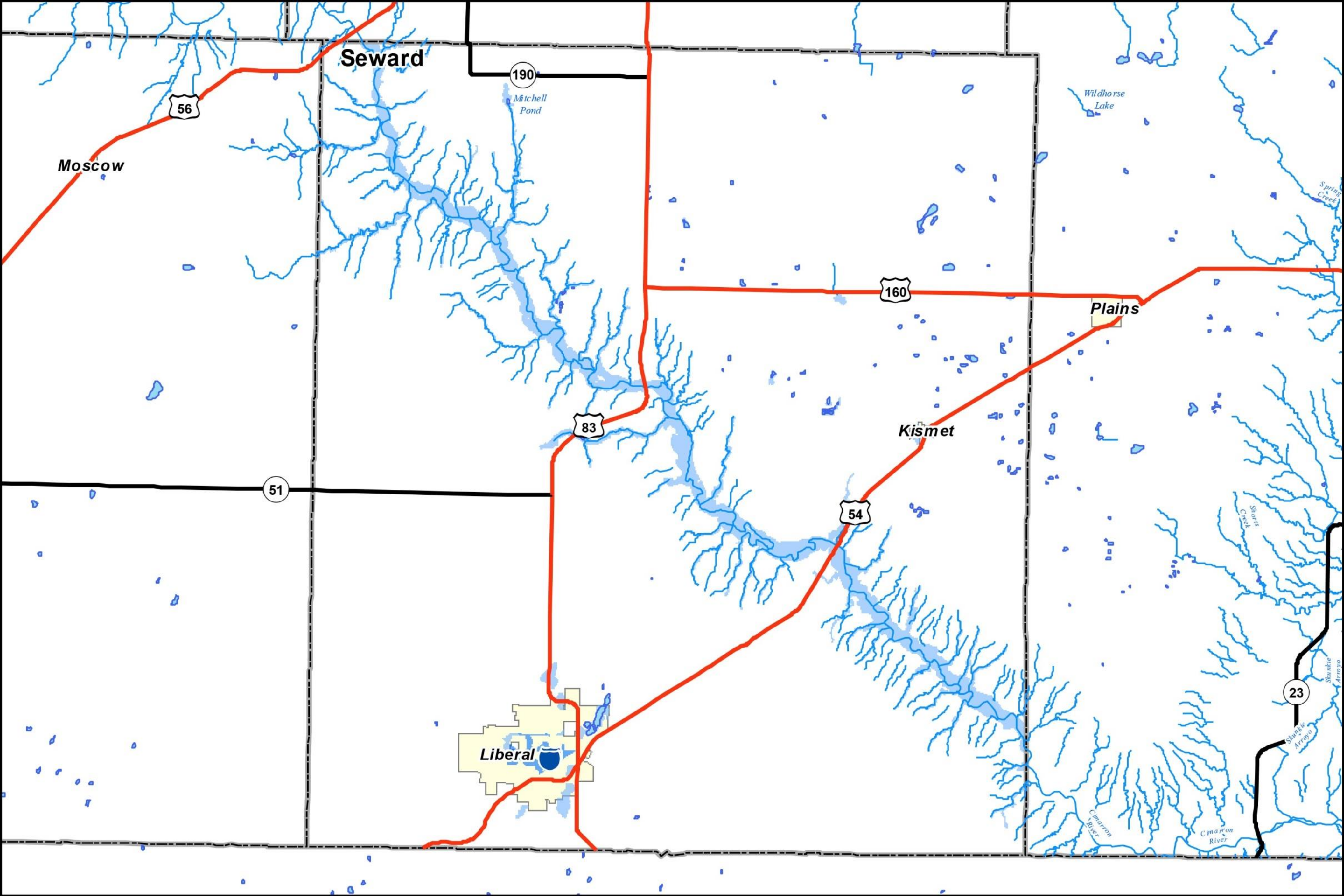
N

0 2.25 4.5 9 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 2/10/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Law Enforcement and Floodplains Seward County, KS

Law Enforcement
0.2% chance flood hazard
1% chance flood hazard
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries

