March 2025

Kansas Region D
Local Hazard Mitigation Plan

Encompassing:
Clark County
Finney County
Ford County
Gray County
Haskell County
Hodgeman County
Lane County
Meade County
Seward County

Prepared By:
Blue Umbrella Solutions

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List of Commonly Used Acronyms

Acronym	Meaning
BRIC	Building Resilient Infrastructure and Communities
EAL	Expected Annual Loss
CRS	Community Rating System
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
GIS	Geographic Information System
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
KDEM	Kansas Division of Emergency Management
LHMP	Local Hazard Mitigation Plan
MPC	Mitigation Planning Committee
NCEI	National Centers for Environmental Information
NFIP	National Flood Insurance Program
NID	National Inventory of Dams
NOAA	National Oceanic and Atmospheric Administration
NRI	National Risk Index
NWS	National Weather Service
RAPT	Resilience Analysis and Planning Tool
USDA	United States Department of Agriculture
USGS	United States Geologic Survey
WUI	Wildland/Urban Interface

Section 1 – Introduction, Assurances, Incorporation, and Adoption

1.1 Introduction

Hazard 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 Local Hazard Mitigation Plan (LHMP) 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 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 2020 LHMP
- Build for a safer future for all citizens
- Foster cooperation for planning and resiliency
- Identify, prioritize, and mitigate hazards
- Assist with sensible and effective planning and budgeting
- Educate citizens about hazards, mitigation, and preparedness
- Comply with relevant federal requirements

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 all citizens.

1.2 Assurances

In an effort to reduce natural disaster losses, the United States Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) in order to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). DMA 2000 amended the Stafford Act by repealing the previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322). Section 322 of the DMA makes the development of a hazard mitigation plan a specific eligibility requirement for any local government applying for Federal mitigation grant funds. This LHMP was prepared to meet the requirements of the DMA 2000, as defined in regulations set forth by the Interim Final Rule (44 Code of Federal Regulations (CFR) Part 201.6).

All adopting jurisdictions certify that they will comply with all applicable Federal statutes and regulations during the periods for which they receive grant funding, in compliance with 44 CFR 13.11(c), and will amend this 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 requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, as amended by the Disaster Mitigation Act of 2000. This plan complies with all the relevant requirements of:

- Code of Federal Regulations (44 CFR) pertaining to hazard mitigation planning
- Federal Emergency Management Agency (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.

Additionally, this LHMP has been completed to address all State of Kansas recommendations and requirements concerning hazard mitigation planning and the requirements of FEMA's Local Mitigation Planning Policy Guide that went into effect April 19, 2023.

1.3 Authorities

The LHMP relies on the authorities given to participating jurisdictions by its citizens and encoded in local and 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 and local laws, statutes, and policies will supersede the provisions of the plan.

1.4 Hazard Mitigation Plan Incorporation and Integration

This hazard mitigation plan is an overarching document that is both comprised of, and contributes to, various county and local codes, plans, reports, and studies. The integration of these can provide the following community benefits:

- Align community goals, objectives, and prime concerns
- Avoid lost opportunities
- Eliminate duplication of effort

Kansas Region D and participating jurisdictions will continue to actively work on incorporating elements of this hazard mitigation plan into any relevant plan, code or ordinance revision or creation. Whenever possible, Kansas Region D and participating jurisdiction will use existing plans, policies, procedures, and programs to aid in the implementation of identified hazard mitigation actions.

On a local level, hazard mitigation plans can be integrated into various planning documents and initiatives to ensure a comprehensive and coordinated approach to reducing the impact of hazards. Local level plans where hazard mitigation strategies should be integrated include:

- **General Plans:** Helps guide long term community development to ensure future resilience against identified hazards.
- **Threat and Hazard Identification and Risk Assessment:** Utilizes information from the LHMP to understand the specific threats and hazards that may impact the community. This informs the development of strategies and resource allocation for emergency management capabilities, ensuring that the community is well-prepared to respond effectively.
- **Comprehensive Land-Use Plans:** Helps guide the development and zoning decisions in a way that minimizes vulnerability to hazards. This includes avoiding construction in high-risk areas and encouraging resilient building practices.
- **Emergency Operations Plans:** Contributes to detailing specific actions to be taken before, during, and after disasters to reduce vulnerability and enhance community resilience.
- **Climate Action Plans:** Can help address both short-term hazards and long-term climate-related risks. This includes considerations for extreme temperatures and changes in precipitation patterns.
- **Transportation Plans:** Helps ensure the resilience of transportation infrastructure to hazards such as floods, and earthquakes. This may involve designing infrastructure to withstand extreme weather events.
- **Infrastructure Master Plans:** Contributes to the design, construction, and maintenance of critical infrastructure, such as water supply systems, roads, bridges, and utility networks.

- **Community Development Plans:** Helps ensure that new development projects align with hazard resilience goals. This may involve establishing building codes that prioritize hazard-resistant construction.
- **Open Space and Recreation Plans:** Provides for the consideration of green infrastructure and open spaces for flood control, wildfire buffers, and other hazard mitigation purposes.
- **School Emergency Plans:** Enhances the safety and resilience of educational facilities. This may involve retrofitting buildings, establishing evacuation routes, and conducting regular drills.
- **Public Health Preparedness Plans:** Addresses potential health risks associated with hazards. This includes planning for medical surge capacity, disease prevention, and healthcare facility resilience.

Specifically, the following detail where previous Kansas Region D LHMPs were utilized for jurisdictional plans:

- **Clark County:** County Emergency Operations Plan
- **Finney County:** County Emergency Operations Plan
- **Ford County:** County Emergency Operations Plan
- **Gray County:** County Emergency Operations Plan
- **Haskell County:** County Emergency Operations Plan
- **Hodgeman County:** County Emergency Operations Plan
- **Lane County:** County Emergency Operations Plan
- **Meade County:** County Emergency Operations Plan
- **Seward County:** County Emergency Operations Plan

Integrating hazard mitigation with FEMA programs and initiatives provides many benefits to Kansas Region D participating jurisdictions. These benefits include a streamlined planning and funding process for hazard mitigation projects, enhanced community resilience from the leveraging of federal programs to create a holistic approach to resilience, broad based data sharing allowing for an improved understating of community risk, and enhanced funding opportunities where jurisdictions can leverage multiple sources of federal funding to implement hazard mitigation actions. Programs currently being integrated into the LHMP include:

National Flood Insurance Program (NFIP):

- NFIP: The NFIP is a federal program, managed by FEMA, which exists to provide flood insurance for property owners in participating communities, to improve floodplain management practices, and to develop maps of flood hazard areas.
- Community Rating System (CRS): NFIP's CRS incentivizes communities to go beyond minimum floodplain management standards to reduce flood risk. Communities earn CRS points for implementing flood hazard mitigation activities, which can result in lower flood insurance premiums for residents. Hazard mitigation planning can guide communities in adopting flood-specific measures that qualify for CRS points.
- Building Standards: NFIP policies encourage communities to adopt and enforce building standards to minimize flood damage. By integrating hazard mitigation planning, communities can identify and prioritize infrastructure improvements that meet or exceed NFIP standards, especially in areas vulnerable to flooding.
- Floodplain Management Plans: Developing comprehensive floodplain management plans as part of hazard mitigation planning can support NFIP compliance while addressing risks specific to community needs.

Hazard Mitigation Assistance (HMA) Grants

- Planning Support: FEMA's HMA grant programs (including the Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM), and Building Resilient Infrastructure and Communities (BRIC) grants) provide funding for hazard mitigation plans. These plans can help identify, prioritize, and implement mitigation projects that reduce risk and align with FEMA's overall resilience goals.

- Eligible Project Types: HMA Grants fund a variety of projects (e.g., retrofitting infrastructure, elevating buildings, property acquisitions) that can align with community-specific hazard mitigation goals. By aligning local hazard mitigation strategies with HMA-eligible project types, communities can maximize available funding to address critical risks.
- Funding Integration with Local Mitigation Projects: Communities can leverage HMA grantss to implement local mitigation projects that align with broader hazard mitigation goals. For example, using FMA funds to reduce flood risk in NFIP-insured properties or leveraging BRIC funds for innovative infrastructure resilience projects.

Threat and Hazard Identification and Risk Assessment (THIRA)

- Comprehensive Risk Identification: THIRA provides a structured approach for communities to identify and prioritize their risks based on a full spectrum of hazards, including natural and human-caused events. Integrating hazard mitigation planning with THIRA enables communities to address multi-hazard risks with targeted mitigation strategies.
- Capability Targets Alignment: THIRA also helps communities identify capability gaps and set targets for resilience. Hazard mitigation plans can use these targets to outline mitigation actions that align with capability-building priorities, such as improving emergency response infrastructure or fortifying lifeline systems.
- Unified Risk and Capability Assessments: By integrating hazard mitigation planning with the THIRA process, communities can develop a more cohesive picture of their risk and capability needs, allowing for more focused and impactful use of FEMA resources across initiatives.

Integration of hazard mitigation into these various plans ensures that resilience efforts are embedded in the broader fabric of community development. Coordination and collaboration among different sectors and stakeholders are essential for the successful implementation of hazard mitigation strategies on the local level. Plan incorporation and integration is crucial for creating a cohesive and coordinated approach to address various aspects of hazard mitigation. All participating jurisdictions utilize similar internal procedures for plan incorporation and integration. The following represent commonly utilized methods:

- **Cross-Referencing:** Identify and cross-reference relevant sections of different plans and policies. This involves explicitly noting connections between the goals, strategies, and actions outlined in one plan with those in others.
- **Consistency Checks:** Conduct consistency checks to ensure that the language, objectives, and strategies in different plans and policies align with each other.
- **Joint Planning Committees:** Establish joint planning committees or task forces that involve representatives from different departments or agencies responsible for various plans (for example, the MPC). These committees facilitate communication, collaboration, and the coordination of planning efforts across sectors.
- **Collaborative Workshops and Meetings:** Organize collaborative workshops and meetings to bring together stakeholders involved in different planning processes (as seen in the planning meetings for the LHMP). These forums provide an opportunity for stakeholders to share information and discuss common goals.
- **Alignment with State and Regional Plans:** Ensure that local plans align with broader regional and state plans. This involves considering regional and state priorities and incorporating them into local planning efforts to create a harmonized approach to development.
- **Data Sharing and Analysis:** Share relevant data among planning efforts and conduct joint data analysis. This helps in creating a common understanding of the challenges and opportunities, facilitating evidence-based decision-making across different plans.

- **Unified Implementation Strategies:** This involves identifying common actions and initiatives that contribute to the achievement of multiple goals outlined in various plans.

1.5 Adopting Jurisdictions

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 was required to meet detailed participation requirements, which included the following:

- Participation in planning meetings
- Provision of information to support the plan development
- Identification of relevant mitigation actions
- Review and comment on plan drafts
- Fostering the public input process
- Formal adoption of the plan

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

Table 1: Adopting Jurisdictions

Jurisdiction	Planning Engagement	Name	Title
Clark County	**x**	**Millie Fudge**	**Emergency Manager**
City of Ashland	x	Paula Rice	Superintendent
City of Englewood	x	Sue Chester	City Clerk
City of Minneola	x	Tyler Know	City Manager
USD #219 - Minneola	x	Lance Custer	Superintendent
USD #220 - Ashland	x	Paula Rice	Superintendent
Ashland Health Center	x	Darinda Berryman	Administrator
CMS Electric Cooperative	x	Kirk Thompson	General Manager
Minneola District Hospital	x	Jalin Johnson	COO
Southern Pioneer Electric COOP	x	Nate Gillespie	Ops Manager
Finney County	**x**	**Paul Resley**	**Emergency Manager**
City of Garden City	x	Matt Allen	City Manager
City of Holcomb	x	Jenny Hamill	City Administrator
Garden City Community College	x	Craig Lurtz	Director Facilities
USD #363 – Holcomb	x	Dr. Scott Myers	Superintendent
USD #457 – Garden City	x	Dr. Mike Dominguez	Superintendent
Lane-Scott Electric Cooperative	x	Richard McLeon	General Manager
Midwest Energy	x	Craig Augustine	Ops Project Manager
Pioneer Electric Cooperative	x	Tolan Seger	Manager of Safety and Compliance
Sunflower Electric Power Corporation	x	Dillon Stum	Associate General Counsel
Victory Electric Cooperative	x	Ryan Miller	Manager of Operations
Wheatland Electric Cooperative	x	Curtis Peterson	Manager of Operations
Pawnee Watershed Joint District #81	x	Randy Still	Supervisor
Ford County	**x**	**Rex Beemer**	**Emergency Manager**
City of Bucklin	x	Cody Warden	Mayor
City of Dodge City	x	Josh Adams	Director of Development Services
City of Ford	x	Heide Duffield	Mayor
City of Spearville	x	Zach Donley	Utility Superintendent
Dodge City Community College	x	Harold Nolte	President

Table 1: Adopting Jurisdictions

Jurisdiction	Planning Engagement	Name	Title
USD #381 - Spearville	x	Diana Butler	Superintendent
UDS #443 – Dodge City	x	M. Shawn Lampe	Director of Safety
USD #459 - Bucklin	x	Amy Ricks	Superintendent
Bucklin Hospital District	x	Judy Kregar	Administrator
Pawnee Watershed Joint District #81	x	Randy Still	Supervisor
Sunflower Electric Power Corporation	x	Dillon Stum	Associate General Counsel
Victory Electric Cooperative	x	Ryan Miller	Manager of Operations
Gray County	**x**	**Sean Wendel**	**Emergency Manager**
City of Cimarron	x	Mark Pingsterhaus	City Administrator
City of Copeland	x	Shelia Croft	City Cler
City of Ensign	x	Aracely Ballesteros	City Clerk
City of Ingalls	x	Leonard Rodenbur	Mayor
City of Montezuma	x	Kindra Koehn	City Administrator
USD #102 - Cimarron	x	Dr. Mike Waters	Superintendent
USD #371 - Montezuma	x	Jay Zehr	Superintendent
USD #476 – Copeland / South Gray	x	Jay Zehr	Superintendent
USD #477 - Ingalls	x	Ted Brown	Superintendent
CMS Electric Cooperative	x	Chuck Martin	Office Manager
Pioneer Electric Cooperative	x	Tolan Seger	Manager of Safety and Compliance
Pawnee Watershed Joint District #81	x	Randy Still	Manager
Midwest Energy	x	Craig Augustine	Ops Project Manager
Sunflower Electric Power Corporation	x	Dillon Stum	Associate General Counsel
Victory Electric Cooperative	x	Justin Straight	Manager of Safety
Wheatland Electric Cooperative	x	Curtis Peterson	Manager of Operations
Haskell County	**x**	**Deb Brown**	**Emergency Manager**
City of Satanta	x	Shellie Barker	City Clerk
City of Sublette	x	Daylen Elsey	City Superintendent
USD #374 - Sublette	x	Rex Richardson	Superintendent
USD #507 - Satanta	x	Karen Burrows	Superintendent
Satanta District Hospital	x	Tina Pendergraft	CEO
Pioneer Electric COOP	x	Tolan Seger	Manager of Safety and Compliance
Midwest Energy	x	Craig Augustine	Ops Project Manager
Southern Pioneer Electric Company	x	Nate Gillespie	Ops Manager
Sunflower Electric Power Corporation	x	Dillon Stum	Associate General Counsel
Victory Electric Cooperative	x	Justin Straight	Manager of Safety
Hodgeman County	**x**	**Mike Burke**	**Emergency Manager**
City of Hanston	x	Gary Seiler	Mayor
City of Jetmore	x	Bill Goebel	Mayor
Marena Township	x	Michelle Walters	Board Member
USD #227 – Hodgeman County	x	Robert Reed	Superintendent
Hodgeman County Health Center	x	Phil Ginder	Administrator
Horse Thief Reservoir District	x	Audrey Rupp	Administrator
Lane-Scott Electric Cooperative	x	Richard McLeon	General Manager
Midwest Energy	x	Craig Augustine	Ops Project Manager
Pawnee Watershed Joint District #81	x	Randy Still	Manager
Sunflower Electric Power Corporation	x	Dillon Stum	Associate General Counsel
Victory Electric Cooperative	x	Justin Straight	Manager of Safety
Lane County	**x**	**Billie Barnett**	**Emergency Manager**
City of Dighton	x	Craig Collins	City Superintendent

Table 1: Adopting Jurisdictions

Jurisdiction	Planning Engagement	Name	Title
USD #468 – Healy Public Schools	x	Jeff Jones	Superintendent
USD #482- Dighton	x	Matt Hendrick	Superintendent
Lane-Scott Electric Cooperative	x	Richard McLeon	General Manager
Midwest Energy	x	Bobby Kennedy	Supervisor
Sunflower Electric Power Corporation	x	Dillon Stum	Associate General Counsel
Pawnee Watershed Joint District #81	x	Randy Still	Supervisor
Lane County Hospital	x	Ryan Schroller	Preparedness Supervisor
S&T Telecom	x	Fritz Doke	Supervisor
Meade County	**x**	**Bryan Burgess**	**Emergency Manager**
City of Fowler	x	Carrie Sutterfield	City Clerk
City of Meade	x	Dean Cordes	City Manager
City of Plains	x	June Bender	City Clerk
USD #225 - Fowler	x	Corri McDowell	Principal
USD #226 - Meade	x	Rex Bruce	Superintendent
USD #483 – Kismet / Plains	x	Dan Frisby	Superintendent
Artesian Valley Health System	x	Jesse Pereda	Safety Officer
CMS Electric Cooperative	x	Chuck Martin	Office Manager
Southern Pioneer Electric Company	x	Nate Gillespie	Ops Manager
Sunflower Electric Power Corporation	x	Dillon Stum	Associate General Counsel
Seward County	**x**	**Greg Standard**	**Emergency Manager**
City of Kismet	x	Rodney Lewis	Mayor
City of Liberal	x	Scarlette Diseker	City Manager
Seward County Community College	x	Josh Tucker	Director of Facilities
USD #480 - Liberal	x	Stephen Linkou	Superintendent
USD #483 – Kismet / Plains	x	Dan Frisby	Superintendent
CMS Electric Cooperative	x	Chuck Martin	Office Manager
Pioneer Electric Cooperative	x	Tolan Seger	Manager of Safety and Compliance
Southern Pioneer Electric Company	x	Nate Gillespie	Ops Manager
Midwest Energy	x	Bobby Kennedy	Supervisor
Sunflower Electric Power Corporation	x	Dillon Stum	Associate General Counsel

1.6 Plan Adoption

This plan was submitted to the Kansas Division of Emergency Management (KDEM) and FEMA Region VII prior to adoption (approval pending adoption protocol). This methodology allows for a single plan adoption by participating jurisdictions in the event of plan revisions during the review and approval process. Upon review and approved pending adoption status by FEMA Region VII, adoption resolutions will be signed by the participating jurisdictions. FEMA approval documentation and jurisdictional adoption resolutions may be found in Appendix A.

Administration and oversight of the hazard mitigation program is the responsibility of KDEM and Kansas Region D Emergency Managers. The plan will be reviewed annually and will be updated every five years, or as required by changing hazard mitigation regulations or guidelines.

Section 2 – Documentation of the Planning Process

2.1 Guiding Principle

The guiding principle for the creation and utilization of this LHMP is as follows:

- Through partnerships among all local jurisdictions, identify and reduce the vulnerability to natural hazards to protect the health, safety, quality of life, environment, and economy of the diverse communities within Kansas Region D.

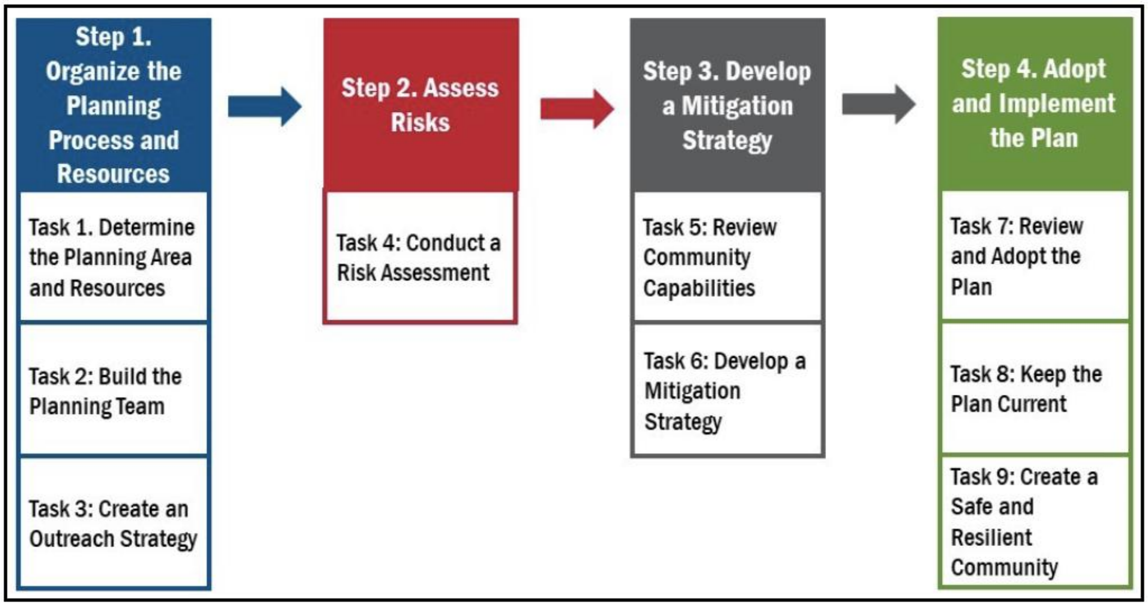
2.2 Planning Process

The process established for this planning effort is based on the Disaster Mitigation Act of 2000 planning and update requirements and the FEMA associated guidance for local hazard mitigation plans (Local Mitigation Planning Policy Guide (FP 206-21-0002), effective April 19, 2023). 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, underserved communities, and local emergency management organizations.
- Creation of a Mitigation Planning Committee (MPC) to codify and guide the planning process.
- 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.
- Creation of a multi-pronged outreach strategy to engage stakeholders.
- Conduct a thorough review of all relevant current and historic planning efforts.
- Conduct a review of all related and relevant state and local plans for integration and incorporation.
- Collect data on all related state plans and initiatives, local plans' hazard risk, local plans' mitigation strategies and actions, critical facilities and community lifelines, flood plains, Repetitive Loss/Severe Repetitive Loss properties, hazard events, on-going and completed mitigation actions, and mitigation program changes since the development of the previous plan.
- Complete a risk and vulnerability assessment using data from the FEMA and other federal and state agency resources. Analyses were conducted at the state level, county by county, of state-owned facilities, and county by county drawing on local assessments.
- Develop and update the capability assessment of Kansas Region D and all participating jurisdictions.
- Develop a comprehensive mitigation strategy effectively addressing Kansas Region D's hazards and mitigation program objectives. This included 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.

The following figure summarizes these steps:

Figure 1: Planning Process

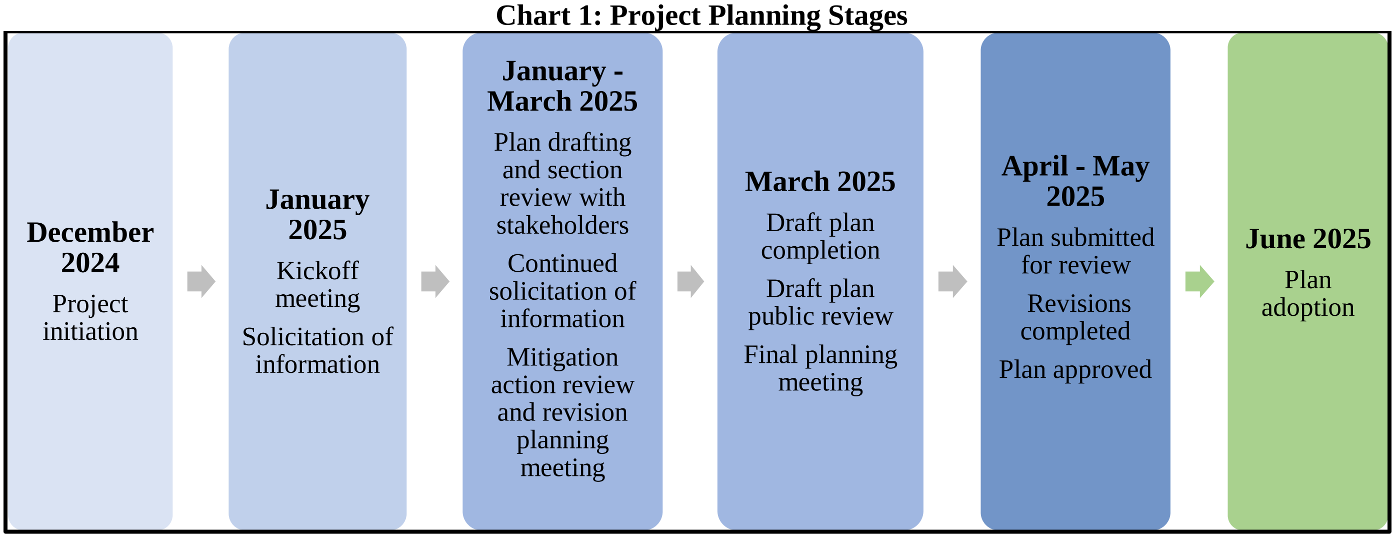


Source: FEMA

2.3 Project Timeline

The Kansas Region D LHMP review and revision process began in May 2024, with the first public meeting held in June 2024. The following chart indicates the planning stages completed as part of this process:

Chart 1: Project Planning Stages



2.4 Plan Organization

This LHMP is both a reference document and an action plan. It has information and resources to educate readers and decision-makers about hazard events and related issues and a comprehensive strategy that participating jurisdictions, stakeholders, and community members can follow to improve resilience. This LHMP is composed of the following sections:

- **Section 1 - Introduction, Assurances, Incorporation, and Adoption:** Details the regulatory framework for plan development, participating jurisdictions, how the plan will be incorporated into other planning mechanisms, and adoption requirements.
- **Section 2 – Planning Process:** Outlines the steps taken to complete this LHMP, consideration of planning equity, the people involved in its creation, strategies to invite public participation, and technical and planning resources utilized in completing this plan.
- **Section 3 - Regional Profile and Development Trends:** Details demographic information, vulnerable populations, critical facility and community lifeline information, agricultural data, and a discussion of climate change parameters.
- **Section 4 – Capability Assessment:** Provides a comprehensive evaluation of existing abilities to effectively mitigate hazards and manage disaster risks. This assessment involves analyzing the community's current resources, policies, programs, and systems to determine how well it can implement mitigation strategies.
- **Section 5 - Hazard Identification and Risk Assessment:** Describes the hazards that can impact the planning area, including extent, previous occurrences, changing conditions, and vulnerabilities.
- **Section 6 - Mitigation Strategy:** Outlines the specific actions, policies, and projects designed to reduce or eliminate the risks and impacts of hazards on a community. These strategies are developed based on the findings from the hazard identification and risk assessment phases and are tailored to address the unique vulnerabilities and capabilities of the community.
- **Section 7 - Plan Maintenance:** Summarizes plan maintenance responsibilities, monitoring and update requirements, and opportunities for continued public involvement.
- **Appendices:** Provides supplementary detailed information and supporting documents. The appendices serve to enhance the main content by offering further clarification, data, and documentation that support the planning process and implementation.

2.5 2025 Plan Update

In undertaking this planning effort, Kansas Region D determined that wide variances in planning format and data do not allow for effective continuous planning. To provide planning continuity every effort was made during this plan update to adhere as closely as possible to elements of the previous LHMP. As such, the level of analysis and detail included in this risk assessment is cumulative, allowing participating jurisdictions to have a robust base to further mold and improve their mitigation strategies over the next five years.

As part of this planning effort, each section of the previous mitigation plan was reviewed based on current and available data. The plan was reviewed against the following elements:

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

Based on the above criteria, each section of the previous LHMP was revised as required. In addition to data revisions, the format and sequencing of the previous plan was updated for ease of use and plan clarity. Key updated elements from the previous LHMP include:

- Expanded definition and discussion of underserved communities and vulnerable populations.
- Updated goals and objectives, including a new goal and objectives.
- Updated critical facilities and community lifelines list.

- Expanded detailing of historic hazard occurrences.
- Updated mapping using newly available data.
- Updated county and jurisdictional capabilities assessment.
- Integration of relevant revised plans.
- Updated mitigation actions, including progress on previous actions.

2.6 Hazard Mitigation Planning Equity

Planning equity refers to the principle of fairness and justice in planning and development processes. It emphasizes the equitable distribution of resources, opportunities, and benefits among all members of a community, particularly those who have historically been marginalized or disadvantaged (also known in Kansas as equity priority communities). The concept of planning equity recognizes that planning decisions can have significant impacts on different groups of people and aims to ensure that these decisions promote social justice and inclusivity. It involves addressing spatial inequalities, such as disparities in access to housing, transportation, public services, green spaces, and employment opportunities.

Planning equity entails involving diverse stakeholders in decision-making processes, including community members, advocacy groups, and underrepresented populations. It seeks to empower marginalized communities by giving them a voice in shaping the development and planning policies that directly affect their lives.

Planning equity and hazard mitigation planning are closely related, as both aim to create more resilient and inclusive communities. As part of this planning effort, the following intersections were considered between planning equity and hazard mitigation planning:

- Vulnerability assessment: Planning equity recognizes that certain communities, particularly marginalized and disadvantaged populations, may be more vulnerable to hazards due to social, economic, and environmental factors. When conducting a vulnerability assessment as part of hazard mitigation planning, it is important to consider equity issues and identify areas or groups that may experience disproportionate impacts.
- Engaging marginalized communities: Planning equity emphasizes the inclusion and participation of diverse stakeholders, including marginalized communities, in decision-making processes. In hazard mitigation planning it is crucial to engage these communities to understand their unique needs, concerns, and perspectives regarding hazards.
- Addressing social disparities: Hazard mitigation planning can help address social disparities by considering the unequal distribution of resources and opportunities in the context of hazards. This can involve implementing mitigation measures that specifically target vulnerable populations, such as affordable housing in safer areas or improved access to emergency services and transportation for underserved communities.
- Equitable distribution of resources: Planning equity promotes the equitable distribution of resources, and this principle can be applied to hazard mitigation planning. It involves ensuring that mitigation measures and investments are allocated fairly, with consideration given to communities that have historically received less attention or investment. This can help reduce existing disparities and enhance the resilience of marginalized communities.

By integrating planning equity into hazard mitigation planning, it becomes possible to develop strategies and actions that not only reduce the risks associated with hazards but also promote social justice, inclusivity, and resilience for all members of the community.

As part of this planning process, planners considered potential inequities and encouraged the participation of potentially vulnerable citizens and communities. This process began with recognizing that disparities exist within the region, including health outcomes and living conditions for people of color, people with disabilities, and historically disadvantaged communities. It was recognized that these populations may be at greater risk to the hazards identified in this plan and may be limited in their ability to adapt, respond, and recover if an event were to occur.

As recommended in FEMA's "Guide to Expanding Mitigation," Kansas Region D took a whole community approach to this planning effort, including:

- Inviting historically underserved populations to participate in the planning and decision-making processes
- Inviting faith based and community organizations, nonprofit groups, schools, and academia to be plan stakeholders

The following table identifies our equity partners who were contacted directly via phone and email to inform them of the planning process:

Table 2: Equity Partners

Equity Partner	Representative and Title	Description
Participating County Health Departments	MaryAnn Cunningham, Administrator, Clark County	Health departments in Kansas play a crucial role in promoting public health and ensuring community well-being. They provide a range of services, including disease prevention, health education, immunizations, and environmental health inspections. Additionally, they focus on maternal and child health, family planning, and emergency preparedness. To support underserved and vulnerable populations, Kansas health departments offer sliding-scale fees for services, free or low-cost vaccinations, and programs addressing chronic disease management, nutrition, and mental health. They often collaborate with community organizations to expand access to care, address health disparities, and advocate for resources in rural and low-income areas, ensuring equitable healthcare for all residents.
	Shruti Chhabra, Administrator, Finney County	
	Angela Sowers, Administrator, Ford County	
	Denice Cragg, Administrator, Gray County	
	Robin Hull, Administrator, Haskell County	
	Gina Pack, Administrator, Hodgeman County	
	Arlene Doll, Administrator, Lane County	
	Rachel Clowdis, Administrator, Meade County	
	Brie Greeson, Administrator, Seward County	
Regional Hospitals	Darinda Berryman, Administrator, Ashland Health Center	Regional hospitals in Kansas provide essential healthcare services, including emergency care, inpatient and outpatient treatments, surgical procedures, and diagnostic testing. They are vital hubs for medical care in rural and underserved areas, often serving as the primary healthcare providers for their communities. To support underserved and vulnerable populations, these hospitals offer financial assistance programs, free or reduced-cost care, and outreach initiatives such as mobile health clinics. Many collaborate with local
	Jalin Johnson, COO, Minneola District Hospital	

Table 2: Equity Partners

Equity Partner	Representative and Title	Description
	Judy Kregar, Administrator, Bucklin Hospital District Tina Pendergraft, CEO, Satanta District Hospital Phil Ginder, Administrator, Hodgeman County Health Center Jesse Pereda, Safety Officer, Artesian Valley Health System	organizations to address barriers to care, including transportation and health education. Regional hospitals also play a critical role in recruiting and retaining healthcare professionals in rural areas, ensuring access to quality care for all residents.
Kansas Statewide Homeless Coalition Region Two - Southwest Kansas	Kayla Knier, Regional Coordinator	The Kansas State Homeless Coalition, Inc. is a not-for-profit organization based in Lawrence, KS. Our work is to coordinate with communities throughout the state to provide advocacy, training, education, and support in an effort to end homelessness in Kansas. We also provide remote services to those experiencing homelessness in areas with limited resources.

As many of these equity partners serve all jurisdictions within Kansas Region D, they were leveraged to reach our underserved and isolated communities by providing them with the LHMP and all surveys relating to this plan. All feedback comments, both written and verbal, were incorporated into the fabric of this plan as appropriate.

2.7 Mitigation Planning Committee

Project initiation began with the selection of a Mitigation Planning Committee (MPC), consisting of the Kansas Region D emergency manager and representative staff from each participating jurisdiction. From project inception to completion, the MPC was notified at each major plan development milestone through a combination of meetings and electronic communication. In general, all MPC members were asked to participate in the following ways:

- Attend and participate in meetings
- Assist with the collection of data
- Assure the accuracy and completeness of data
- Assist with the revision and development of mitigation actions
- Review planning elements and drafts
- Integrate hazard mitigation planning elements with other planning mechanisms

As an additional responsibility, MPC members helped establish project operating procedures and timelines, and assisted with the establishment of project milestones.

The following table represents members of the MPC:

Table 3: MPC Members

Jurisdiction	Name	Title
Clark County	Millie Fudge	Emergency Manager
Finney County	Paul Resley	Emergency Manager
Ford County	Rex Beemer	Emergency Manager
Gray County	Sean Wendel	Emergency Manager
Haskell County	Deb Brown	Emergency Manager
Hodgeman County	Mike Burke	Emergency Manager

Table 3: MPC Members

Jurisdiction	Name	Title
Lane County	Billie Barnett	Emergency Manager
Meade County	Bryan Burgess	Emergency Manager
Seward County	Greg Standard	Emergency Manager
KDEM	Stephanie Goodman	State Hazard Mitigation Officer
KDEM	Mike Ahlf	Mitigation Planner
KDEM	Dirk Christian	Planning and Mitigation Bureau Director
KDEM	Cathy Hernandez	KDEM Regional Coordinator

2.8 Participating Stakeholders

Kansas Region D acknowledges that effective hazard mitigation planning should involve a diverse group of stakeholders, including government agencies, private sector entities, private non-profit organizations, quasi-governmental authorities, and special districts. The coordination and cooperation of these stakeholders assists with all aspects of plan development, including:

- Data collection
- Hazard and risk analysis
- Capability assessment
- Mitigation action review, revision, and development
- Plan implementation

These participating stakeholders were contacted directly by MOC members via phone and email during the entirety of the planning process concerning plan progress and meeting information (including remote meeting login information and in person meeting address and time when applicable), and included:

- Local and regional agencies involved in hazard mitigation activities.
- Agencies that have the authority to regulate development.
- National Flood Insurance Program coordinators.
- Neighboring communities.
- Representatives of business, academia, and other private organizations.
- Non-profit and community-based organizations who work to provide support to socially vulnerable and underserved communities.

The following table details our participating stakeholders:

Table 4: Participating Stakeholders

Name	Title	Jurisdiction or Agency
J.D Hegwood	District Manager	CMS Electric Coop
Matt Foos	Council member	City of Spearville
Shannon Hoskinson	City Electric	City of Cimarron
Lancy Lacy	City Public Works	City of Cimarron
Craig Collins	Superintendent Dighton/Fire	City of Dighton
Kyndell Penick	VP of Safety and Key Accounts	Victory Electric
Justin Straight	Manager of Safety	Victory Electric
Daylon Elsey	City Superintendent	City of Sublette
Marcus Rogge	Commissioner	Haskell County
Richard Foskuhl	Foreman	City of Montezuma

Table 4: Participating Stakeholders

Name	Title	Jurisdiction or Agency
Troy Buller	Gray County Commissioner	Gray County
Tom Lowery	City Superintendent	City of Ensign
Warren Wright	City Superintendent	City of Montezuma
Bradley Hines	Dodge City Fire Chief	Dodge City Fire Department
Brian Henson	Dodge City Fire Captain	Dodge City Fire Department
Josh Adams	Director of Development Services	City of Dodge City
Brian Fornwalt	Airport Manager	City of Liberal
Bertha Rodriguez	Airport Assistant	City of Liberal
J.D Hegwood	District Manager	CMS Electric Coop

Emphasis was placed on inviting local building departments, who played a critical role in creating and reviewing this LHMP. Their expertise was used to help identify local vulnerabilities and develop building-related mitigation measures. Additionally, jurisdictional NFIP coordinators played a key role in mitigation planning at the community level. These coordinators were actively engaged and for their expertise on flood risk, mitigation strategies, and NFIP compliance. Information concerning building codes, NFIP participation, and building and NFIP representatives may be found in Section 4. While not all of these organizations attended meetings, each was actively courted to provide information, data, and feedback as necessary and as related to their areas of expertise.

2.9 Coordinating Stakeholders

The Kansas Region D MPC provided the opportunity for a wide variety of coordinating stakeholders to participate in the planning process. Coordinating stakeholders have information and resources that are important to the planning process, but do not participate fully in the planning process. While not all of these organizations attended meetings, each was actively courted to provide information, data, and feedback as necessary and as related to their areas of expertise.

The following provides a list of all coordinating stakeholders involved in the development of this LHMP:

- Kansas Department of Agriculture
- Kansas Department of Aging and Disability Services
- Kansas Department of Health and Environment
- Kansas Department of Transportation
- Kansas Department of Wildlife and Parks
- Kansas Division of Emergency Management
- Kansas Fire Marshal
- Kansas Historical Society
- National Oceanic and Atmospheric Administration
- National Weather Service (NWS)
- United States Army Corps of Engineers
- United States Census Bureau
- United States Department of Agriculture (USDA)
- United States Geological Survey (USGS)
- University of Wisconsin SILVIS Labs

2.10 Community Outreach

As part of the overall planning process, members of the community (the public) were provided with numerous opportunities to contribute and comment on the creation and adoption of the plan. For participating jurisdictions, the public was defined as any person with an interest in the resilience and welfare of Kansas Region D. These opportunities included:

- Kansas Region D Emergency Management webpage updates concerning all hazard mitigation activities, survey links, and meeting information.
- Flyers to post to advertised meeting locations and details.
- Online and paper surveys.
- Comment period, along with an online survey, upon completion of draft plan.

All open public meetings were held at easily accessible community locations. As many participating jurisdictions and citizens have limited communications capabilities, meeting notices were placed in high visibility locations and our MPC was asked to conduct a word-of-mouth campaign concerning the planning process to include as many participants as possible.

Figure 2: Kansas Region D Kickoff Flyer

Kansas Region D Hazard Mitigation Plan Kickoff Meeting

Weather Reschedule

Monday, January 13th, 2025

1:00PM – 2:30PM

Community Center

508 West Sunnyside Avenue, Montezuma, Kansas

Please join us to learn about the Kansas Region D Hazard Mitigation Plan, and the process we will undertake to update the plan for 2025. At this meeting you can provide feedback on possible hazards, projects to mitgate hazards, and community concerns. Please don't hesitate to let us know if you have any questions, and we look forward to seeing you there!

Contact Us

- **Clark:** Millie Fudge (clemgt@ucom.net; shunt@ucom.net)
- **Finney:** Paul Resley (presley@finneycounty.org)
- **Ford:** Rex Beemer (rbeemer@fordcounty.net)
- **Gray:** Sean Wendel (swendel@grayco.org)
- **Haskell:** Debra Brown (dbrown@haskellcountyks.com)
- **Hodgeman:** Mike Burke (hgcoem@yahoo.com)
- **Lane:** Bill Barnett (lcem.fire164@gmail.com)
- **Meade:** Bryan Burgess (bburgess@meadeco.org)
- **Seward:** Greg Standard (gstandard@sewardcountyks.org)
- **Regional Coordinator:** Cathy Hernandez (catherine.hernandez@ks.gov)

For those who cannot attend the in person meetings, please join us virtually.

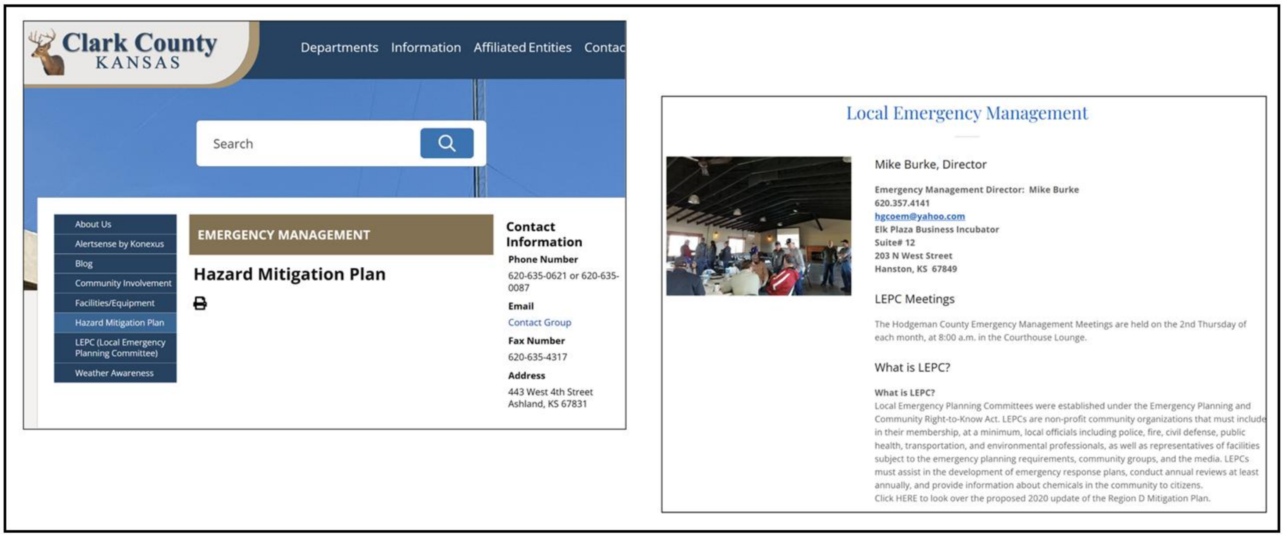
Virtual Meeting Link

https://us06web.zoom.us/j/83620737796?pwd=RCCq0MXkgrglaejk8p1y5JnjbfZ54a.1
Meeting ID: 836 2073 7796
Passcode: 560294

Kansas

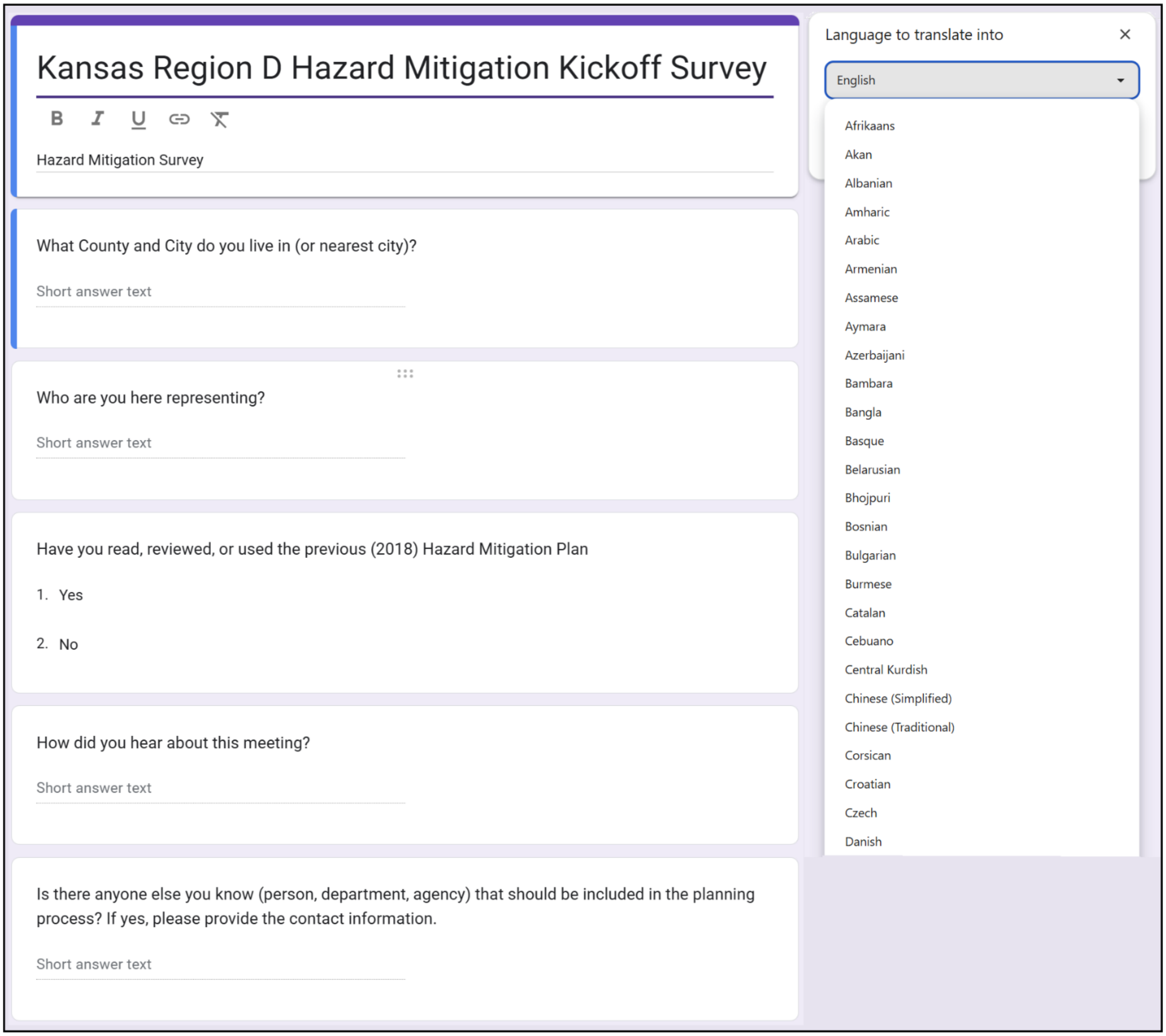
Along with public meetings, and to help generate community interest and participation, a parallel online outreach strategy was undertaken. Because Kansas Region D encompasses many rural communities, an online strategy was enacted. This allowed remote and underserved communities to participate fully in the process without having to travel long distances. Information concerning the hazard mitigation planning process, along with links to public surveys, were provided through county emergency management websites:

Figure 3: County Emergency Management Website LHMP Information



Additionally, throughout the planning process numerous public surveys were released to allow community members to provide feedback and input on the LHMP update using a series of guided questions and open comment fields. The surveys used Google's auto translate feature to provide a host of languages to complete the forms.