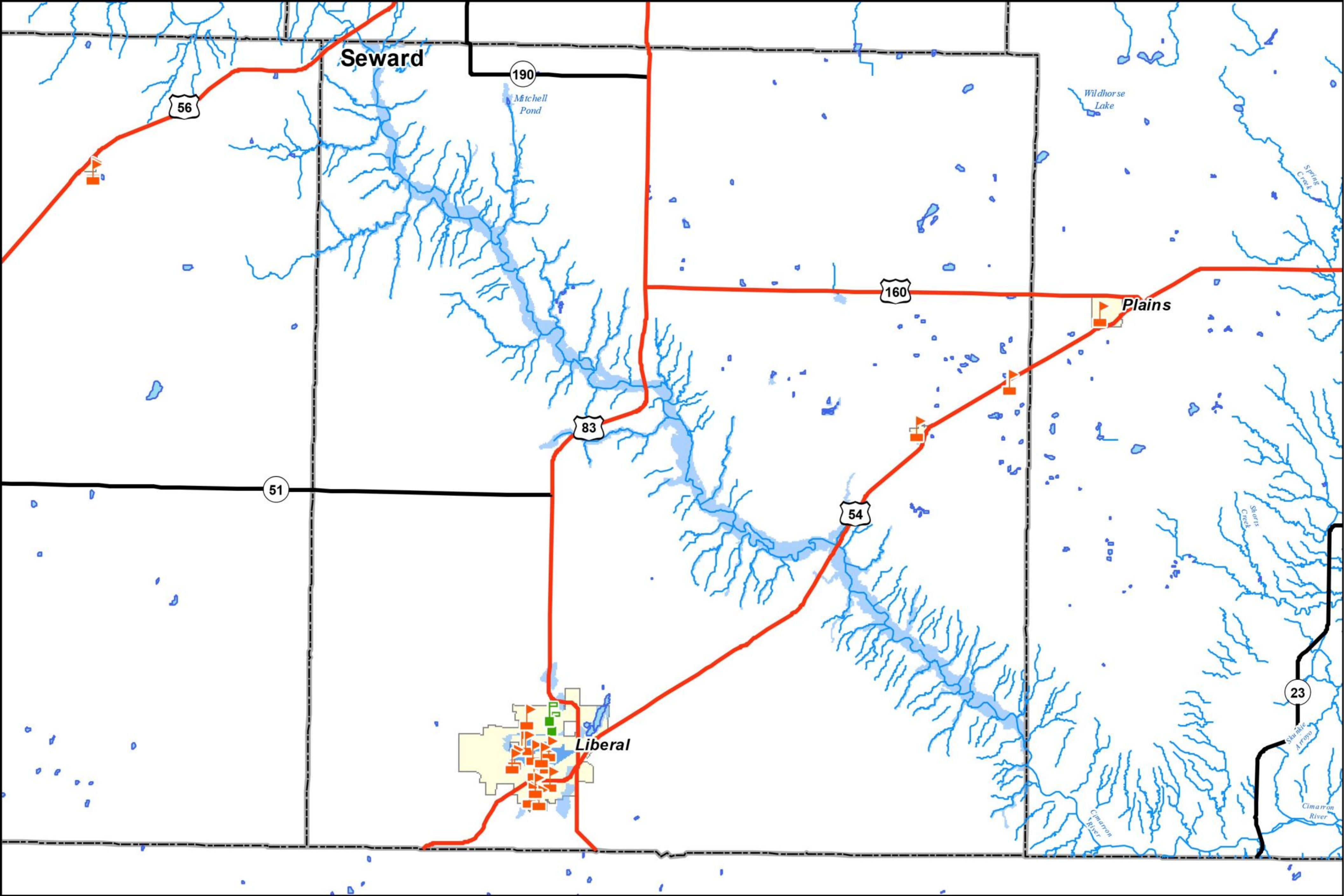
N

0 2.25 4.5 9 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 3/6/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Schools, Colleges and Floodplains Seward County, KS

School
College
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries
0.2% chance flood hazard
1% chance flood hazard