Figure 4: Kansas Region D Hazard Mitigation Plan Kickoff Survey



> ***Public Comment:*** *Thank you for caring for this community.*

Input from the general public provided the MPC with a clearer understanding of local concerns, helped confirm identified hazards, helped shape proposed mitigation actions, and provided elected officials with a guide and tool to set local, regional, and 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 mitigate 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. Comments and feedback from the surveys are both incorporated in this LHMP and are included in Appendix B.

2.11 Planning Meetings

Numerous in-person meetings were conducted for the 2024 LHMP update. All of the meetings were held in a publicly accessible location and advertised as open to the public. These meeting were conducted to discuss the mitigation planning process as well as gain public support and input for the plan update. The following is a brief synopsis of those meetings.

- **LHMP Update Kick-Off and Public Information Meeting – January 13, 2025:** Kansas Region D hosted a kick-off meeting for the MPC, stakeholders, and the public. The meeting was used to present the general structure and timeline for the LHMP process, discuss jurisdictional participation requirements, present data concerning changing demographics and development, review and discuss identified hazards that could impact the region, and present next steps. During the meeting, MPC members, plan stakeholders, and the public were invited to voice any concerns, ask questions, and provide input on the mitigation plan update. Additionally, MPC members were tasked with collecting contact information, and advised of future data collection requirements such as hazard history, facility information, and other pertinent information from participating jurisdictions.
- **LHMP Capability Review, and Mitigation Strategy Review Meeting – March 3, 2025:** Kansas Region D had a planning meeting for the MPC. Attendees reviewed and revised, as necessary, the hazards list and vulnerability assessment. MPC members also reviewed the mitigation strategy to ensure it was in-line with the current planning environment.
- **LHMP Update Final Review Meeting – April 1, 2025:** Kansas Region D hosted a public final plan review meeting for the MPC, stakeholders, and the public. At the meeting, MPC members, jurisdictional representatives, plan stakeholders, and the public were invited to voice any concerns, ask questions, and provide input on the mitigation plan update. Additionally, members of the public were invited to review a draft copy of the LHMP update posted to jurisdictional and county websites for two weeks prior to the final meeting, and prior to its submission to FEMA Region VII.

Formal meetings were supplemented with planning calls and frequent email communications

2.12 Planning Document Resources

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 a jurisdiction's resilience to disasters.

- **2017 Kansas Region D Hazard Mitigation Plan**
  The previous LHMP has been reviewed and is incorporated throughout this plan per FEMA requirements.
- **2023 Kansas State Hazard Mitigation Plan**
  Completed by the ADEM, this plan was utilized to provide the framework for hazard mitigation. This plan set a baseline for standards and practices for hazard mitigation planning and was used as a resource for information and data.
- **Kansas Region D Comprehensive Master Plans**
  These plans provide a local government's long-term framework for future growth and development. All specific plans, subdivisions, public works projects, and zoning decisions must be consistent with the general plan. These plans provided background information on the county and jurisdictions, information on risk and vulnerabilities, and a review of existing policies related to hazards and mitigation.
- **Kansas Region D Emergency Operations Plans**

This plan is used to develop procedures for the protection of personnel, equipment, and critical records to help determine existing established policies that ensure the continuity of government and essential services during and after disasters.

- **Planning and Zoning Documents and Ordinances**
  Planning and zoning ordinances are tools used by local governments to regulate land use and development within their jurisdictions. These ordinances are essential for implementing a community's land development plan and ensuring orderly growth and development. These documents were reviewed, assessed, and cataloged to compile each participating jurisdiction's capabilities.

2.13 Technical Resources

A variety of technical resources during plan development. These technical resources were instrumental in completing an accurate vulnerability and risk assessment, and include:

- **FEMA Digital Flood Insurance Rate Maps**: FEMA's National Flood Hazard Layer data was instrumental in mapping floodplain locations and estimating potential flood impacts and loss estimates.
- **FEMA National Risk Index (NRI):** An online mapping application that identifies communities most at risk to natural hazards. The mapping service visualizes natural hazard risk metrics and includes data about expected annual losses from natural hazards, social vulnerability, and community resilience. The NRI's interactive web maps are at the county and Census tract level and made available via GIS services for custom analyses.
- **FEMA Resilience Analysis and Planning Tool (RAPT):** FEMA and Argonne National Laboratory created RAPT to support state, local, tribal, territorial analysis in identifying focus areas for building resilience, response, and recovery capabilities. RAPT is a geographic information system web map tool with clickable layers of community resilience indicators, infrastructure locations, and hazard data.
- **Homeland Infrastructure Foundation-Level Data (HIFLD)**
  A program managed by the U.S. Department of Homeland Security (DHS) that provides authoritative geospatial data for use by government agencies, emergency responders, and other authorized users involved in homeland security, emergency management, and critical infrastructure protection. The primary goal of HIFLD is to support homeland defense, security, and emergency preparedness missions by offering high-quality, reliable geospatial information.
- **National Oceanic and Atmospheric Administration (NOAA)/National Centers for Environmental Information (NCEI):** Provided weather data and historical events occurrence data.
- **U.S. Army Corps of Engineers (USACE):** Provided dam and flood control data.
- **U.S. Department of Agriculture (USDA):** Provided drought and agricultural data.
- **U.S. Geological Survey:** Provided geologic hazard occurrence and probability data.
- **National Weather Service (NWS):** Provided meteorological and storm event occurrence and probability data.
- **U.S. Drought Monitor:** Provided drought occurrence and intensity data.
- **Kansas Office of State Geologist:** Provided data about Kansas Region D's geology and seismology.
- **FEMA Map Service Center:** The official public source for flood hazard information produced in support of the National Flood Insurance Program (NFIP).
- **United States Census Bureau:** Data concerning populations, socially vulnerable populations, and housing.
- **KDEM:** LHMP planning guidance and technical support.

Section 3 – Regional Profile and Development Trends

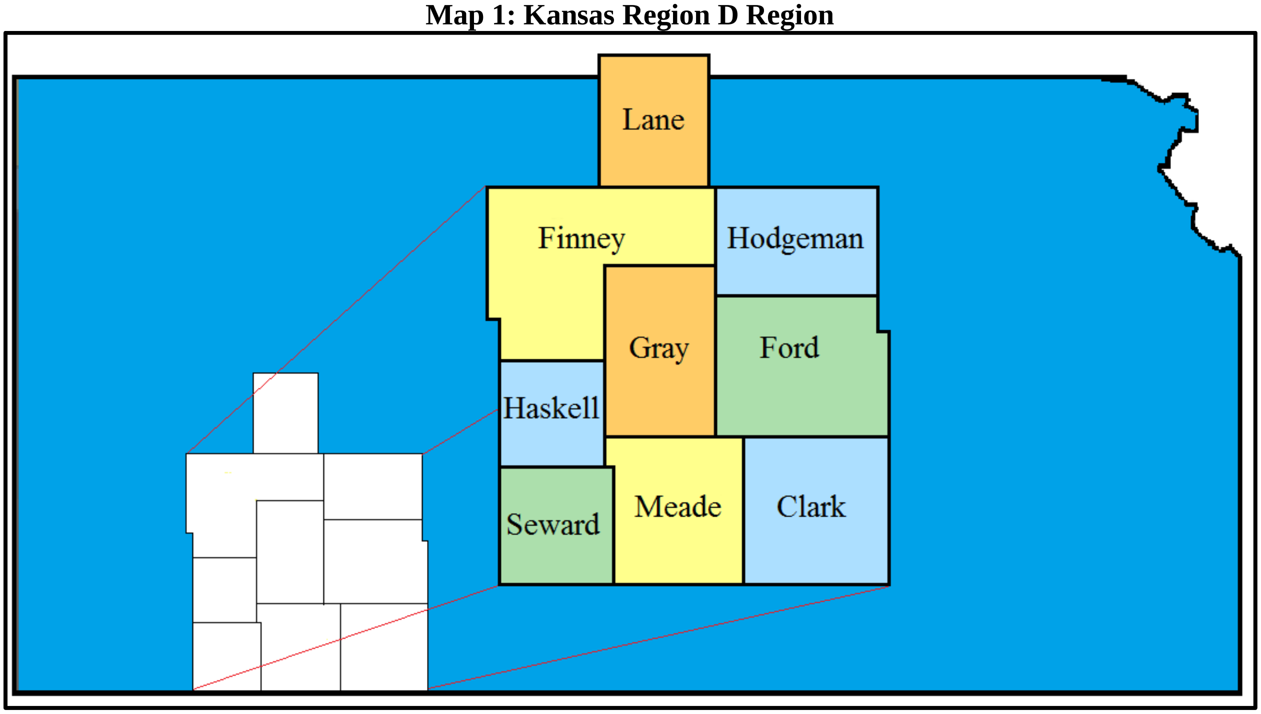
3.1 Introduction

Data concerning development trends and conditions is of great importance in determining regional and local risk and vulnerability to identified hazards, especially in locations which are susceptible to identified hazards. In general, any increase in population or development in hazard susceptible areas tends to increase both the risk and the vulnerability to that hazard. As such, the information presented in this chapter details relevant population and building statistics for participating jurisdictions in Kansas Region D. This data will then be used to determine and refine potential hazard vulnerability in succeeding sections.

3.2 Jurisdictional Maps

The following map details the location of Kansas Region D and participating counties:

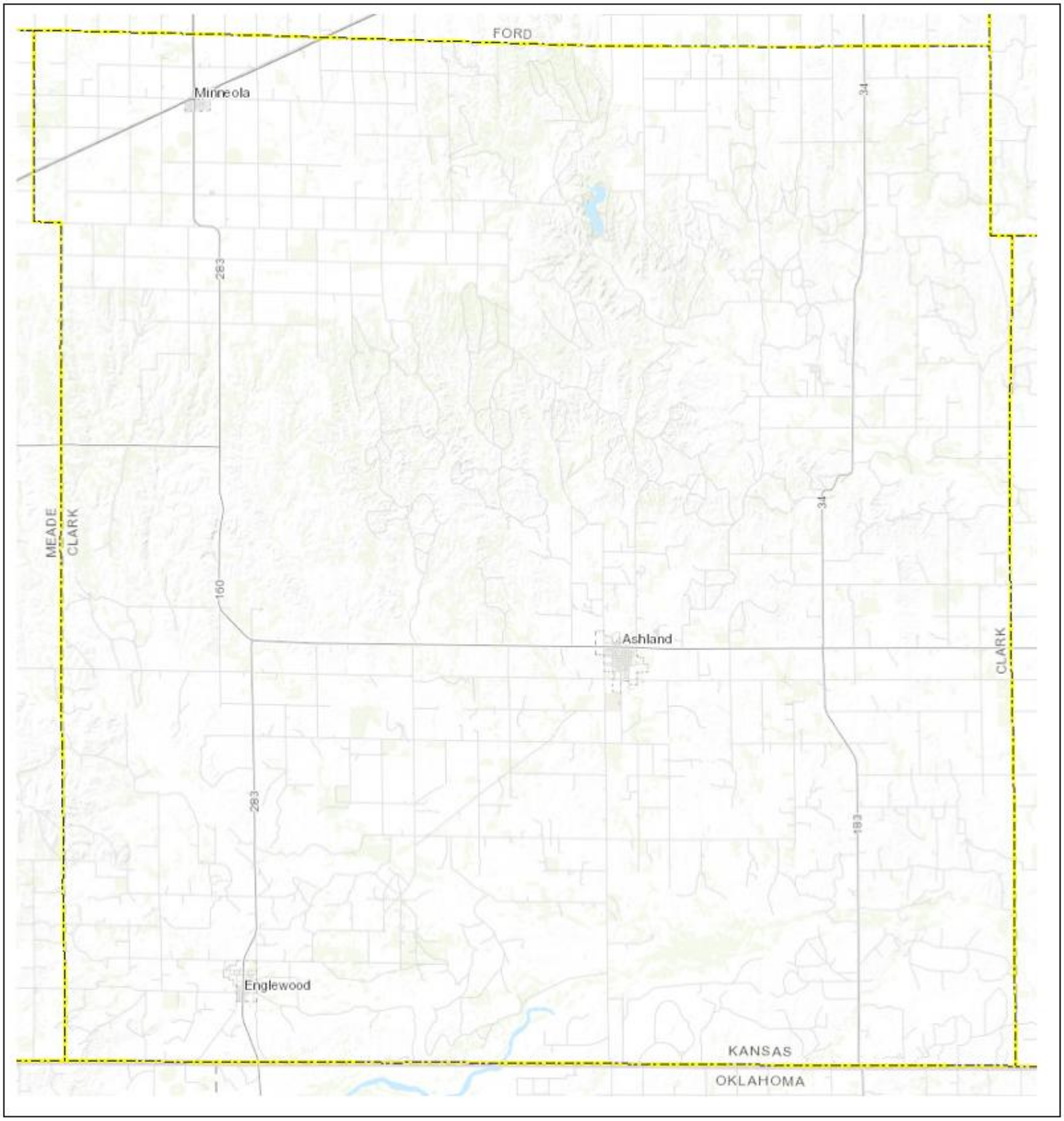
Map 1: Kansas Region D Region



Source: State of Kansas

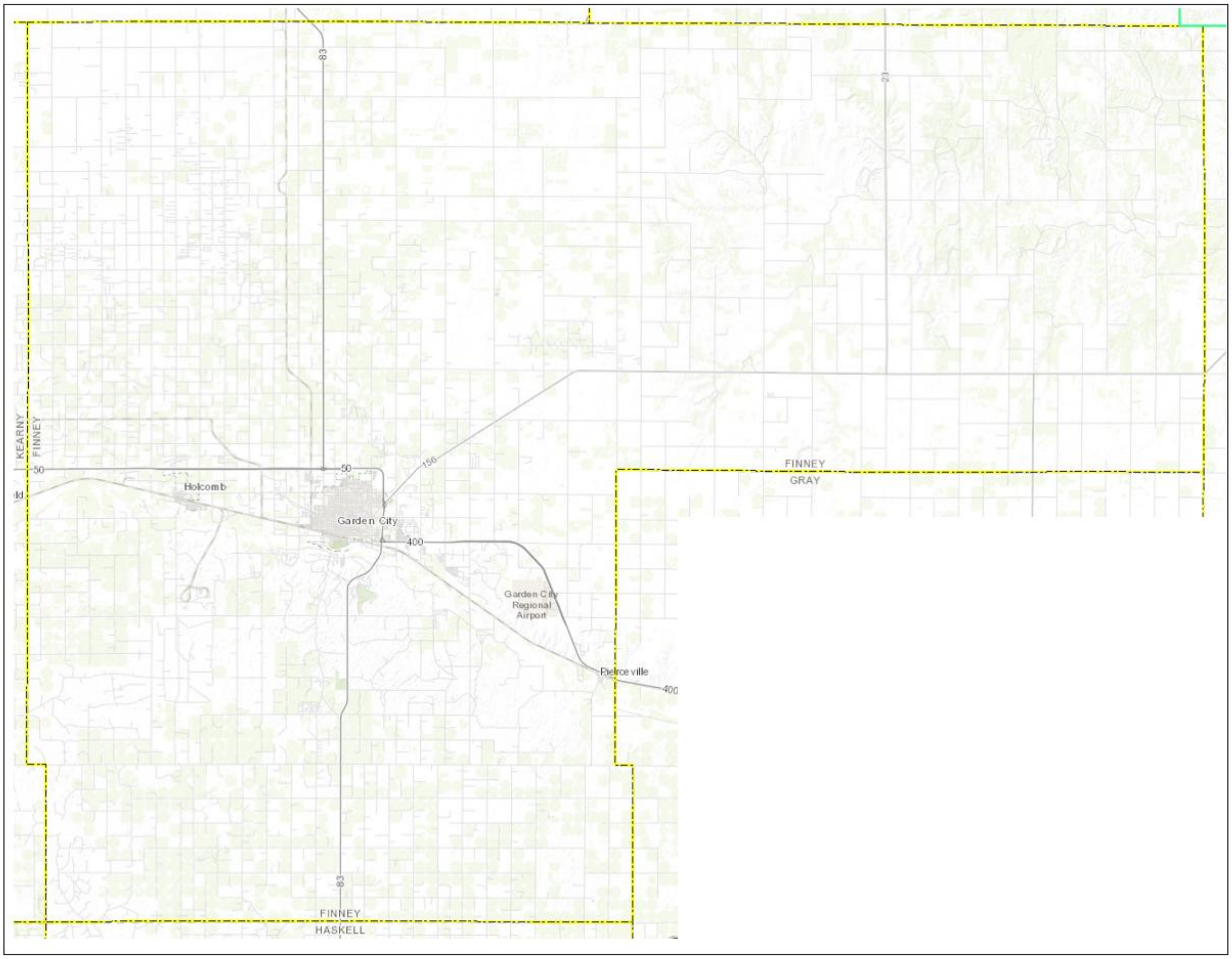
The following maps from the Kansas Department of Transportation detail each participating Kansas Region D county along with participating jurisdictions:

Map 2: Clark County



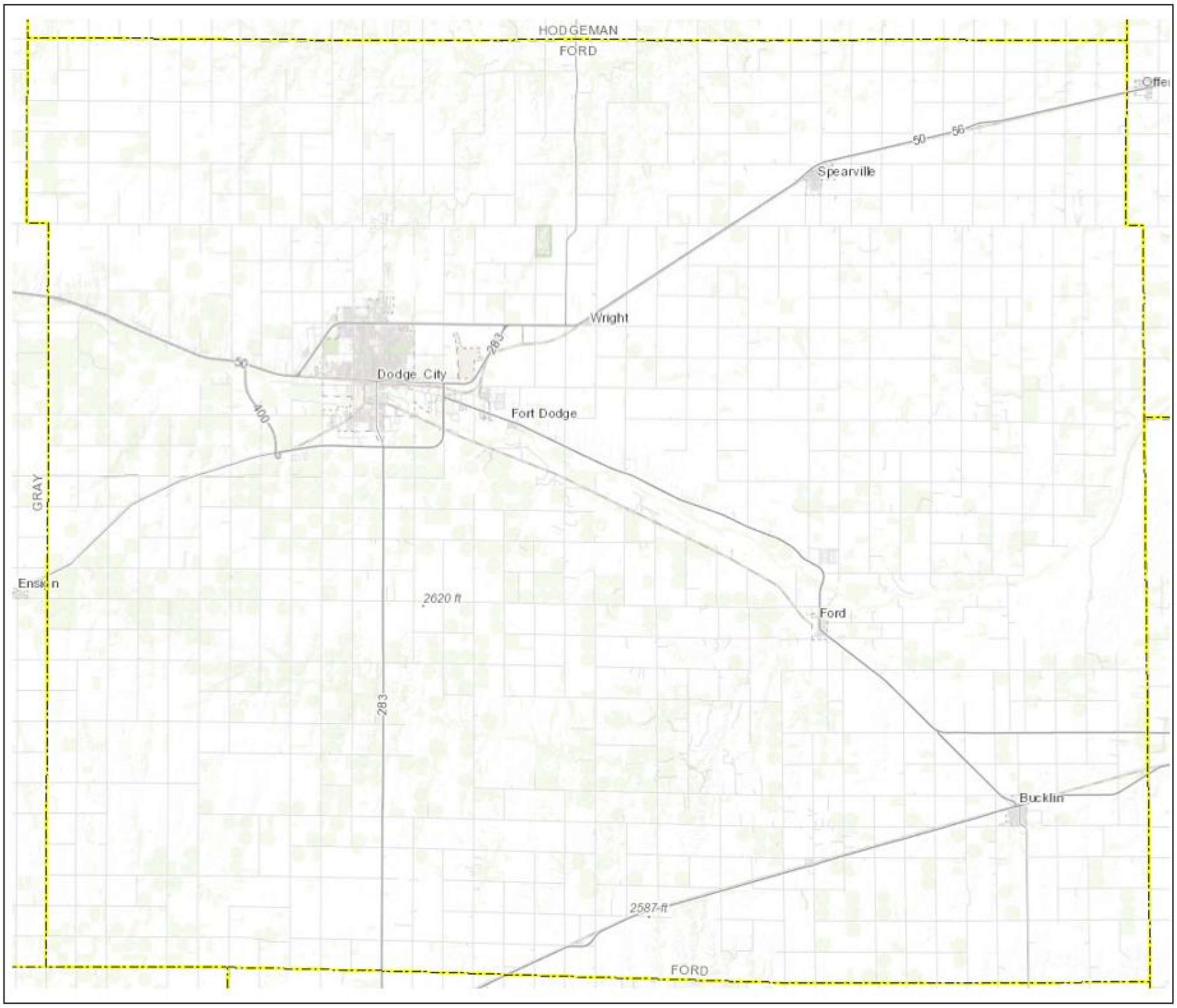
Source: Kansas Department of Transportation

Map 3: Finney County



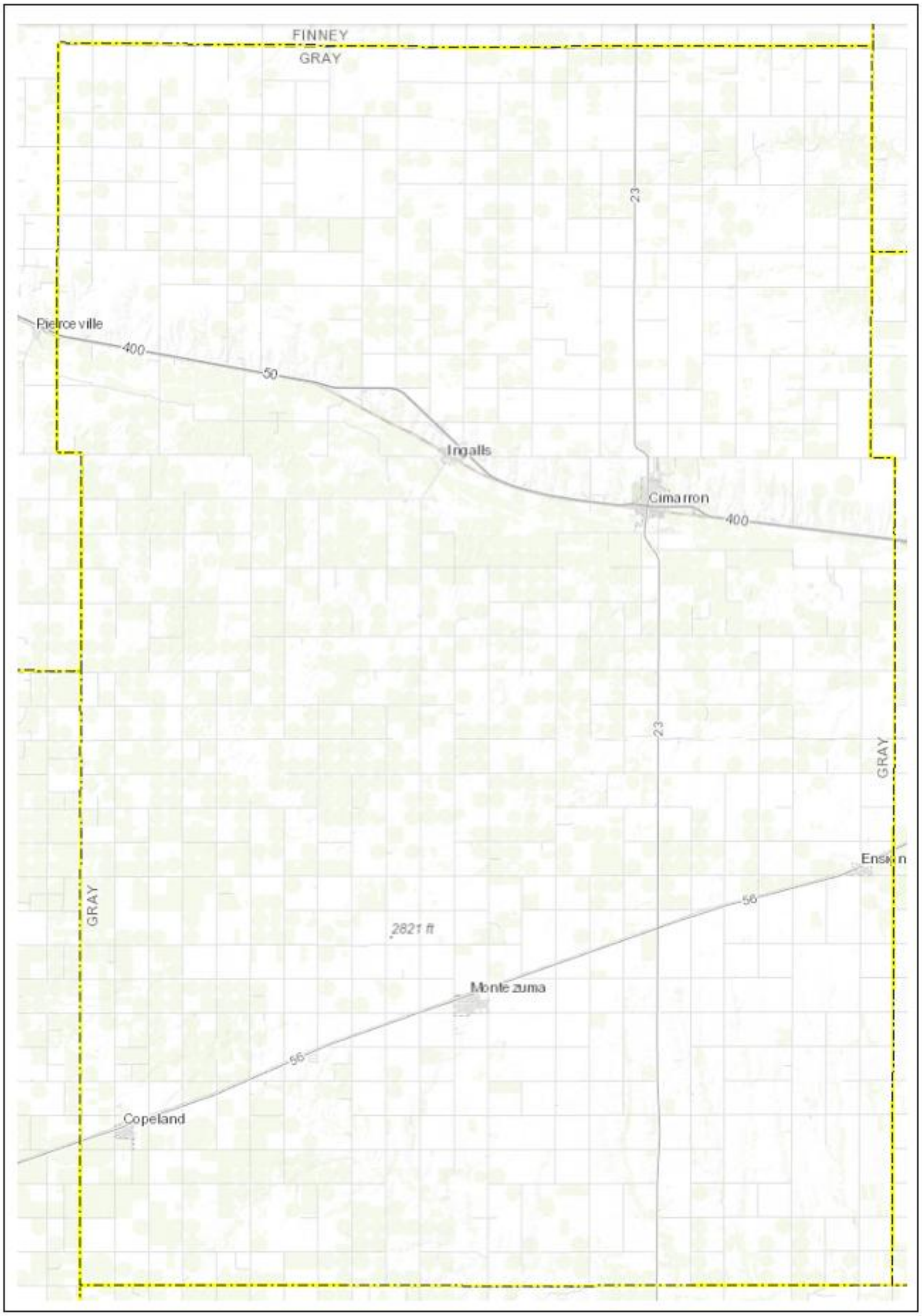
Source: Kansas Department of Transportation

Map 4: Ford County



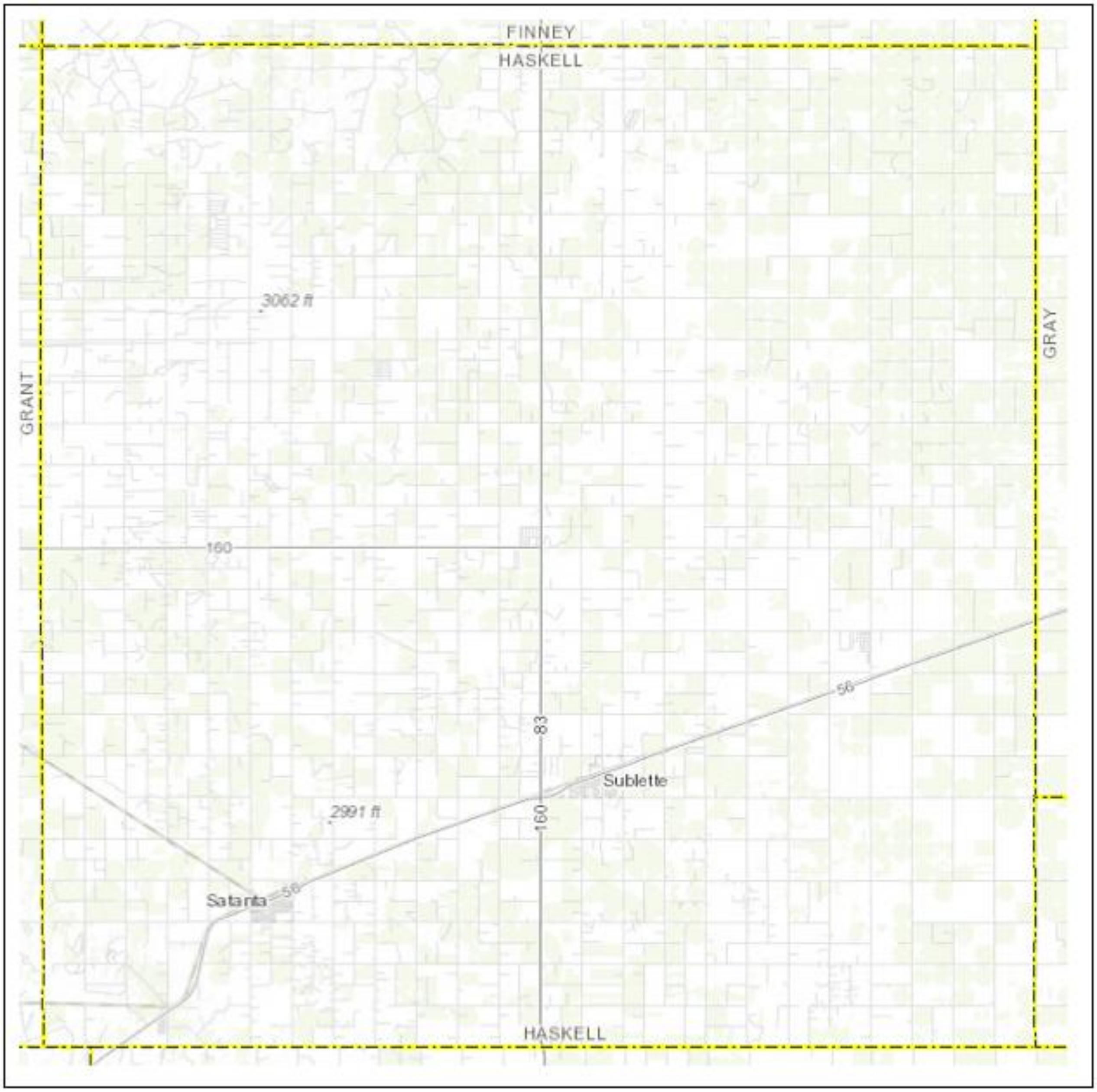
Source: Kansas Department of Transportation

Map 5: Gray County



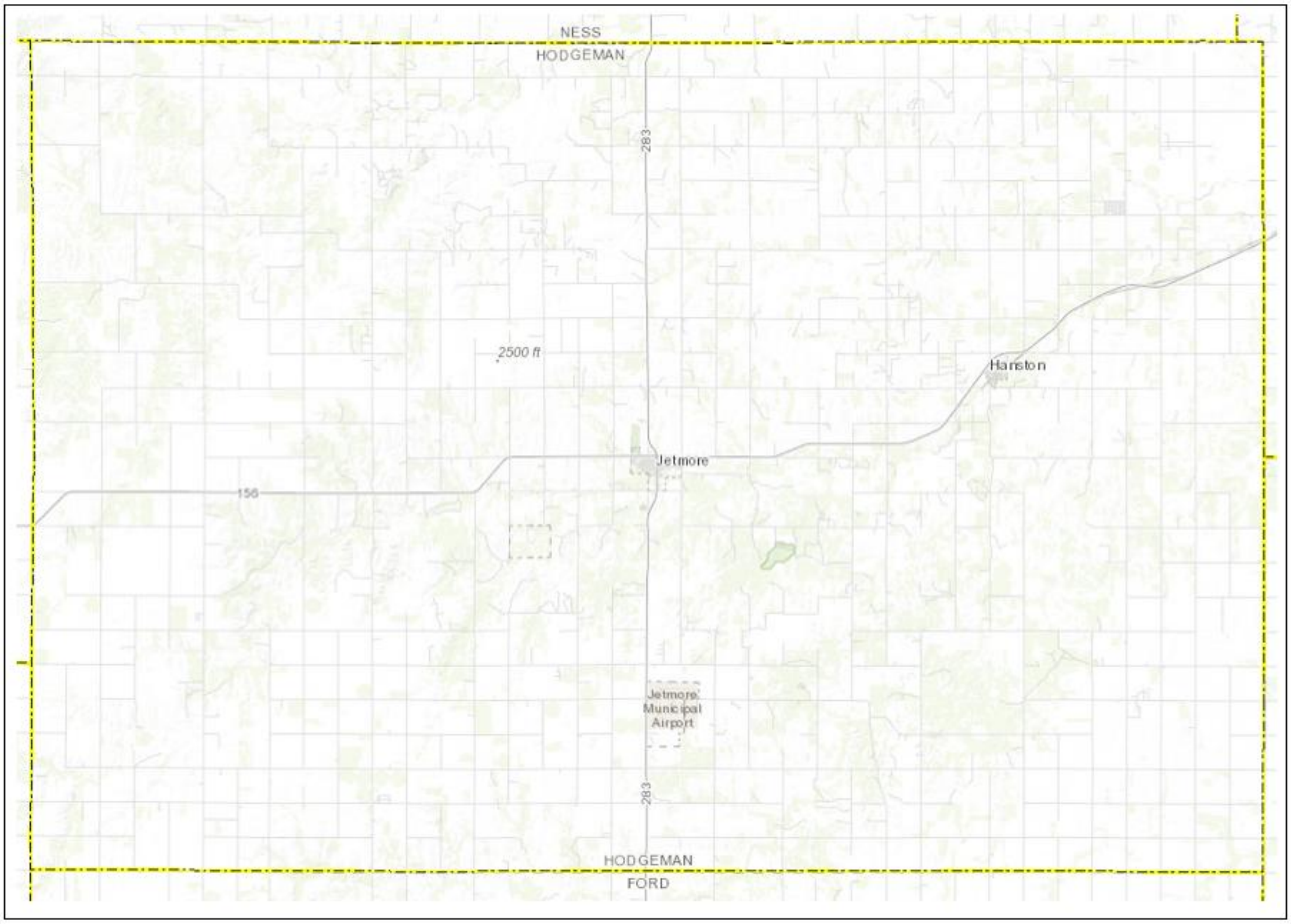
Source: Kansas Department of Transportation

Map 6: Haskell County



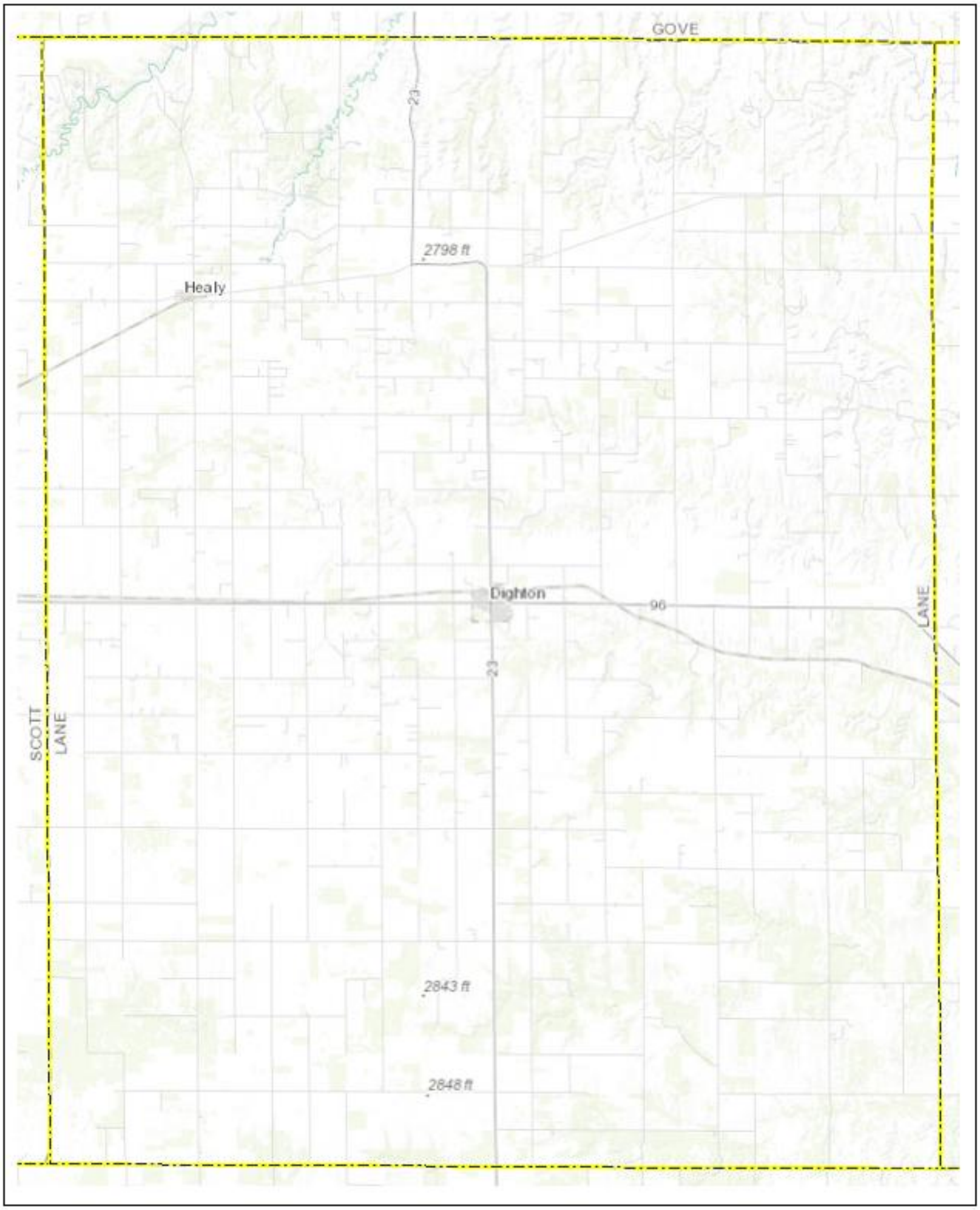
Source: Kansas Department of Transportation

Map 7: Hodgeman County



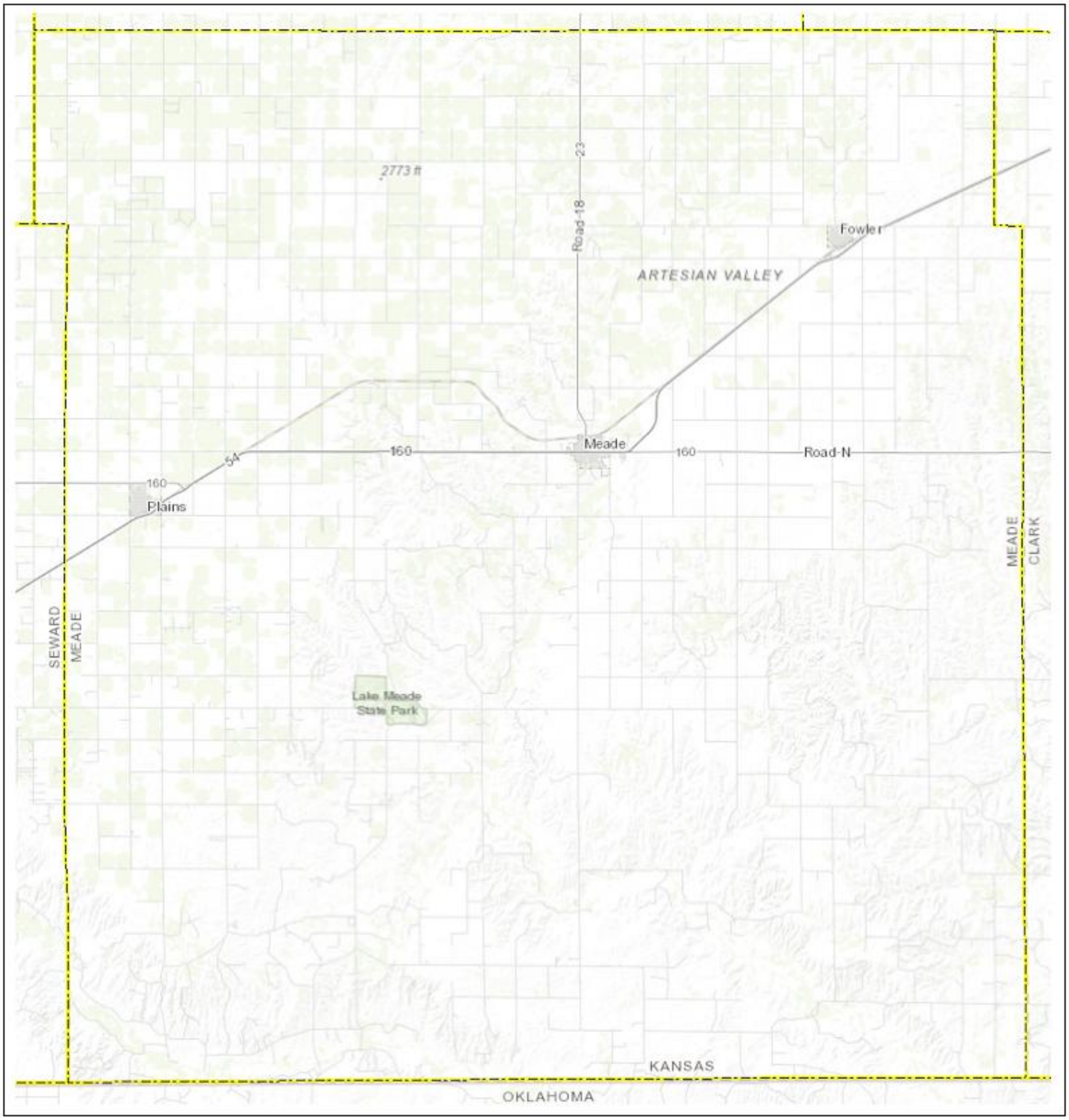
Source: Kansas Department of Transportation

Map 8: Lane County



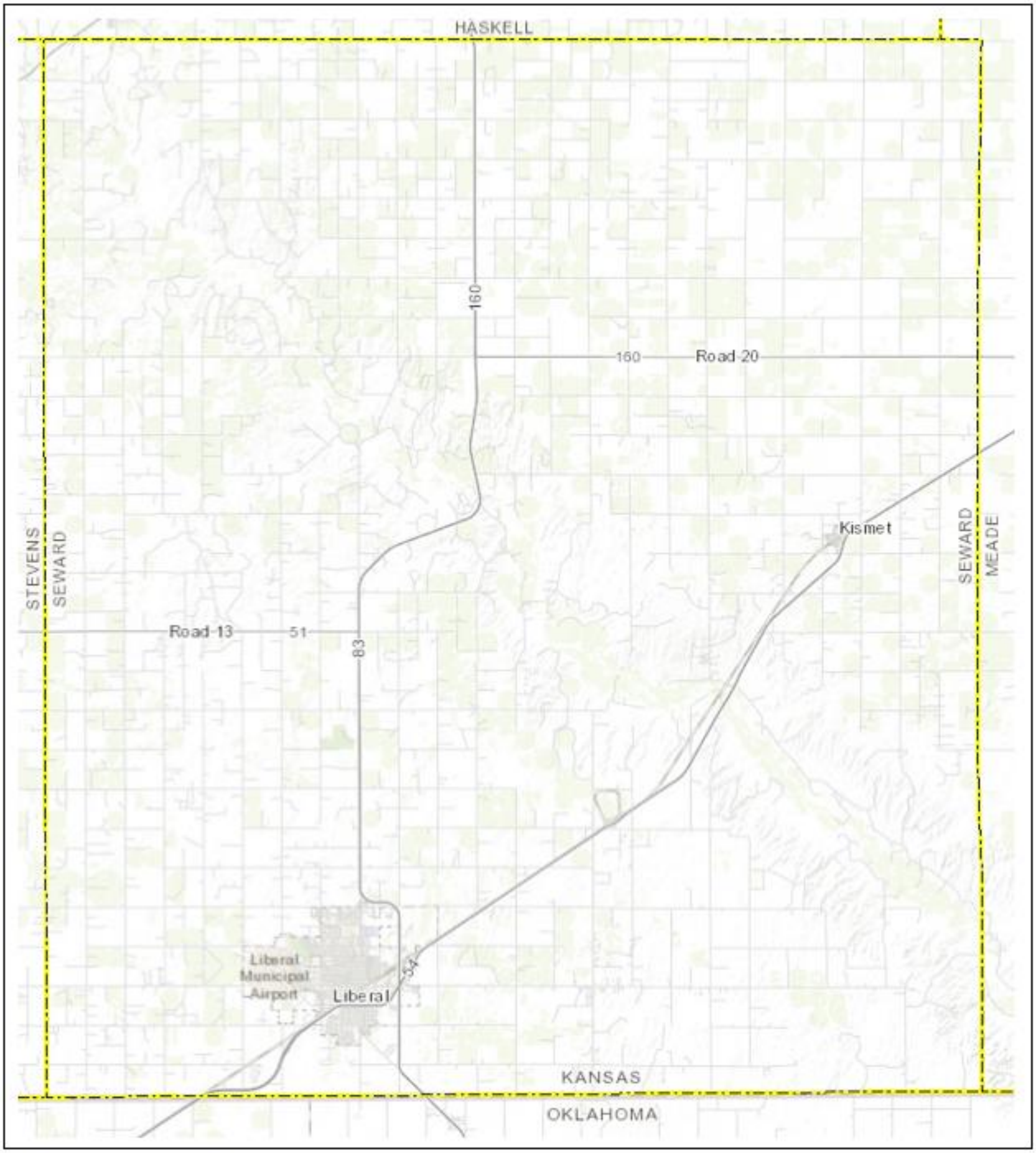
Source: Kansas Department of Transportation

Map 9: Meade County



Source: Kansas Department of Transportation

Map 10: Seward County



Source: Kansas Department of Transportation

3.3 Population Data

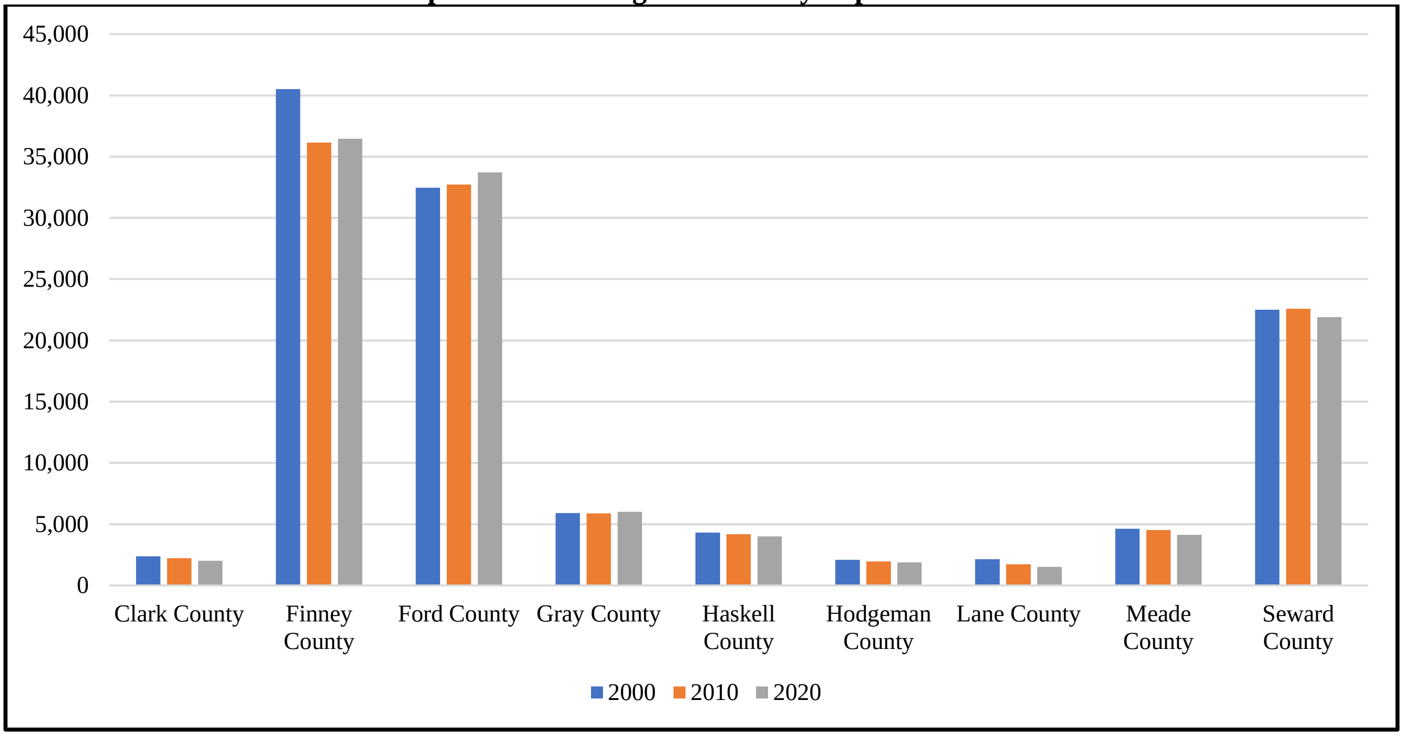
Kansas Region D has seen population growth within the over the 20-year period from 2000 to 2020, as indicated by data collected from the United State Census Bureau. The following table, and associated graph presents population data for Kansas Region D:

Table 5: Kansas Region D Population Data

Jurisdiction	Population			Percentage Population Change 2000-2020	Total Land Area (Sq. Mi.)	Population Density
	2000	2010	2020			
Clark County	**2,390**	**2,231**	**2,006**	**-16.1%**	**977.0**	**2**
City of Ashland	975	1,143	768	-21.2%	1.7	457
City of Englewood	109	99	88	-19.3%	1.0	87
City of Minneola	731	517	719	-1.6%	0.5	1,563
Finney County	**40,523**	**36,139**	**36,451**	**-10.0%**	**1,302.0**	**28**
City of Garden City	28,060	26,050	26,403	-5.9%	10.8	2,445
City of Holcomb	1,961	1,764	2,367	20.7%	1.4	1,753
Ford County	**32,458**	**32,727**	**33,718**	**3.9%**	**1,098.3**	**31**
City of Bucklin	725	1,153	649	-10.5%	0.6	1,159
City of Dodge City	25,065	26,298	27,186	8.5%	14.7	1,847
City of Ford	300	290	214	-28.7%	0.4	510
City of Spearville	818	760	970	18.6%	0.6	1,617
Gray County	**5,904**	**5,870**	**6,020**	**2.0%**	**869.0**	**7**
City of Cimarron	1,916	2,025	2,376	24.0%	1.1	2,084
City of Copeland	352	280	332	-5.7%	0.3	1,328
City of Ensign	191	229	152	-20.4%	0.3	524
City of Ingalls	329	313	240	-27.1%	0.3	923
City of Montezuma	986	796	915	-7.2%	0.8	1,204
Haskell County	**4,307**	**4,196**	**3,990**	**-7.4%**	**578.0**	**7**
City of Santana	1,266	1,420	1,082	-14.5%	0.6	1,834
City of Sublette	1,592	1,602	1,605	0.8%	0.9	1,745
Hodgeman County	**2,085**	**1,955**	**1,872**	**-10.2%**	**860.0**	**2**
City of Hanston	261	324	325	24.5%	0.3	1,083
City of Jetmore	908	933	790	-13.0%	4.5	176
Lane County	**2,155**	**1,725**	**1,523**	**-29.3%**	**717.4**	**2**
City of Dighton	1,245	941	751	-39.7%	0.9	834
Meade County	**4,631**	**4,523**	**4,120**	**-11.0%**	**978.0**	**4**
City of Fowler	562	542	471	-16.2%	0.5	1,002
City of Meade	1,672	1,647	1,388	-17.0%	1.5	951
City of Plains	1,181	1,071	1,301	10.2%	1.0	1,301
Seward County	**22,510**	**22,588**	**21,902**	**-2.7%**	**639.7**	**34**
City of Kismet	483	431	383	-20.7%	0.2	1,596
City of Liberal	19,663	20,308	19,025	-3.2%	11.4	1,664

Source: US Census Bureau

Graph 1: Kansas Region D County Population Data



Source: US Census Bureau

3.4 Socially Vulnerable and At-Risk Populations

As a subset of the population data, Kansas Region D has socially vulnerable and at-risk populations, populations that 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 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."

***Public Comment:** I have concerns about protecting the elderly in our community.*

Identifying socially vulnerable populations is a cornerstone of effective hazard mitigation planning because it helps ensure that all community members are protected. Socially vulnerable groups often face heightened challenges in preparing for, responding to, and recovering from disasters. By recognizing these populations, future mitigation efforts can design targeted interventions, such as accessible evacuation routes, culturally appropriate communication strategies, and prioritized resource distribution, to reduce risks and improve outcomes. Addressing social vulnerabilities also fosters equity, ensuring that no group bears a disproportionate share of a disaster's impacts.

The following tables presents information on potential at risk populations within Kansas Region D and participating jurisdictions using 2020 census data:

Table 6: Kansas Region D Vulnerable Population Data

Jurisdiction	Population 5 and Under	Population 65+	Speaking Language Other Than English	Living Below Poverty Level	Disability, Under the Age of 65
Clark County	**135**	**469**	**116**	**211**	**364**
City of Ashland	18	173	65	68	117
City of Englewood	3	34	11	19	18
City of Minneola	62	194	29	75	179
Finney County	**3,094**	**3,991**	**15,528**	**4,666**	**5,001**
City of Garden City	2,067	3,220	11,776	3,538	3,997
City of Holcomb	203	168	604	194	186
Ford County	**2,947**	**3,662**	**16,724**	**3,979**	**3,737**
City of Bucklin	36	123	15	41	195
City of Dodge City	2,557	2,358	15,605	3,697	2,918
City of Ford	4	35	5	6	19
City of Spearville	77	256	23	70	46
Gray County	**441**	**916**	**1,126**	**277**	**469**
City of Cimarron	172	259	508	119	111
City of Copeland	10	54	106	10	32
City of Ensign	0	46	44	5	38
City of Ingalls	45	29	70	0	34
City of Montezuma	45	282	163	50	91
Haskell County	**275**	**545**	**1,576**	**451**	**397**
City of Santana	55	180	413	76	141
City of Sublette	137	238	539	247	144
Hodgeman County	**103**	**420**	**152**	**212**	**245**
City of Hanston	39	72	27	99	35
City of Jetmore	38	191	47	77	183
Lane County	**71**	**326**	**140**	**189**	**283**
City of Dighton	40	167	99	78	236
Meade County	291	718	923	358	519
City of Fowler	37	121	85	89	93
City of Meade	45	281	121	69	275
City of Plains	137	114	688	190	69
Seward County	**1,955**	**2,102**	**12,769**	**3,066**	**2,350**
City of Kismet	9	64	99	40	81
City of Liberal	1,768	1,694	11,035	2,625	2,002

Source: US Census Bureau

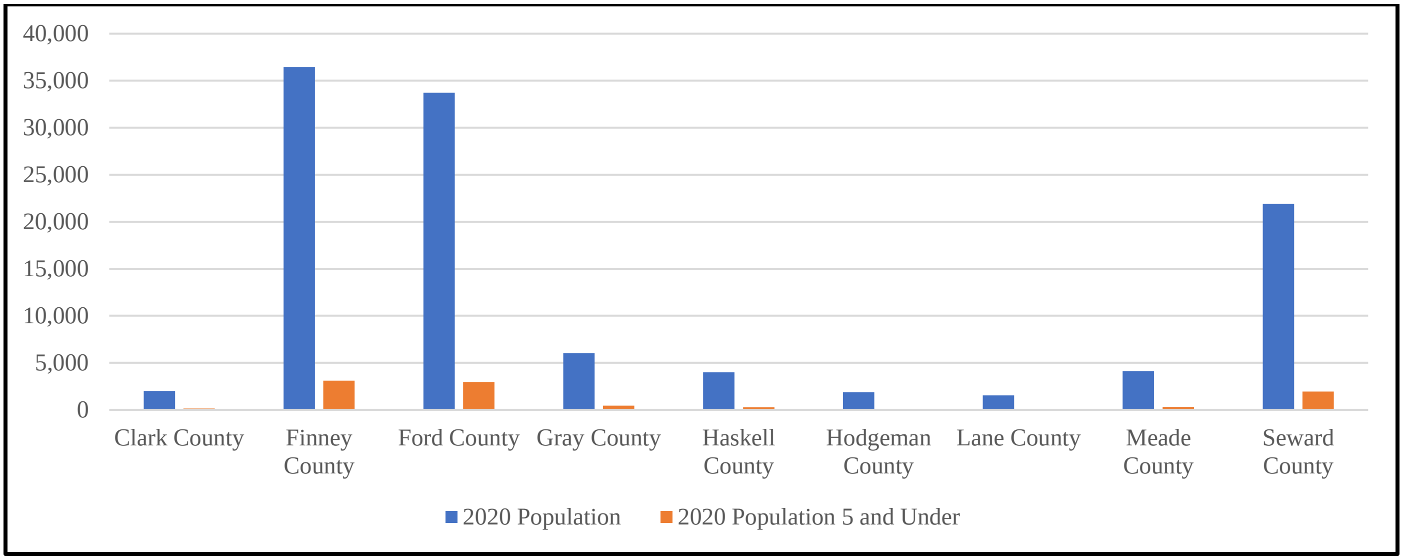
The following tables, and associated graphs, present information on potential at risk populations as a percentage of the total jurisdictional population within Kansas Region D and participating jurisdictions using 2020 census data:

Table 7: Kansas Region D Vulnerable Population as Percentage of Total Population

Jurisdiction	Population 5 and Under	Population 65+	Speaking Language Other Than English	Living Below Poverty Level	Disability, Under the Age of 65
Clark County	**6.7%**	**23.4%**	**5.8%**	**10.5%**	**18.1%**
City of Ashland	2.3%	22.5%	8.5%	8.9%	15.2%
City of Englewood	3.4%	38.6%	12.5%	21.6%	20.5%
City of Minneola	8.6%	27.0%	4.0%	10.4%	24.9%
Finney County	**8.5%**	**10.9%**	**42.6%**	**12.8%**	**13.7%**
City of Garden City	7.8%	12.2%	44.6%	13.4%	15.1%
City of Holcomb	8.6%	7.1%	25.5%	8.2%	7.9%
Ford County	**8.7%**	**10.9%**	**49.6%**	**11.8%**	**11.1%**
City of Bucklin	5.5%	19.0%	2.3%	6.3%	30.0%
City of Dodge City	9.4%	8.7%	57.4%	13.6%	10.7%
City of Ford	1.9%	16.4%	2.3%	2.8%	8.9%
City of Spearville	7.9%	26.4%	2.4%	7.2%	4.7%
Gray County	**7.3%**	**15.2%**	**18.7%**	**4.6%**	**7.8%**
City of Cimarron	7.2%	10.9%	21.4%	5.0%	4.7%
City of Copeland	3.0%	16.3%	31.9%	3.0%	9.6%
City of Ensign	0.0%	30.3%	28.9%	3.3%	25.0%
City of Ingalls	18.8%	12.1%	29.2%	0.0%	14.2%
City of Montezuma	4.9%	30.8%	17.8%	5.5%	9.9%
Haskell County	**6.9%**	**13.7%**	**39.5%**	**11.3%**	**9.9%**
City of Santana	5.1%	16.6%	38.2%	7.0%	13.0%
City of Sublette	8.5%	14.8%	33.6%	15.4%	9.0%
Hodgeman County	**5.5%**	**22.4%**	**8.1%**	**11.3%**	**13.1%**
City of Hanston	12.0%	22.2%	8.3%	30.5%	10.8%
City of Jetmore	4.8%	24.2%	5.9%	9.7%	23.2%
Lane County	**4.7%**	**21.4%**	**9.2%**	**12.4%**	**18.6%**
City of Dighton	5.3%	22.2%	13.2%	10.4%	31.4%
Meade County	**7.1%**	**17.4%**	**22.4%**	**8.7%**	**12.6%**
City of Fowler	7.9%	25.7%	18.0%	18.9%	19.7%
City of Meade	3.2%	20.2%	8.7%	5.0%	19.8%
City of Plains	10.5%	8.8%	52.9%	14.6%	5.3%
Seward County	**8.9%**	**9.6%**	**58.3%**	**14.0%**	**10.7%**
City of Kismet	2.3%	16.7%	25.8%	10.4%	21.1%
City of Liberal	9.3%	8.9%	58.0%	13.8%	10.5%

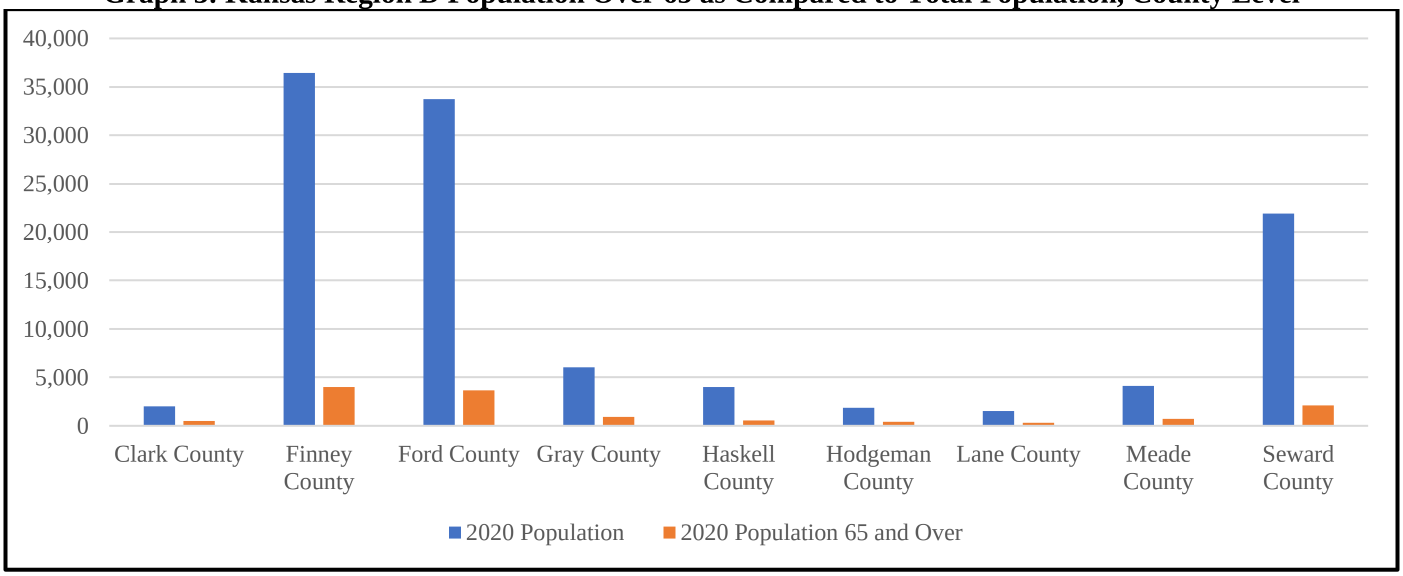
Source: US Census Bureau

Graph 2: Kansas Region D Population Under Five as Compared to Total Population, County Level



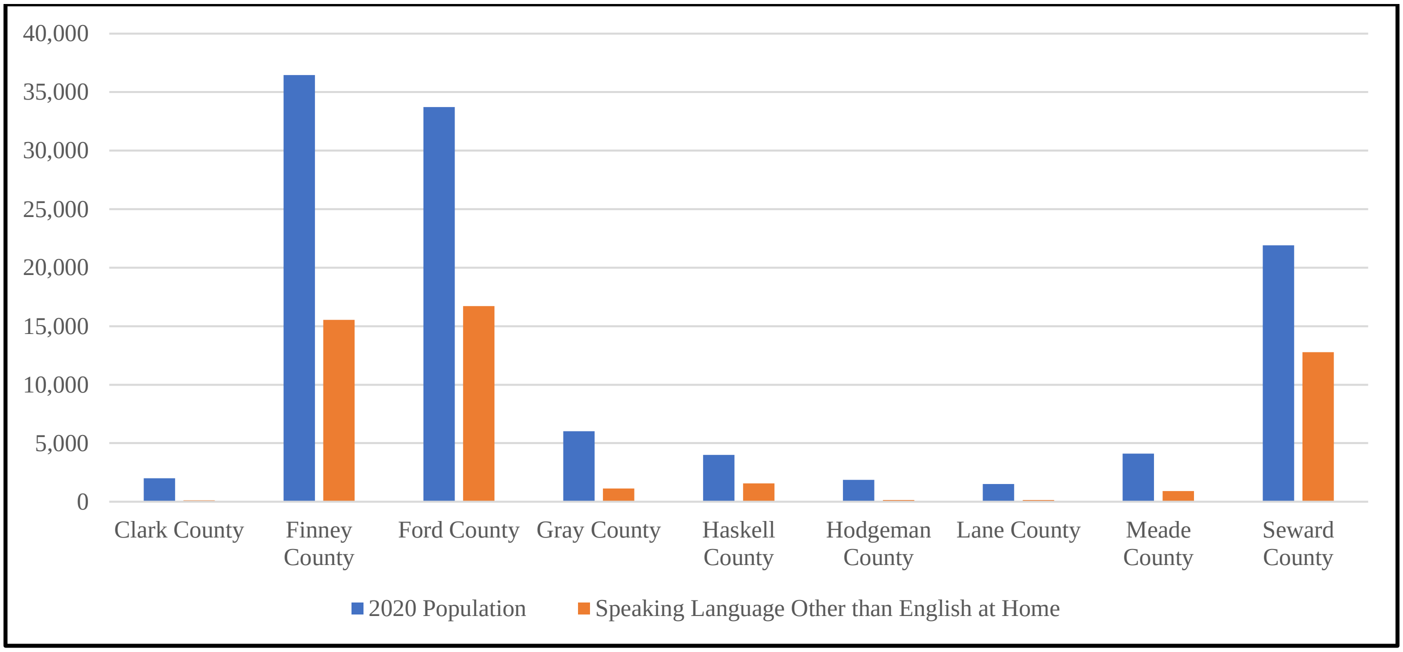
Source: US Census Bureau

Graph 3: Kansas Region D Population Over 65 as Compared to Total Population, County Level



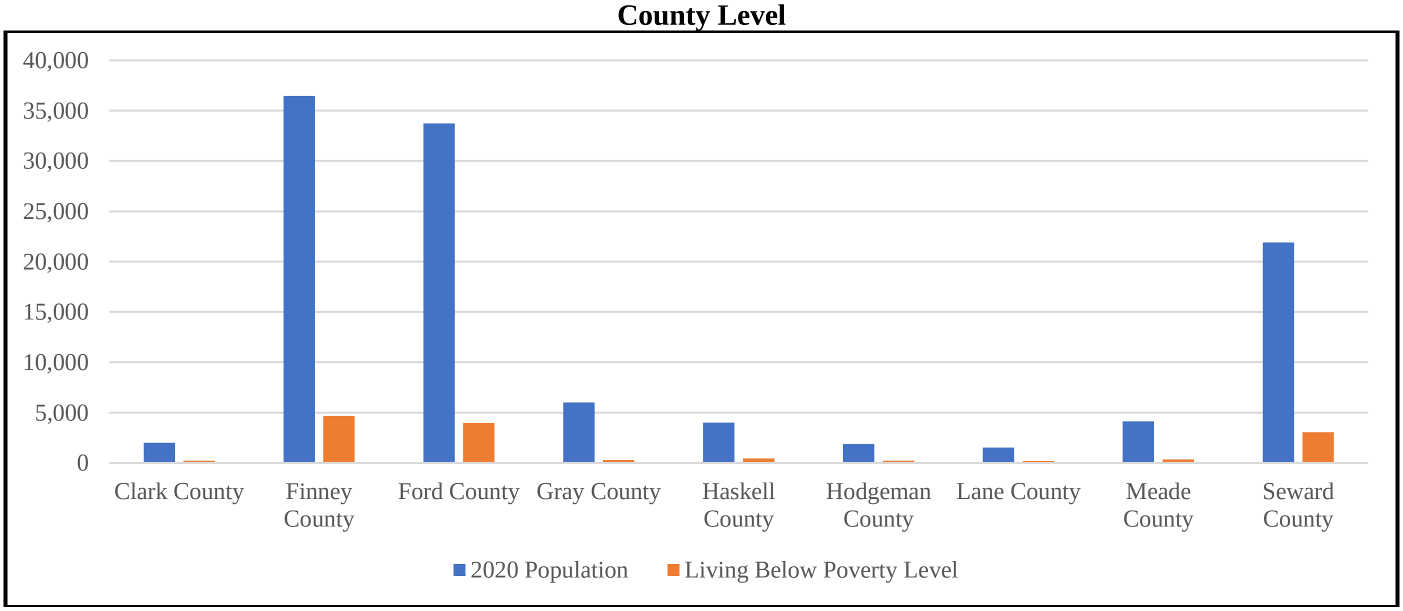
Source: US Census Bureau

Graph 4: Kansas Region D Population Speaking Language Other Than English as Compared to Total Population, County Level



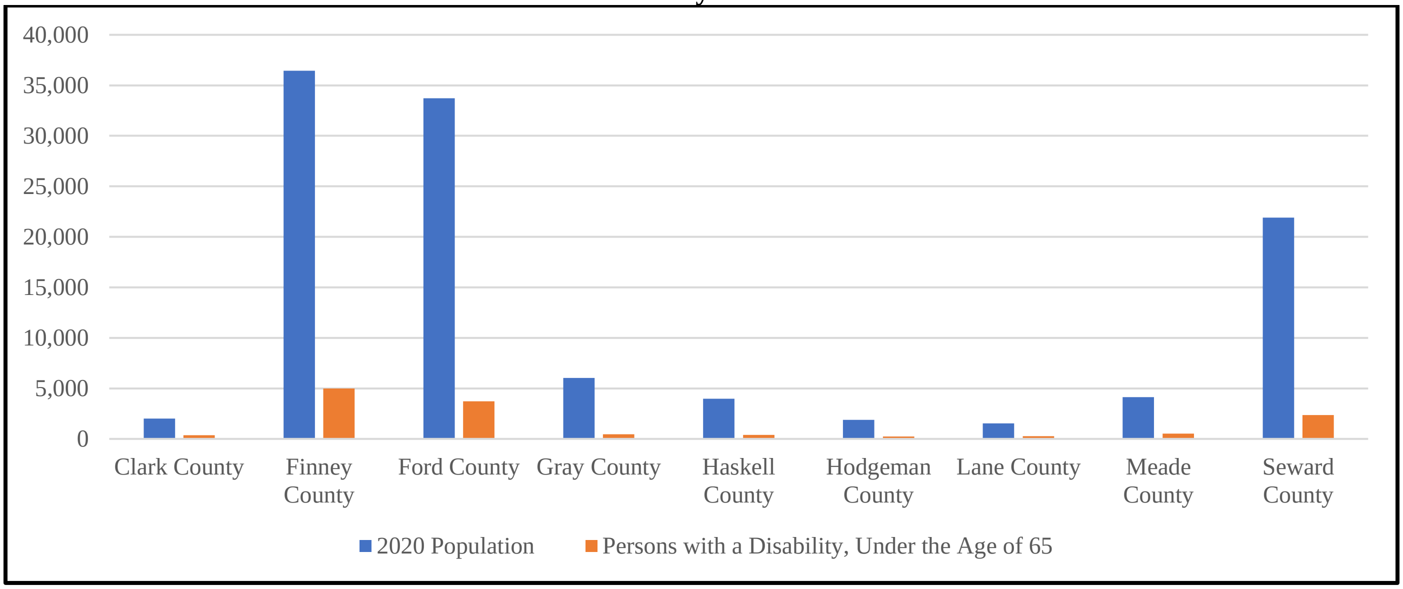
Source: US Census Bureau

Graph 5: Kansas Region D Population Living Below the Poverty Level as Compared to Total Population, County Level



Source: US Census Bureau

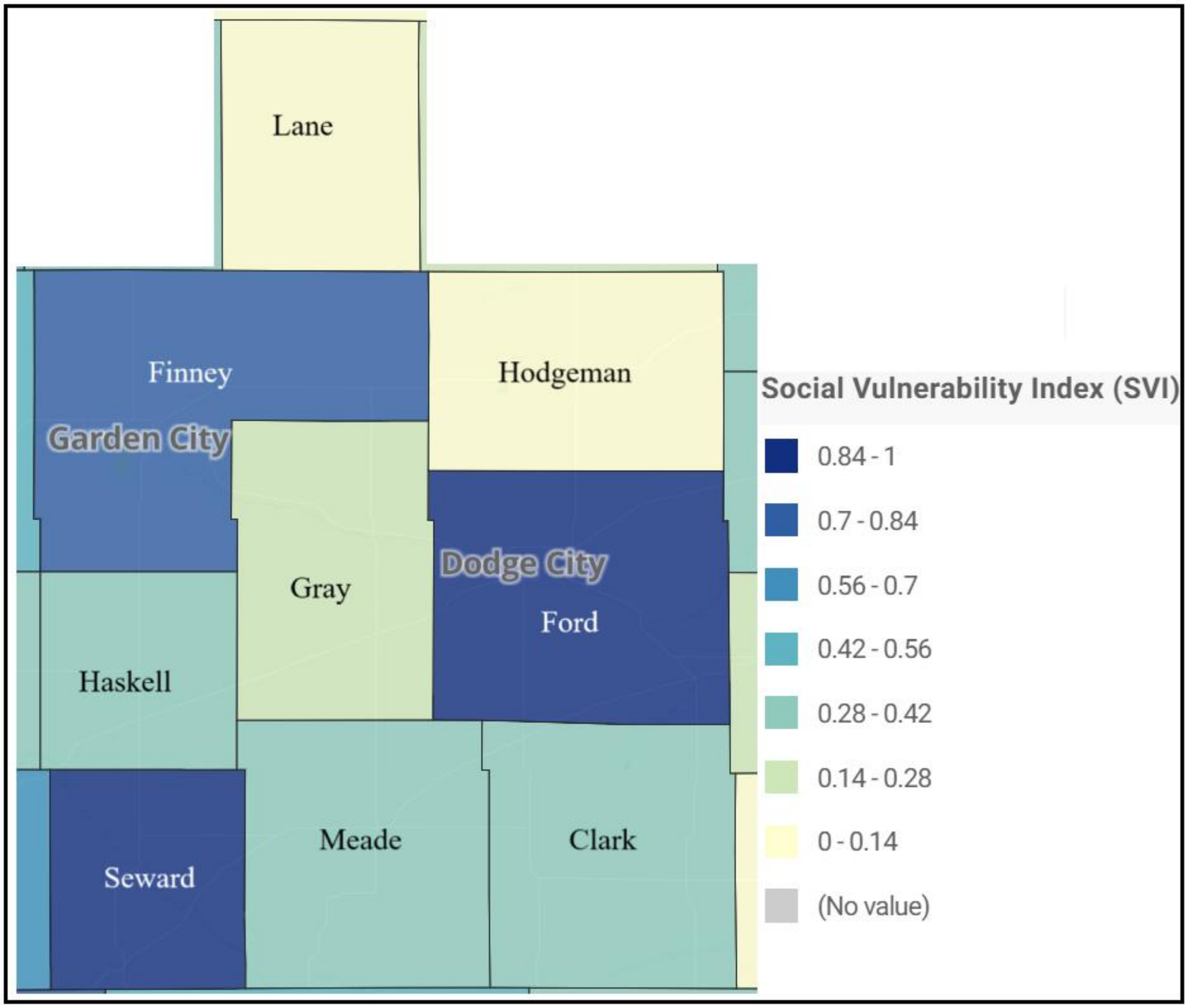
Graph 6: Kansas Region D Population Under 65 with a Disability as Compared to Total Population, County Level



Source: US Census Bureau

The Centers for Disease Control's Social Vulnerability Index Map shows the relative social vulnerability of communities based on factors such as socioeconomic status, household composition, disability, minority status, language, housing type, and transportation access. This map highlights areas where populations may have increased difficulty preparing for, responding to, and recovering from the impacts of hazard events. The following map helps identify vulnerable populations that may require additional resources and targeted support during mitigation planning and response efforts. By integrating this data, participating jurisdictions can prioritize investments, tailor outreach strategies, and ensure equitable distribution of resources to reduce disaster impacts on those most at risk. Social Vulnerability Index values range from 0 (least vulnerable) to 1 (most vulnerable). The Social Vulnerability Index can also be categorized as follows: Very Low (0.0-0.19), Low (0.20-0.39); Moderate (0.40-0.59); High (0.60-0.79); Very High (0.80-1.0):

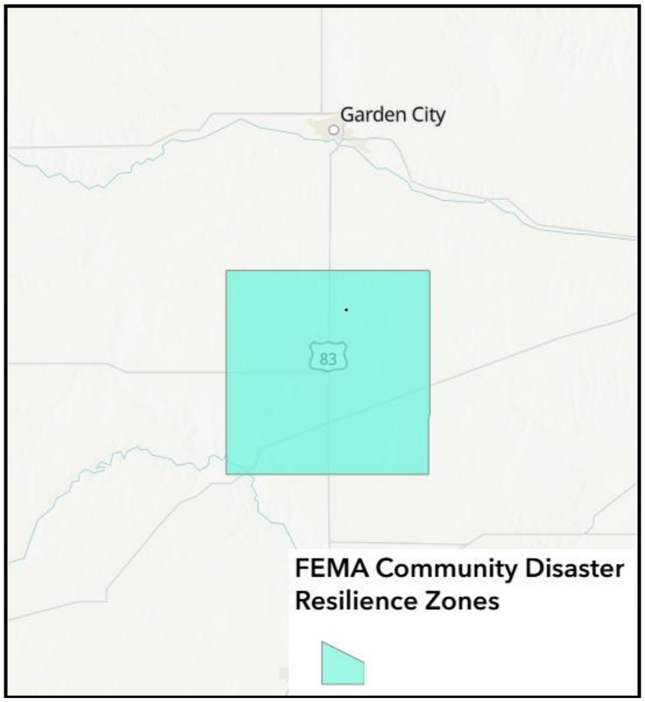
Map 11: FEMA CDC Kansas Region D Social Vulnerability Index



Source: CDC

A Community Disaster Resilience Zone is a designated area that has been identified as particularly vulnerable to natural disasters and other hazards. The goal of establishing such zones is to focus resources, planning efforts, and mitigation strategies on areas that need the most support to improve their resilience to disasters. These zones are typically selected based on factors such as the frequency and severity of past disasters, the level of community vulnerability, and the potential impact of future events. Communities designated as Community Disaster Resilience Zone can receive increased financial and technical assistance to plan and implement resilience projects. For example, they are eligible for Building Resilient Infrastructure and Communities grant funds at an increased federal cost share of up to 90%, relative to the baseline of up to 75%. As of this plan, one communities within Kansas Region D has received this designation. Tract 20081463100 Haskell County Kansas was identified as a Community Disaster Resilience Zone on September 6, 2023:

Map 12: Haskell County Census Tract 20081463100 Community Disaster Resilience Zone



Source: FEMA

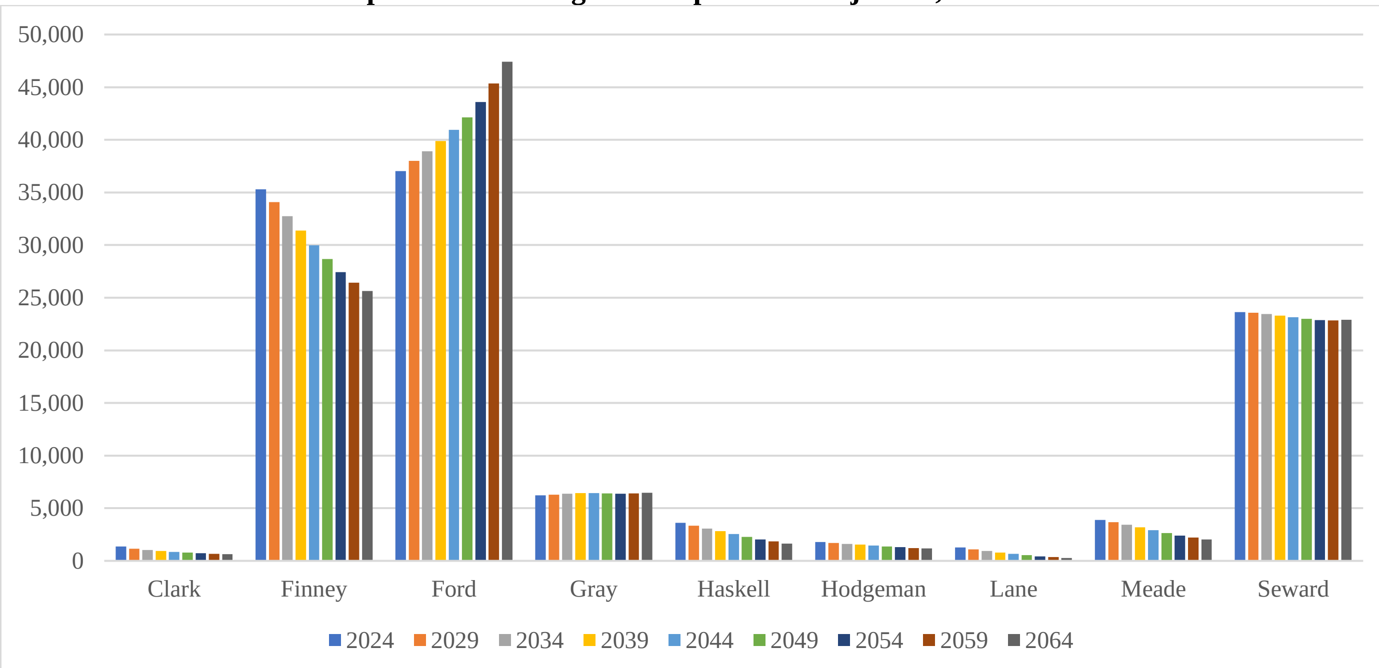
3.5 Regional Population Migration

Kansas Region D is experiencing consistent population decline as people increasingly migrate from rural areas to urban centers. This transformation reflects broader demographic trends witnessed across the United States. Demographic research indicates that this migration is occurring due to the following factors:

- **Economic Opportunity:** A primary driver of the population movement from rural to urban areas is the quest for better economic prospects. Large, regional urban centers offer a diverse range of employment opportunities in sectors like manufacturing, healthcare, finance, and technology. These opportunities often come with higher wages and better access to educational and healthcare facilities compared to rural areas.
- **Access to Education and Training:** Urban centers are often home to educational institutions, including colleges, universities, and vocational schools. Young people from rural areas often migrate to these urban settings to pursue higher education and vocational training. This educational mobility is a key factor in the rural-to-urban population shift.

The following graph, using data from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, indicates population projections (potentially dur to rural-to-urban migration) for Kansas Region D. As indicated in the report, all counties are indicated to have either a generally static or decreasing population over the next 40 years.