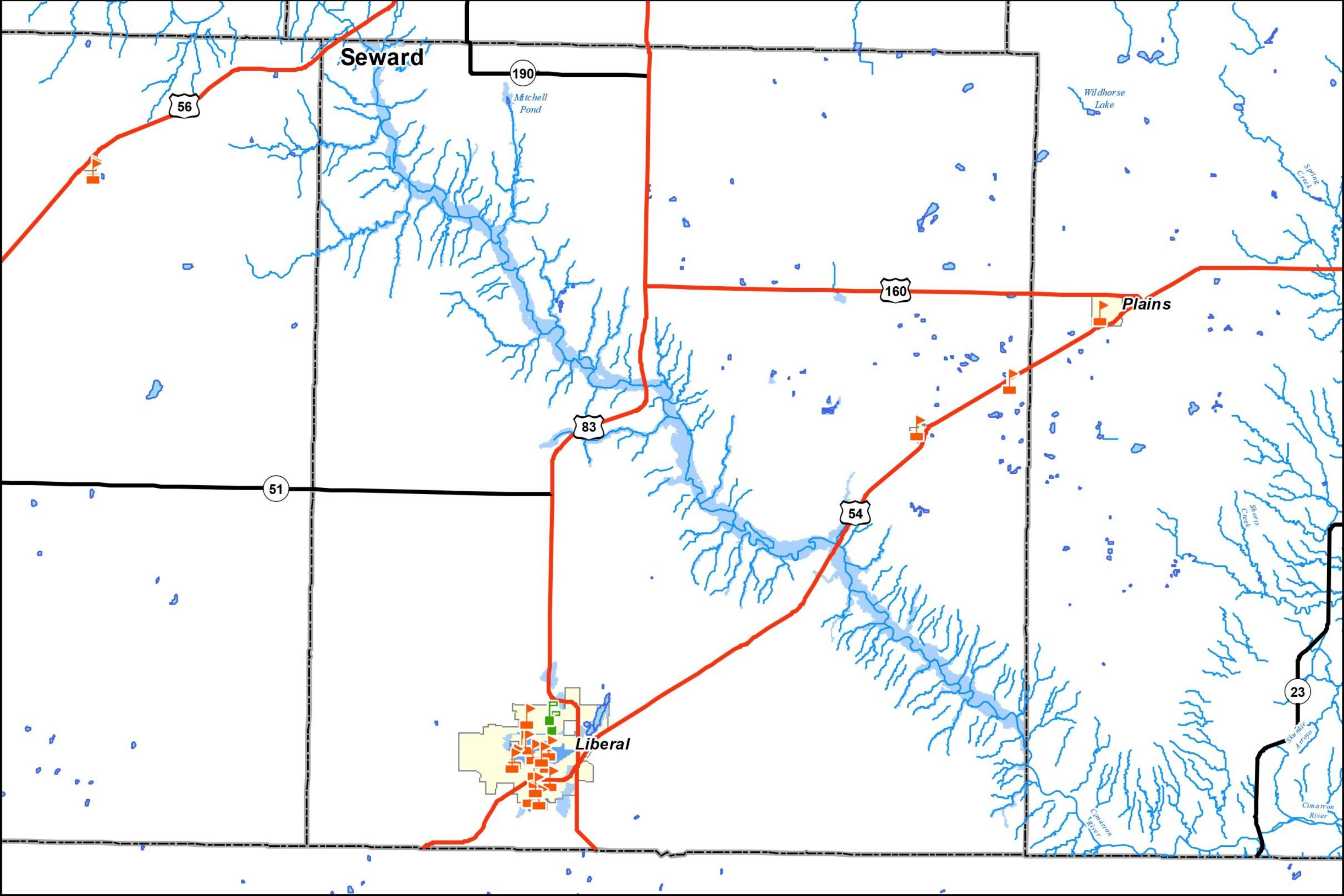
N

0 2.25 4.5 9 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 4/1/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Schools, Colleges and Floodplains
Seward County, KS

School
College
Interstates
US Highways
Kansas Highways
Streams
Lake
County Boudaries
City Boundaries
0.2% chance flood hazard
1% chance flood hazard