Graph 7: Kansas Region D Population Projection, 2024-2064



Source: Wichita State University Center for Economic Development and Business Research Kansas Population Forecast

3.6 Housing Data

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. The following table and associated graphs, using data from the U.S. Census, present total and occupied housing unit information for Kansas Region D and all participating jurisdictions:

Table 8: Kansas Region D Housing Data

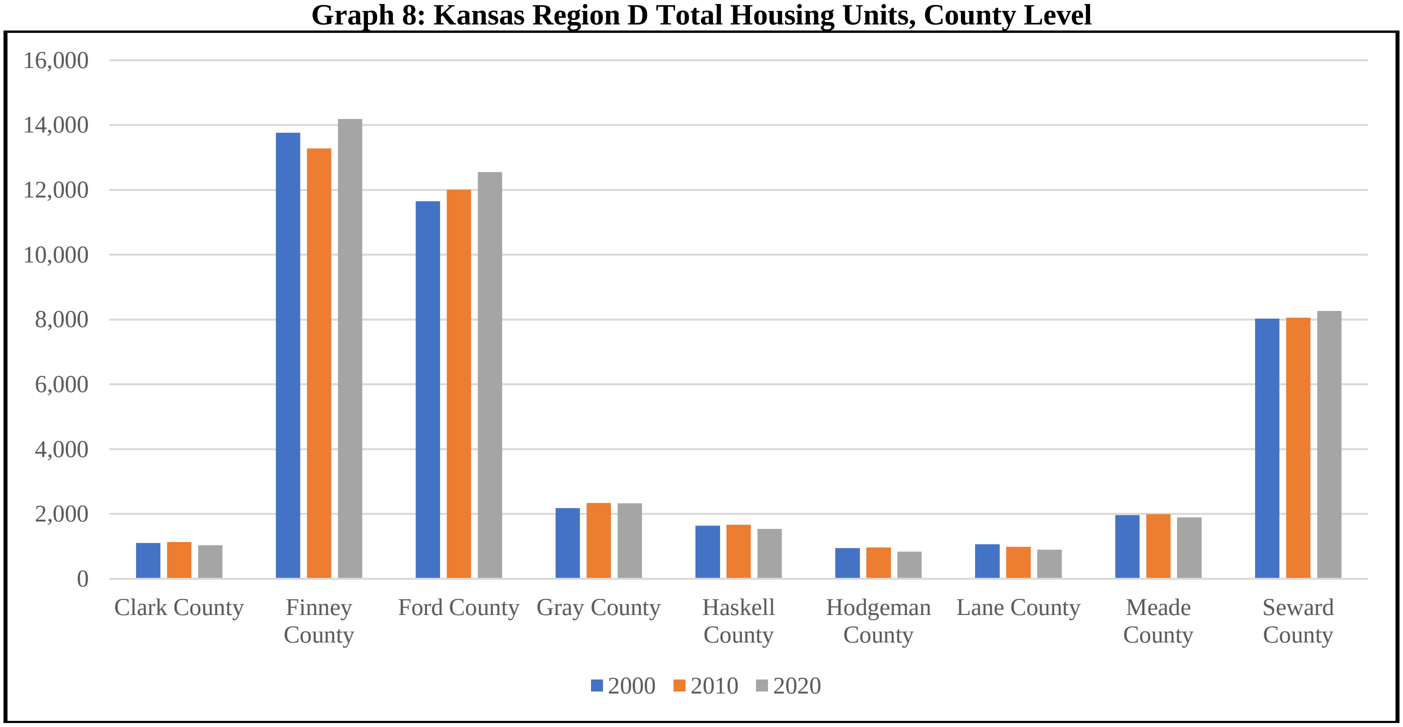
Jurisdiction	2000		2010		2020		2000 - 2020	
	Total	Occupied	Total	Occupied	Total	Occupied	Numeric Change (Total Units)	Percent Change (Total Units)
Clark County	**1,111**	**979**	**1,135**	**923**	**1,042**	**836**	**-69**	**-6.2%**
City of Ashland	478	423	465	381	452	357	-26	-5.4%
City of Englewood	57	49	68	40	55	28	-2	-3.5%
City of Minneola	322	291	334	289	332	288	10	3.1%
Finney County	**13,763**	**12,948**	**13,276**	**12,359**	**14,185**	**13,064**	**422**	**3.1%**
City of Garden City	9,824	9,271	9,656	9,071	10,431	9,676	607	6.2%
City of Holcomb	593	593	680	654	722	687	129	21.8%
Ford County	**11,650**	**10,852**	**12,005**	**11,145**	**12,550**	**11,376**	**900**	**7.7%**
City of Bucklin	338	303	340	287	344	284	6	1.8%
City of Dodge City	8,990	8,396	9,378	9,378	9,869	9,000	879	9.8%
City of Ford	122	111	120	96	115	86	-7	-5.7%
City of Spearville	315	296	320	300	327	298	12	3.8%
Gray County	**2,181**	**2,181**	**2,340**	**2,153**	**2,327**	**2,092**	**146**	**6.7%**

Table 8: Kansas Region D Housing Data

Jurisdiction	2000		2010		2020		2000 - 2020	
	Total	Occupied	Total	Occupied	Total	Occupied	Numeric Change (Total Units)	Percent Change (Total Units)
City of Cimarron	748	717	842	789	829	745	81	10.8%
City of Copeland	134	127	130	112	118	93	-16	-11.9%
City of Ensign	77	69	86	76	70	61	-7	-9.1%
City of Ingalls	116	111	121	113	111	97	-5	-4.3%
City of Montezuma	368	341	390	366	425	400	57	15.5%
Haskell County	**1,639**	**1,481**	**1,666**	**1,510**	**1,545**	**1,345**	**-94**	**-5.7%**
City of Santana	470	431	460	424	449	377	-21	-4.5%
City of Sublette	646	571	626	556	593	520	-53	-8.2%
Hodgeman County	**945**	**796**	**973**	**803**	**842**	**724**	**-103**	**-10.9%**
City of Hanston	133	105	119	96	109	92	-24	-18.0%
City of Jetmore	429	365	439	366	378	333	-51	-11.9%
Lane County	**1,065**	**910**	**990**	**799**	**895**	**736**	**-170**	**-16.0%**
City of Dighton	632	557	615	506	550	461	-82	-13.0%
Meade County	**1,968**	**1,728**	**1,998**	**1,713**	**1,900**	**1,584**	**-68**	**-3.5%**
City of Fowler	262	230	273	231	273	207	11	4.2%
City of Meade	754	654	766	670	735	611	-19	-2.5%
City of Plains	448	404	439	385	433	367	-15	-3.3%
Seward County	**8,027**	**7,419**	**8,061**	**7,460**	**8,268**	**7,359**	**241**	**3.0%**
City of Kismet	167	155	155	145	154	124	-13	-7.8%
City of Liberal	7,012	6,494	7,118	6,623	7,389	6,618	377	5.4%

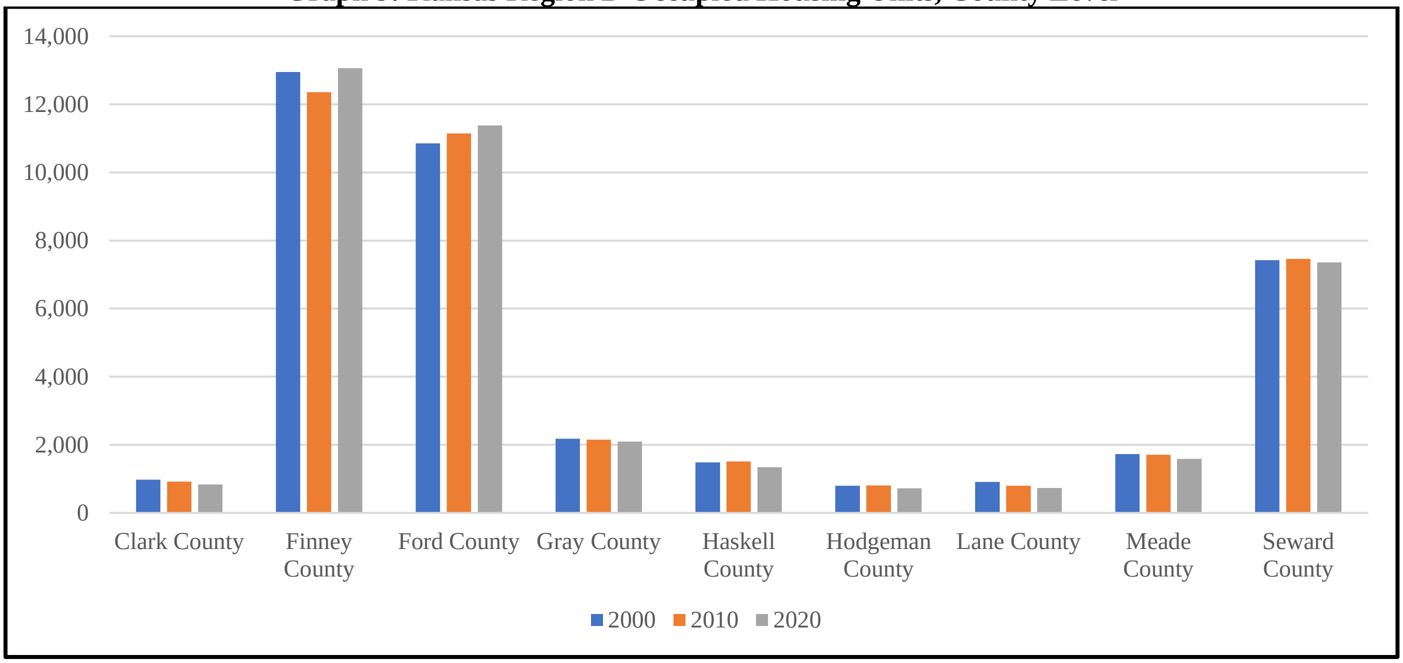
Source: US Census Bureau

Graph 8: Kansas Region D Total Housing Units, County Level



Source: US Census Bureau

Graph 9: Kansas Region D Occupied Housing Units, County Level



Source: US Census Bureau

Of particular concern when considering housing data is mobile home residences. Data from the NOAA National Severe Storms Laboratory reports that people living in mobile homes are especially at risk for injury and death as even anchored mobile homes can be seriously damaged when winds gust over 80 miles per hour. Additionally, study data from Michigan State University reported that the two biggest factors related to wind event fatalities were housing quality (measured by mobile homes as a proportion of housing units) and income level. When a tornadic wind 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 indicates the percentage of mobile homes for each Kansas Region D:

Table 9: Kansas Region D Mobile Home Data

Jurisdiction	2000		2010		2020		2000 - 2020
	Total	Percentage of Total Housing Units	Total	Percentage of Total Housing Units	Total	Percentage of Total Housing Units	Numeric Change
Clark County	**51**	**4.6%**	**51**	**4.5%**	**41**	**3.9%**	**-10**
City of Ashland	18	3.8%	23	4.9%	16	3.5%	-2
City of Englewood	1	1.8%	6	8.8%	10	18.2%	9
City of Minneola	17	5.3%	9	2.7%	10	3.0%	-7

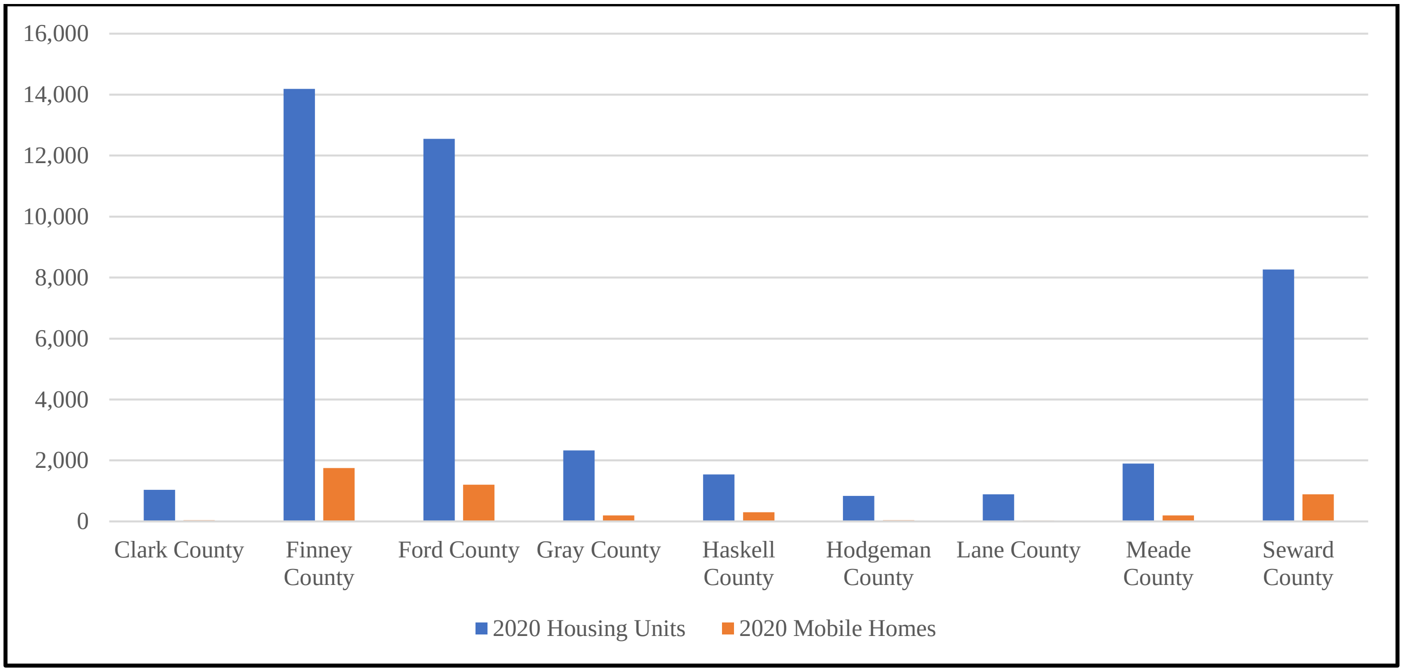
Table 9: Kansas Region D Mobile Home Data

Jurisdiction	2000		2010		2020		2000 - 2020
	Total	Percentage of Total Housing Units	Total	Percentage of Total Housing Units	Total	Percentage of Total Housing Units	Numeric Change
Finney County	**2,159**	**15.7%**	**1,221**	**9.2%**	**1,749**	**12.3%**	**-410**
City of Garden City	888	9.0%	435	4.5%	838	8.0%	-50
City of Holcomb	56	9.4%	30	4.4%	50	6.9%	-6
Ford County	**1,432**	**12.3%**	**1,365**	**11.4%**	**1,202**	**9.6%**	**-230**
City of Bucklin	39	11.5%	43	12.6%	13	3.8%	-26
City of Dodge City	742	8.3%	956	10.2%	801	8.1%	59
City of Ford	26	21.3%	18	15.0%	8	7.0%	-18
City of Spearville	20	6.3%	28	8.8%	2	0.6%	-18
Gray County	**381**	**17.5%**	**283**	**12.1%**	**193**	**8.3%**	**-188**
City of Cimarron	96	12.8%	89	10.6%	79	9.5%	-17
City of Copeland	33	24.6%	12	9.2%	19	16.1%	-14
City of Ensign	21	27.3%	19	22.1%	22	31.4%	1
City of Ingalls	33	28.4%	21	17.4%	6	5.4%	-27
City of Montezuma	26	7.1%	14	3.6%	4	0.9%	-22
Haskell County	**329**	**20.1%**	**220**	**13.2%**	**305**	**19.7%**	**-24**
City of Santana	66	14.0%	47	10.2%	67	14.9%	1
City of Sublette	94	14.6%	69	11.0%	90	15.2%	-4
Hodgeman County	**75**	**7.9%**	**56**	**5.8%**	**39**	**4.6%**	**-36**
City of Hanston	12	9.0%	2	1.7%	10	9.2%	-2
City of Jetmore	24	5.6%	42	9.6%	12	3.2%	-12
Lane County	**81**	**7.6%**	**69**	**7.0%**	**31**	**3.5%**	**-50**
City of Dighton	35	5.5%	28	4.6%	11	2.0%	-24
Meade County	**150**	**7.6%**	**88**	**4.4%**	**197**	**10.4%**	**47**
City of Fowler	10	3.8%	0	0.0%	3	1.1%	-7
City of Meade	40	5.3%	19	2.5%	48	6.5%	8
City of Plains	54	12.1%	51	11.6%	146	33.7%	92
Seward County	**1,471**	**18.3%**	**1,143**	**14.2%**	**891**	**10.8%**	**-580**
City of Kismet	46	27.5%	10	6.5%	34	22.1%	-12
City of Liberal	1,025	14.6%	915	12.9%	649	8.8%	-376

Source: US Census Bureau
-: No data

The following graph provides a comparison of mobile home stock to the total housing stock for each participating county:

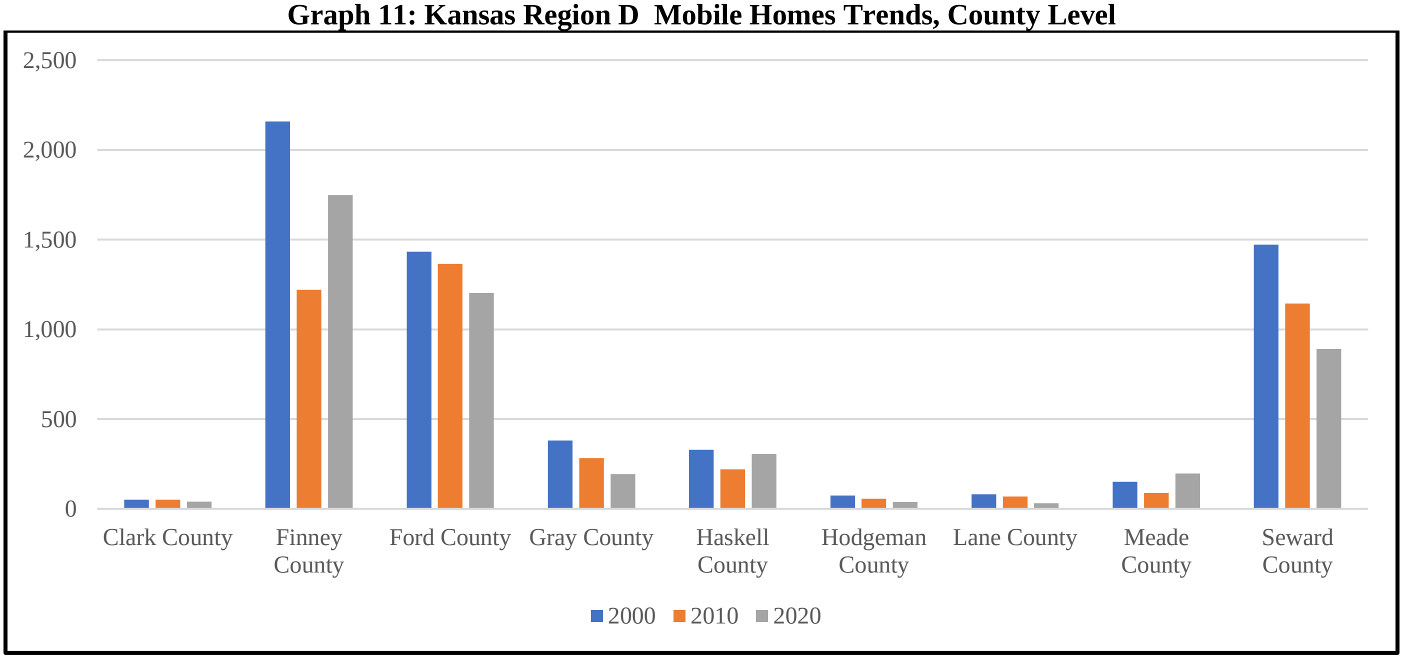
Graph 10: Kansas Region D Mobile Homes Compared to Total Housing Stock, County Level



Source: U.S. Census Bureau

The following graph provides trend data for mobile home stock for each participating county:

Graph 11: Kansas Region D Mobile Homes Trends, County Level



Source: U.S. Census Bureau

3.7 Valuation Data

Participating county Assessor Offices were contacted to determine if a valuation of properties was available for participating jurisdictions. It was determined that, due to the reporting format of available data, determining valuations for each jurisdiction was not feasible. As such, data on building valuation for participating jurisdictions was sourced from the FEMA NRI by Census tract, presented in the following table:

Table 10: FEMA Hazus Kansas Region D Building Valuation

Jurisdiction	Census Tract	Building Valuation
Clark County	**All**	**$923,265,153**
Cities of Ashland, Englewood, and Minneola	20025967100	$923,265,153
Finney County	**All**	**$6,693,571,967**
City of Garden City	Multiple	$4,617,788,006
City of Holcomb	20055960100	$1,094,430,422
Ford County	**All**	**$7,090,135,601**
Cities of Bucklin and Ford	20057961700	$771,268,231
City of Dodge City	Multiple	$5,721,968,595
City of Spearville	20057961600	$596,898,775
Gray County	**All**	**$1,930,932,536**
City of Cimarron and Ingalls	20069962600	$938,640,447
Cities of Copeland, Ensign, and Montezuma	20069962700	$992,292,089
Haskell County	**All**	**$876,482,107**
Cities of Satanta and Sublette	20081463100	$876,482,107
Hodgeman County	**All**	**$992,277,626**
Cities of Hanston and Jetmore	20083461100	$992,277,626
Lane County	**All**	**$1,034,794,886**
City of Dighton	20101956600	$1,034,794,886
Meade County	**All**	**$1,510,521,400**
Cities of Fowler and Plains	20119966600	$1,016,374,470
City of Meade	20119966700	$494,146,930
Seward County	**All**	**4,461,074,615**
City of Kismet	20175966000	$769,922,901
City of Liberal	Multiple	$3,667,466,580

Source: FEMA

3.8 School District Data

Children are among the most vulnerable populations during disasters, requiring special consideration in preparedness and response efforts. A community with high school enrollment typically has a significant portion of its population dependent on schools for safety, education, and emergency support during crises. Additionally, disruptions to education during disasters can have long-term impacts on children's well-being and development. Communities with higher school enrollment may face increased challenges in ensuring the safety and continuity of education during hazard events, making it essential to prioritize schools in mitigation planning and resource allocation.

The following table, and associated graph, present school enrollment information from the Kansas Department of Education for school years 2013, 2018, and 2024:

Table 11: Kansas Region D School Enrollment Information

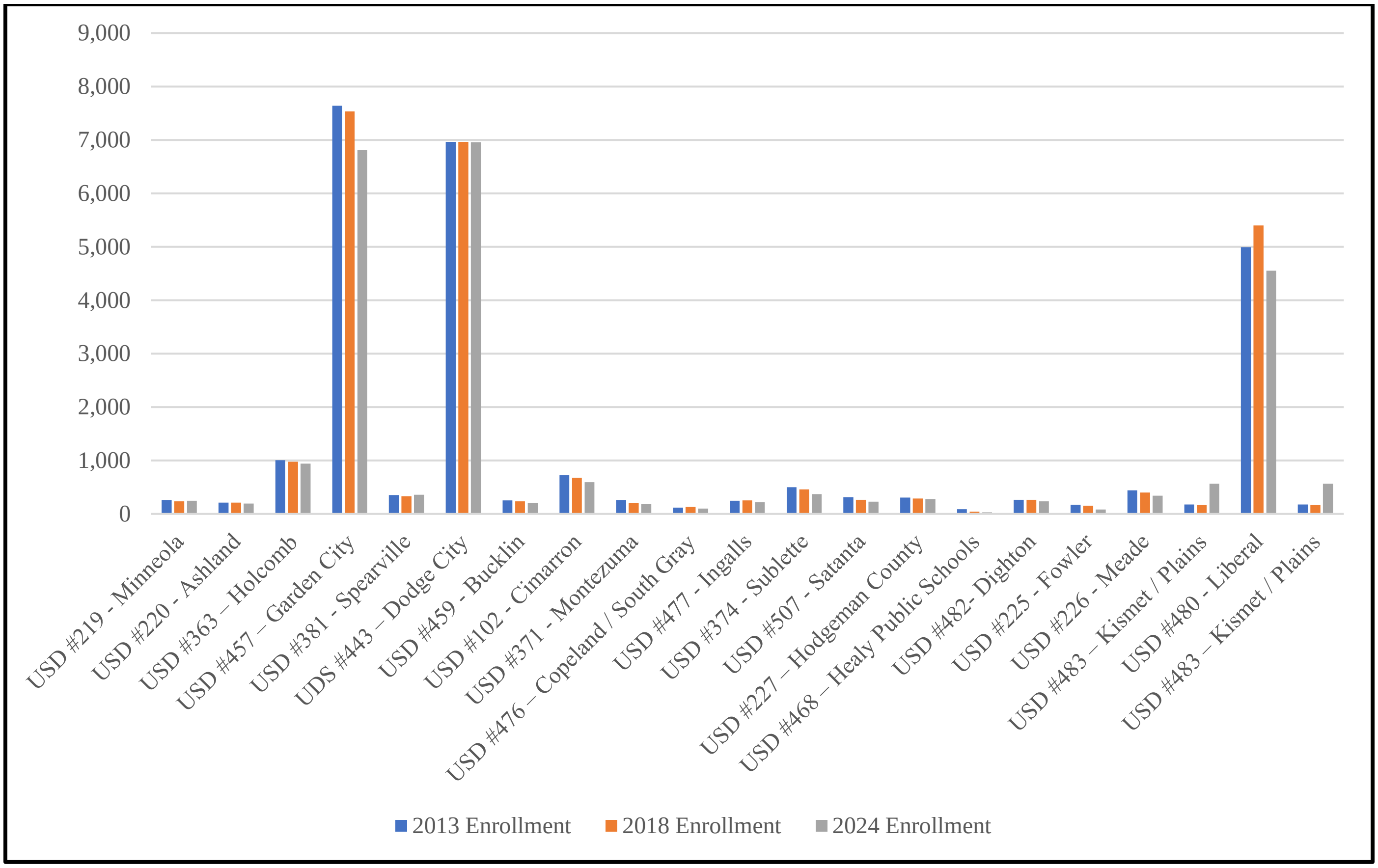
District	2013 Enrollment	2018 Enrollment	2024 Enrollment	Enrollment Change (2013-2024)
USD #219 - Minneola	259	237	245	-14
USD #220 - Ashland	213	214	192	-21
USD #363 – Holcomb	1,006	979	939	-67
USD #457 – Garden City	7,640	7,534	6,812	-828
USD #381 - Spearville	353	331	356	3
UDS #443 – Dodge City	6,960	6,964	6,959	-1

Table 11: Kansas Region D School Enrollment Information

District	2013 Enrollment	2018 Enrollment	2024 Enrollment	Enrollment Change (2013-2024)
USD #459 - Bucklin	254	238	208	-46
USD #102 - Cimarron	723	674	594	-129
USD #371 - Montezuma	260	198	185	-75
USD #476 – Copeland/ South Gray	120	131	100	-20
USD #477 - Ingalls	247	250	219	-28
USD #374 - Sublette	497	459	369	-128
USD #507 - Satanta	314	264	231	-83
USD #227 – Hodgeman County	305	290	276	-29
USD #468 – Healy Public Schools	86	44	29	-57
USD #482- Dighton	267	265	237	-30
USD #225 - Fowler	168	150	83	-85
USD #226 - Meade	442	400	341	-101
USD #483 – Kismet / Plains	178	166	563	385
USD #480 - Liberal	4,995	5,400	4,554	-441
USD #483 – Kismet / Plains	178	166	563	385

Source: Kansas Public Education Department

Graph 12: Kansas Region D School Enrollment Trends



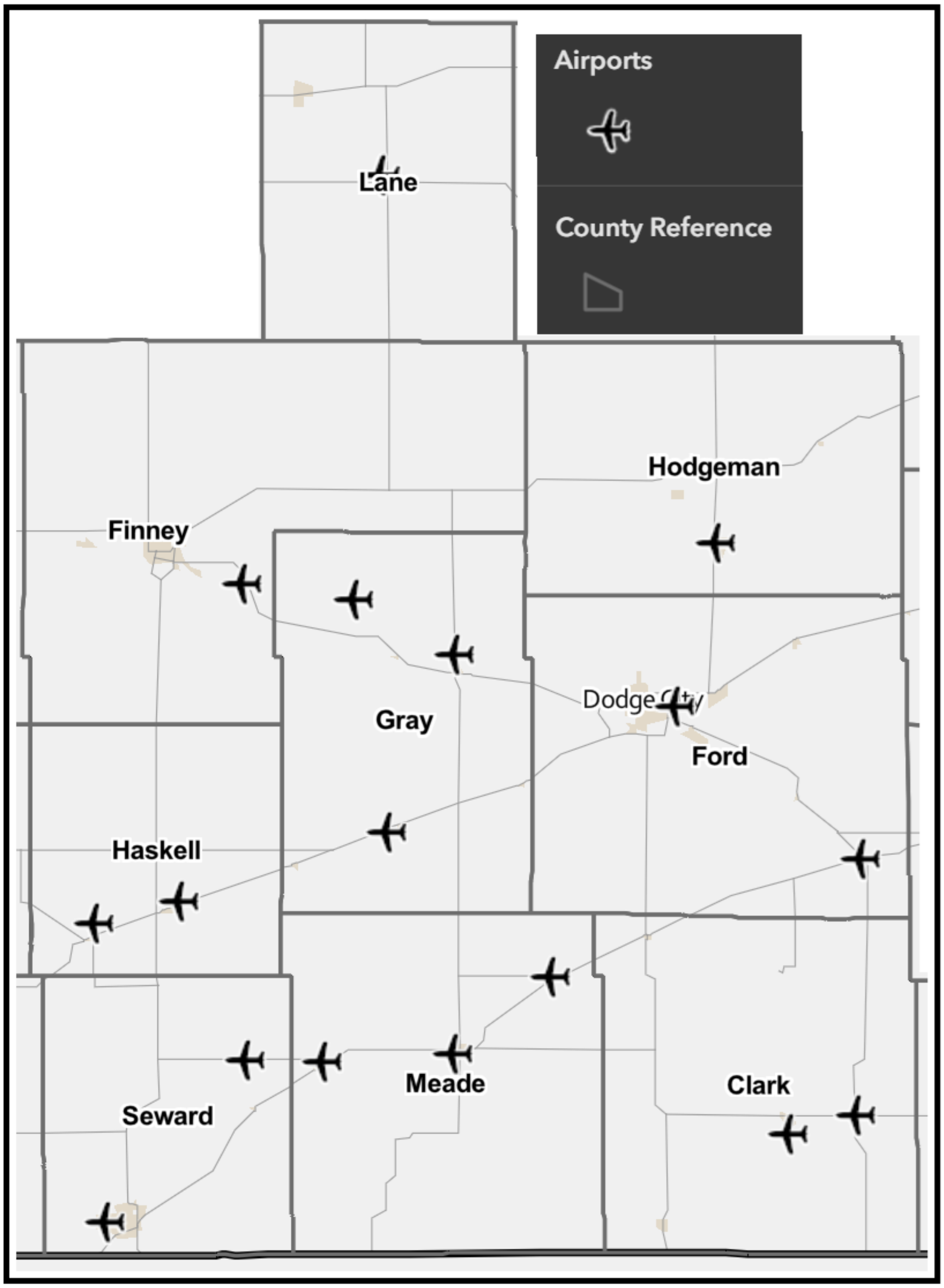
3.9 Critical Infrastructure

Certain critical infrastructure has a net positive value on the community as they contribute to the public good by facilitating the basic functions of society. These locations help maintain order, public health, education, and help the economy function. Additionally, components are integral to disaster response and recovery operations. The following is a list of considered critical infrastructure:

- Airports
- Communication facilities
- Fire facilities
- Health care facilities
- Highways and bridges
- Law enforcement facilities
- Schools

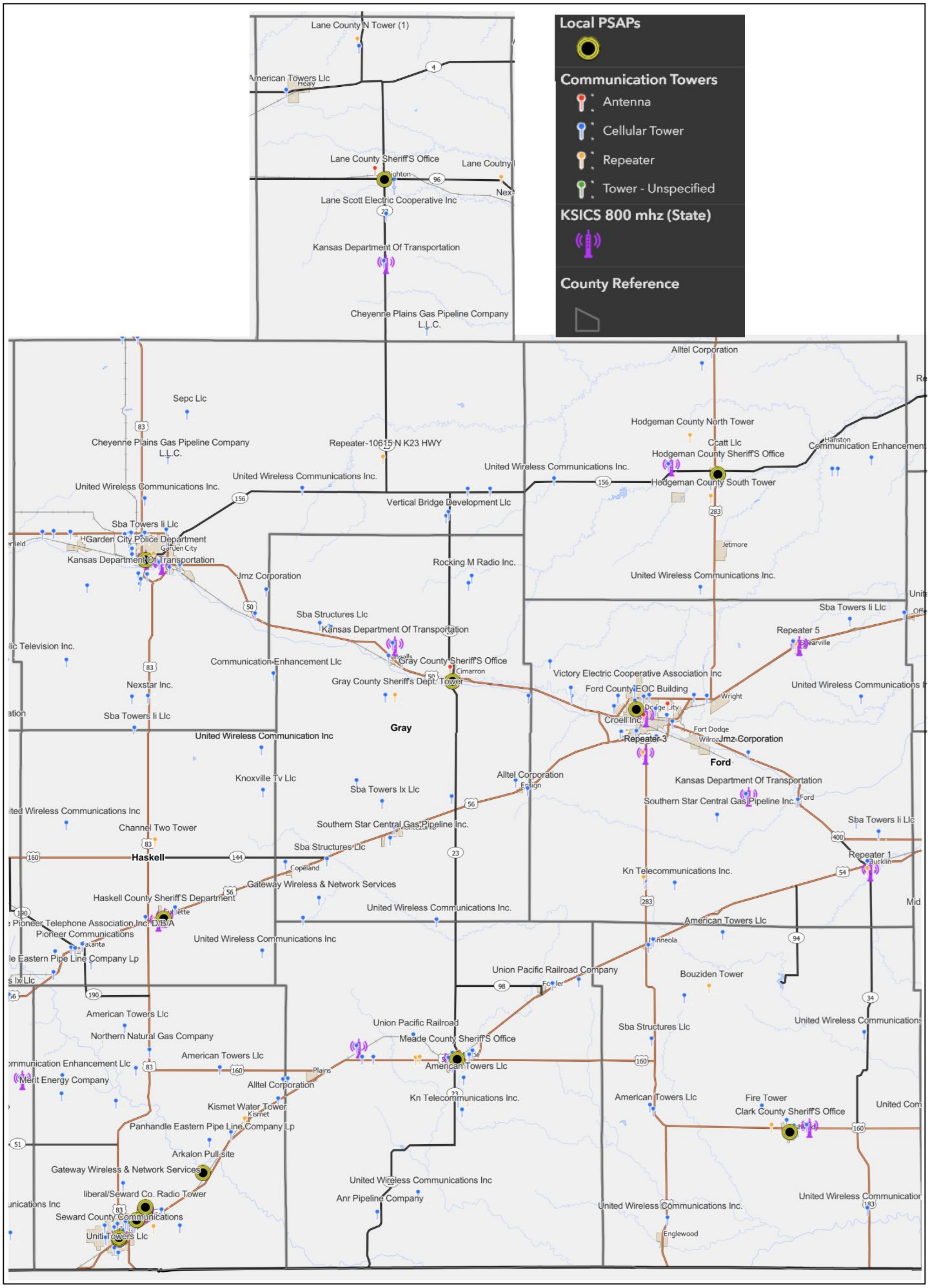
The following maps break down critical infrastructure locations:

Map 13: Kansas Region D Airports



Source: Kansas EOPmapper

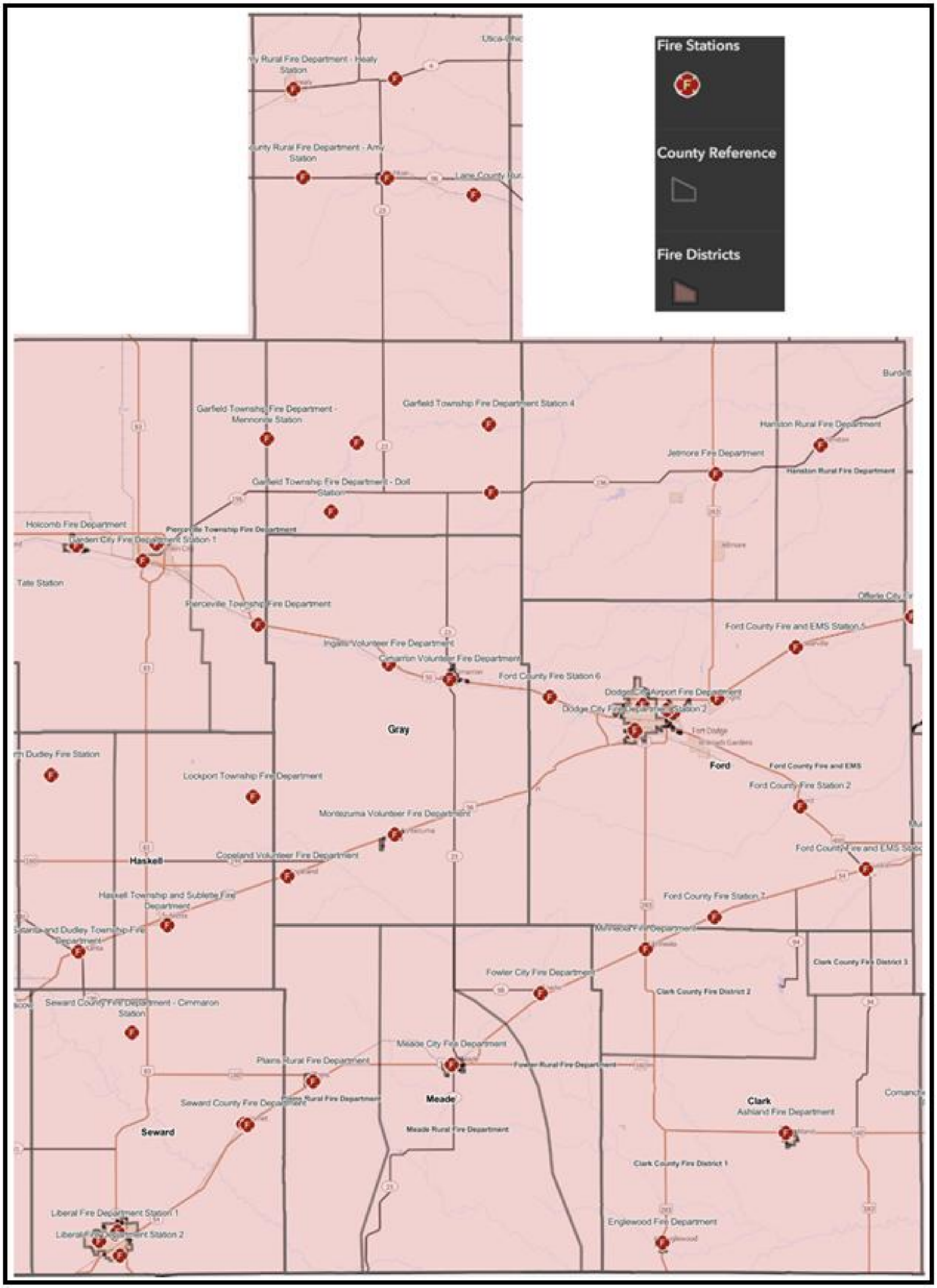
Map 14: Kansas Region D Communications Infrastructure



Local PSAPs
Communication Towers
Antenna
Cellular Tower
Repeater
Tower - Unspecified
KSICS 800 mhz (State)
County Reference
Lane County N Tower (1)
American Towers Llc
Lane County Sheriff'S Office
Lane Coutny
Lane Scott Electric Cooperative Inc
Kansas Department Of Transportation
Cheyenne Plains Gas Pipeline Company L.L.C.
Alltel Corporation
Sepc Llc
Cheyenne Plains Gas Pipeline Company L.L.C.
Repeater-10615 N K23 HWY
Hodgeman County North Tower
Ccatt Llc
Hodgeman County Sheriff'S Office
Communication Enhancement
United Wireless Communications Inc.
Hodgeman County South Tower
United Wireless Communications Inc.
United Wireless Communications Inc.
Vertical Bridge Development Llc
Sba Towers Ii Llc
Garden City Police Department
Kansas Department Of Transportation
Jmz Corporation
Rocking M Radio Inc.
Jetmore
United Wireless Communications Inc.
Sba Structures Llc
Kansas Department Of Transportation
Sba Towers Ii Llc
Repeater 5
Communication Enhancement Llc
Gray County Sheriff'S Office
Gray County Sheriffs Dept. Tower
Victory Electric Cooperative Association Inc
Ford County EOC Building
United Wireless Communications
Nexstar Inc.
Sba Towers Ii Llc
Croell Inc.
Repeater 3
Jmz Corporation
United Wireless Communication Inc
Gray
Ford
Knoxville Tv Llc
Sba Towers Ix Llc
Alltel Corporation
Kansas Department Of Transportation
Southern Star Central Gas Pipeline Inc.
Channel Two Tower
Southern Star Central Gas Pipeline Inc.
Sba Towers Ii Llc
Sba Structures Llc
Haskell
Repeater 1
Gateway Wireless & Network Services
Kn Telecommunications Inc.
Haskell County Sheriff'S Department
United Wireless Communications Inc.
Pioneer Telephone Association Inc. D/B/A Pioneer Communications
United Wireless Communications Inc
American Towers Llc
Eastern Pipe Line Company Lp
Union Pacific Railroad Company
Bouziden Tower
American Towers Llc
Northern Natural Gas Company
Union Pacific Railroad
Sba Structures Llc
United Wireless Communications
American Towers Llc
Meade County Sheriff'S Office
Communication Enhancement Llc
American Towers Llc
Merit Energy Company
Alltel Corporation
Kismet Water Tower
Kn Telecommunications Inc.
American Towers Llc
Fire Tower
Clark County Sheriff'S Office
Panhandle Eastern Pipe Line Company Lp
Arkalon Pull site
Gateway Wireless & Network Services
United Wireless Communications Inc
liberal/Seward Co. Radio Tower
Anr Pipeline Company
United Wireless Communications Inc.
United Wireless Communication
Seward County Communications
Uniti Towers Llc

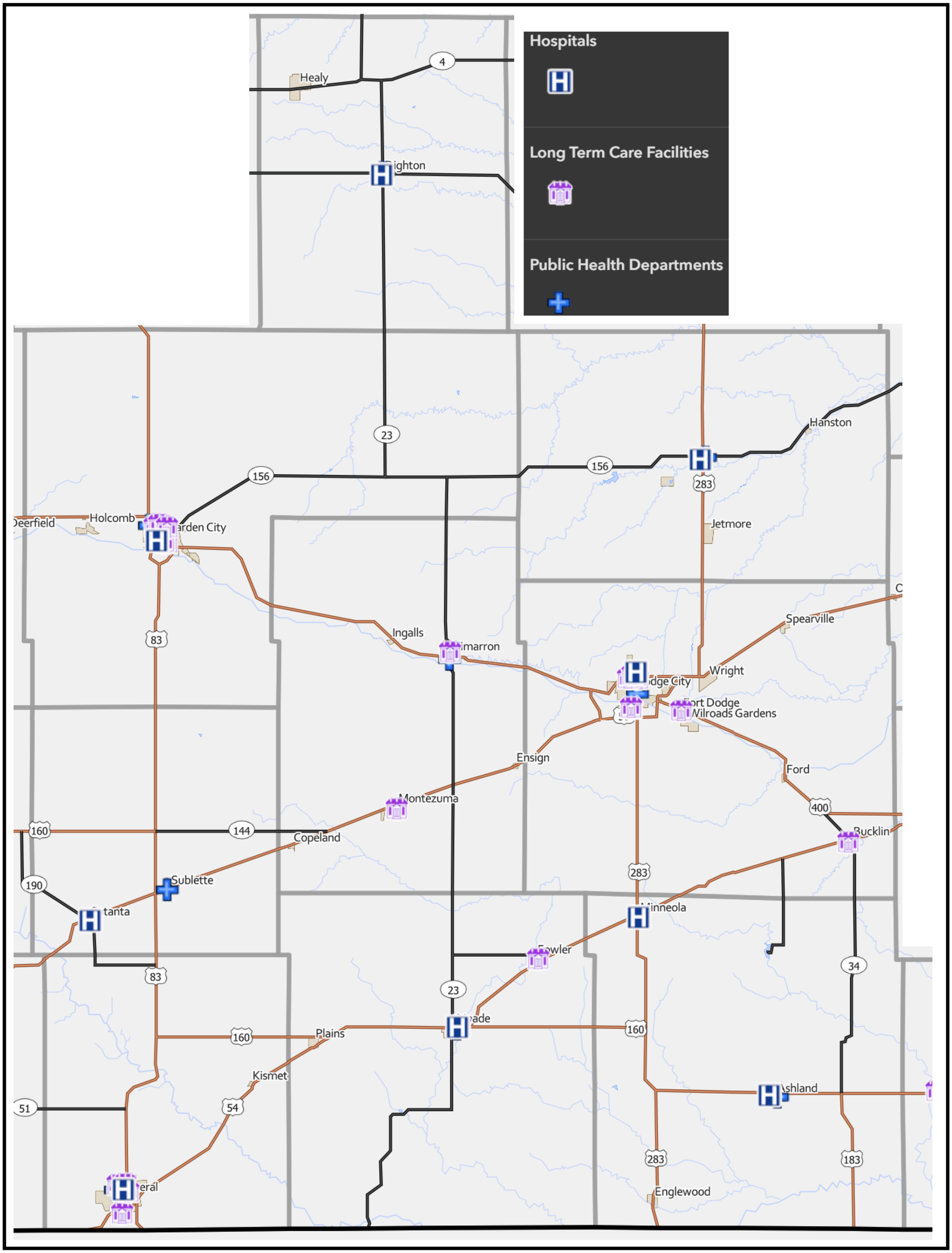
Source: Kansas EOPmapper

Map 15: Kansas Region D Fire Response Infrastructure


Fire Stations
County Reference
Fire Districts
Garfield Township Fire Department - Mennonite Station
Garfield Township Fire Department Station 4
Garfield Township Fire Department - Doll Station
Holcomb Fire Department
Pierceville Township Fire Department
Garden City Fire Department Station 1
Tate Station
Jetmore Fire Department
Hanston Rural Fire Department
Ford County Fire and EMS Station 5
Ingalls Volunteer Fire Department
Cimarron Volunteer Fire Department
Ford County Fire Station 6
Dodge City Airport Fire Department
Dodge City Fire Department Station 2
Gray
Ford
Lockport Township Fire Department
Montezuma Volunteer Fire Department
Ford County Fire Station 2
Haskell
Copeland Volunteer Fire Department
Haskell Township and Sublette Fire Department
Ford County Fire Station 7
Fowler City Fire Department
Clark County Fire District 3
Clark County Fire District 2
Seward County Fire Department - Cimmaron Station
Meade City Fire Department
Plains Rural Fire Department
Fowler Rural Fire Department
Seward County Fire Department
Meade
Meade Rural Fire Department
Seward
Clark
Ashland Fire Department
Clark County Fire District 1
Englewood Fire Department
Liberal Fire Department Station 1
Liberal Fire Department Station 2

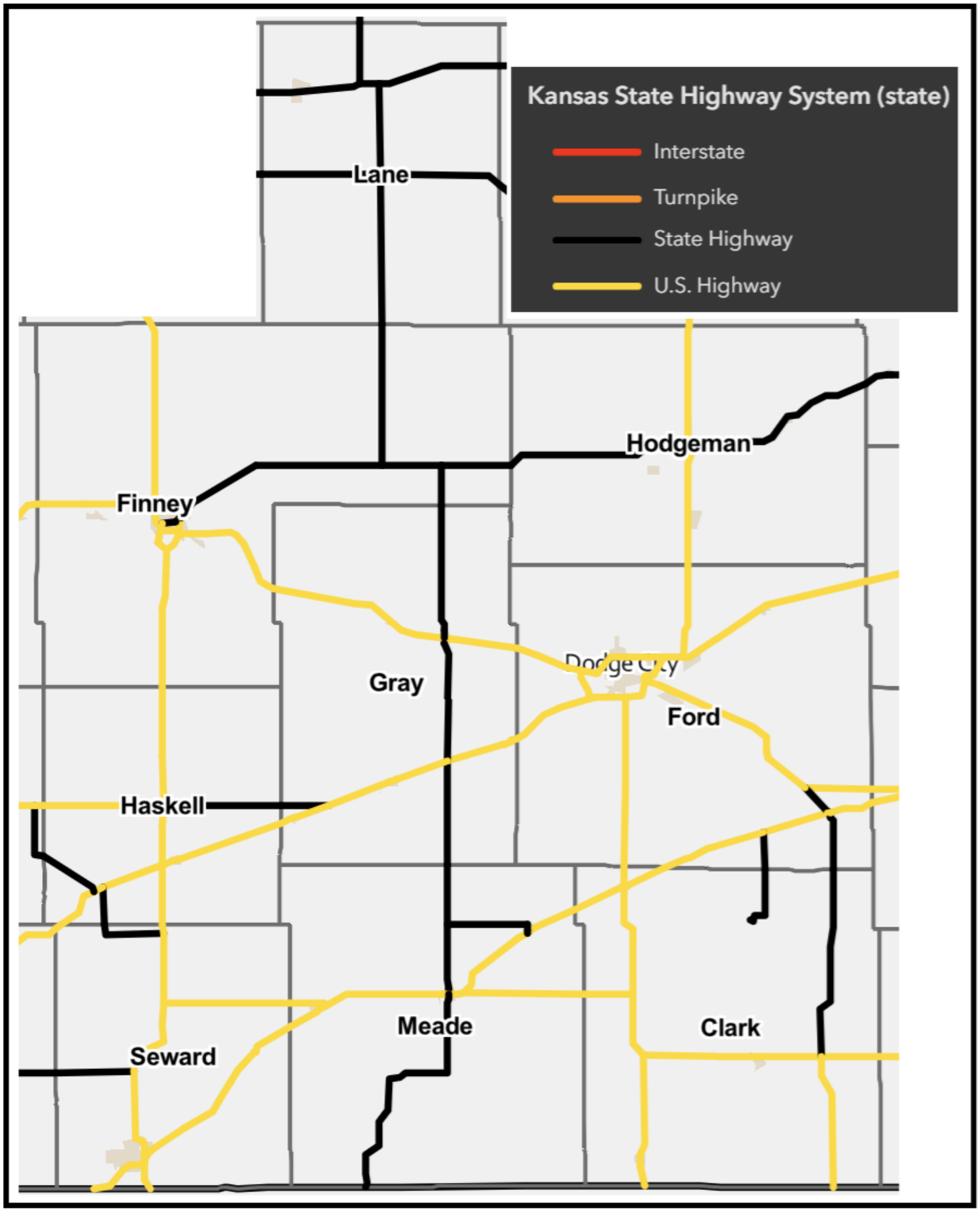
Source: Kansas EOPmapper

Map 16: Kansas Region D Health Care Infrastructure


Hospitals
Long Term Care Facilities
Public Health Departments
Healy
Hanston
Jetmore
Holcomb
Ingalls
Spearville
Wright
Fort Dodge
Wilroads Gardens
Ensign
Ford
Montezuma
Copeland
Bucklin
Sublette
Fowler
Plains
Kismet
Englewood

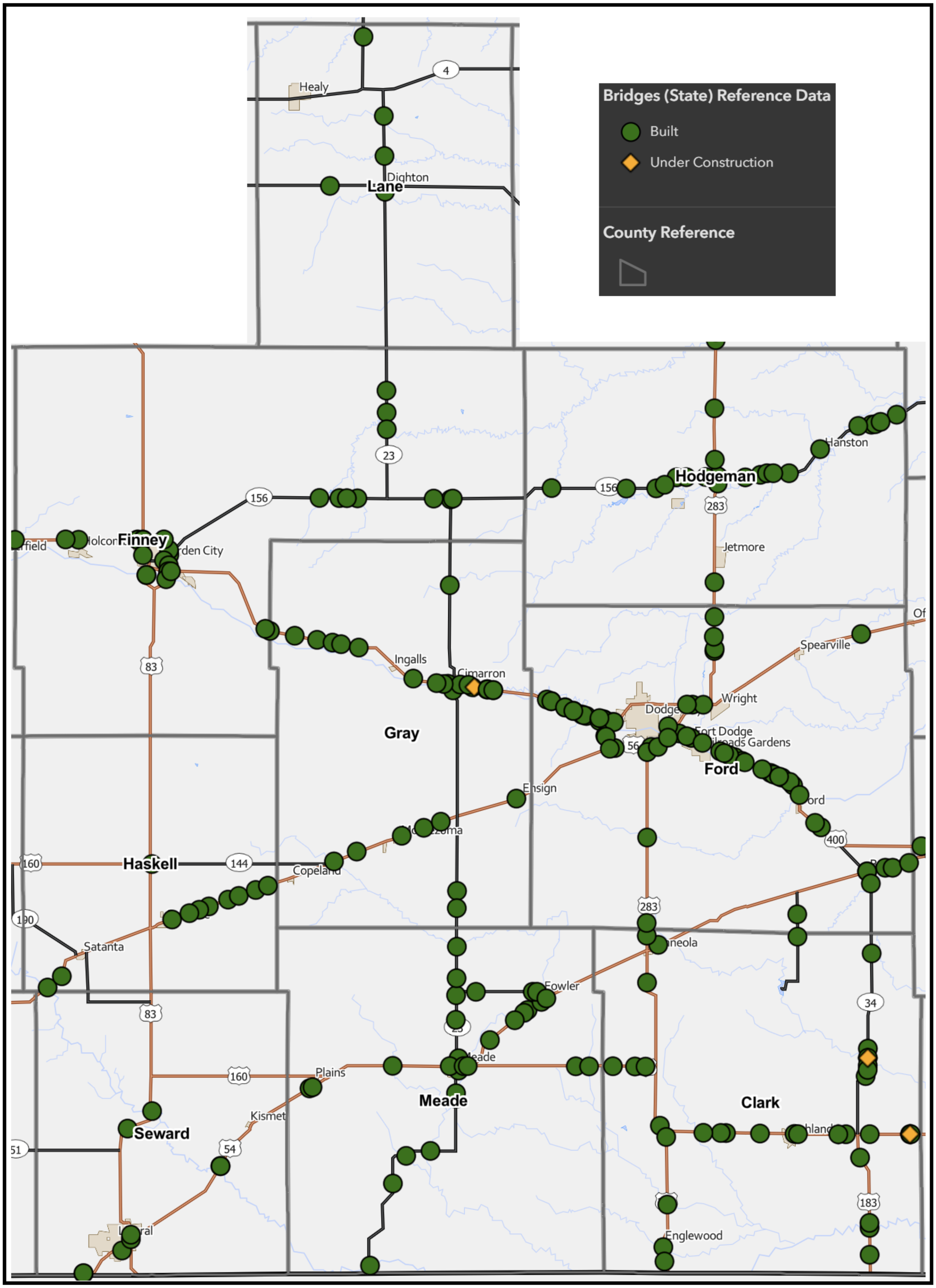
Source: Kansas EOPmapper

Map 17: Kansas Region D Highway Infrastructure



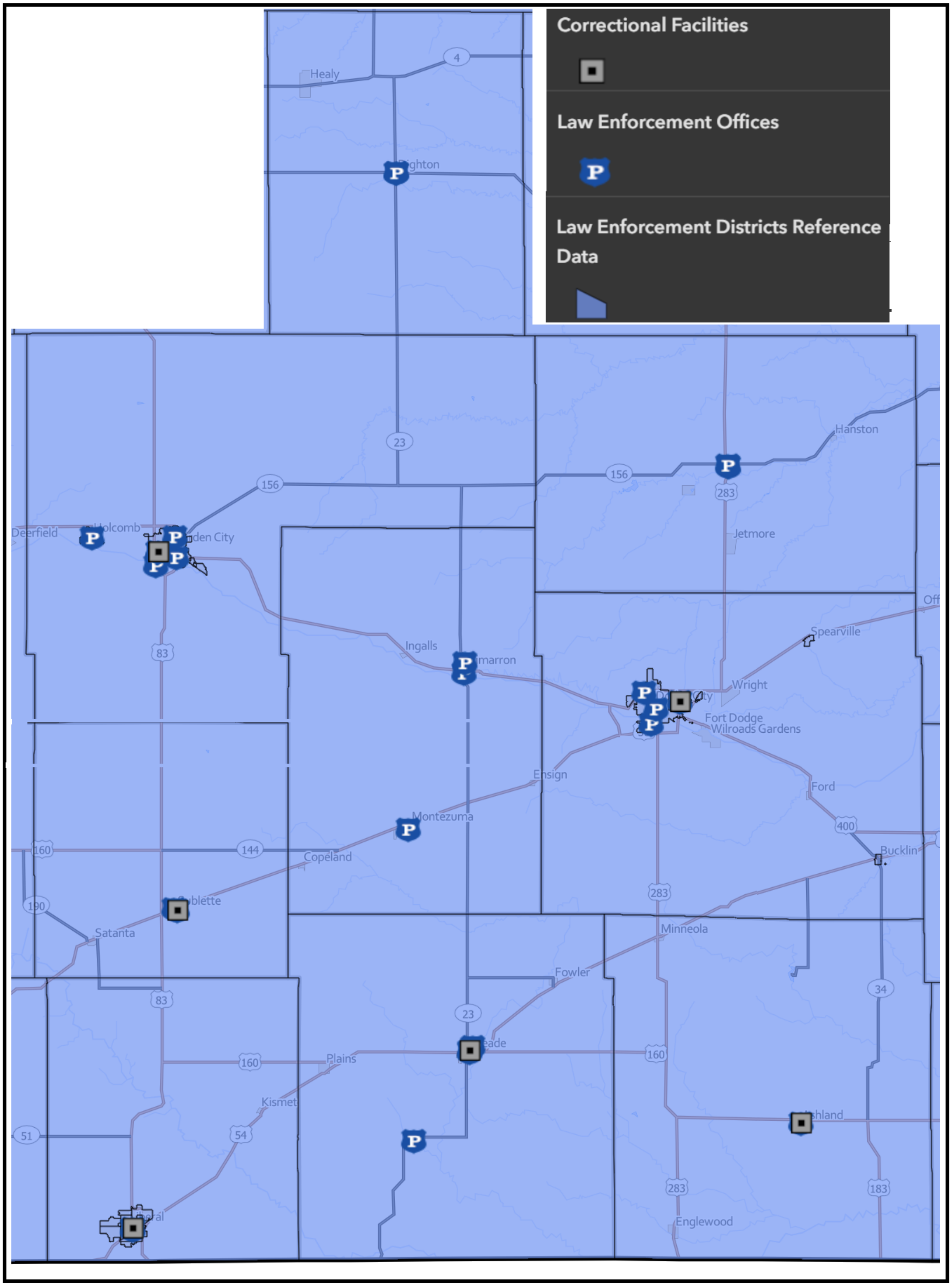
Source: Kansas EOPmapper

Map 18: Kansas Region D Bridge Infrastructure


Bridges (State) Reference Data
Built
Under Construction
County Reference
Lane
Finney
Hodgeman
Gray
Ford
Haskell
Seward
Meade
Clark
Healy
Dighton
Hanston
Jetmore
Spearville
Wright
Ingalls
Cimarron
Ensign
Copeland
Satanta
Plains
Kismet
Fowler
Englewood

Source: Kansas EOPmapper

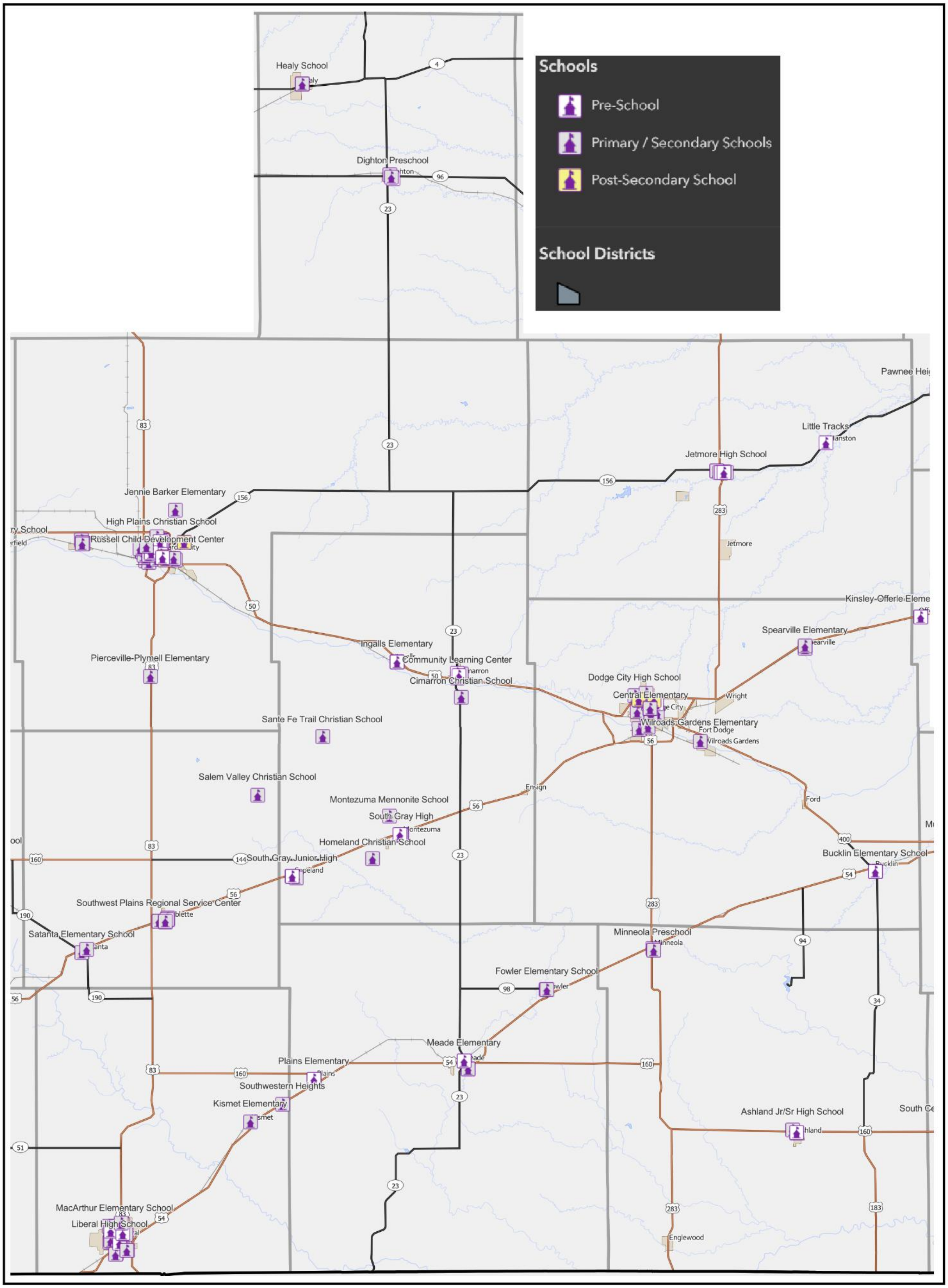
Map 19: Kansas Region D Law Enforcement Infrastructure



Correctional Facilities
Law Enforcement Offices
Law Enforcement Districts Reference Data
Healy
Deerfield
Ingalls
Hanston
Jetmore
Spearville
Wright
Fort Dodge
Wilroads Gardens
Ensign
Ford
Bucklin
Copeland
Satanta
Minneola
Fowler
Plains
Kismet
Englewood

Source: Kansas EOPmapper

Map 20: Kansas Region D Educational Infrastructure


Schools
Pre-School
Primary / Secondary Schools
Post-Secondary School
School Districts
Healy School
Dighton Preschool
Jetmore High School
Little Tracks
Jennie Barker Elementary
High Plains Christian School
Russell Child Development Center
Pierceville-Plymell Elementary
Ingalls Elementary
Community Learning Center
Cimarron Christian School
Spearville Elementary
Dodge City High School
Central Elementary
Wilroads Gardens Elementary
Sante Fe Trail Christian School
Salem Valley Christian School
Montezuma Mennonite School
South Gray High
Homeland Christian School
South Gray Junior High
Bucklin Elementary School
Southwest Plains Regional Service Center
Satanta Elementary School
Minneola Preschool
Fowler Elementary School
Meade Elementary
Plains Elementary
Southwestern Heights
Kismet Elementary
Ashland Jr/Sr High School
MacArthur Elementary School
Liberal High School
Jetmore
Wright
Fort Dodge
Wilroads Gardens
Ensign
Ford
Englewood

Source: Kansas EOPmapper

Roads and highways play a vital regional role maintaining response and recovery capabilities. The following table further details road infrastructure information for Kansas Region D:

Table 12: Kansas Region D Road Mileage

County	Annual Budget	Number Employees	Concrete	Asphalt	Gravel	Earth	Total
Clark County	$988,042	11	0	7	572	45	624
Finney County	$4,990,822	28	2	232	992	0	1,226
Ford County	$4,844,738	23	0	228	162	0	390
Gray County	$4,055,000	17	0	85	1,157	0	1,242
Haskell County	$3,794,612	13	0	118	519	0	637
Hodgeman County	$1,331,030	15	0	5	832	220	1,057
Lane County	$915,888	14	0	3	463	131	597
Meade County	$1,961,567	13	1	101	162	0	264
Seward County	$2,576,248	16	0	137	446	100	683

Source: KDOT. 2022 data

3.10 Historic Places

Historic buildings are generally more vulnerable to natural hazards due to their age, materials, and construction methods. These structures were often built before modern building codes and may lack the structural reinforcements required to withstand hazards. Additionally, the materials used in historic buildings, like old brick, wood, or mortar, may have deteriorated over time, further reducing their resilience.

Preserving historic buildings poses unique challenges in hazard mitigation because retrofitting or upgrading them to meet modern safety standards must balance maintaining their historical integrity. This vulnerability underscores the importance of integrating historic preservation with hazard mitigation planning, ensuring that these culturally significant structures are protected while minimizing risks to public safety. For cultural and historic locations within Kansas Region D the following resources were consulted:

- **National Register of Historic Places**: The official list of the United States' historic properties deemed worthy of preservation for their significance in American history, architecture, archaeology, engineering, or culture. Administered by the National Park Service under the Department of the Interior, it includes districts, sites, buildings, structures, and objects. Established by the National Historic Preservation Act of 1966, the register seeks to recognize and protect cultural heritage. While listing does not impose restrictions on private property, it provides eligibility for preservation incentives.
- **Kansas Register of Historic Places:** An official listing of properties, sites, structures, buildings, landscapes areas and objects significant in the history, architecture, and culture of the state of Kansas and its communities. Administered by the Kansas Historic Preservation Program, the register aims to recognize and protect the state's rich heritage. Properties listed in the register are evaluated based on their historical importance, architectural merit, and cultural contributions. Inclusion in the register not only acknowledges a property’s significance but also provides opportunities for preservation grants, technical assistance, and tax incentives. It also ensures that state-funded projects consider the impact on these cultural assets, promoting stewardship and sustainable preservation efforts.

The following table details properties and locations in Kansas Region D and participating jurisdictions listed on these registers.

Table 13: Kansas Region D Historic Places

Location	Jurisdiction	National Register	Kansas Register
Ashland Grade School	Ashland	x	x
Bear Creek Redoubt	Ashland	x	
Cimarron Redoubt	Ashland	x	
Stein House	Ashland	x	x
Stockgrowers State Bank	Ashland	x	x
900 Block North Seventh Street Historic District	Garden City	x	
Buffalo Hotel	Garden City	x	x
Bungalow Historic District	Garden City	x	
Cedar Cliff	Garden City	x	
Hope House	Garden City	x	x
Little Finnup House	Garden City	x	
Sabine Hall	Garden City	x	
Thompson, Sen. William H., House	Garden City	x	
Windsor Hotel	Garden City	x	
Atchison, Topeka and Santa Fe Railway Depot	Dodge City	x	
Burr House	Dodge City	x	
Dodge City Downtown Historic District	Dodge City	x	
Dodge City Public Library	Dodge City	x	
Hennessy Hall, Saint Mary of the Plains Campus	Dodge City	x	
Lora Locke Hotel	Dodge City	x	
Mueller-Schmidt House	Dodge City	x	
Sacred Heart Cathedral	Dodge City	x	
Santa Fe Trail Ruts	Dodge City	x	
Immaculate Heart of Mary Catholic Church	Windthorst	x	
Cimarron Hotel	Cimarron	x	
Gray County Courthouse (Old)	Cimarron	x	
Barton, Welborn 'Doc', House	Ingalls	x	
Hackberry Creek Bridge	Jetmore	x	x
Haun, T. S., House	Jetmore	x	
Hodgeman County Courthouse	Jetmore	x	x
Lane County Community High School	Dighton	x	x
Pottorff Site	Healy	x	
Fowler Swimming Pool and Bathhouse	Fowler	x	x

Source: National Register of Historic Places, Kansas Register of Historical Places

3.11 Economic Conditions

U.S. Census data provides key insights into the working-age population actively participating in the economy. This data helps measure the labor force participation rate, a critical economic indicator reflecting the proportion of the eligible population contributing to the workforce. It excludes certain groups, such as retirees, students, or those not seeking employment, giving a clearer picture of economic engagement and workforce trends.

Table 14: Population in Labor Force

Jurisdiction	Population over 16	In Labor Force	Employed	Unemployed
Clark County	1,569	969	949	20

Table 14: Population in Labor Force

Jurisdiction	Population over 16	In Labor Force	Employed	Unemployed
Finney County	28,051	19,717	18,628	1,066
Ford County	24,876	17,542	16,726	816
Gray County	4,255	2,902	2,840	62
Haskell County	2,805	1,763	1,677	86
Hodgeman County	1,328	858	834	24
Lane County	1,191	753	749	4
Meade County	3,039	1,905	1,883	22
Seward County	15,599	10,904	10,442	462

Source: U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates

3.12 Physical Setting and Land Cover

Kansas Region D lies within the High Plains region of the Great Plains, featuring predominantly flat to gently rolling terrain with occasional sand dunes and river valleys. The elevation gradually increases from east to west, ranging from around 2,000 feet in the eastern part of the region to over 3,500 feet near the Colorado border.

This region is part of the larger Ogallala Formation, a thick layer of sedimentary deposits that forms the foundation of the High Plains Aquifer system. Over time, wind and water erosion have shaped the land, contributing to its characteristic open and treeless landscape.

The land cover of Kansas Region D is dominated by agricultural fields, grasslands, and limited forested areas. The vast majority of the land is used for commercial agriculture, with major crops including wheat, corn, sorghum, and alfalfa. Irrigated farmland is common due to the reliance on groundwater from the Ogallala Aquifer. In drier areas, dryland farming techniques are used for crops that can withstand low moisture conditions. Native shortgrass prairie dominates areas not converted to cropland, especially in the western and southern parts of the region.

Although water is limited, river valleys and wetlands provide important habitat for wildlife. Small reservoirs and playa lakes, which temporarily hold water after heavy rains, play a role in local ecosystems.

Despite its semi-arid climate, Kansas Region D has several important rivers and water sources, though surface water is limited. The Arkansas River is the most significant river in Southwest Kansas, flowing eastward from Colorado through Syracuse, Garden City, and Dodge City before continuing into central Kansas. Due to extensive upstream water use for irrigation, the river often runs dry in parts of Southwest Kansas, especially during droughts. The river valley provides fertile soil for agriculture and serves as a key groundwater recharge area for the Ogallala Aquifer.

The Cimarron River originates in New Mexico and flows northeastward through Oklahoma and into Southwest Kansas, primarily in Haskell and Seward Counties. Unlike the Arkansas River, the Cimarron River is often ephemeral, meaning it flows only seasonally or after heavy rainfall. The riverbed consists of sandy channels, which can absorb much of the water before it reaches other parts of the region.

Although not a surface water body, the Ogallala Aquifer is the most crucial water source in Kansas Region D. It is an underground reservoir supplying water for irrigation, municipal use, and livestock farming. Over-extraction has led to declining water levels, raising concerns about the long-term sustainability of agriculture in the region.

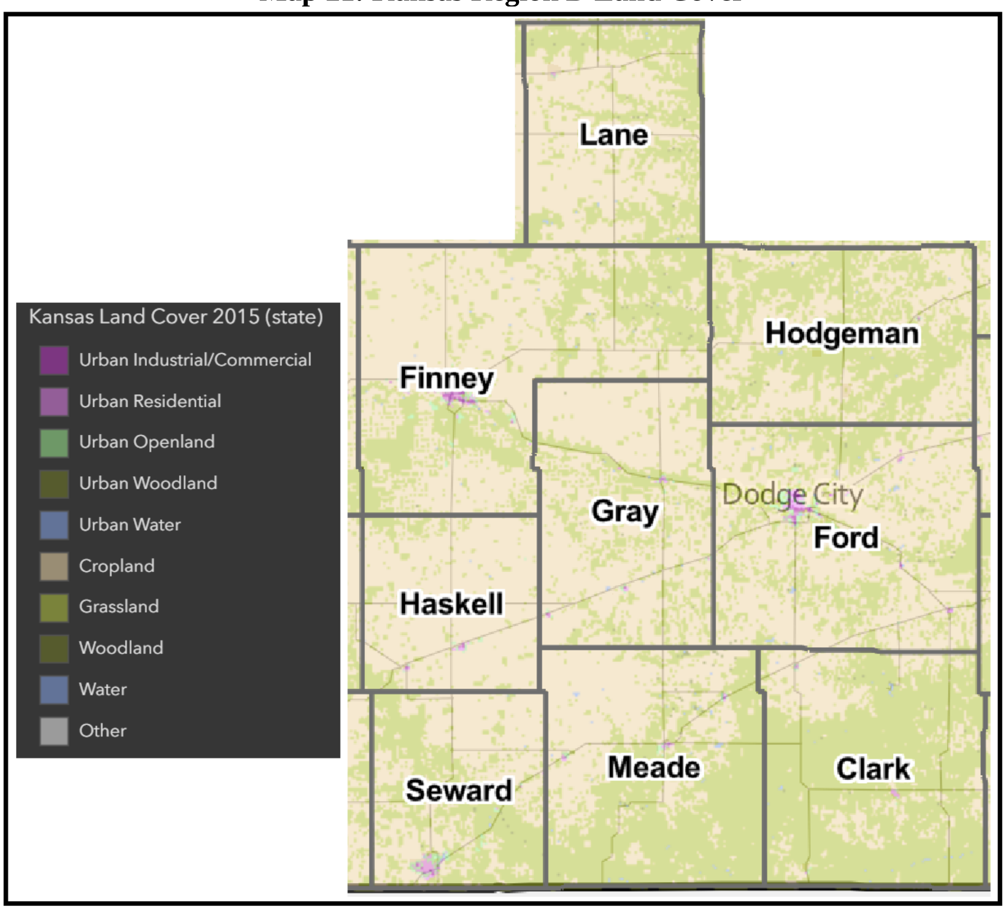
Land use in a region has a profound and lasting impact on future development. The way land is allocated and utilized can shape the economic, social, and environmental aspects of a region for decades. Land use affects that can impact future development include:

- **Economic Development:** Land use decisions influence the location and type of economic activities in a region. Zoning regulations that encourage the development of industrial zones can attract manufacturing businesses, while zoning for commercial and residential areas can promote retail and housing development. These decisions can have long-term implications for job creation, revenue generation, and overall economic health.

- **Transportation and Infrastructure:** Land use planning is closely tied to transportation infrastructure. The location of roads and other transportation facilities is determined in part by land use decisions. Well-planned land use can lead to efficient transportation networks, reducing congestion, and improving mobility. Poorly planned land use, on the other hand, can result in traffic congestion and increased infrastructure costs.
- **Housing and Urbanization:** Land use policies influence the availability and affordability of housing in a region. Zoning regulations, for example, can determine the density of residential areas and the types of housing permitted. Inadequate or restrictive land use policies can lead to housing shortages and higher costs, while well-planned policies can support diverse housing options and affordability.
- **Resilience to Climate Change:** Land use planning plays a critical role in a region's ability to adapt to climate change. Smart land use decisions can reduce vulnerability to natural disasters, such as flooding and wildfires, by avoiding high-risk areas and implementing resilient building codes and infrastructure.
- **Long-Term Costs:** Land use decisions can affect the long-term costs of development. Efficient land use planning can reduce the need for costly infrastructure extensions and maintenance, while inefficient or sprawling development can strain municipal budgets.

As indicated by the following map from the USGS National Land Cover Database, land cover in Kansas Region D consists largely of cultivated cropland and grassland:

Map 21: Kansas Region D Land Cover



Source: Kansas EOPmapper and USGS

Rural areas tend to retain their rural nature over time, but there are several factors that can influence the evolution of these areas, including:

- **Economic Conditions:** The economic viability of agriculture can vary significantly over time due to factors like crop prices, weather patterns, and changes in agricultural technology. Economic challenges may lead some farmers to sell their land for non-agricultural uses or to consolidate their operations, potentially affecting the rural landscape.
- **Urbanization and Development:** In some cases, rural areas may experience suburbanization or the expansion of nearby urban centers. This can result in residential and commercial development encroaching on agricultural land. However, the extent of this development depends on local zoning and land use regulations.
- **Infrastructure Development:** The construction of new transportation infrastructure, such as highways or railroads, can influence land use patterns. Improved infrastructure may make it easier to transport agricultural products to markets or to access rural areas for development.
- **Government Policies:** Government policies, including agricultural subsidies, land use regulations, and conservation programs, can impact the way rural and agricultural land is used. For example, conservation programs may encourage farmers to preserve land for wildlife habitat rather than development.
- **Local Planning and Zoning:** Local governments play a key role in land use planning and zoning regulations. These policies can determine whether agricultural land can be converted to non-agricultural uses, such as residential or commercial development. Some areas may have strict zoning that preserves agricultural character, while others may allow more flexibility.
- **Population Trends:** Demographic trends, including population growth or decline, can influence the demand for land in rural areas. If there is an influx of new residents seeking a rural lifestyle, it can drive demand for residential development in formerly agricultural areas.

Based on the available data, it is likely that Kansas Region D will retain its mostly rural character during the life of this plan.

3.13 Infrastructure Development

Infrastructure repair can have a significant impact on regional development, both positive and negative. The specific effects depend on the scale of the repair projects, the quality of the infrastructure, and the overall economic and social context of the region, and may include:

- **Improved Connectivity:** Repairing and upgrading infrastructure, such as roads, bridges, and ports, can enhance connectivity within and between regions. This improved connectivity can reduce transportation costs, facilitate the movement of goods and people, and attract businesses and investments to the region.
- **Economic Growth:** Functional infrastructure supports economic activities. When infrastructure is repaired, it can create jobs directly in the construction and maintenance sectors. Additionally, it can indirectly stimulate economic growth by providing a reliable foundation for businesses to operate and expand, leading to increased production and trade.
- **Enhanced Productivity:** Well-maintained infrastructure can increase productivity by reducing downtime and transportation delays. This, in turn, can make regional industries more competitive and efficient.
- **Attracting Investment:** Regions with modern and well-maintained infrastructure are often more attractive to investors. Businesses are more likely to invest in regions with reliable transportation, utilities, and communication networks, as it reduces operational risks and costs.
- **Quality of Life:** Infrastructure repair can enhance the quality of life for residents by providing access to essential services such as clean water, sanitation, healthcare, and education. This can contribute to improved human development indicators and overall well-being.

- **Resilience and Disaster Mitigation:** Infrastructure repair can include upgrades to make infrastructure more resilient to natural disasters and climate change impacts. This can help protect communities and assets and reduce the long-term costs of recovery and reconstruction.
- **Social Equity:** Infrastructure repair can address disparities in access to essential services. It can benefit marginalized communities by providing them with equal access to transportation, utilities, and public facilities.

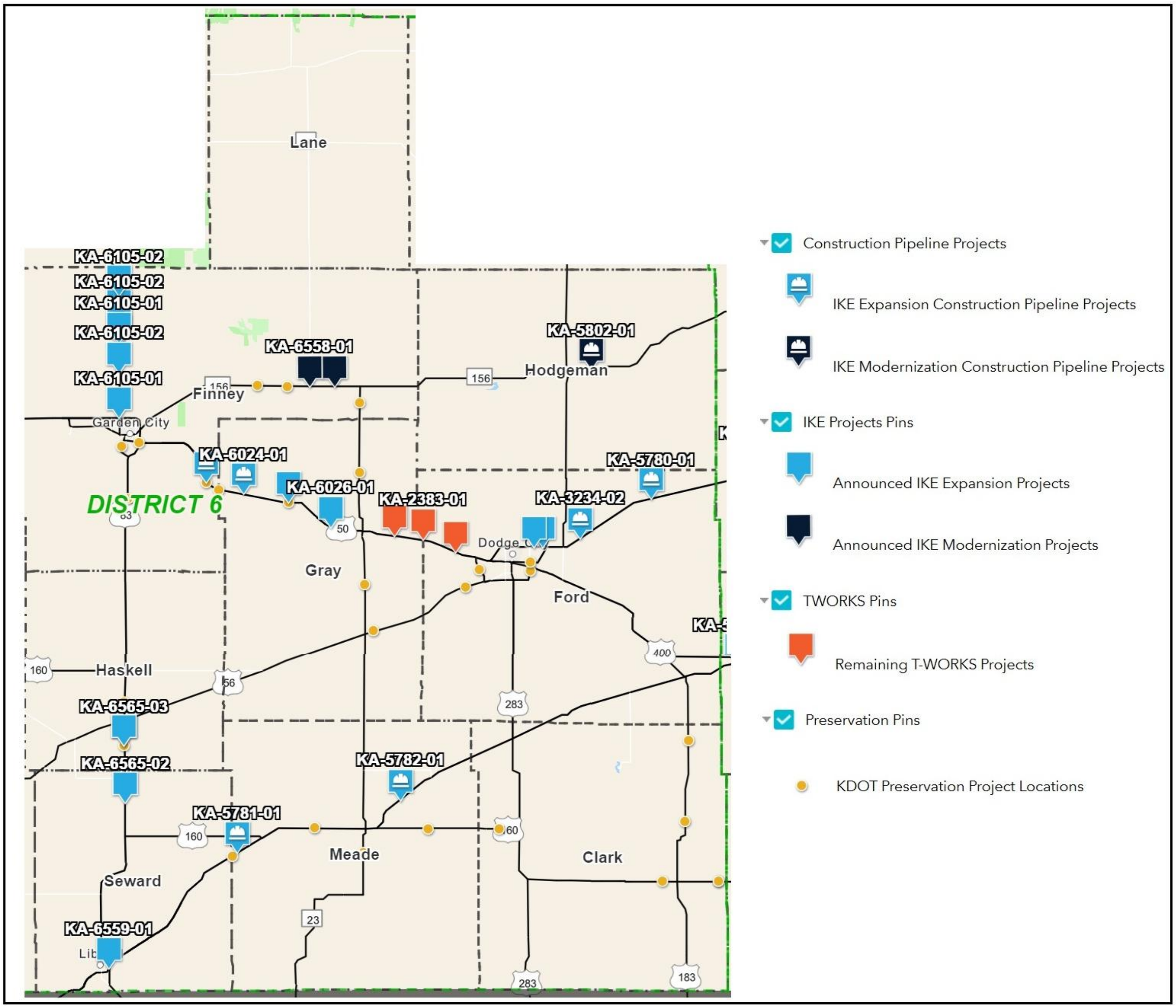
However, it is important to note that there can be negative impacts as well, including:

- **Disruption During Construction:** Repair projects can disrupt communities and businesses during the construction phase, leading to short-term challenges.
- **Costs and Budget Constraints:** Large-scale infrastructure repair projects can be costly, and they may strain regional budgets or lead to increased taxes or debt.
- Environmental Concerns: If not done carefully, infrastructure repair projects can have adverse environmental impacts, such as habitat disruption or water pollution.

The Eisenhower Legacy Transportation Program is a 10-year program that addresses highways, bridges, public transit, aviation, short-line rail and bike/pedestrian needs across Kansas. The program and associated projects are focused on making roads safer, supporting economic growth and creating more options and resources for Kansans and their communities.

The following map represents Eisenhower Legacy Transportation Program project in Kansas Region D:

Map 22: Kansas Region D Eisenhower Legacy Transportation Program Projects



Source: Kansas Department of Transportation

The following table details county public works road project details for each Kanas Region D County, including road, bridge, and culvert projects and the associated construction costs:

Table 15: Kansas Region D Road Projects

County	Road Projects (miles)	Bridge Projects (Number)	Culverts (Number)	Total Construction Costs
Clark County	0	0	0	$0
Finney County	17	0	0	$259,732
Ford County	0	0	0	$0
Gray County	0	0	0	$0
Haskell County	0	0	0	$0
Hodgeman County	5	0	0	$15,000
Lane County	8	0	0	$98,643
Meade County	5	0	0	$133,069
Seward County	0	0	0	$0

Source: KDOT, 2022 data

Within the past year, KDOT has completed numerous project within Ford County , including three passing lanes on U-50, US50-400 four lane from Cimarron to Dodge, 283 and US56 round about installation.

MPC members have indicated that there are no large-scale development project that would result in an influx of populations or an increase in residential or commercial building. Any future development is potentially vulnerable to the hazards identified in this plan. However, many of the participating jurisdictions of Kansas Region D have taken steps to reduce the potential impacts through the utilization of building codes and comprehensive plans. A comprehensive plan outlines the long-term vision and goals for the development of a city or municipality. It serves as a strategic guide for future growth, land use, infrastructure, and community development. Comprehensive plans are typically created through a collaborative process involving local government officials, city planners, residents, and various stakeholders. A key component of a comprehensive plan is land use planning, which defines how land will be used, including residential, commercial, industrial, recreational, and green spaces.

There have been no major changes in existing jurisdictional facilities, either through construction or renovation. Additionally, a review of jurisdictional budgets, as possible, does not indicate any future projects related to increasing the resilience of any existing facilities or of construction facilities. As such, it is expected that the vulnerability of jurisdictional facilities is generally the same as during the life of the previous plan and will remain generally the same during the life of this plan.

Based on available information ,and on ground observations, the majority of undeveloped in the region remained undeveloped since the completion of the previous LHMP in 2020 and will likely remain so over the life of life of this LHMP.

3.14 Agricultural Data

Agriculture forms a large part of both the economic and social fabric of Kansas Region D. USDA National Agricultural Statistics Service data from 2007, 2012, 2017, and 2022 (the latest available data) was used to develop an understanding of the agricultural footprint within the county, as detailed in the following table:

Table 16: Kansas Region D Regional Agricultural Data

Year	2007	2012	2017	2022
Number of Farms	3,632	3,558	3,096	3,441
Total Farm Acreage	4,750,684	4,854,327	4,675,025	4,962,893
Market Value of Products Sold	$3,623,412,000	$4,587,564,000	$4,715,860,000	$6,231,701,000
Value of Machinery and Equipment*	$9,094,026	$15,995,242	$19,619,439	$25,915,339
Value of Lands and Buildings*	$1,869,873	$2,591,126	$2,958,910	$3,115,101

Source: USDA National Agricultural Statistics Service
*: Average per farm

The following tables and graphs detail county specific agricultural data:

Table 17: Kansas Region D Number of Farms, 2007-2022

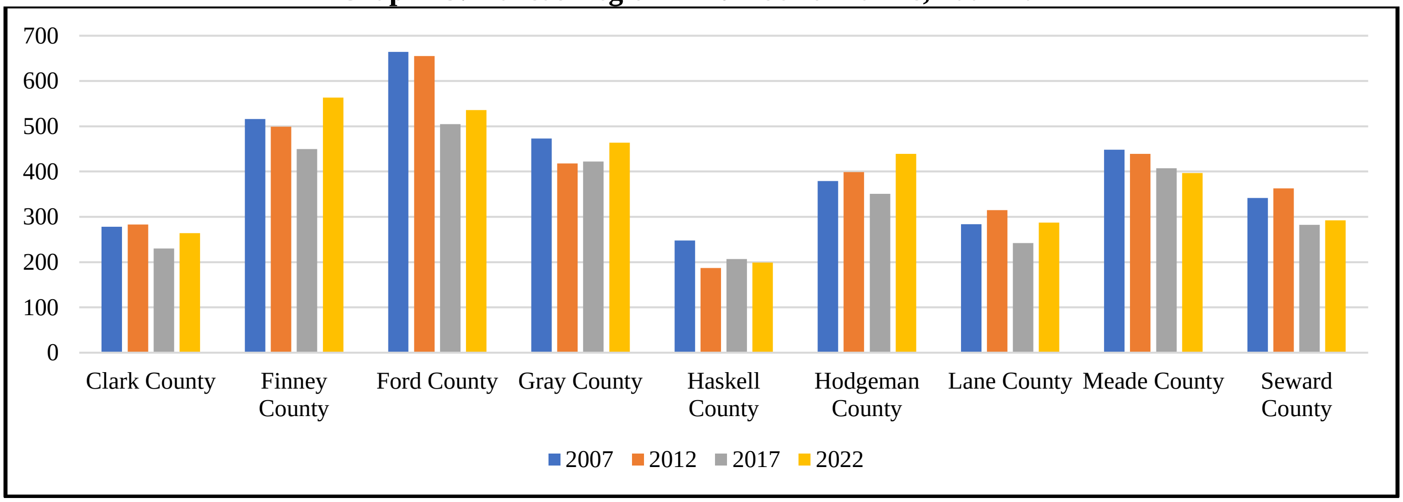
County	2007	2012	2017	2022
Clark County	278	283	230	264
Finney County	516	499	450	563
Ford County	664	655	505	536
Gray County	473	418	422	464
Haskell County	248	187	207	199
Hodgeman County	379	399	351	439
Lane County	284	315	242	287
Meade County	448	439	407	397

Table 17: Kansas Region D Number of Farms, 2007-2022

County	2007	2012	2017	2022
Seward County	342	363	282	292

Source: USDA National Agricultural Statistics Service

Graph 13: Kansas Region D Number of Farms, 2007-2022



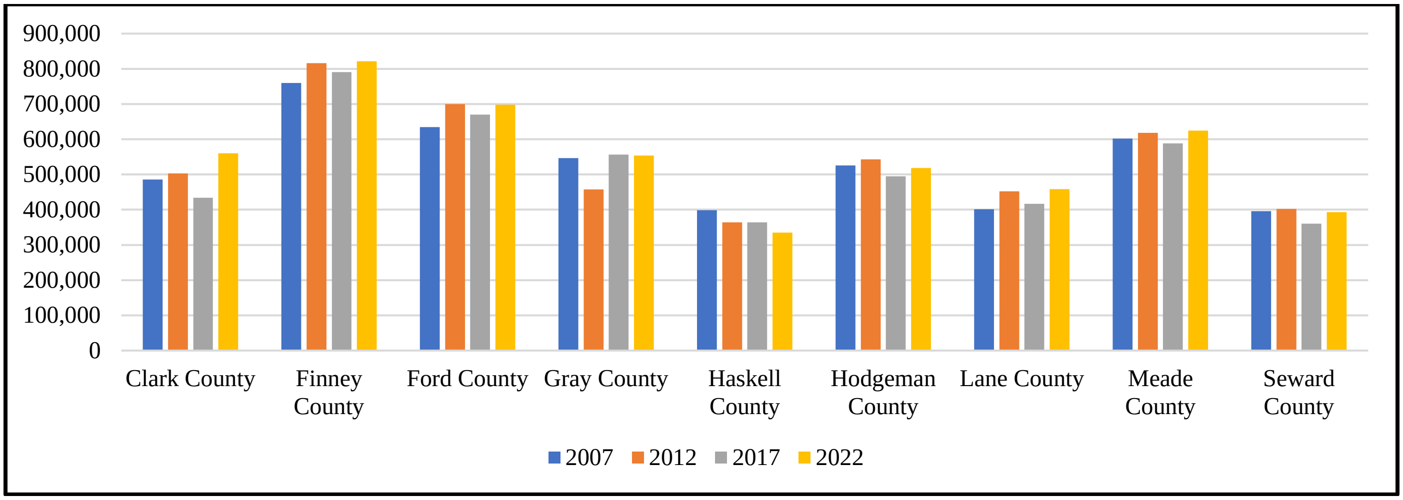
Source: USDA National Agricultural Statistics Service

Table 18: Kansas Region D Farm Acreage, 2007-2022

County	2007	2012	2017	2022
Clark County	485,996	503,272	434,295	560,252
Finney County	760,110	815,905	790,500	821,433
Ford County	634,240	699,719	669,832	698,533
Gray County	546,118	457,153	556,070	553,976
Haskell County	398,805	363,603	363,751	334,602
Hodgeman County	525,754	542,530	494,925	518,034
Lane County	401,399	452,332	417,017	458,845
Meade County	602,281	617,997	587,924	624,369
Seward County	395,981	401,816	360,711	392,849

Source: USDA National Agricultural Statistics Service

Graph 14: Kansas Region D Farm Acreage, 2007-2022



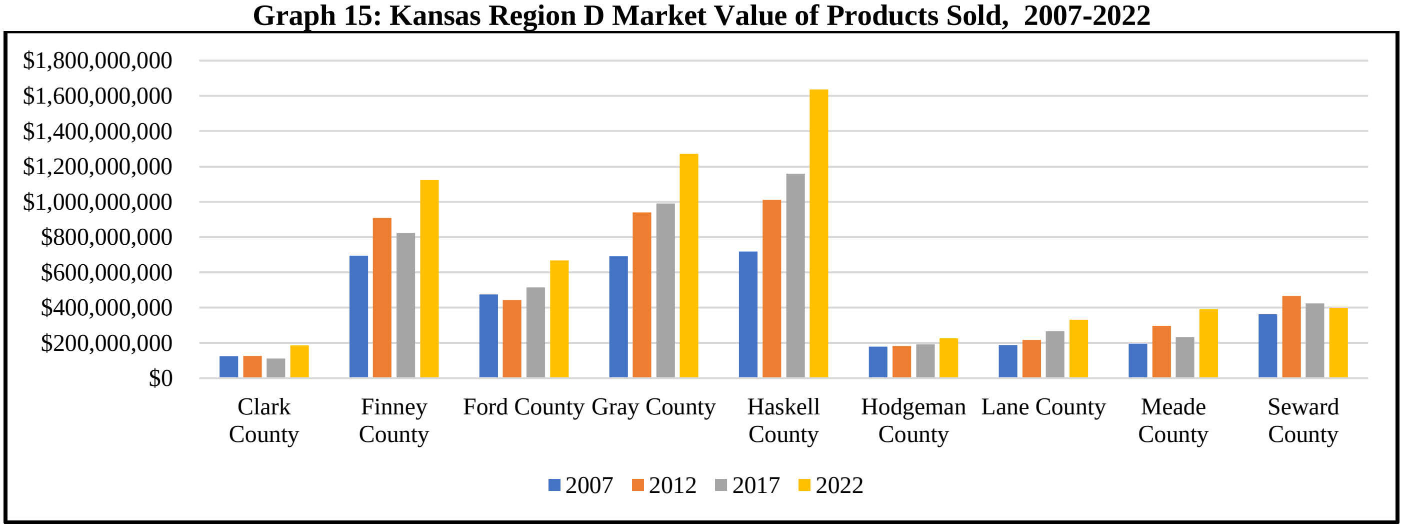
Source: USDA National Agricultural Statistics Service

Table 19: Kansas Region D Market Value of Products Sold, 2007-2022

County	2007	2012	2017	2022
Clark County	$123,547,000	$126,151,000	$111,420,000	$186,224,000
Finney County	$693,528,000	$909,209,000	$823,091,000	$1,122,314,000
Ford County	$474,076,000	$441,837,000	$515,252,000	$667,781,000
Gray County	$691,381,000	$939,416,000	$990,653,000	$1,271,532,000
Haskell County	$718,293,000	$1,009,877,000	$1,159,098,000	$1,636,349,000
Hodgeman County	$179,335,000	$182,098,000	$191,891,000	$226,540,000
Lane County	$187,007,000	$216,828,000	$266,374,000	$332,189,000
Meade County	$194,591,000	$296,841,000	$233,384,000	$390,750,000
Seward County	$361,654,000	$465,307,000	$424,697,000	$398,022,000