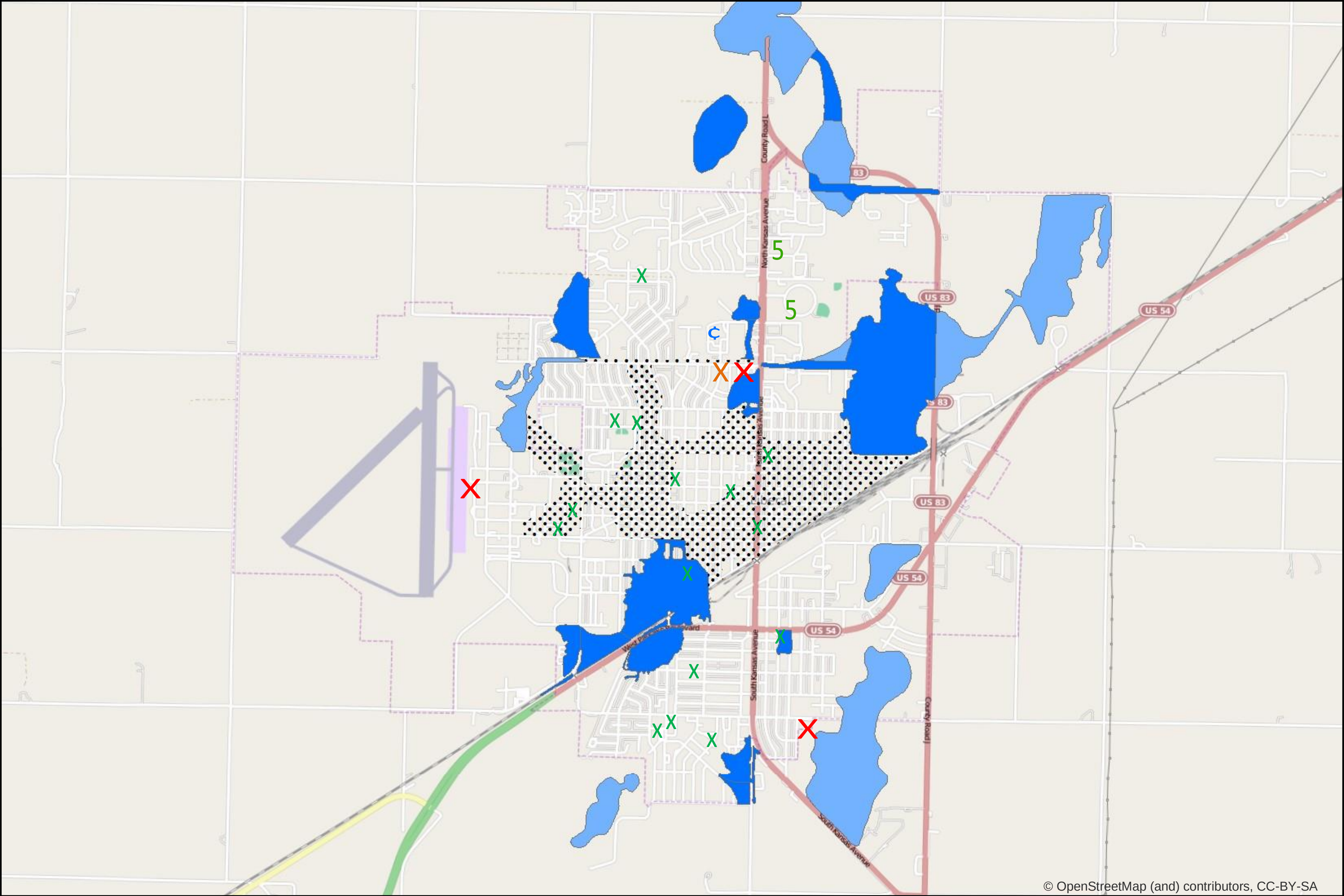
N

0 2.25 4.5 9 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA

Date: 4/1/2014

AD ASTRA PER ASPERA
Kansas
Adjutant General
Division of Emergency Management



Fire Station
School
Hospital
EMS

Flood Zone

0.2% Chance Annual Flood
A
AE
Floodway

Flood Hazard Areas Critical Infrastructure City of Liberal Seward County, KS

0 0.375 0.75 1.5 Miles

Data Sources: USGS, US Census Bureau, KS Adjutant General, KDOT, USDA, KDA, KDHE

Date: 7/31/2014

Kansas Adjutant General
Division of Emergency Management