Source: USDA National Agricultural Statistics Service

Graph 15: Kansas Region D Market Value of Products Sold, 2007-2022



Source: USDA National Agricultural Statistics Service

Table 20: Kansas Region D Market Value of Land and Buildings (Average per Farm), 2007-2022

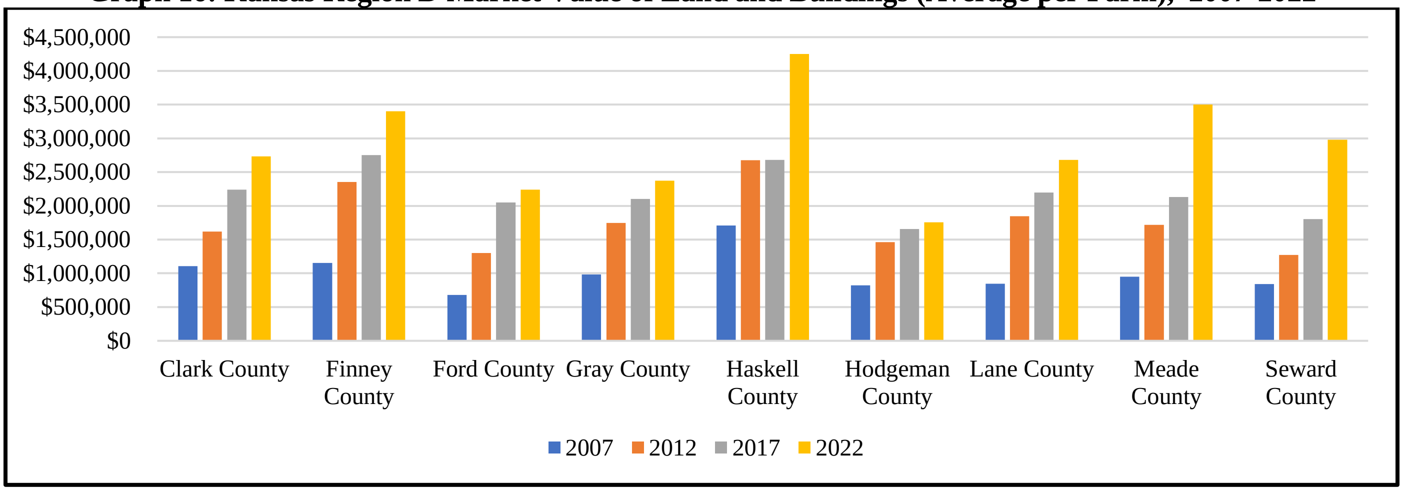
County	2007	2012	2017	2022
Clark County	$1,104,498	$1,617,572	$2,241,930	$2,734,210
Finney County	$1,153,579	$2,353,291	$2,749,764	$3,403,396

Table 20: Kansas Region D Market Value of Land and Buildings (Average per Farm), 2007-2022

County	2007	2012	2017	2022
Ford County	$680,092	$1,301,528	$2,051,886	$2,238,569
Gray County	$983,325	$1,747,136	$2,103,461	$2,370,392
Haskell County	$1,708,092	$2,676,768	$2,682,671	$4,248,356
Hodgeman County	$824,336	$1,461,357	$1,658,340	$1,756,201
Lane County	$845,541	$1,846,320	$2,195,555	$2,681,093
Meade County	$952,328	$1,717,237	$2,131,999	$3,502,738
Seward County	$842,235	$1,274,033	$1,803,833	$2,980,384

Source: USDA National Agricultural Statistics Service

Graph 16: Kansas Region D Market Value of Land and Buildings (Average per Farm), 2007-2022



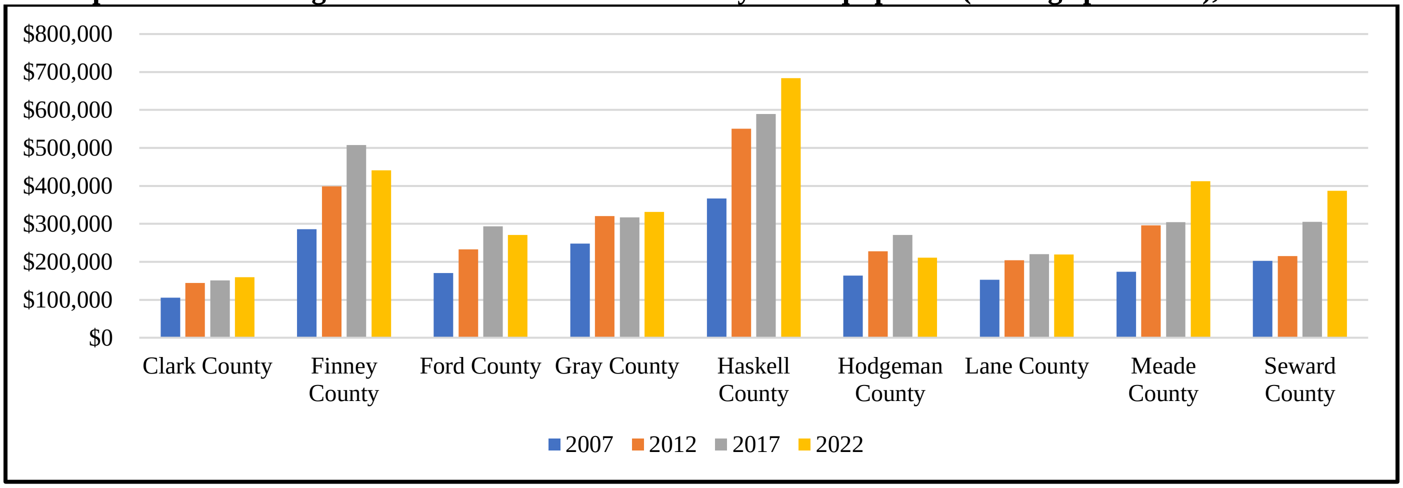
Source: USDA National Agricultural Statistics Service

Table 21: Kansas Region D Market Value of Machinery and Equipment (Average per Farm), 2007-2022

County	2007	2012	2017	2022
Clark County	$105,579	$143,990	$150,734	$159,146
Finney County	$285,752	$399,313	$507,327	$441,328
Ford County	$170,110	$232,825	$293,262	$270,838
Gray County	$248,223	$320,818	$317,212	$331,244
Haskell County	$367,208	$550,993	$589,216	$683,726
Hodgeman County	$163,440	$227,944	$271,148	$210,736
Lane County	$153,133	$204,458	$220,218	$219,285
Meade County	$174,018	$295,835	$304,190	$412,123
Seward County	$202,410	$214,950	$305,603	$386,675

Source: USDA National Agricultural Statistics Service

Graph 17: Kansas Region D Market Value of Machinery and Equipment (Average per Farm), 2007-2022



Source: USDA National Agricultural Statistics Service

3.15 Regional Climate

Kansas Region D experiences a semi-arid climate, characterized by hot summers, cold winters, low annual precipitation, and frequent strong winds. The region's climate is shaped by its inland location, far from large bodies of water, and its position within the Great Plains. These factors contribute to significant temperature fluctuations, drought conditions, and occasional extreme weather events such as tornadoes and dust storms.

Kansas Region D has a wide range of temperatures throughout the year. Summers are typically hot and dry, with average high temperatures in July ranging between 90°F and 100°F. Heatwaves are common, occasionally pushing temperatures above 105°F . The lack of humidity makes the heat somewhat more bearable compared to more humid regions, but it also increases the risk of wildfires and drought.

Winters, in contrast, are cold and dry, with January temperatures often ranging between 15°F and 40°F. Arctic air masses can bring severe cold spells, dropping temperatures below 0°F for short periods. Snowfall is generally light, averaging between 15 to 25 inches per year, though strong winds can cause dangerous wind chills and blowing snow hazards.

Kansas Region D receives relatively low annual precipitation, averaging between 15 and 20 inches per year. Most of this rainfall occurs in the spring and early summer, typically from May to July, when thunderstorms are more frequent. These storms can produce heavy downpours, localized flooding, and occasionally hail. Despite occasional heavy rains, the region is prone to drought due to its naturally dry climate and high evaporation rates. Long periods without significant rainfall can strain agricultural production, particularly for crops such as wheat, sorghum, and corn, which are vital to the local economy. The reliance on the Ogallala Aquifer for irrigation has become a pressing issue, as water levels continue to decline due to overuse.

One of the most defining features of the climate in Kansas Region D is its persistent and strong winds. Winds often exceed 20 to 30 mph, particularly in the spring. These winds contribute to dust storms, especially during dry periods when topsoil becomes loose.

Severe weather is also a concern. Kansas Region D is located within Tornado Alley, making it vulnerable to tornadoes, especially in the spring and early summer. Thunderstorms in the Region Dan produce large hail, damaging winds, and even flash flooding in low-lying areas.

3.16 Potential Impacts of Climate Change

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. Where applicable, and with proper scientific evidence, potential climate change factors will be addressed in subsequent sections for relevant identified hazards.

Data from the NOAA NCEI Kansas 2022 State Climate Summary indicates the following concerning the climate change in the state:

- Temperatures have risen approximately 1.5° Fahrenheit since the beginning of the 20th century.
- Recent multiyear periods have been among some of the warmest on record for Kansas, comparable to the extreme heat of the Dust Bowl era of the 1930s.
- Greater warming has occurred in the winter and spring months.
- The frequency of extreme precipitation events has been highly variable but shows a general increase, with the number of 2-inch precipitation events was well above average during the 2015–2020 period.
- Although projections of overall annual precipitation are uncertain, summer precipitation is projected to decrease across the state while winter precipitation is projected to increase.
- The increase in extreme precipitation events has been more pronounced in the eastern part of the state.
- The intensity of future droughts is projected to increase.
- Drought, combined with the extreme summer heat, is expected to have significant negative impacts on crop yields, livestock production, and pasture conditions.
- The frequency and severity of wildfires is projected to increase.

Section 4 –Capability Assessment

4.1 Introduction

This capability overview for Kansas Region D and participating jurisdictions documents programs, policies, and funding mechanisms for participating jurisdictions. All listed capabilities documented in the previous LHMP were reviewed for relevance and updated to reflect the current environment, as necessary. Additionally, any programs, policies, or funding mechanisms that are no longer applicable, are outdated, or are no longer in existence have been removed. As part of this process, updated jurisdictional capability profiles were sent for review and, if necessary, further revision.

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, and 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 jurisdiction’s vulnerability to an identified hazard. Additionally, a capability assessment can detail current successful mitigation actions that should continue to receive support.

4.2 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

The scope of regulation 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.

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).

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.

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.

4.3 Administrative and Technical Capabilities

The administrative and technical functions of Kansas Region D are critical in the effective implementation of hazard mitigation strategies. These functions ensure that the county is prepared to reduce risks associated with natural and human-made hazards and can efficiently identify, integrate, and manage mitigation projects.

Kansas Region D has a small, but dedicated staff across multiple departments for hazard mitigation roles including planning, engineering, and mapping. Additionally, the county has numerous communication channels available, including websites and social media platforms, and a variety of trained Public Information Officers and general staff to disseminate hazard mitigation information to all stakeholders and the public.

The following table details Kansas Region D and participating jurisdiction departments and their roles in supporting hazard mitigation planning:

Table 22: Kansas Region D and Participating Jurisdictions Departments Supporting Mitigation Planning

Department or Position	Hazard Mitigation Roles
Governing Board or Chief Executive	• Provides adoption resolution for LHMP. • Approves ordinances and bylaws and facilitates capital improvements budget.
Building Department	• Enforces building codes that enhance structural resilience to hazards. • Conducts inspections and issues permits ensuring compliance.
Emergency Management Department	• Develops, implements, and updates the LHMP. • coordinates between various departments, agencies, and external stakeholders to ensure a cohesive approach to hazard mitigation. • Provides public education on matters concerning hazard mitigation. • Coordinates hazard grant application process. • Involving local businesses, non-profits, and residents in the planning process to foster a collaborative approach to mitigation. • Supports the planning and implementation of mitigation projects.
Finance Department	• Allocates funding for hazard mitigation projects. • Manages grants and other financial resources to support mitigation efforts.

Table 22: Kansas Region D and Participating Jurisdictions Departments Supporting Mitigation Planning

Department or Position	Hazard Mitigation Roles
Fire Department	• Wildfire mitigation through controlled burns and fuel management. • Outreach programs to educate the public on fire safety, such as how to prevent home fires, create defensible spaces around properties. • Community planning to create defensible spaces and ensure buildings are more fire-resistant
Geographic Information System (GIS)	• Provides critical data and mapping services for hazard identification and risk assessments. • Utilizes advanced modeling techniques to predict the impact of various hazards on the community. • Supports the planning and implementation of mitigation projects.
Health Department	• Addresses public health risks associated with identified hazards. • Plans for emergency medical response and disease control measures. • Monitors environmental hazards (e.g., water contamination, hazardous materials).
Planning Department	• Enforces zoning and land-use policies to minimize hazard risks. • Integrates hazard mitigation into comprehensive and capital improvement plans.
Public Works Department	• Manages infrastructure resilience projects (e.g., road improvements, drainage systems).

The following table indicates if a participating jurisdiction has the above noted departments:

Table 23: Participating Jurisdiction Departments

Jurisdiction	Board / Exec	Building	Emergency Management	Financial	Fire	GIS	Health	Planning	Public Works
Clark County	x		x	x			x		x
City of Ashland	x			x					x
City of Englewood	x			x					x
City of Minneola	x			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					x
Ford County	x		x	x			x	x	x
City of Bucklin	x			x					x
City of Dodge City	x	x		x				x	x
City of Ford	x			x					x
City of Spearville	x	x		x					x
Gray County	x		x	x			x		x
City of Cimarron	x	x		x					x
City of Copeland	x			x					x
City of Ensign	x			x					x
City of Ingalls	x			x					x
City of Montezuma	x	x		x					x
Haskell County	x		x	x			x	x	x
City of Satanta	x			x				x	x
City of Sublette	x			x				x	x
Hodgeman County	x		x	x			x		x
City of Hanston	x			x					x

Table 23: Participating Jurisdiction Departments

Jurisdiction	Board / Exec	Building	Emergency Management	Financial	Fire	GIS	Health	Planning	Public Works
City of Jetmore	x			x					x
Lane County	x	x	x	x			x		x
City of Dighton	x	x		x					x
Meade County	x		x	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		x
City of Kismet	x	x		x					x
City of Liberal	x	x		x					x

Note: Blank space indicates no department or representative

4.4 Regulation of Development

The regulation of development plays a crucial role in helping a community become more resilient in the face of various hazards. Effective regulation of development contributes to community resilience through:

- **Risk Reduction:** Regulations guide land use and construction practices, ensuring that they provide strong protection against hazards.
- **Public Safety:** Building codes and land-use regulations establish minimum safety standards for construction, including structural integrity, fire resistance, and the use of resilient materials.
- **Infrastructure Resilience:** Regulations may require infrastructure improvements, such as the construction of resilient roads, bridges, utility systems, and drainage systems. This strengthens a community's ability to withstand hazards, ensures the continued operation of critical services, and aids in recovery.
- **Floodplain Management:** Regulations in flood-prone areas can mandate elevation requirements for new construction, ensuring that structures are built above the base flood elevation. This minimizes flood damage, reduces the need for costly post-disaster repairs, and protects property values.
- **Land Use Planning:** Effective land-use planning helps communities avoid inappropriate development in areas at high risk of hazards.
- **Community Awareness:** Public education and outreach can be incorporated into regulations, requiring communities to inform residents about local hazards, evacuation routes, and preparedness. Informed residents are more likely to take protective measures and respond effectively to disasters.

The following sections provide further detail on building codes, zoning ordinances, and floodplain management.

Building Codes

In Kansas, the authority for enacting and enforcing building codes lies with local governments, such as cities and counties. Each jurisdiction can adopt its own building code, which can be based on national or international building codes like the International Building Code or the International Residential Code. However, Kansas mandates the 2006 International Building Code as the minimum code for any jurisdiction that does not have a code adopted. All participating jurisdictions in Kansas Region D utilize the 2006 International Building Code. In general, jurisdictions implementing building codes require building permits for the following activities:

- Construction
- Manufactured home placement
- New Utility service/meter relocation/service upgrade
- Grading-Solar panels
- Accessory structures

- Additions
- Roofs
- Wells
- Demolition

Building codes establish general minimum construction standards and are enforced through authorized local building inspection agencies and inspectors. Building codes provide for:

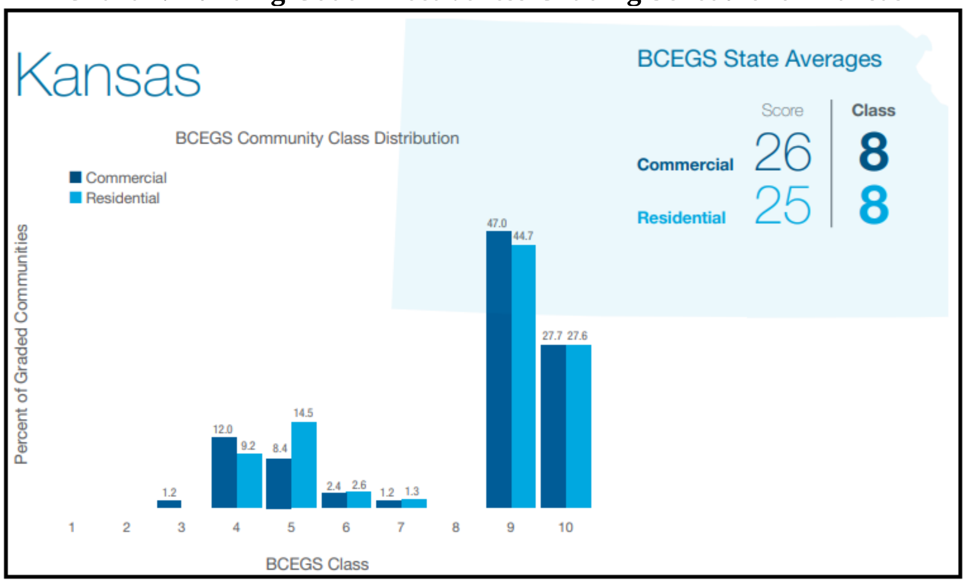
- **Life Safety:** Building codes include provisions for fire safety, emergency egress, and the use of fire-resistant materials.
- **Accessibility and Life Support:** Building codes incorporate accessibility standards, ensuring that buildings are designed to accommodate all individuals. This is crucial during and after disasters when people with mobility issues may require assistance. Accessible features also benefit emergency responders and support recovery efforts.
- **Retrofitting Existing Buildings:** Building codes may require the retrofitting of older structures to meet modern safety standards.
- **Public Awareness:** Building codes promote public awareness of hazards and the importance of resilient construction. This can lead to informed decision-making by property owners, builders, and developers, resulting in safer structures.

Key hazard resistant building code provisions found in current building codes include:

- **Structural Design Requirements:** Provides requirements for the structural design of buildings to ensure their resistance to various hazards, including earthquakes, high winds, and snow loads. These requirements are aimed at enhancing the overall structural integrity and safety of buildings.
- **Wind Design Requirements:** Provides specific provisions for wind design, considering the geographical location of the structure. Wind loads are calculated based on factors such as wind speed, exposure, and building height.
- **Seismic Design Requirements:** Incorporates seismic design provisions to address earthquake hazards. The code includes seismic design categories and requirements for the design and construction of buildings in seismic-prone regions.
- **Flood-Resistant Design Requirements:** Includes provisions related to flood-resistant design, particularly in areas prone to flooding. It may specify elevation requirements, construction materials, and other considerations to reduce the risk of flood damage. The vast majority of the regulations required by the NFIP are included within the International Building Code and the International Residential Code.
- Fire-Resistant Construction Requirements: Requirements for fire-resistant construction are included to mitigate the risk of fire hazards. This includes specifications for fire-resistant materials, assemblies, and building features.
- **Material and Construction Standard Requirements:** Establishes standards for building materials and construction methods to ensure the durability and safety of structures, considering various hazards.

The Building Code Effectiveness Grading Schedule assesses the building codes in effect in a particular community and how the community enforces its building codes, with special emphasis on mitigation of losses from natural hazards. The program assigns each participating municipality a Building Code Effectiveness Grading Schedule grade of 1 (exemplary commitment to building code enforcement) to 10 (lowest possible score). The following graph illustrates the rating for each rated State of Kansas participating municipality:

Chart 2: Building Code Effectiveness Grading Schedule for Kansas



Source: Building Code Effectiveness Grading Schedule

The average score for the State of Kansas was 26 (Class 8) rating for commercial, and a 25 (Class 8) for residential.

As part of this planning effort, both county and participating jurisdiction personnel charged with regulating or overseeing development were given the opportunity to review and comment of the elements of this plan. Please note that not all counties or jurisdictions have building departments. The following personnel involved in regulating development were notified of the planning process and invited to provide input:

Table 24: Participating Jurisdiction Building Department Representatives

Jurisdiction	Name	Title
Dodge City	Josh Adams	Director of Development Services
Garden City	Trent Maxwell	Neighborhood and Development Services Director
Kismet	Albert Gallegos	Administrator
Liberal	Keith Bridenstine	Administrator
Seward County	Albert Gallegos	Administrator

Zoning Ordinances

Zoning ordinances in Kansas Region D govern land use, development, and building requirements and are overseen by patriating jurisdictions as applicable. Zoning ordinances work by dividing the land into different zoning districts and establishing rules and guidelines for land use, building placement, density, and setback within the zoning districts. In general, zoning ordinances establish:

- **Zoning districts:** Areas designated for specific types of land use, such as residential, commercial, industrial, agricultural, mixed-use, or special districts.
- **Land usage within a zoning district:** Specifications as to which activities, buildings, and operations are permitted in each zoning district.
- **Enforcement:** Zoning ordinances are enforced by the local building department or zoning enforcement officers.

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.

Legal authority for Kansas Region D local governments to adopt and implement zoning regulations is found at K.S.A. 12-741, which provides for the enactment of planning and zoning laws and regulations by cities and counties. The components of local zoning ordinances are detailed at K.S.A. 12-753(a). and include the provision for the adoption or amendment of zoning regulations and the provision for restricting and regulating the height, number of stories and size of buildings

Zoning ordinances play a significant role in enhancing hazard resilience for communities and can help reduce vulnerability to various natural and man-made hazards by regulating land use and development practices. In Kansas Region D, locally instituted and enforced zoning ordinances provide for:

- **Land Use Planning:** Zoning ordinances designate land use zones within a community, ensuring that certain areas are reserved for particular uses. This can prevent the construction of critical infrastructure, homes, or businesses in high-risk zones, such as floodplains or wildfire-prone areas.
- **Setback Requirements:** Zoning ordinances often mandate specific setbacks, which are distances between structures and property lines or natural features. These setbacks can help prevent buildings from being too close to potential hazards, potentially reducing the risk of damage.
- **Building Height and Design Standards:** Zoning codes can establish building height limits to reduce exposure to certain hazards. Design standards, including materials and construction methods, can be specified to make structures more resilient.
- **Floodplain Management:** Many zoning ordinances incorporate floodplain regulations, which dictate where and how buildings can be constructed within flood-prone areas. These regulations may require buildings to be elevated, use flood-resistant materials, or include openings to allow floodwaters to pass through.
- **Wildfire Mitigation Zones:** In regions susceptible to wildfires, zoning ordinances can establish wildfire mitigation zones with specific requirements for defensible space, fire-resistant landscaping, and building materials to reduce the risk of wildfires spreading to structures.

In addition to zoning ordinances, historic preservation is an important consideration for all jurisdictions within Kansas Region D. Historic preservation is enacted under K.S.A. 12-755(a)(3), and provides local governments the authority they need to adopt zoning regulations to preserve structures listed on local, state, or national historic registers.

Properly applied, zoning restriction and historic preservation are some of the most effective hazard mitigation tools available against a wide variety of hazards.

Floodplain Management Ordinances

Floodplain ordinances and management are one of the most effective hazard mitigation tools available against flooding.

Local floodplain ordinances, required for NFIP participants, are often used to prevent inappropriate development in floodplains and to reduce flood hazards. In general, they allow the jurisdiction 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.
- Manage planned growth.
- Grant permits for use in development within special flood hazard areas that are consistent with the community ordinance and the NFIP under 44 CFR 60.3.

The NFIP floodplain management regulations work alongside local building codes by providing specific flood-related requirements that must be met in addition to general building code standards. In NFIP communities, when constructing or substantially improving a structure in a Special Flood Hazard Area, the structure must be elevated to or above the Base Flood Elevation, which is a requirement imposed by the NFIP's regulations. The following details the relevant municipal code sections for floodplain management for Kansas Region D and participating jurisdictions. Please note that not all participating jurisdictions have floodplain management codes or ordinances.

Code and Ordinance Summary
The following table indicates the status of the above enumerated codes and ordinances for participating jurisdictions:

Table 25: Jurisdictional Codes and Ordinances

Jurisdiction	Building Code*	Zoning Ordinance	Floodplain Ordinance
Clark County	x		
City of Ashland	x		x
City of Englewood	x		x
City of Minneola	x		x
Finney County	x	x	
City of Garden City	x	x	x
City of Holcomb	x	x	x
Ford County	x	x	x
City of Bucklin	x	x	x
City of Dodge City	x	x	x
City of Ford	x		x
City of Spearville	x	x	x
Gray County	x	x	
City of Cimarron	x	x	x
City of Copeland	x	x	x
City of Ensign	x		x
City of Ingalls	x	x	
City of Montezuma	x	x	
Haskell County	x	x	
City of Satanta	x	x	x
City of Sublette	x	x	
Hodgeman County	x	x	
City of Hanston	x		x
City of Jetmore	x	x	x
Lane County	x	x	x
City of Dighton	x	x	x
Meade County	x		
City of Fowler	x		x

Table 25: Jurisdictional Codes and Ordinances

Jurisdiction	Building Code*	Zoning Ordinance	Floodplain Ordinance
City of Meade	x		x
City of Plains	x		x
Seward County	x	x	x
City of Kismet	x	x	x
City of Liberal	x	x	x

Note: Blank indicates no code or ordinance
*: May include state mandated 2006 IBC

4.5 Jurisdictional Plans

Planning plays a critical role in hazard mitigation by helping communities identify, assess, and reduce risks associated with natural and man-made hazards. Effective planning involves a proactive, strategic, and comprehensive approach to minimize the impact of disasters and enhance community resilience. Jurisdictions were asked if they had completed the following plans:

- **Capital Improvement Plan:** Allocates funding for infrastructure projects, including those that enhance resilience, such as stormwater management systems and seismic retrofits.
- **Community Wildfire Protection Plan**: Focused on reducing wildfire risks, this plan involves community input and includes strategies for fuel reduction, public education, and emergency response improvements.
- **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.
- **Emergency Operations Plan:** An emergency operations plan outlines the responsibility and means and methods by which resources are deployed during and following an emergency or disaster. In Kansas Region D, the overarching county provides emergency operation planning for jurisdictions within its borders.
- **Floodplain Management Plan:** This plan aims to manage flood risks through zoning, building codes, and public education, often in coordination with FEMA's NFIP.
- **Land Use and Zoning Plan:** These plans regulate development to minimize exposure to hazards, such as restricting construction in flood-prone or wildfire-prone areas.

The following table indicates the status of the above enumerated plans for participating jurisdictions. Please note that some of these are umbrella plans from the county providing coverage to participating jurisdictions:

Table 26: Participating Jurisdiction Plans

Jurisdiction	Capital Improve	Community Wildfire Protection*	Comprehensive	Emergency Operations*	Floodplain Management	Land Use and Zoning
Clark County				x		
City of Ashland				x		
City of Englewood				x		
City of Minneola				x		
Finney County	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	x
City of Bucklin				x		
City of Dodge City	x	x	x	x	x	
City of Ford				x		

Table 26: Participating Jurisdiction Plans

Jurisdiction	Capital Improve	Community Wildfire Protection*	Comprehensive	Emergency Operations*	Floodplain Management	Land Use and Zoning
City of Spearville				x		
Gray County				x		
City of Cimarron				x		
City of Copeland				x		
City of Ensign				x		
City of Ingalls				x		
City of Montezuma	x		x	x		
Haskell County				x		
City of Satanta				x		
City of Sublette				x		
Hodgeman County				x		
City of Hanston				x		
City of Jetmore				x		
Lane County				x	x	
City of Dighton				x		
Meade County				x		
City of Fowler				x		
City of Meade				x		
City of Plains				x		
Seward County	x		x	x	x	
City of Kismet	x		x	x	x	
City of Liberal	x			x	x	

Note: Blank indicates no plan
*: May be under county plan

4.6 Financial Capabilities

Kansas Region D and all participating jurisdictions can raise revenue through the application of a tax, an assessment, or a fee, each approved by a distinct constitutional and statutory authority. The differences between a tax, assessment, and fee are primarily related to their purpose and how they are imposed:

- **Tax:** A mandatory financial charge imposed by a government on individuals or entities to generate revenue for public services, such as schools, roads, and public safety. Taxes are broad and general in nature.
- **Assessment:** A charge levied on property owners to fund specific local improvements that benefit their property, like road paving or sewer systems. It is usually proportional to the benefit received.
- **Fee:** A charge for a specific service provided by the government, such as a building permit, park entry, or utility connection. Fees are usually voluntary and paid directly by the user of the service.

Additionally, Kansas Region D and all participating jurisdictions can borrow money in a number of different ways, generally used as a means of financing large projects such as infrastructure and buildings. Major methods include:

- **General Obligation Bonds:** General obligation bonds have been the traditional form of financing for capital projects such as land acquisition, park development, and transportation projects that are owned and operated by the county. In general, repayment is guaranteed by both tax revenue and operating revenue.
- **Revenue Bonds:** Generally used to finance water and wastewater projects, airports, and stormwater systems. Payment for debt service on revenue bonds comes from user fees generated by the capital facility that is being built.

- **Local Improvement District Bonds:** When a capital project is going to primarily benefit a subset of the population, a Local Improvement District can be formed. Local Improvement Districts are commonly used for projects such as street improvements, water and sewer systems, and the burying of power lines. Bond payment is through an assessment to property owners in the improvement district.

Concerning hazard mitigation, Kansas Region D and all participating jurisdictions have numerous avenues to fund potential projects, including:

- **Grants:** Kansas Region D can apply for state and federal grants for hazard mitigation projects through myriad programs.
- **Bond Issuance:** Kansas Region D can issue bonds to finance large-scale mitigation projects, such as infrastructure upgrades.
- **Public-Private Partnerships:** Kansas Region D can collaborate with private entities to fund and implement mitigation measures.
- **Reserves and General Funds:** Kansas Region D may allocate funds from their general budget or reserves for mitigation activities.

Participating Stakeholder Financial Capability Summary
The following table indicates the status of the above enumerated financial capabilities for participating jurisdictions:

Table 27: Participating Jurisdiction Financial Capabilities

Jurisdiction	Tax	Assessment	Fee	Grant Application	Public-Private Partnership	Reserves and General Funds
Clark County	x	x	x	x	x	x
City of Ashland	x	x	x	x	x	x
City of Englewood	x	x	x	x	x	x
City of Minneola	x	x	x	x	x	x
Finney County	x	x	x	x	x	x
City of Garden City	x	x	x	x	x	x
City of Holcomb	x	x	x	x	x	x
Ford County	x	x	x	x	x	x
City of Bucklin	x	x	x	x	x	x
City of Dodge City	x	x	x	x	x	x
City of Ford	x	x	x	x	x	x
City of Spearville	x	x	x	x	x	x
Gray County	x	x	x	x	x	x
City of Cimarron	x	x	x	x	x	x
City of Copeland	x	x	x	x	x	x
City of Ensign	x	x	x	x	x	x
City of Ingalls	x	x	x	x	x	x
City of Montezuma	x	x	x	x	x	x
Haskell County	x	x	x	x	x	x
City of Satanta	x	x	x	x	x	x
City of Sublette	x	x	x	x	x	x
Hodgeman County	x	x	x	x	x	x
City of Hanston	x	x	x	x	x	x
City of Jetmore	x	x	x	x	x	x
Lane County	x	x	x	x	x	x
City of Dighton	x	x	x	x	x	x

Table 27: Participating Jurisdiction Financial Capabilities

Jurisdiction	Tax	Assessment	Fee	Grant Application	Public-Private Partnership	Reserves and General Funds
Meade County	x	x	x	x	x	x
City of Fowler	x	x	x	x	x	x
City of Meade	x	x	x	x	x	x
City of Plains	x	x	x	x	x	x
Seward County	x	x	x	x	x	x
City of Kismet	x	x	x	x	x	x
City of Liberal	x	x	x	x	x	x

4.7 Community-Based Classifications

Kansas Region D currently participates in the following community-based classifications, which attest to the continued investment in community resilience.

Public Protection Classification

An Insurance Services Office (ISO) fire rating, officially known as the Public Protection Classification (PPC) rating, is a score given to evaluate the fire protection capabilities of a community. This rating assesses how well-equipped a local fire department is to respond to fires, which can impact insurance premiums for homeowners and businesses within that community. Key Components of the ISO Fire Rating include:

- Emergency Communications: This evaluates the community's emergency call center and dispatch system. The speed and efficiency of handling emergency calls are critical factors.
- Fire Department: The number, training, and equipment of the firefighters are assessed. This includes the department's ability to handle fires, the number of engines, and the availability of water supply.
- Water Supply: The availability and reliability of water sources, such as hydrants and water mains, are evaluated. This also includes the volume of water available for firefighting.
- Community Risk Reduction: This includes fire prevention efforts, public fire safety education, and building code enforcement. Effective risk reduction programs can positively impact the ISO rating.

The ISO rating is given on a scale from 1 to 10, with a Class 1 rating representing the best public protection and superior fire protection services and a Class 10 rating indicating that the community’s fire protection does not meet ISO's minimum standards. A better (lower) ISO rating can lead to lower insurance premiums for property owners because it indicates a lower risk of fire damage. The following table details ISO ratings for program participants:

Table 28: Participating Jurisdiction ISO Ratings

Jurisdiction	ISO Rating
Clark County	Not rated
City of Ashland	8
City of Englewood	10
City of Minneola	6
Finney County	Not rated
City of Garden City	3
City of Holcomb	Not rated
Ford County	Not rated
City of Bucklin	Not rated
City of Dodge City	5
City of Ford	Not rated

Table 28: Participating Jurisdiction ISO Ratings

Jurisdiction	ISO Rating
City of Spearville	7
Gray County	9
City of Cimarron	6
City of Copeland	6
City of Ensign	9
City of Ingalls	6
City of Montezuma	6
Haskell County	Not rated
City of Satanta	Not rated
City of Sublette	Not rated
Hodgeman County	9
City of Hanston	7
City of Jetmore	6
Lane County	7
City of Dighton	6
Meade County	10
City of Fowler	5
City of Meade	5
City of Plains	6
Seward County	5/5y
City of Kismet	5/5y
City of Liberal	3

Source: Insurance Services Office
-: Not rated

Firewise USA Program

The Firewise USA program is a national initiative designed to help communities at risk from wildfires take proactive steps to reduce their vulnerability. Managed by the National Fire Protection Association (NFPA), the program encourages local solutions for wildfire safety by involving homeowners, community leaders, and other stakeholders in reducing fire risks. Key Elements of the program include:

- **Community Engagement:** The program focuses on encouraging communities to work together to develop and implement plans that reduce the risk of wildfire damage. This includes organizing community events, educational workshops, and fire preparedness activities.
- **Risk Assessment:** The program helps communities assess their wildfire risk by identifying vulnerable areas, such as overgrown vegetation or homes with flammable roofing materials. Communities then create a plan to address these risks.
- **Mitigation Actions:** The program encourages property owners to take specific actions to make their homes and surroundings more fire-resistant. These actions might include clearing brush and dead trees, using fire-resistant building materials, and creating defensible space around homes.
- **Education and Resources:** The program provides educational materials and resources to help communities understand wildfire risks and the steps they can take to mitigate them. This includes guidelines for homeowners, tips for creating fire-resistant landscapes, and strategies for community preparedness.
- **Community Cohesion:** The program fosters a sense of shared responsibility and cooperation among community members, which can enhance overall preparedness and resilience.

- **Potential Insurance Discounts:** Some insurance companies offer discounts to homeowners in recognized Firewise communities, reflecting the reduced risk of wildfire damage.

As of this plan, no participating jurisdictions are in the Firewise USA Program.

StormReady Community

The StormReady program is a community preparedness initiative developed by the NWS to enhance the ability to prepare for and respond to severe weather events. The goal of StormReady is to help communities develop comprehensive weather safety plans that save lives and protect property. Key Components of the program include:

- **Establishing Warning Systems:** Communities must have multiple ways to receive severe weather warnings and alert the public. This can include NOAA Weather Radios, emergency alert systems, and local broadcast media.
- **Emergency Operations Center:** A designated location where emergency managers and public officials can monitor weather conditions and coordinate responses.
- **Public Education Programs:** Communities in this program must promote weather safety and preparedness through public outreach, including safety fairs, school programs, and distributing weather information materials.
- **Training:** Community leaders and emergency managers undergo training on how to prepare for, respond to, and recover from severe weather.
- **Advanced Monitoring Systems:** Communities are required to monitor local weather conditions in real-time, often using local spotters, weather stations, and other technology to keep track of changing weather patterns.
- **Formal Emergency Plans:** Communities must develop and maintain formal plans for responding to various types of severe weather, including hurricanes, tornadoes, floods, and winter storms. These plans should detail evacuation routes, shelter locations, and post-disaster recovery strategies.
- **Collaboration with the NWS:** Communities work closely with their local NWS office to ensure they have the latest information and resources for weather preparedness and response.
- **Potential Insurance Benefits:** Some insurance providers may offer benefits or discounts to communities that are StormReady certified, reflecting the reduced risk of weather-related damage.

As of this plan, Ford County, Lane County, and Seward County are in the StormReady program.

4.8 Special Districts Mitigation Capabilities

Special districts, which are independent government units created for specific purposes, have several mitigation capabilities:

- Infrastructure Development and Maintenance: They can build and maintain infrastructure like levees, drainage systems, or firebreaks to reduce the impact of natural hazards.
- Emergency Services: Some districts manage fire protection, flood control, or emergency medical services, which are critical in disaster response and mitigation.
- Land Use and Zoning: They can enforce zoning regulations that limit development in high-risk areas.
- Public Education and Outreach: Special districts often provide information and resources to help communities prepare for and respond to hazards.
- Collaboration: They often work with local, state, and federal agencies to coordinate mitigation efforts and share resources.

Fire district mitigation capabilities include:

- Fire Prevention Programs: They conduct inspections, enforce fire codes, and promote fire-safe practices within communities.
- Hazardous Fuels Management: Fire districts manage vegetation to reduce fuel loads, including controlled burns and clearing brush, to prevent the spread of wildfires.
- Emergency Response Planning: They develop and implement response plans for wildfires, floods, and other emergencies, ensuring quick and effective action.
- Public Education: Fire districts educate residents on fire safety, evacuation procedures, and emergency preparedness.
- Infrastructure Protection: They work to protect critical infrastructure and buildings by ensuring compliance with building codes and fire-resistant construction practices.
- These capabilities allow special districts to play a crucial role in reducing risks and enhancing community resilience against natural hazards.

School district mitigation capabilities include:

- Building Safety: They enforce building codes and design schools to withstand hazards like earthquakes, floods, and tornadoes.
- Emergency Preparedness Plans: School districts develop and regularly update emergency response plans, including evacuation routes, shelter-in-place procedures, and communication strategies.
- Drills and Training: They conduct regular safety drills and provide training for students, teachers, and staff on how to respond during emergencies.
- Community Coordination: School districts collaborate with local emergency services, law enforcement, and public health agencies to ensure a coordinated response to hazards.
- Resilience Education: They integrate disaster preparedness into the curriculum, teaching students about hazard awareness and safety practices.

Water district mitigation capabilities include:

- Flood Control: They manage reservoirs, levees, and drainage systems to prevent or reduce flooding.
- Water Supply Management: Water districts ensure the stability and reliability of water supplies during droughts or emergencies by implementing conservation measures and diversifying water sources.
- Infrastructure Resilience: They maintain and upgrade water infrastructure to withstand hazards like earthquakes, storms, and wildfires.
- Emergency Response: Water districts develop and implement emergency response plans to quickly address disruptions in water services due to natural hazards.
- Public Education: They educate the community on water conservation, hazard preparedness, and response strategies.

Watershed district mitigation capabilities include:

- Flood Control: They design and maintain infrastructure like dams, levees, and retention basins to control flooding and manage stormwater.
- Water Quality Management: Watershed districts implement practices to reduce pollution, manage runoff, and protect drinking water sources.

- Erosion Control: They work to prevent soil erosion by implementing land management practices and restoring natural vegetation along waterways.
- Public Education: Watershed districts educate the community on water conservation, pollution prevention, and the importance of maintaining healthy watersheds.
- Habitat Restoration: They engage in efforts to restore wetlands, rivers, and other ecosystems to enhance biodiversity and natural resilience to hazards.

The above enumerated capabilities allow special districts to play a crucial role in reducing risks and enhancing community resilience against natural hazards. The following table list relevant special districts within Kansas Region D:

Table 29: Kansas Region D Special Districts

Special District Name	District Type	Representative	Title
USD #219 - Minneola	School	Lance Custer	Superintendent
USD #220 - Ashland	School	Paula Rice	Superintendent
USD #363 – Holcomb	School	Dr. Scott Myers	Superintendent
USD #457 – Garden City	School	Dr. Mike Dominguez	Superintendent
USD #381 - Spearville	School	Diana Butler	Superintendent
UDS #443 – Dodge City	School	M. Shawn Lamp	Director of Safety
USD #459 - Bucklin	School	Amy Ricks	Superintendent
USD #102 - Cimarron	School	Dr. Mike Waters	Superintendent
USD #371 - Montezuma	School	Jay Zehr	Superintendent
USD #476 – Copeland / South Gray	School	Jay Zehr	Superintendent
USD #477 - Ingalls	School	Ted Brown	Superintendent
USD #374 - Sublette	School	Rex Richardson	Superintendent
USD #507 - Satanta	School	Karen Burrows	Superintendent
USD #227 – Hodgeman County	School	Robert Reed	Superintendent
USD #468 – Healy Public Schools	School	Jeff Jones	Superintendent
USD #482- Dighton	School	Matt Hendrick	Superintendent
USD #225 - Fowler	School	Corri McDowell	Principal
USD #226 - Meade	School	Rex Bruce	Superintendent
USD #483 – Kismet / Plains	School	Chad Mease	Superintendent
USD #480 - Liberal	School	Stephen Linkou	Superintendent

4.9 Jurisdictional Compliance with NFIP

Kansas Region D NFIP participating communities are committed to continued involvement and compliance. To help facilitate compliance, NFIP participating communities:

- Meet the minimum standards set forth in the program.
- Adopted floodplain regulations through local ordinance.
- Enforce floodplain ordinances through building restrictions.
- Regulate new construction in Special Flood Hazard Areas as outlined in their floodplain ordinance.
- Utilize FEMA DFIRMs, where available.
- Monitor floodplain activities.

A community's NFIP coordinator plays a crucial role in managing and implementing floodplain management activities to reduce flood risk. Rules Governing the Kansas Natural Resource Commission’s Floodplain Administrator Accreditation Program Title 18 (amended June 1, 2018) Subtitle I. General provisions Section 1801.1 Purpose. The purpose of this program is to provide a procedure for accrediting floodplain administrators. Each county, city, or town shall designate a person to serve as the floodplain administrator to administer and implement the community Flood Damage Prevention Ordinance or Code pursuant to Ark. Code Ann. §14-268-104 and any local codes and regulations relating to the management of flood-prone areas. This program will assure that persons responsible for important economic decisions affecting health, safety, and welfare of the State receive annual training to assist them in managing development in floodplains.

Responsibilities of a floodplain administrator/NFIP coordinator typically include:

- **Administering Floodplain Regulations:** Ensuring the community complies with NFIP standards by enforcing local ordinances and building codes in designated flood-prone areas.
- **Assisting Property Owners:** Providing guidance on flood insurance requirements, helping residents understand their flood risk, and facilitating access to NFIP insurance.
- **Maintaining Flood Maps:** Keeping and updating FIRMs to reflect current flood risks and communicating changes to stakeholders.
- **Coordinating Flood Risk Reduction Efforts:** Collaborating with federal, state, and local agencies to implement flood mitigation strategies and projects.
- **Community Outreach:** Educating the public about flood hazards, mitigation measures, and the importance of flood insurance coverage.

By fulfilling these duties, NFIP coordinators help reduce flood damage and promote community resilience. The following represent NFIP coordinators for each participating community within Kansas Region D:

Table 30: Kansas Region D Jurisdictional NFIP Coordinators

Jurisdiction	Name	Title
Clark County	Chuck McKinney	Chairman
City of Ashland	Kristi Lee	City Clerk
City of Englewood	Vacant	Vacant
City of Minneola	Norma Vrtiska	Floodplain Administrator
Finney County	Trent Maxwell	Development Services Director
City of Garden City	Trent Maxwell	Development Services Director
City of Holcomb	Trent Maxwell	Development Services Director
Ford County	Melissa Drake	Planning and Zoning Director
City of Bucklin	Nannette Dill	Clerk
City of Dodge City	Kevin Israel	Floodplain Administrator
City of Ford	Lori Riegel	Floodplain Administrator
City of Spearville	Does not participate	Does not participate
Gray County	Does not participate	Does not participate
City of Cimarron	Mark Pingsterhaus	City Administrator
City of Copeland	Shelia Croft	City Clerk
City of Ensign	Does not participate	Does not participate
City of Ingalls	Does not participate	Does not participate
City of Montezuma	Vacant	Vacant
Haskell County	Does not participate	Does not participate
City of Satanta	Charlotte Liebert	City Clerk
City of Sublette	Does not participate	Does not participate
Hodgeman County	Does not participate	Does not participate
City of Hanston	Chad Burns	Floodplain Administrator

Table 30: Kansas Region D Jurisdictional NFIP Coordinators

Jurisdiction	Name	Title
City of Jetmore	Does not participate	Does not participate
Lane County	Billie Barnett	Emergency Manager
City of Dighton	Craig Collins	Floodplain Administrator
Meade County	Does not participate	Does not participate
City of Fowler	Does not participate	Does not participate
City of Meade	Does not participate	Does not participate
City of Plains	Kurt Jones	Planning and Zoning Director
Seward County	Albert Gallegos	Administrator
Kismet	Albert Gallegos	Administrator
Liberal	Keith Bridenstine	Administrator

Participation in the NFIP is based on an agreement between the participating community and the federal government. If a community agrees to adopt and enforce a floodplain ordinance designed to reduce future flood risks, all citizens in the participating community can purchase flood insurance. In Kansas Region D, as part of NFIP participation, NFIP communities must:

- Use current NFIP flood maps in adopting floodplain management regulations.
- Require permits and regulate development in SFHAs.
- Ensure that development does not increase the flood hazard on other properties.
- Meet current elevation standards. Ensuring the lowest occupied floor is elevated to or above the base flood elevation indicated on the NFIP flood map.

A jurisdiction might choose not to participate in the NFIP for several reasons, despite the program's benefits in managing flood risks and providing insurance options. Participating in the NFIP requires adopting and enforcing floodplain management regulations, maintaining records, and updating flood maps. Smaller jurisdictions, or those with limited resources, might find this administrative effort overwhelming. Some jurisdictions perceive their flood risk as minimal or nonexistent, especially if there are no SFHAs within their jurisdiction. Finally, implementing flood mitigation measures, such as updating infrastructure or adhering to NFIP standards, can be expensive. Jurisdictions with constrained budgets may prioritize other needs over NFIP participation. All jurisdiction that do not participate are currently not mapped.

While most floodplain requirements have been incorporated into the current Building Codes, some additional provisions and regulations may be required by a community. Communities participating in the NFIP are required to adopt, enforce and maintain a local floodplain ordinance as a stipulation of compliance with the program. The purpose of this ordinance is to ensure public safety, minimize impact to people and property from flooding, protect watercourses from encroachment, and maintain the capability of floodplains to retain and carry off floodwaters. The local floodplain coordinator is typically the municipal official responsible for overseeing the enforcement and update of the document.

Kansas Region D jurisdictional floodplain ordinances are typically enforced by law enforcement departments and/or code enforcement offices. For all Kansas Region D NFIP participating communities the enforcement process works as follows:

- **Identification of Violations:** Violations are often identified through various means, such as citizen complaints, routine inspections, or observations by enforcement officers.
- **Notification:** Once a violation is identified, the responsible party is typically notified of the violation. This notification may come in the form of a written citation, warning letter, or verbal communication depending on the severity of the violation and local procedures.

- **Correction Notice:** In many cases, the responsible party is given a certain amount of time to correct the violation. They may be required to remedy the situation, obtain necessary permits, or comply with specific regulations.
- **Follow-up Inspections:** After the designated correction period, enforcement officers may conduct follow-up inspections to ensure that the violation has been addressed satisfactorily.
- **Penalties and Fines:** If the responsible party fails to comply with the ordinance or correct the violation within the specified timeframe, they may face penalties or fines. These penalties can vary depending on the nature and severity of the violation and may escalate for repeated offenses.
- **Legal Action:** In cases of persistent non-compliance or serious violations, local authorities may initiate legal proceedings against the responsible party. This can involve court appearances, injunctions, or other legal measures to compel compliance.

Additionally, FEMA has specific requirements NFIP communities must follow both before (pre-disaster) and after (post-disaster) a flood event. These requirements are designed to mitigate flood risks, promote sustainable development, and ensure eligibility for federal disaster assistance and flood insurance benefits. The following figure represents both pre- and post-disaster NFIP community requirements:

Figure 5: Pre- and Post-Disaster Community NFIP requirements

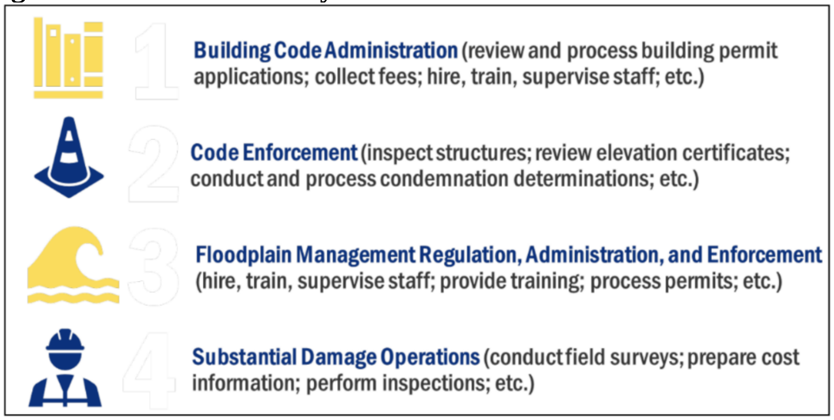
Source: FEMA

When structures located in the SFHAs are substantially modified (more than 50% damaged or improved) they are required to be brought into compliance with current NFIP standards and local building codes. In cases of repairs being conducted as a result of damage, jurisdictional NFIP coordinators are responsible for substantial damage and improvement determinations. These determinations are required for compliance in the NFIP and must be completed before residents begin repairs or permits are issued.

However, the May 2020 Report to Congressional Committees on the National Flood Insurance Program by the United States Government Accountability indicates "FEMA generally does not collect or analyze the results of these assessments, limiting its ability to ensure the process operates as intended. Furthermore, FEMA has not clarified how communities can access NFIP claims data. Such data would help communities target substantial damage assessments after a flood." This has been found to be true in Kansas Region D, with submitted information and data underutilized and some FEMA available data unshared and/or unadvertised.

Section 1206 of the Disaster Recovery Reform Act of 2018 authorizes the FEMA to provide communities with the resources to administer and enforce building code and floodplain management ordinances following a major disaster declaration through FEMA's Public Assistance Program. To be eligible for reimbursement under the Public Assistance Program, including for the Disaster Recovery Reform Act of 2018 Section 1206, communities must be designated for Public Assistance permanent work under a major disaster declaration and be legally responsible to administer and enforce building codes or floodplain management regulations. Communities must also be in good standing with the NFIP. Available assistance includes:

Figure 6: Disaster Recovery Reform Act of 2018 Available Assistance



Source: FEMA

It is worth noting that this assistance is available for a variety of hazards occurrence types, not just flooding.

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 all NFIP participating jurisdictions will continue to develop both electronic (including social media) and in person outreach activities.

4.10 Challenges and Opportunities for Capability Improvement

As always, challenges exist due to the day-to-day demands of the working environment, including staffing issues, budget restrictions, and staffing turnover. These issues can, and do, impact the utilization and incorporation of the LHMP and the completion of identified hazard mitigation projects.

As part of this planning process, the MPC worked to identify gaps and deficiencies identified in the completion of this LHMP. Resulting from this assessment is a series of problem statements, concise descriptions of issues or challenges that need to be addressed. These problem statements were determined to be applicable to all participating jurisdictions:

- Continued climate change is driving an increased incidence of major hazard occurrences, stressing the response, recovery, and mitigation capabilities of even the most prepared jurisdiction.
- Available funding for the completion of hazard mitigation projects is at a premium, with only occasional room in available budgets for required project match. On a yearly basis, many counties and jurisdictions throughout Kansas Region D fully allocate their tax revenue to basic services and programs. Because of this, funding for mitigation projects is often unavailable or severely limited. While the capability to assess special taxes or issue bonds does exist, historically it has been shown that passing these measures is extremely difficult. As a result, many needed mitigation projects throughout Kansas Region D are not completed due to lack of funding. All Kansas Region D jurisdictions should, as possible, prioritize budgeting for mitigation projects.
- The difficulties in applying for and managing hazard mitigation grants can be a challenge.
- Staffing at all levels is stretched thin, with many personnel wearing multiple hats, compromising mitigation capabilities.

Improving capabilities can lead to enhanced performance, increased efficiency, and better outcomes in hazard mitigation planning and implementation. The following identify recommended improvements:

- Continued instruction should be solicited from KDEM and FEMA Region VII on grant application and grant management strategies to reflect changing requirements.
- All participating jurisdictions should conduct more extensive educational outreach to all communities, especially vulnerable and underserved communities, on mitigation actions and methodologies
- Participating NFIP communities should apply for membership in the CRS to allow citizens to receive discounts off their federally backed flood insurance policies.
- Participating jurisdictions who are not current participants should apply for membership in the Firewise USA program.
- Participating jurisdictions without an ISO Fire Suppression Rating should apply for a rating.
- All participating jurisdictions should continue to explore and engage in public-private emergency planning partnerships to further increase hazard resiliency through the infusion of additional funding and expertise to help complete mitigation projects.
- Participating jurisdictions do not participate in the StormReady program should join.
- All participating jurisdictions should institute a more robust system to track the occurrence and impact of hazard occurrences.

The following table summarizes these opportunities for each participating jurisdiction:

Table 31: Participating Jurisdiction Departments

Jurisdiction	Grant Education	Community Outreach	NFIP App.	CRS App.	Firewise App.	ISO App.	StormReady App.	Impact Tracking
Clark County	x	x		x	x	x	x	x
City of Ashland	x	x		x	x		x	x
City of Englewood	x	x		x	x		x	x
City of Minneola	x	x		x	x		x	x
Finney County	x	x		x	x	x	x	x
City of Garden City	x	x		x	x		x	x
City of Holcomb	x	x		x	x	x	x	x
Ford County	x	x		x	x	x		x
City of Bucklin	x	x		x	x	x	x	x
City of Dodge City	x	x		x	x		x	x
City of Ford	x	x		x	x	x	x	x
City of Spearville	x	x	x	x	x		x	x
Gray County	x	x	x	x	x		x	x
City of Cimarron	x	x		x	x		x	x
City of Copeland	x	x		x	x		x	x
City of Ensign	x	x	x	x	x		x	x
City of Ingalls	x	x	x	x	x		x	x
City of Montezuma	x	x		x	x		x	x
Haskell County	x	x		x	x	x	x	x
City of Satanta	x	x		x	x	x	x	x
City of Sublette	x	x	x	x	x	x	x	x
Hodgeman County	x	x	x	x	x		x	x
City of Hanston	x	x		x	x		x	x
City of Jetmore	x	x	x	x	x		x	x
Lane County	x	x		x	x			x
City of Dighton	x	x		x	x		x	x
Meade County	x	x	x	x	x		x	x
City of Fowler	x	x	x	x	x		x	x

Table 31: Participating Jurisdiction Departments

Jurisdiction	Grant Education	Community Outreach	NFIP App.	CRS App.	Firewise App.	ISO App.	StormReady App.	Impact Tracking
City of Meade	x	x	x	x	x		x	x
City of Plains	x	x		x	x		x	x
Seward County	x	x		x	x			x
City of Kismet	x	x		x	x		x	x
City of Liberal	x	x		x	x		x	x

To help overcome many of these identified challenges, participating jurisdictions will work collaboratively using the following strategies, as appropriate:

- **Innovation and Adaptation:** Foster a culture of innovation and adaptability. Encourage employees to think creatively, embrace change, and explore new ways of doing things to overcome challenges.
- **Training and Development:** Invest in training and development to enhance skills and knowledge.
- **Communication Improvement:** Enhance communications and provide clear and transparent communication when sharing information, aligning teams, and addressing concerns.
- **Collaboration and Teamwork:** Encourage collaboration and teamwork which allows for the pooling of diverse skills and perspectives, leading to more effective problem-solving (the MPC is a good example of effective use of this strategy).
- **Technology Adoption:** Embrace technology to streamline operations and enhance productivity.
- **Agile Project Management:** Implement agile project management methodologies to enhance flexibility and responsiveness to changing conditions. Agile approaches allow teams to adapt quickly to challenges.

As appropriate, these strategies will be tailored for specific circumstances, with a combination of these strategies often being more effective than relying on a single approach.

Section 5 – Hazard Identification and Risk Assessment

5.1 Introduction

The goal of this hazard mitigation is to reduce the future impacts of hazards, including deaths and injuries, property damage, and disruption to local and county economies, and to further reduce the amount of public and private funds spent to assist recovery. To complete this goal, hazard mitigation decision-making in this plan has been based on a robust risk assessment, completed to identify natural, human caused, and technological hazards that represent a risk to Kansas Region D. The following provide a definition of the risk assessment terms used during this assessment:

- **Hazard:** An act or phenomenon that has the potential to produce harm or other undesirable consequences to a person or thing.
- **Exposure:** The people, property, systems, or functions that could be lost to a hazard. Generally, exposure includes what lies in the area the hazard could affect.
- **Vulnerability:** Vulnerability is susceptibility to physical injury, harm, damage, or economic loss. It depends on an asset's construction, contents, and economic value of its functions.
- **Risk:** A function of hazard, vulnerability, and exposure. It refers to the likelihood of an event resulting in an adverse condition that causes injury or damage.

In order to accomplish this assessment, all relevant natural, human caused, and technological hazards, potential vulnerabilities, and exposures were identified. As potential hazards, vulnerabilities, and exposure are identified Kansas Region D can continue to develop a strategy to identify and prioritize mitigation action to defend against these potential risks.

5.2 Declared Federal Disasters

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. §§ 5121-5206) provides for the Federal support of State and local governments and their citizens when impacted by an overwhelming disaster. The Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, establishes the process for requesting a Presidential disaster declaration and defines the type of assistance available.

If it is apparent that a Presidential disaster declaration may be necessary to assist in the recovery of an impacted area, Kansas Region D and FEMA Region VII will conduct a Preliminary Damage Assessment (PDA). This assessment is used to determine:

- The extent of the event.
- The impact of the event on individuals and public facilities.
- The types of federal assistance that may be needed.

Once the PDA is complete, and if a determination is made that the damages exceed available State of Kansas resources, the Governor may submit through FEMA Region VII a declaration request to the President.

A major disaster declaration provides a wide range of federal assistance programs for individuals and public infrastructure, including funds for both emergency and permanent work. Not all programs, however, are activated for every disaster. The determination of which programs are authorized is based on the types of assistance specified in the Governor's request and the needs identified during the initial and subsequent PDAs. FEMA disaster assistance programs may include:

- Individual Assistance
- Public Assistance
- Hazard Mitigation

To recognize and encourage mitigation, FEMA considers the extent to which mitigation measures contributed to the reduction of disaster damages. This could be especially significant in those disasters where, because of mitigation, the estimated public assistance damages fell below the per capita indicator.

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. The MPC reviewed the historical federal disaster declarations to assist in hazard identification. The following table details Disaster Declarations for Kansas Region D:

Table 32: Kansas Region D Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Counties	Individual and Public Assistance	Mitigation Grants
DR-4824-KS	9/24/2024	Severe Storms, Straight-line Winds, Tornadoes, and Flooding	Clark, Finney, Gray, Meade		DR-4824-KS
DR-4811-KS	8/20/2024	Severe Storm, Straight-line Winds, Tornadoes, and Flooding	Hodgeman	-	DR-4811-KS
DR-4774-KS	4/28/2024	Winter Storm	Ford, Gray, Hodgeman		DR-4774-KS
DR-4747-KS	10/26/2023	Severe Storms, Straight-Line Winds, Tornadoes, and Flooding	Clark, Finney, Ford		DR-4747-KS
DR-4654-KS	5/25/2022	Severe Storms and Straight-Line-Winds	Clark, Ford, Gray, Hodgeman, Lane	$399,671	DR-4654-KS
DR-4640-KS	3/22/2022	Severe Storms and Straight-Line Winds	Ford, Gray, Haskell, Hodgeman, Lane, Lincoln, Logan, Meade, Mitchell	$12,159,785	DR-4640-KS
DR-4504-KS	3/29/2020	Covid-19	All Kansas Counties	$447,055,679	DR-4504-KS
DR-4449-KS	8/14/2019	Severe Storms, Straight-Line Winds, Flooding, Tornadoes, Landslides, and Mudslides	Clark, Hodgeman, Meade	$51,157,548	DR-4449-KS
DR-4319-KS	6/16/2017	Severe Winter Storm, Snowstorm, Straight-Line Winds, and Flooding	Finney, Haskell, Lane, Seward	$40,146,036	DR-4319-KS
DR-4304-KS	2/24/2017	Severe Winter Storm	Clark, Ford, Hodgeman, Meade, Seward	$12,516,658	DR-4304-KS
DR-4230-KS	7/20/2015	Severe Storms, Tornadoes, Straight-Line Winds and Flooding	Gray, Haskell, Hodgeman, Meade	$11,018,053	DR-4230-KS
DR-4150-KS	10/22/2013	Severe Storms, Straight-Line Winds, Tornadoes	Clark, Hodgeman, Lane, Meade	$10,135,201	DR-4150-KS
DR-4112	4/26/2013	Snowstorm	Hodgeman	$1,320,793	DR-4112
DR-4063-KS	5/24/2012	Severe Storms, Tornadoes, Straight-Line Winds and Flooding	Hodgeman	$4,883,034	DR-4063-KS
DR-1849-KS	6/25/2009	Severe Storms, Flooding, Straight-Line Winds, and Tornadoes	Finney	$11,534,818	DR-1849-KS

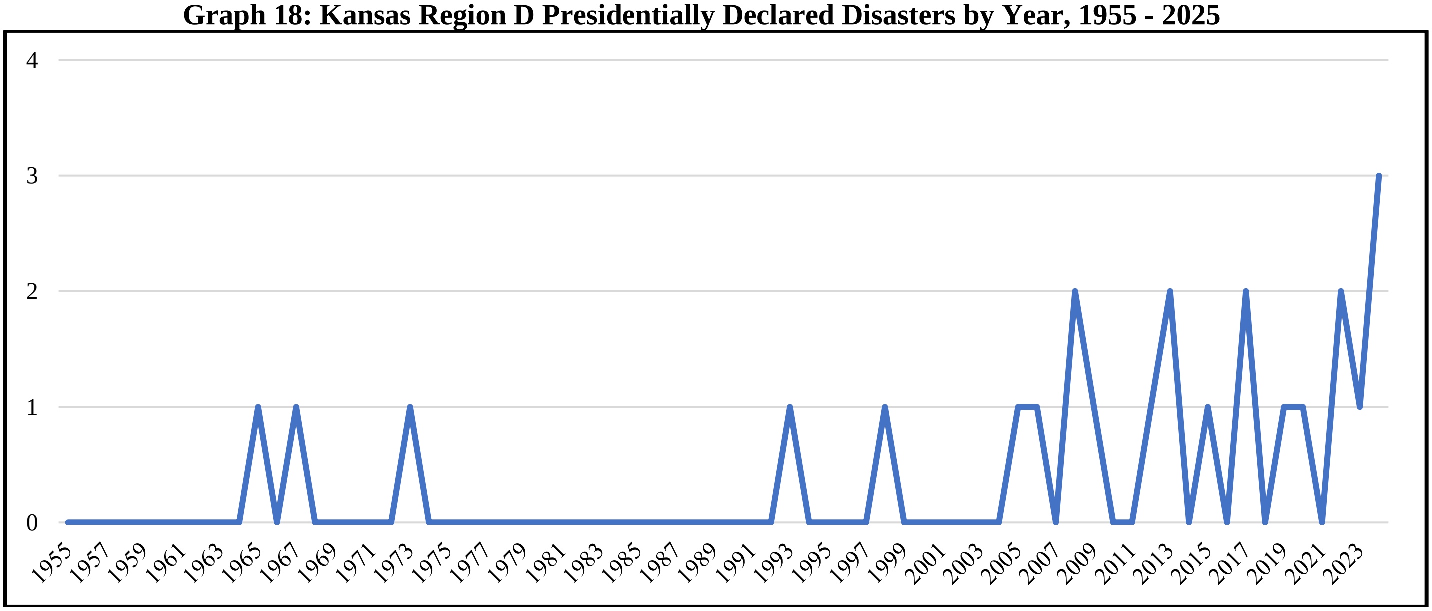
Table 32: Kansas Region D Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Counties	Individual and Public Assistance	Mitigation Grants
DR-1776-KS	7/9/2008	Severe Storms, Flooding, and Tornadoes	Clark, Haskell, Hodgeman, Lane, Seward	$55,300,511	DR-1776-KS
DR-1741-KS	2/1/2008	Severe Winter Storms	Clark, Ford, Hodgeman	$227,086,533	DR-1741-KS
DR-1626-KS	1/26/2006	Severe Winter Storm	Hodgeman	$36,376,189	DR-1626-KS
DR-1579-KS	2/8/2005	Severe Winter Storm, Heavy Rains, and Flooding	Clark	$82,381,461	DR-1579-KS
DR-1254-KS	10/14/1998	Severe Storms, Flooding and Tornadoes	Seward	$6,640,272	DR-1254-KS
DR-1000-KS	7/22/1993	Flooding, Severe Storms	Hodgeman, Lane	-	DR-1000-KS
DR-378-KS	5/2/1973	Severe Storms, Flooding	Clark, Ford, Gray, Haskell, Hodgeman, Meade, Seward	-	DR-378-KS
DR-229-KS	7/18/1967	Tornadoes, Severe Storms, Flooding	Finney	-	DR-229-KS
DR-201-KS	6/23/1965	Flooding	Finney, Ford, Gray	-	DR-201-KS

Source: FEMA
-: Not reported

The following graph represents Presidentially Declared Disasters in the Kansas Region D by year, starting in 1955:

Graph 18: Kansas Region D Presidentially Declared Disasters by Year, 1955 - 2025



Source: FEMA

The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Emergency Declarations supplement State and local or Indian tribal government efforts in providing emergency services, such as the protection of lives, property, public health, and safety, or to lessen or avert the threat of a catastrophe. The total amount of assistance provided for in a single emergency may not exceed $5,000,000. The following types of assistance are available under an Emergency Declaration:

- Public Assistance, Categories A (debris removal) and B (emergency protective measures)
- Individual Assistance, the Individuals and Households Program

The following table details Emergency Declarations for Kansas Region D.

Table 33: Kansas Region D Emergency Declarations

Designation	Declaration Date	Incident Type	Public Assistance
EM-3481-KS	3/13/2020	Kansas Covid-19	All
EM-3282-KS	12/12/2007	Kansas Severe Winter Storms	All
EM-3236-KS	9/10/2005	Hurricane Katrina Evacuation	All

Source: FEMA

The Governor, or the Governor's Authorized Representative, may submit a request for a fire management assistance declaration as required. FEMA will approve declarations for fire management assistance when it is determined that a fire or fire complex on public or private forest land or grassland threatens such destruction as would constitute a major disaster. The MPC reviewed the historical fire management declarations to assist in hazard identification. Research indicates that there have been two fire management declarations for Kansas Region D since 1953:

Table 34: Kansas Region D Fire Management Declarations

Designation	County(ies)	Declaration Date	Incident Name	Public Assistance	Emergency Work
FM-5171-KS	Clark	3/6/2017	Kansas Clark County Fire	$1,082,212	FM-5171-KS
FM-5173-KS	Ford	3/6/2017	Kansas Ford County Fire Complex	$75,847	FM-5173-KS
FM-2878-KS	Haskell and Meade	4/3/2011	Kansas Haskell County Fire	$0	FM-2878-KS

Source: FEMA

The Governor of the State of Kansas has declared two Kansas Disaster Declarations during the past five years for Region D.

- **April 20, 2020:** A declaration was issued for the COVID-19 pandemic.
- **January 18, 2019:** A declaration was issued for a major winter storm system.

5.3 Identified Potential Hazards

One of the first steps in developing a hazard assessment is to identify the hazards that have a reasonable risk of occurring. Proper identification allows for appropriate and well-planned action in order to mitigate the extent and cascading impacts of an incident. Furthermore, while not all disaster contingencies can be planned for, applying an all-hazards approach to the mitigation process does yield greater awareness and better preparedness for unforeseen hazard incidents overall.

The MPC met to discuss previously identified hazards and deliberate on any changes or additions to the regional hazard profile. A thorough and comprehensive revision of data for each hazard was completed as part of this plan update. Additionally, this plan has worked, as per FEMA recommendations, to merge similar hazards together with the aim of both simplifying the usage of the plan and reducing duplication of effort.

The MPC confirmed the following natural hazards that may impact the Kansas Region D:

Table 35: Kansas Region D Identified Natural Hazards

Hazard	Included in 2025 HMP	Notes
Agricultural Infestation	Yes	-
Dam or Levee Failure	Yes	-
Drought	Yes	-
Extreme Temperatures	Yes	-
Flood	Yes	-
Severe Weather	Yes	Combined hail, lightning, and high and thunderstorm winds
Severe Winter Weather	Yes	Renamed from Winter Storm
Tornado	Yes	-
Wildfire	Yes	Renamed with greater focus on wildfires

The MPC confirmed the following human caused and technological hazards that may impact the Kansas Region D, as listed below:

Table 36: Kansas Region D Identified Human Caused and Technological Hazards

Hazard	Included in 2025 HMP	Notes
Cybersecurity Incident	Yes	New
Hazardous Materials Incident	Yes	Renamed from chemical incident
Infrastructure Failure	Yes	Renamed from Utility/Infrastructure Failure
Terrorism	Yes	Now includes active shooter
Transmissible Disease	Yes	Renamed from Major Disease Outbreak

Based on discussion with the MPC, a lack of identified risk or history, and geographic improbability, numerous FEMA identified hazards such as coastal erosion and hurricane were not included in the scope of this plan. Additionally, the following natural hazards included in the State of Kansas HMP were not included for the enumerated reasons:

- **Earthquake:** Information from the Kansas Geological Society indicates that Kansas Region D has had no recorded earthquake above Richter Scale Magnitude 3.0, with effects resembling vibrations caused by heavy traffic. Additionally, FEMA seismic risk maps indicate that the region is in the low-risk category. As such, the MPC opted to not allocate potential resources or funding to mitigate this hazard in favor of prioritizing other hazards.
- **Expansive Soils:** While mapping from the USGS indicates that the majority of Kansas Region D has soils with part of the unit, generally less than 50%, having high swelling potential, no major recorded instances of damage, death, or injury has been noted by the MPC. As such, the MPC opted to not allocate potential resources or funding to mitigate this hazard in favor of prioritizing other hazards.
- **Land Subsidence:** There have been no recorded incidents of subsidence events in Kansas Region D. Additionally, geologic maps indicate that the region has minimal Karst topography, a known contributor to subsidence and minimal identified subsurface void space. Due to a lack of documented history and indicated risk, the MPC opted to not allocate potential resources or funding to mitigate this hazard in favor of prioritizing other hazards.
- **Landslide:** Mapping from the Kansas Geological Survey indicates that Region D has some identified areas of landslide risk. However, due to the lack document occurrence and a generally unfavorable topography, the MPC opted to not allocate potential resources or funding to mitigate this hazard in favor of prioritizing other hazards.
- **Soil Erosion and Dust:** The larger concern of soil erosion, and the associated dust caused by this erosion, is an issue that is managed by the Kansas Department of Agriculture on a statewide basis. As such, the MPC elected to remove this hazard from the plan.

The following table indicates the improvement of worsening of conditions related to the identified hazards in this LHMP since the completion of the 2020 LHMP:

Table 37: Kansas Region D Natural Hazards Change in Conditions

Natural Hazard	Change in Vulnerability	Notes
Agricultural Infestation	Increasing	A increase in drought occurrences and extreme heat is expected to increase the
Dam and Levee Failure	Increasing	A predicted increase in severe precipitation events may stress the capacity of exiting systems.
Drought	Increasing	Available data indicates that the rate of drought occurrence is increasing.
Extreme Temperatures	Increasing	Data indicates that the number of high temperature days has been increasing. Continued climate change is expected to exacerbate these conditions.
Flood	Increasing	Data indicates that while rainfall occurrence has lessened, the number of heavy rainfall events have increased. Additionally, increased drought occurrences have exacerbated conditions related to flash flood events.
Severe Weather	Increasing	Data indicates that incidences of severe weather are likely to increase due to changes in climate.
Severe Winter Weather	Decreasing	Data indicates that incidences of severe winter weather are likely to decrease due to changes in climate.
Tornado	Increasing	Data indicates that the number of tornadoes is expected to increase due to changing climate conditions.
Wildfire	Increasing	Available data indicates that the rate of drought and extreme heat occurrence is increasing, which may increase wildfire occurrence.

Table 38: Kansas Region D Human Caused or Technological Hazards Change in Conditions

Natural Hazard	Change in Vulnerability	Notes
Cybersecurity Incident	Increasing	The reliance on web-based systems and data will continue to make this a persistent threat.
Hazardous Materials Incident	Increasing	Aging handling and transportation systems may increase the occurrence of release events.
Infrastructure Failure	Increasing	Aging infrastructure may increase the occurrence of failure events.
Terrorism	Unknown	The nature of terrorism makes quantifying the change in conditions challenging to quantify.
Transmissible Disease	Increasing	Available data indicates that the rate of drought and extreme heat occurrence is increasing, which may increase vector borne disease occurrence.

5.4 Hazard Planning Significance

For the purposes of this plan, hazard planning significance refers to the relevance of the identified hazard to the jurisdictions of Kansas Region D when calculating risk and vulnerability. In order to help quantify the planning significance for a hazard, data was reviewed on two levels, federal (National Risk Index data) and local (researched plan data relevant to occurrence and vulnerability on a county and local level). This allowed for a comparison between data sets for each hazard type and allowed for a summation at the county level. It is recognized that inconsistencies in methodologies and data make it difficult to make a direct comparison across all data levels. However, as possible, collected data was translated into a unified model that accounted for any variability in data and methodologies.

The result of this assessment provides a larger scale snapshot of how Kansas Region D jurisdictions view risk and allowed for integration of hazard data into the LHMP.

For natural hazards, data from this plan was vetted by the Kansas Region D Emergency Manager and participating jurisdictions to ensure it matched local conditions. Additionally, Kansas Region D utilized FEMA’s National Risk Index (NRI) which provides a method of understating high and local level jurisdictional vulnerability. FEMA’s NRI dataset and online tool was used to help determine local community risk for identified natural hazards in this LHMP.

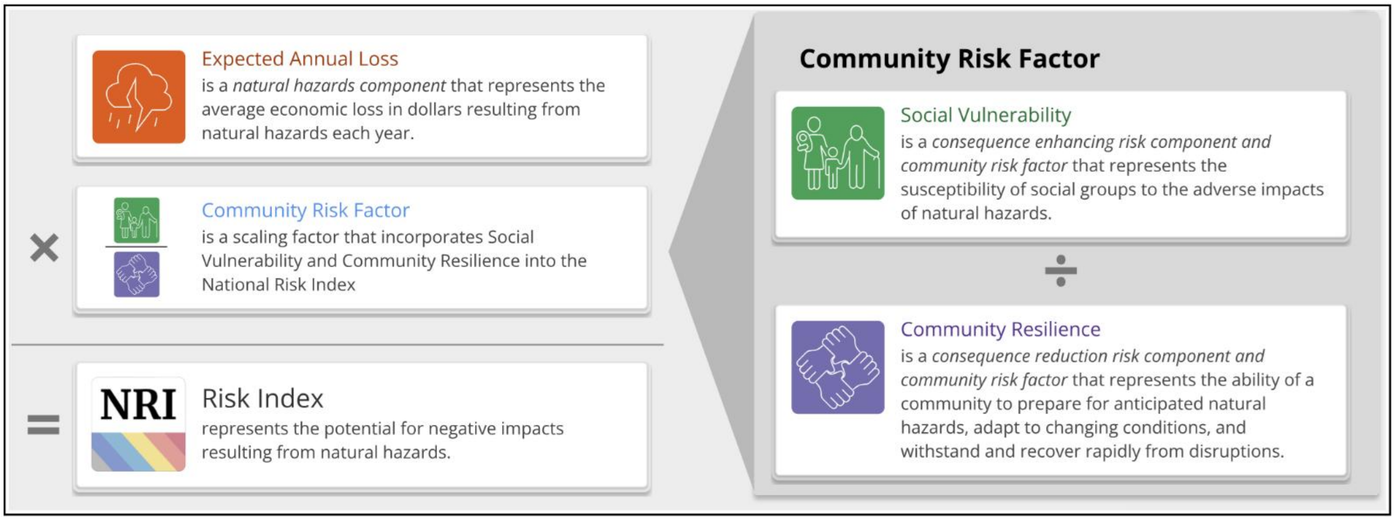
The risk equation behind the Risk Index includes three components, Expected Annual Loss (EAL), social vulnerability (previously discussed), and community resilience (previously discussed). The dataset supporting EAL provides estimates measured in 2022 U.S. dollars. The datasets supporting the social vulnerability and community resilience components have been standardized using a minimum-maximum normalization approach prior to being incorporated into the NRI risk calculation.

As part of the NRI, EAL represents the average economic loss in dollars resulting from a hazard each year. It quantifies loss for relevant consequence types, buildings, people, and agriculture. An EAL score and rating represent a community's relative level of expected losses each year when compared to all other communities at the same level. EAL is calculated using an equation that includes exposure, annualized frequency, and historic loss ratio risk factors. Exposure is a factor that measures the building value, population, and agriculture value potentially exposed to a natural hazard occurrence. Annualized frequency is a factor that measures the expected frequency or probability of a hazard occurrence per year. Historic loss ratio is a factor that measures the percentage of the exposed consequence type value (building, population, or agriculture) expected to be lost due to an occurrence. EAL represents the average economic loss in dollars resulting from natural hazards each year and is proportional to a community’s risk.

To calculate Risk Index values, the NRI generates a Community Risk Adjustment to scale EAL values up or down, depending on their community risk factors, increasing with social vulnerability and decreases with community resilience. For a jurisdiction, a higher social vulnerability results in a higher Risk Index value while higher community resilience results in a lower Risk Index value.

Using these three components, Risk Index values are calculated for each jurisdiction (county and Census tract). The calculated Risk Index values form an absolute basis for measuring Risk within the NRI, and they are used to generate Risk Index percentiles and ratings across communities. The risk equation behind the NRI is as follows:

Figure 7: FEMA NRI



Source: FEMA

For both the Risk Index and EAL there is a qualitative rating that describes the nature of a community's score in comparison to all other communities at the same level, ranging from "Very Low" to "Very High." Because all ratings are relative, there are no specific numeric values that determine the rating.

The National Risk Index provides relative Risk Index percentiles and ratings based on data for Expected Annual Loss due to natural hazards, Social Vulnerability, and Community Resilience. Separate percentiles and ratings are also provided for each component: Expected Annual Loss, Social Vulnerability, and Community Resilience. For the Risk Index and Expected Annual Loss, percentiles and ratings can be viewed as a composite score for all hazards or individually for each of the 18 hazard types.

A community's score is represented by its percentile ranking among all other communities at the same level for Risk, Expected Annual Loss, Social Vulnerability and Community Resilience. For example, if a given Census tract's Risk Index percentile for a hazard type is 85.32 then its Risk Index value is greater than 85.32% of all US Census tracts. These scores are then assigned a qualitative rating that describes the community in comparison to all other communities at the same level, ranging from "Very Low" to "Very High." To determine Risk and Expected Annual Loss ratings, a methodology known as k-means clustering or natural breaks is applied to each value. This approach divides all communities into five groups such that the communities within each group are as similar as possible (minimized variance) while the groups are as different as possible (maximized variance). A cubed root transformation is applied to both Risk and Expected Annual Loss values before k-means clustering. Without the transformation, these values are heavily skewed by an extreme range of population and building value densities between urban and rural communities. By applying a cube root transformation, the National Risk Index controls for this characteristic and provides ratings with greater differentiation and usefulness.

In order to gain an understanding of hazard risk, the following table details the estimated FEMA NRI data for Kansas Region D counties and participating jurisdictions (by census tract):

Table 39: Participating Jurisdiction All Natural Hazard Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile
Clark County	**All**	**Very Low**	**11.61**
Ashland, Englewood, and Minneola	967100	Relatively Moderate	85
Finney County	**All**	**Relatively Low**	**72.29**
Holcomb	960100	Relatively High	94.48
Garden City	960200	Relatively Moderate	83
Garden City	960300	Relatively Moderate	71

Table 39: Participating Jurisdiction All Natural Hazard Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile
Garden City	960401	Relatively Low	29.4
Garden City	960403	Relatively Low	51.1
Garden City	960404	Relatively Moderate	72.03
Garden City	960501	Relatively Moderate	68.09
Garden City	960503	Relatively Low	33.48
Garden City	960505	Relatively Low	47.22
Garden City	960507	Relatively Moderate	73.64
Garden City	960508	Relatively Low	52.28
Garden City	960600	Relatively High	87.63
Ford County	**All**	**Relatively Low**	**60.69**
Spearville	961600	Relatively Low	61.27
Bucklin and City of Ford	961700	Relatively Moderate	74.7
Dodge City	961801	Relatively Moderate	66.47
Dodge City	961802	Relatively Moderate	78.99
Dodge City	961901	Relatively Low	58.4
Dodge City	961902	Relatively Moderate	62.47
Dodge City	962000	Relatively Moderate	81.95
Dodge City	962101	Relatively High	88.97
Dodge City	962102	Relatively Moderate	75.93
Gray County	**All**	**Very Low**	**38.78**
Cimarron and Ingalls	962600	Relatively Moderate	84.87
Copeland, Ensign, and Montezuma	962700	Relatively High	92.48
Haskell County	**All**	**Very Low**	**35.09**
Satanta and Sublette	463100	Relatively High	96.34
Hodgeman County	**All**	**Very Low**	**20.2**
Hanston and Jetmore	461100	Relatively High	91.82
Lane County	**All**	**Very Low**	**18.26**
Dighton	956600	Relatively High	90.81
Meade County	**All**	**Very Low**	**37.45**
Fowler and Plains	966600	Relatively High	95.7
City of Meade	966700	Relatively Low	52.19
Seward County	**All**	**Relatively Low**	**61.72**
Kismet	965600	Relatively High	92.95
Liberal	965700	Relatively High	87.3
Liberal	965800	Relatively Moderate	74.83
Liberal	965900	Relatively Moderate	83.14
Liberal	966000	Relatively Moderate	78.82

Source: FEMA NRI

In order to gain an understanding of vulnerability, the following table details the estimated FEMA EAL data for Kansas Region D counties and participating jurisdictions (by census tract):

Table 40: Participating Jurisdiction All Natural Hazard EAL

Jurisdiction	Census Tract	EAL	National Percentile	Building EAL	Population Equivalence EAL (fatalities)	Agricultural EAL	Composite EAL
Clark County	**All**	Very Low	**12.72**	**$945,749**	**0.02**	**$401,966**	**$1,623,252**

Table 40: Participating Jurisdiction All Natural Hazard EAL

Jurisdiction	Census Tract	EAL	National Percentile	Building EAL	Population Equivalence EAL (fatalities)	Agricultural EAL	Composite EAL
Ashland, Englewood, and Minneola	967100	Relatively High	86.13	$945,749	0.02	$401,966	$1,623,252
Finney County	**All**	**Relatively Low**	**66.05**	**$4,829,236**	**0.24**	**$1,819,503**	**$9,438,376**
Holcomb	960100	Relatively High	94.36	$800,180	0.03	$1,674,816	$2,821,862
Garden City	960200	Relatively Moderate	77.05	$583,352	0.04	$29,374	$1,093,530
Garden City	960300	Relatively Moderate	61.97	$469,224	0.02	$0	$677,263
Garden City	960401	Relatively Low	32.25	$167,844	0.01	$0	$307,337
Garden City	960403	Relatively Low	47.17	$270,527	0.02	$35	$454,874
Garden City	960404	Relatively Moderate	63.99	$393,483	0.03	$28,057	$716,688
Garden City	960501	Relatively Low	58.28	$405,549	0.02	$12,168	$610,691
Garden City	960503	Relatively Low	31.44	$156,005	0.01	$47,964	$300,316
Garden City	960505	Relatively Low	36.98	$239,031	0.01	$0	$351,717
Garden City	960507	Relatively Low	58.79	$493,735	0.01	$0	$619,742
Garden City	960508	Relatively Low	38.78	$142,899	0.02	$210	$368,557
Garden City	960600	Relatively Moderate	77.57	$707,408	0.03	$26,880	$1,115,801
Ford County	**All**	**Relatively Low**	**60.69**	**$4,570,220**	**0.18**	**$1,097,972**	**$7,788,551**
Spearville	961600	Relatively Moderate	72.22	$399,322	0.01	$406,228	$925,438
Bucklin and City of Ford	961700	Relatively Moderate	80.8	$541,915	0.01	$610,373	$1,268,407
Dodge City	961801	Relatively Moderate	62.05	$413,389	0.02	$2	$678,743
Dodge City	961802	Relatively Moderate	68.59	$504,179	0.02	$28,629	$819,997
Dodge City	961901	Relatively Low	50.73	$229,334	0.02	$130	$498,894
Dodge City	961902	Relatively Moderate	62.81	$443,275	0.02	$19,993	$693,574
Dodge City	962000	Relatively Moderate	70.88	$542,040	0.03	$16,861	$884,823
Dodge City	962101	Relatively Moderate	80.1	$959,260	0.02	$383	$1,232,313
Dodge City	962102	Relatively Moderate	67.24	$537,505	0.02	$15,373	$786,363
Gray County	**All**	**Very Low**	**38.1**	**$1,517,225**	**0.05**	**$1,849,190**	**$3,957,006**
Cimarron and Ingalls	962600	Relatively High	85.87	$743,422	0.02	$568,505	$1,601,567
Copeland, Ensign, and Montezuma	962700	Relatively High	92.17	$773,803	0.03	$1,280,685	$2,355,439
Haskell County	**All**	**Very Low**	**30.83**	**$489,077**	**0.03**	**$2,396,275**	**$3,197,072**
Satanta and Sublette	463100	Relatively High	95.58	$489,077	0.03	$2,396,275	$3,197,072

Table 40: Participating Jurisdiction All Natural Hazard EAL

Jurisdiction	Census Tract	EAL	National Percentile	Building EAL	Population Equivalence EAL (fatalities)	Agricultural EAL	Composite EAL
Hodgeman County	**All**	**Very Low**	**23**	**$609,731**	**0.02**	**$1,638,176**	**$2,496,167**
Hanston and Jetmore	461100	Relatively High	92.93	$609,731	0.02	$1,638,176	$2,496,167
Lane County	**All**	**Very Low**	**21.57**	**$1,051,962**	**0.02**	**$1,125,631**	**$2,374,178**
Dighton	956600	Relatively High	92.28	$1,051,962	0.02	$1,125,631	$2,374,178
Meade County	**All**	**Very Low**	**34.88**	**$951,873**	**0.04**	**$2,191,230**	**$3,619,294**
Fowler and Plains	966600	Relatively High	95.03	$627,502	0.02	$2,106,639	$3,012,771
City of Meade	966700	Relatively Low	58.03	$324,371	0.02	$84,591	$606,523
Seward County	**All**	**Relatively Low**	**53.79**	**$2,958,355**	**0.14**	**$1,527,772**	**$6,089,947**
Kismet	965600	Relatively High	91.41	$609,586	0.01	$1,473,790	$2,235,489
Liberal	965700	Relatively Moderate	79.45	$841,235	0.03	$20,557	$1,200,486
Liberal	965800	Relatively Moderate	70.08	$547,692	0.03	$304,004	$860,833
Liberal	965900	Relatively Moderate	74.97	$482,009	0.04	$19,000	$1,015,968
Liberal	966000	Relatively Moderate	66.81	$477,833	0.03	$5,287	$777,170

Source: FEMA NRI

The following table detail the FEMA NRI and EAL ratings for each FEMA evaluated natural hazard for Kansas Region D counties and participating jurisdictions (by census tract):

Table 41: Clark County FEMA NRI Summary, All Natural Hazards

Natural Hazard	NRI Rating	EAL Rating
Drought	Relatively Low	Relatively Low
Extreme Heat	Very Low	Very Low
Extreme Cold	Relatively Moderate	Relatively Moderate
Flood	Very Low	Very Low
Hail	Relatively Moderate	Relatively Moderate
Lightning	Very Low	Very Low
Strong Wind	Very Low	Relatively Low
Ice Storm	Relatively Low	Relatively Low
Winter Weather	Very Low	Very Low
Tornado	Relatively Low	Very Low
Wildfire	Relatively Low	Very Low

Source: FEMA NRI

Table 42: Finney County FEMA NRI Summary, All Natural Hazards

Natural Hazard	NRI Rating	EAL Rating
Drought	Relatively Moderate	Relatively Moderate
Extreme Heat	No Rating	No Expected Annual Losses
Extreme Cold	Relatively High	Relatively High

Flood	Relatively Low	Relatively Low
Hail	Relatively High	Relatively High
Lightning	Relatively Low	Relatively Low
Strong Wind	Relatively High	Relatively Moderate
Ice Storm	Relatively Low	Relatively Low
Winter Weather	Relatively Low	Relatively Low
Tornado	Relatively Moderate	Relatively Moderate
Wildfire	Very Low	Very Low

Source: FEMA NRI

Table 43: Ford County FEMA NRI Summary, All Natural Hazards

Natural Hazard	NRI Rating	EAL Rating
Drought	Relatively Moderate	Relatively Moderate
Extreme Heat	No Rating	No Expected Annual Losses
Extreme Cold	Relatively High	Relatively Moderate
Flood	Relatively Low	Relatively Low
Hail	Relatively High	Relatively High
Lightning	Relatively Low	Relatively Low
Strong Wind	Relatively Moderate	Relatively Moderate
Ice Storm	Relatively Low	Relatively Low
Winter Weather	Relatively Low	Relatively Low
Tornado	Relatively Moderate	Relatively Moderate
Wildfire	Relatively Low	Relatively Low

Source: FEMA NRI

Table 44: Gray County FEMA NRI Summary, All Natural Hazards

Natural Hazard	NRI Rating	EAL Rating
Drought	Relatively Moderate	Relatively Moderate
Extreme Heat	No Rating	No Expected Annual Losses
Extreme Cold	Relatively High	Relatively Moderate
Flood	Very Low	Very Low
Hail	Relatively Moderate	Relatively Moderate
Lightning	Very Low	Very Low
Strong Wind	Relatively Moderate	Relatively Moderate
Ice Storm	Relatively Low	Relatively Low
Winter Weather	Very Low	Relatively Low
Tornado	Relatively Low	Relatively Low
Wildfire	Very Low	Very Low

Source: FEMA NRI

Table 45: Haskell County FEMA NRI Summary, All Natural Hazards

Natural Hazard	NRI Rating	EAL Rating
Drought	Relatively Moderate	Relatively Moderate
Extreme Heat	No Rating	No Expected Annual Losses
Extreme Cold	Very High	Relatively Low
Flood	No Rating	No Expected Annual Losses
Hail	Very Low	Very Low
Lightning	Very Low	Very Low
Strong Wind	Relatively Low	Relatively Low
Ice Storm	Relatively Low	Relatively Low
Winter Weather	Very Low	Very Low
Tornado	Relatively Low	Relatively Low
Wildfire	Very Low	Very Low

Source: FEMA NRI

Table 46: Hodgeman County FEMA NRI Summary, All Natural Hazards

Natural Hazard	NRI Rating	EAL Rating
Drought	Relatively Low	Relatively Low
Extreme Heat	No Rating	No Expected Annual Losses
Extreme Cold	Relatively Low	Relatively Low
Flood	Very Low	Very Low
Hail	Relatively Moderate	Relatively Moderate
Lightning	Very Low	Very Low
Strong Wind	Relatively Moderate	Relatively Moderate
Ice Storm	Relatively Low	Relatively Low
Winter Weather	Very Low	Relatively Low
Tornado	Relatively Low	Relatively Low
Wildfire	Very Low	Very Low

Source: FEMA NRI

Table 47: Lane County FEMA NRI Summary, All Natural Hazards

Natural Hazard	NRI Rating	EAL Rating
Drought	Relatively Moderate	Relatively Moderate
Extreme Heat	No Rating	No Expected Annual Losses
Extreme Cold	Relatively Low	Relatively Low
Flood	No Rating	No Expected Annual Losses
Hail	Relatively Moderate	Relatively Moderate
Lightning	Very Low	Very Low
Strong Wind	Relatively Low	Relatively Moderate
Ice Storm	Relatively Low	Relatively Low
Winter Weather	Very Low	Relatively Low
Tornado	Very Low	Relatively Low
Wildfire	Very Low	Very Low

Source: FEMA NRI

Table 48: Meade County FEMA NRI Summary, All Natural Hazards

Natural Hazard	NRI Rating	EAL Rating
Drought	Relatively Moderate	Relatively Moderate
Extreme Heat	No Rating	No Expected Annual Losses
Extreme Cold	Relatively Moderate	Relatively Moderate
Flood	Very Low	Very Low
Hail	Relatively Low	Relatively Low
Lightning	Very Low	Very Low
Strong Wind	Relatively Moderate	Relatively Moderate
Ice Storm	Relatively Low	Relatively Low
Winter Weather	Very Low	Very Low
Tornado	Relatively Low	Relatively Low
Wildfire	Relatively Low	Relatively Low

Source: FEMA NRI

Table 49: Seward County FEMA NRI Summary, All Natural Hazards

Natural Hazard	NRI Rating	EAL Rating
Drought	Relatively Moderate	Relatively Moderate
Extreme Heat	No Rating	No Expected Annual Losses
Extreme Cold	Relatively High	Relatively High
Flood	Relatively Low	Relatively Low
Hail	Relatively Moderate	Relatively Moderate
Lightning	Relatively Low	Relatively Low
Strong Wind	Relatively High	Relatively High
Ice Storm	Relatively Low	Relatively Low
Winter Weather	Relatively Low	Relatively Low
Tornado	Relatively Moderate	Relatively Moderate
Wildfire	Relatively Low	Relatively Low

Source: FEMA NRI

Where appropriate, differences in vulnerability to identified hazards are noted in each individual hazard section.

As the FEMA NRI does not provide data concerning human caused and technological caused hazards the hazard rating methodology used on the 20202 Kansas Region D HMP was followed to help determine hazard planning significance for the county level. A standardized methodology, which allows for greater flexibility and room for subject matter expertise, was developed to compare different hazards' risk. Where possible, this method prioritizes hazard risk based on a blend of quantitative factors extracted from available data sources. These factors include:

- Probability of occurrence (expected frequency)
- Probable magnitude of impact (estimated strength, magnitude, onset, duration, and damage potential)
- Warning time of hazard occurrence (what type of warning can be expected)
- Duration of event (how long will hazard conditions exist)

The scores for the four hazard rating factors (probability of hazard occurrence, magnitude, warning time, and duration) were given a criticality rating from one to four (four being the highest concern or impact) and summed at a county level for each natural hazard using the following formula:

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

The numerical result of the formula for each hazard allowed for an assignment of a planning significance. The following table details planning significance ranges.

Table 50: Planning Significance Rating Range

	Score Range	
Planning Significance	**Low Score**	**High Score**
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 result of this assessment provides a larger scale snapshot of how participating counties view risk and allowed for integration of hazard data into this HMP. This allowed for a comparison between counties for each human caused and technological hazard type. It is recognized that inconsistencies in methodologies and data make it difficult to make a direct comparison, however, as possible, collected data was translated into a unified model that accounted for any variability in data and methodologies.

The following tables show the hazard planning significance of natural hazards and technological and human caused hazards for Kansas Region D:

Table 51: Kansas Region D Technical and Human Caused Hazard Planning Significance

County	Cybersecurity Incident	Hazardous Materials Incident	Infrastructure Failure	Terrorism	Transmissible Disease
Clark County	High	Low	Moderate	Low	Moderate
Finney County	High	Low	Moderate	Low	Moderate
Ford County	High	Low	Moderate	Low	Moderate
Gray County	High	Low	Moderate	Low	Moderate
Haskell County	High	Low	Moderate	Low	Moderate
Hodgeman County	High	Low	Moderate	Low	Moderate
Lane County	High	Low	Moderate	Low	Moderate
Meade County	High	Low	Moderate	Low	Moderate
Seward County	High	Low	Moderate	Low	Moderate

Calculations for the planning significance for each human caused and technological hazard on a county basis are presented in the corresponding hazard section.

5.5 Additional Hazard Occurrence and Assessment Data

NOAA's National Centers for Environmental Information (NCEI) Storm Events Database was used as the primary source of information for previous occurrences of storm events. It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or National Weather Service (NWS) office. When reporting an event, the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Most of the events from NCEI are not associated with a federal emergency or disaster. If the event occurred at the same time as an event that was later determined to be a federal emergency or disaster, it is included with the NCEI data even if it occurred in a county not included in the federal declaration.

The State of Kansas EOPmapper system was used to determine which critical facilities were located within the boundaries of identified hazards (when applicable, and if data was available).

Data was also obtained and utilized using Hazus-MH, Version 2.2 SP1, a program administered by the FEMA used to model losses. Modelling for hazards uses Hazus analysis to estimate losses and projected impacts from historical and annualized hazard events. Hazus default data was used in the analysis, including the 2020 Census and other State and Federal government facility databases. A level I analysis was run in Hazus for flood and earthquake, meaning the default population, building stock, and critical infrastructure data within the program was used to calculate losses and damages. Multiple hazard scenarios were run to estimate losses for the identified hazards. For the earthquake and hurricane hazards, historic event scenarios and probabilistic scenarios were run. Flood losses were analyzed using the 100 return scenarios as well as a probabilistic scenario.

Where appropriate, other utilized modeling types and systems are detailed in the relevant hazard analysis section.

5.6 Jurisdictional Critical Facilities

Certain facilities and assets, such as infrastructure and community lifelines, have a net positive value on the community as they contribute to the public good by facilitating the basic functions of society. These facilities maintain order, public health, education, and help the economy function. Additionally, there are infrastructure and facilities integral to disaster response and recovery operations. Conversely, some infrastructure and facilities are of extreme importance due to the negative externalities created when they are impacted by a disaster. What fits these definitions will vary slightly from community to community, but the definitions remain as a guideline for identifying critical facilities and infrastructure. Kansas Region D and participating jurisdictions maintain critical facility details under separate cover for security purposes. For this LHMP, it is assumed that all critical facilities are at equal risk to non-point hazard occurrence but may have varying risk to point hazard occurrence (dam failure and flood). Data concerning critical facilities potentially impacted by these point hazards, as available, is detailed under the respective hazard section.

Each hazard section provides a discussion on potentially vulnerable community lifelines. Community lifelines enable the continuous operation of critical government and business functions and are essential to human health and safety or economic security, and include safety, health, energy, communication, transportation, and water systems.

5.7 Hazard Profiles

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.

For hazards that have a higher chance of occurrence for specific jurisdictions throughout Kansas Region D, a discussion is provided as to the differing levels of potential vulnerability. All other hazards have been determined to have an equal chance of occurrence for all participating jurisdictions.

The following hazards are presented in alphabetical order, and not by planning significance, for ease of reference.

5.8 Agricultural Infestation

5.8.1 Hazard Description

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.

The 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.

5.8.2 Location & Extent

All of Kansas Region D is vulnerable to agricultural infestation. Based on the non-geographic specific aspect of this hazard, i.e., no one area is at a greater risk, all of the planning area's structural inventory and population is vulnerable.

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 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.

Of particular concern are Confined Animal Feeding Operations (CAFOs) facilities, defined as facilities with 300 or more animal units. The CAFO facilities are regulated by the Kansas Department of Health & Environment, 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: 9
- Finney County: 33
- Ford County: 43
- Gray County: 33
- Haskell County: 21
- Hodgeman County: 38
- Lane County: 19
- Meade County: 23
- Seward County: 30

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.

Kansas Region D is also susceptible to various forms of crop infestations and disease. The following major crops are particularly susceptible to infestation:

- **Wheat:** Kansas Region D is part of the Great Plains Wheat Belt. Wheat is susceptible to infestations by pests including insects like the Hessian fly, aphids, and wheat stem sawflies, as well as diseases like wheat rust.
- **Corn and Sorghum:** Staple crops, they are susceptible to infestations by pests such as corn rootworms, corn borers, and aphids. Sorghum may also be affected by sugarcane aphids.
- **Cotton:** Can be susceptible to infestations by pests like cotton bollworms and spider mites.
- **Soybeans:** Susceptible to infestations by pests such as soybean aphids, soybean cyst nematodes, and various caterpillar species.

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.

Trees within Kansas Region D are also susceptible to a variety pest and disease including:

- Emerald Ash Borer
- Pine Wilt
- Oak Wilt
- Dutch Elm Disease

The MPC view agricultural infestation as not only a local or county hazard, but as a regional hazard as well. Discussions with the MPC and a review of all available data indicated that agricultural infestation is a concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Clark County:** Agriculture is a large part of the fabric and economy of all jurisdictions within the county. As such, the potential economic and social impacts of an infestation event are of major concern.
- **Finney County:** Agriculture is a large part of the fabric and economy of all jurisdictions within the county. As such, the potential economic and social impacts of an infestation event are of major concern.
- **Ford County:** Agriculture is a large part of the fabric and economy of all jurisdictions within the county. As such, the potential economic and social impacts of an infestation event are of major concern.
- **Gray County:** Agriculture is a large part of the fabric and economy of all jurisdictions within the county. As such, the potential economic and social impacts of an infestation event are of major concern.
- **Haskell County:** Agriculture is a large part of the fabric and economy of all jurisdictions within the county. As such, the potential economic and social impacts of an infestation event are of major concern.
- **Hodgeman County:** Agriculture is a large part of the fabric and economy of all jurisdictions within the county. As such, the potential economic and social impacts of an infestation event are of major concern.
- **Lane County:** Agriculture is a large part of the fabric and economy of all jurisdictions within the county. As such, the potential economic and social impacts of an infestation event are of major concern.
- **Meade County:** Agriculture is a large part of the fabric and economy of all jurisdictions within the county. As such, the potential economic and social impacts of an infestation event are of major concern.
- **Seward County:** Agriculture is a large part of the fabric and economy of all jurisdictions within the county. As such, the potential economic and social impacts of an infestation event are of major concern.

5.8.3 Previous Occurrences

The following table, using data from the USDS, indicates the total crop insurance paid per county for infestation events from 2011-2021 (latest available data):

Table 52: Kansas Region D Total Agricultural Crop Insurance Paid per County, 2011-2021

Jurisdiction	Total Crop Insurance Paid
Clark County	$22,814,365
Finney County	$78,919,982
Ford County	$41,933,806
Gray County	$46,360,683
Haskell County	$30,964,376
Hodgeman County	$22,774,474
Lane County	$52,134,902
Meade County	$17,125,057
Seward County	$19,071,052

Source: FEMA NRI

Infestation events can cause significant agricultural impacts. The following map from the United States Department of Agriculture details total agricultural losses, by county, due to infestation conditions from 1989 to 2023:

5.8.4 Probability of Future Incidents

The probability of agricultural infestation in Kansas Region D can vary depending on a variety of factors. These factors include:

- **Crop Types:** The types of crops grown in Southewest Kansas play a significant role in determining the probability of infestation. Different crops are susceptible to different pests and diseases.
- **Climate:** Climate conditions, including temperature and humidity, can influence the prevalence of pests and diseases. Warmer and wetter conditions may be more conducive to certain infestations, while dry conditions may reduce the risk.
- **Geography:** Geographic features, such as proximity to bodies of water, forests, or neighboring agricultural regions, can affect the likelihood of infestations. Certain pests and diseases may be more prevalent in specific geographical areas.
- **Crop Management Practices:** The adoption of pest management practices, including crop rotation, the use of resistant crop varieties, and the application of pesticides, can impact the probability of infestation. Sustainable and integrated pest management practices can help mitigate infestation risks.
- **Seasonal Variability:** Infestation risks can vary from season to season. Some years may see higher infestation levels due to factors like weather patterns or the cyclical nature of pest populations.
- **Migration of Pests:** The movement of pests from other regions or neighboring states can introduce infestation risks. Monitoring and surveillance are essential to detect and respond to potential threats.
- **Disease Vectors:** The presence of disease vectors, such as certain insects or animals that can transmit diseases to crops or livestock, can increase the likelihood of infestations.
- **Biosecurity Measures:** Measures taken to prevent the introduction and spread of pests and diseases, such as quarantine procedures and biosecurity protocols, can help reduce the probability of infestation.

The Kansas Forest Service and Kansas Department of Agriculture have identified the following as emerging agricultural infestation threats:

- **Thousand Cankers Disease of Walnut:** Caused by a combination of a fungus (Geosmithia morbida) and the walnut twig beetle (Pityophthorus juglandis). The walnut twig beetles carry fungal spores, and when they tunnel through the outer bark into the tree the fungus is transmitted during gallery construction. The fungus kills an area under the bark and the areas of dead tissue are called cankers. When the walnut twig beetles are abundant, numerous cankers can form and coalesce to girdle twigs and branches, restricting movement of water and nutrients. Black walnut (Juglans nigra), the most valuable native species to the state, is the most susceptible of the Juglans species to this disease.

- **Asian Longhorned Beetle:** Feeds on a wide variety of hardwood tree species that are native or planted in Kansas. It kills trees by creating large tunnels as larvae causing branches or stems to break and eventually lead to tree death. Because this beetle is not native to North America, it has no known natural enemies, and Kansas trees have low resistance to this pest. It has not been detected in Kansas. It has been stated that if the beetle were to become established in the US, it could become one of the most destructive and costly pests ever to industry, urban neighborhoods, and natural forests.
- **Gypsy Moth:** Moth has been infested the northeast, resulting in massive defoliation of shade, fruit, and ornamental trees as well as hardwood forests. Caterpillars devour the leaves of many hardwood tree species and shrubs that can turn a usually lush summer scene into one of winter.
- **Asian Gypsy Moth:** A native species of Asia, first detected in Washington in 1991. Ongoing and completed eradication of various sites in the U.S. have so far prevented the establishment of this generalist feeder. This moth is much more destructive if it became established and spread east because of its broad host range and the females are active fliers due to their larger wingspan.
- **Sudden Oak Death:** In June 2019, the causal agent of Sudden Oak Death, Phytophthora ramorum, was detected in rhododendrons originating from Park Hill Plants nursery in Oklahoma, and plants from that nursery were shipped to 60 Walmart stores across Kansas and one Home Depot store in Pittsburg, Kansas. Sudden Oak Death is caused by Phytophthora ramorum, a water mold pathogen. The pathogen is also the cause of the Ramorum Leaf Blight, Ramorum Dieback and Phytophthora Canker Diseases. This pathogen is considered especially dangerous because it affects a wide variety of trees, shrubs and plants and there is no known cure.
- **Tomato Brown Rugose Fruit Virus:** Tomato Brown Rugose Fruit Virus is a newly discovered tobamovirus that has been found, but not yet established, in the United States. Its two main hosts are tomatoes and peppers, causing concern for growers of these plants. The virus is mechanically transmitted, meaning it can be transmitted from one plant to the next on contaminated tools and equipment, and workers handling many plants in a greenhouse.

It's important to note that agricultural infestations are a dynamic and complex issue, and the probability of infestation can vary from year to year. Farmers and agricultural professionals in Kansas Region D typically rely on agricultural extension services, research institutions, and government agencies to provide information, guidance, and resources for managing and mitigating infestation risks. Proactive pest monitoring and management practices are essential for minimizing the impact of infestations on crop yields and agricultural productivity in the region.

The following table, using data from the USDS, indicates the annualized crop insurance paid per county for agricultural infestation events from 2011-2021 (latest available data):

Table 53: Kansas Region D Annualized Agricultural Infestation Crop Insurance Paid per County, 2011-2021

Jurisdiction	Annualized Crop Insurance Paid
Clark County	$2,281,437
Finney County	$7,891,998
Ford County	$4,193,381
Gray County	$4,636,068
Haskell County	$3,096,438
Hodgeman County	$2,277,447
Lane County	$5,213,490
Meade County	$1,712,506
Seward County	$1,907,105

Source: FEMA NRI

5.8.5 Projected Changes in Hazard Location, Intensity, Frequency, and Duration

Climate change can have several impacts on agricultural infestation in Kansas Region D, affecting the types and prevalence of pests and diseases that farmers face, and can include:

- **Increased Pest Populations:** Warmer temperatures and milder winters can promote the survival and reproduction of certain pests. In Kansas Region D, this may include insects like aphids, corn borers, and various types of beetles. Higher pest populations can lead to more frequent and severe infestations, potentially reducing crop yields.
- **Altered Pest Behavior:** Changes in temperature and climate patterns can influence the behavior and life cycles of pests. Some insects may emerge earlier in the season or have more generations per year, increasing the likelihood of damage to crops.
- **Extended Growing Seasons:** Longer growing seasons, a consequence of warming temperatures, can provide pests with additional time to feed on crops. This extension can lead to greater crop damage if effective pest management strategies are not in place.
- **Shifts in Pest Distribution:** Climate change can result in shifts in the geographic distribution of pests. Pests that were once uncommon in Kansas Region D may become more prevalent as temperatures become more suitable for their survival and reproduction.
- **Altered Disease Dynamics:** Climate change can influence the prevalence and distribution of plant diseases. Warmer and wetter conditions can create favorable environments for certain pathogens, such as fungi and bacteria, increasing the risk of disease outbreaks in crops.
- **Increased Risk of Invasive Species:** Changes in temperature and climate patterns can facilitate the introduction and establishment of invasive species. These species may outcompete native pests and diseases, posing new challenges for farmers.
- **Water Stress:** Climate change can result in more variable precipitation patterns, including more frequent droughts. Water-stressed crops may be more susceptible to pest infestations, as their natural defenses may be compromised.
- **Pesticide Resistance:** As pest populations adapt to changing conditions, they may develop resistance to pesticides more rapidly. This can reduce the effectiveness of chemical pest control methods.
- **Impact on Beneficial Organisms:** Climate change can also affect the populations and behaviors of beneficial organisms, such as natural predators and parasites of pests. Disruptions in these natural control mechanisms can exacerbate infestation problems.

5.8.6 Vulnerability and Impact

FEMA NRI

The FEMA NRI does not provide a rating for the agricultural infestation hazard.

Population

Agricultural infestation is rarely a direct cause of death, though the associated stress can all contribute to increased mortality. However, , an agricultural infestation can have significant impacts on the people in an impacted agricultural community, affecting their livelihoods, health, and well-being, and include:

- **Reduced Income:** For farmers and agricultural workers, the most immediate impact of infestations is often reduced income due to crop or livestock losses. Details concerning economic conditions and employment may be found in Section 3.11.
- **Increased Health Risks:** Infestations involving disease vectors can increase the risk of vector-borne diseases.
- **Migration:** In some cases, people may be forced to migrate in search of better economic opportunities due to infestation-related job losses.

- **Increased Healthcare Costs:** Infestations that result in human health issues can lead to increased healthcare costs for individuals and communities, putting additional financial strain on affected populations.
- **Psychological Stress:** Infestations can cause psychological stress and anxiety, particularly for farmers and agricultural workers who face uncertainty and financial pressures due to crop or livestock losses.

Buildings and Structures
In general, buildings within all jurisdictions are not directly vulnerable to losses as a result of agricultural infestation. However, there is a potential that building repair and maintenance could diminish due to resultant economic conditions.

Governmental Operations
Governmental operations and facilities will likely experience minimal impacts from agricultural infestation conditions.

Transportation and Electrical Infrastructure
Aside from additional agricultural checkpoints altering or slowing traffic patterns, agricultural infestation is unlikely to impact either the transportation or electrical infrastructure.

Water and Wastewater Utilities
Water and wastewater utilities will likely experience minimal impacts from agricultural infestation conditions.

Medical and Response Facilities
Medical and response facilities will likely experience minimal impacts from agricultural infestation conditions.

Educational Facilities
Educational facilities will likely experience minimal impacts from agricultural infestation conditions

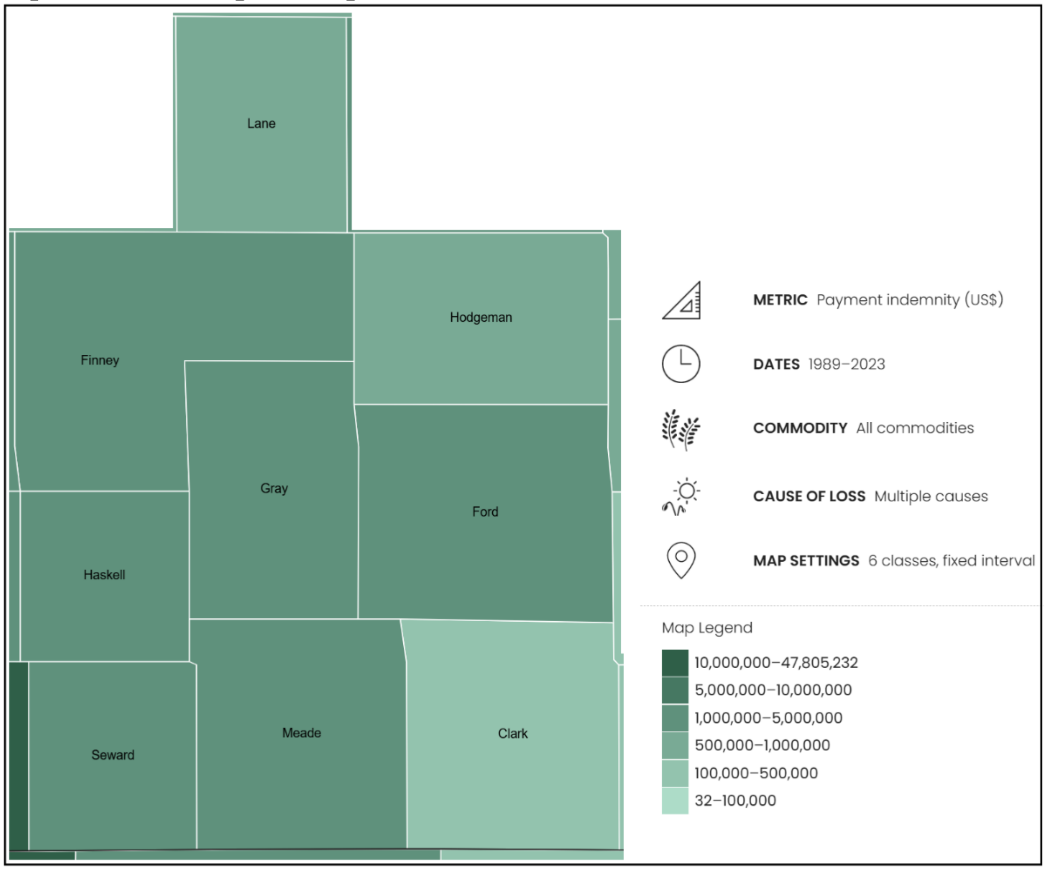
Communication Systems
Communication systems will likely experience minimal impacts from agricultural infestation conditions

Environmental and Agricultural Impacts
Potential impacts on the agricultural community include:

- **Reduced Crop Yields:** One of the most direct impacts of infestation is a decrease in crop yields. Pests, diseases, and invasive species can damage or destroy plants, resulting in smaller harvests.
- **Crop Quality Reduction:** Infestations can also reduce the quality of crops by causing physical damage, deformities, or contamination. This can affect the marketability and value of agricultural products.
- **Livestock Health Issues:** Infestations can lead to health problems in livestock, including weight loss, reduced productivity, and increased susceptibility to diseases. Livestock infestations can also impact meat and dairy quality.
- **Trade Barriers:** Agricultural infestations can lead to trade restrictions and barriers. Countries may impose import bans or stringent regulations on products from regions affected by certain pests or diseases to prevent their spread.
- **Increased Chemical Use:** To combat infestations, farmers may resort to increased pesticide or chemical use. This can have adverse effects on the environment and human health, as well as contribute to pesticide resistance.
- **Disruption of Farming Practices:** Infestations can disrupt normal farming practices, leading to delays in planting or harvesting, increased labor requirements, and a need for specialized pest management.

The following map from the United States Department of Agriculture details total county-wide agricultural losses due to drought conditions from 1989 - 2023:

Map 23: Kansas Region D Agricultural Losses Due to Infestation Events, 1989 to 2023



Source: USDA

Agricultural infestations can have several environmental impacts, often interconnected with agricultural practices, and can include:

- **Pesticide Use:** To combat infestations, farmers may resort to increased pesticide use. The application of pesticides can result in chemical runoff into nearby water bodies, leading to water pollution. This pollution can harm aquatic ecosystems, affecting fish and other aquatic species.
- **Loss of Biodiversity:** Infestations can alter the composition of plant and animal species in agricultural areas. The introduction of invasive species or the suppression of native vegetation can lead to reduced biodiversity, impacting the health of ecosystems.

- **Soil Erosion:** In some cases, infestations can weaken or kill plants, leaving soil exposed to erosion by wind and water. Soil erosion can degrade soil quality, reduce agricultural productivity, and contribute to sedimentation in water bodies.
- **Habitat Changes:** Changes in land use and agricultural practices prompted by infestations can lead to alterations in habitat structure and availability. These changes can affect wildlife populations, including species that rely on specific habitats within agricultural landscapes.
- **Water Quality Impacts:** Infestations can indirectly affect water quality through their influence on land management. Runoff from infested areas, along with pesticide residues and sediment, can compromise water quality and lead to issues such as algal blooms and oxygen depletion in water bodies.
- **Impact on Pollinators:** Some agricultural pests and diseases can have detrimental effects on pollinators, including bees and butterflies. Reduced pollinator populations can harm the reproduction of flowering plants, including many agricultural crops.
- **Secondary Effects on Non-Target Species:** Pest control measures, such as the use of pesticides, may have unintended consequences by affecting non-target species, including beneficial insects, birds, and mammals.
- **Impact on Natural Pest Control:** Some infestations can disrupt natural pest control mechanisms by altering the populations and behaviors of beneficial organisms, such as predators and parasitoids. This can lead to increased reliance on chemical pest control.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a county level:

- **Clark County:** With 264 farms, 560,252 acres in agriculture, $186,224,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of agricultural infestation.
- **Finney County:** With 563 farms, 821,433 acres in agriculture, $1,112,314,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of agricultural infestation.
- **Ford County:** With 536 farms, 698,533 acres in agriculture, $667,781,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of agricultural infestation.
- **Gray County:** With 464 farms, 553,976 acres in agriculture, $1,271,532,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of agricultural infestation.
- **Haskell County:** With 199 farms, 334,602 acres in agriculture, $1,636,349,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of agricultural infestation.
- **Hodgeman County:** With 439 farms, 518,034 acres in agriculture, $226,540,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of agricultural infestation.
- **Lane County:** With 287 farms, 458,845 acres in agriculture, $332,189,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of agricultural infestation.
- **Meade County:** With 397 farms, 624,369 acres in agriculture, $390,750,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of agricultural infestation.
- **Seward County:** With 292 farms, 392,849 acres in agriculture, $398,022,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of agricultural infestation.

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with drought may include:

- Decrease in water quality
- Increased wildfire risk
- Environmental degradation
- Land subsidence
- Damage to agricultural lands

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 54: Agricultural Infestation Consequence Analysis

Subject	Potential Impacts
Health and Safety of the Public	Infestations involving disease vectors can increase the risk of disease transmission to humans.
Health and Safety of Responders	Impact would be minimal as no first response effort is anticipated.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. Agricultural infestation is not expected to require a plan activation.
Property, Facilities, and Infrastructure	Impact would be minimal.
Impact on Environment	Loss of biodiversity, habitat changes water quality degradation, loss of pollinators, and secondary effects on non-target species from increased pesticide usage.
Economic Conditions	Impacts to the economy will depend on the severity of the infestation. The potential for economic loss to the community could be if the infestation is hard to contain, eliminate, or reduce. Impact could be minimized from crop insurance payments.
Public Confidence in Governance	Confidence could be in question depending on timeliness and steps taken to warn the producers and public and treat/eradicate the infestation.

5.8.7 Future Development

As agricultural activities in Region D continue to expand the threat of infestations from pests, diseases, and invasive species increases, posing serious challenges to productivity and sustainability. Without effective management, agricultural infestations can significantly hinder progress, leading to economic losses, environmental degradation, and food insecurity.

One of the most immediate impacts of infestations is the reduction in crop yields. Pests such as locusts, aphids, and caterpillars can destroy large portions of crops, while plant diseases like rust, blight, and mildew can spread rapidly, decimating entire harvests. This not only affects food availability but also drives up costs for farmers and consumers. Additionally, infestations can lead to increased dependence on pesticides, which may be necessary to control outbreaks but come with financial costs, health risks, and environmental concerns, such as soil and water contamination. Over time, excessive pesticide use can also lead to pesticide-resistant pests, further exacerbating the problem.

Beyond economic losses, infestations can cause supply chain disruptions that affect both local and international markets. If a region is heavily affected by an outbreak, governments may impose trade restrictions, quarantines, or export bans to prevent the spread of pests and diseases. This not only affects the profitability of farmers but can also contribute to food shortages and price volatility, making it harder for vulnerable populations to access affordable food. In developing regions, where many communities rely on agriculture for their livelihoods, severe infestations can push farmers into debt or force them to abandon their fields altogether.

5.8.8 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the agricultural infestation hazard.

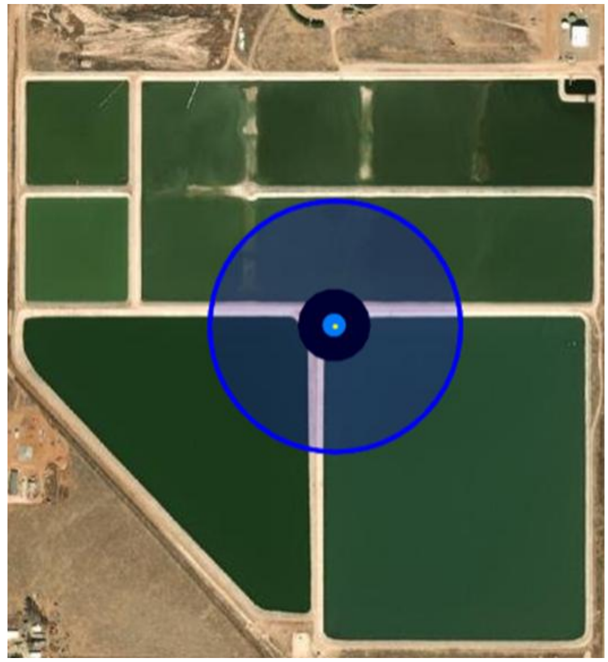
Table 55: Example Agricultural Infestation Mitigation Actions

Category	Example Action
Planning and Regulation	Develop an Agricultural Pest and Disease Management Plan to establish response protocols for infestations.
	Implement zoning and land-use policies that encourage crop diversity to reduce the risk of large-scale infestations.
	Coordinate with State and Federal Agencies (e.g., USDA, EPA) for pest control resources and policy alignment.
Infrastructure	Install physical barriers and netting for high-risk crops to minimize pest access.
	Build biosecurity checkpoints at major entry points to prevent the introduction of invasive pests.
Natural Systems	Encourage crop rotation and diversification to disrupt pest life cycles and reduce monoculture vulnerability.
	Promote Soil Health Programs to enhance natural pest resistance through organic matter and beneficial microbes.
	Preserve and restore wetlands that support natural pest control ecosystems.
Education	Conduct farmer training programs on pest identification, reporting, and best mitigation practices.
	Develop public awareness campaigns about invasive species risks and biosecurity measures.
	Create school and community agricultural programs to educate the next generation on sustainable farming.
	Distribute pest and disease prevention guides to help farmers recognize and mitigate potential threats.

5.9 Dam or Levee Failure

5.9.1 Hazard Description

A dam is a barrier across flowing water that obstructs, directs, or slows down the flow, often creating a reservoir, lake, or impoundment. Most dams have a section called a spillway or weir, over or through, which water flows, either intermittently or continuously. Dams commonly come in two types, embankment (the most common) and concrete (gravity, buttress, and arch), as well as sizes. They also serve a number of purposes and provide essential benefits, including drinking water, irrigation, hydropower, flood control, and recreation.



Large or small, dams have a powerful presence that is frequently overlooked until a failure occurs. Dams fail in two ways, a controlled spillway release done to prevent full failure, or the partial or complete collapse of the dam itself. In each instance, an overwhelming amount of water, and potentially debris, is released. Dam failures are rare, but when they do occur, they can cause loss of life and immense damage to property, critical infrastructure, and the environment.

Possible reasons for dam failure include but are not limited to:

- Sub-standard construction materials/techniques
- Spillway design error
- Geological instability caused by changes to water levels during filling or poor surveying
- Sliding of a mountain into the reservoir
- Poor maintenance, especially of outlet pipes
- Human, computer, or design error
- Internal erosion, especially in earthen dams
- Earthquakes
- Terrorism

There are three classifications of dam failure, hydraulic, seepage, and structural. The following is an explanation of each these failure classifications:

- **Hydraulic:** This failure is a result of an uncontrolled flow of water over and around the dam structure as well as the erosive action on the dam and its foundation. The uncontrolled flow causing the failure is often classified as wave action, toe erosion, or gullying. Earthen dams are particularly susceptible to hydraulic failure because earthen materials erode more quickly than other materials, such as concrete and steel. This type of failure constitutes approximately 40% of all dam failures.
- **Seepage:** Seepage is the velocity of an amount of water controlled to prevent failure. This occurs when the seepage occurs through the structure to its foundation, where it begins to erode within. This type of failure accounts for approximately 4% of all dam failures.
- **Structural:** A failure that involves the rupture of the dam or the foundation by water movement, earthquake, or sabotage. When weak materials construct dams (large, earthen dams) are the primary cause of this failure. Structural failure occurs with approximately 30% of dam failures.

A levee is a man-made structure built to control or prevent the overflow of water from rivers, lakes, or other bodies of water. Levees are typically earthen embankments or walls constructed along the banks of water bodies to provide protection against flooding. They serve as barriers to keep water within its natural or artificial channels, protecting adjacent land areas from inundation. Levees typically have a sloping side that faces the water (riverside) and a steeper side facing away from the water (landside). They may also include features like berms, floodwalls, and floodgates to enhance their effectiveness in flood control. Levee failures can occur in various ways, and they are typically classified into different types based on the mechanism or cause of the failure, and include:

- **Overtopping:** Occurs when floodwaters rise above the crest or top of the levee. This can happen when the floodwater volume exceeds the levee's design capacity or when the levee has been poorly maintained or constructed. Overtopping can erode the levee's surface and eventually lead to breaches.
- **Erosion:** Occurs when the flowing water erodes the soil or materials comprising the levee. Erosion can result from the force of the water or from seepage of water through the levee's foundation, which can carry soil particles away and weaken the structure.
- **Seepage:** Occurs when water infiltrates the levee through the soil or the levee's foundation. Over time, seeping water can weaken the structural integrity of the levee. Piping, a type of seepage failure, is particularly concerning, as it involves the formation of tunnels or pipes within the levee through which water flows, further eroding the structure.
- **Slumping or Landslide:** Occurs when a portion of the levee's embankment or slope collapses. This can result from saturated soils, unstable materials, or rapid changes in water levels. Slumping or landslides can lead to breaches in the levee.
- **Breach:** A complete failure of the levee, resulting in a significant opening or hole through which floodwaters can freely flow into protected areas. Breaches can occur due to any combination of failure mechanisms, and they can be sudden and catastrophic.
- **Design or Construction Errors:** Levee failures can also occur due to inadequate height or width, poor materials, or improper compaction during construction. These errors may not become apparent until the levee is put to the test by a flood event.

5.9.2 Location and Extent

The KDA Division of Water Resources (KDA-DWR) is responsible for the review and approval of plans for constructing new dams and for modifying existing dams, ensuring quality control during construction, and monitoring dams that, if they failed, could cause loss of life, or interrupt public utilities or services. The KDA-DWR regulates the construction, operation, and maintenance of all dams or other water obstructions, with the exception of federal reservoirs.

The Obstructions in Streams Act (K.S.A 82a-303b) requires owners of high hazard (class C) and significant hazard dams (class B) dams to have a qualified engineer conduct periodic dam inspections. For high hazard dams, the inspection must be done every three years. For significant hazard dams, an inspection must be done every five years. Dam Hazard Classifications are detailed in the following table:

Table 56: Dam Hazard Potential Classification

Hazard Potential	Class	Definition	Inspection Timeline	Number of Regional Dams in Category
High	C	Failure or mis-operation will result in probable loss of life.	Three Years	44
Significant	B	Failure or mis-operation results in no probable loss of life but can cause major economic loss, disruption of	Five Years	22

Table 56: Dam Hazard Potential Classification

Hazard Potential	Class	Definition	Inspection Timeline	Number of Regional Dams in Category
		lifeline facilities or impact the public's health, safety, or welfare.		
Low	A	Failure or mis-operation results in no probable loss of human life and low economic losses.	Not inspected, downstream conditions are reassessed to determine if conditions have changed to necessitate reclassification	571

Source: KDA-DWR

The following table details dams by county by hazard potential:

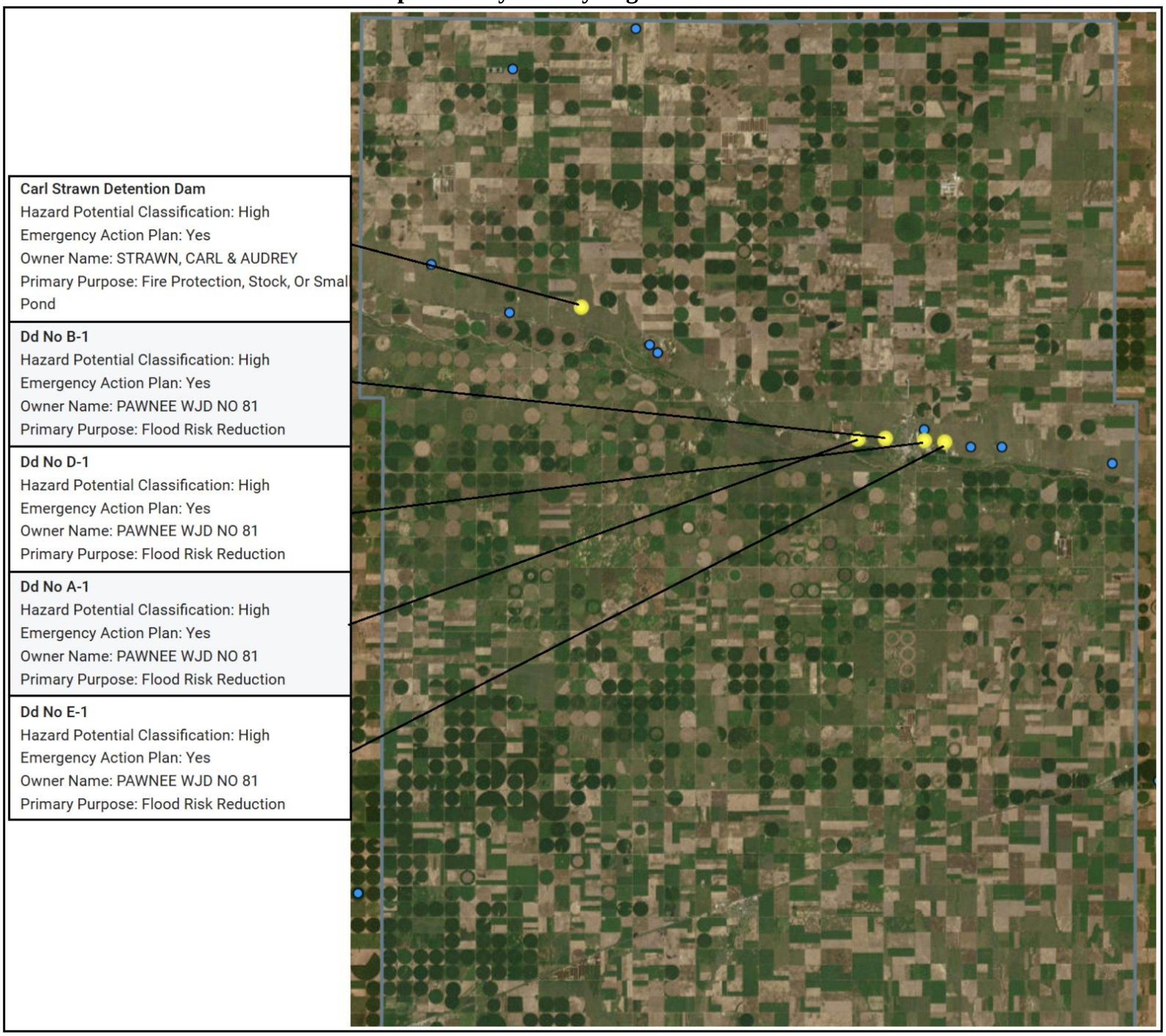
Table 57: Kansas Region D Significant and High Hazard Dams by County

County	Low	Significant	High
Clark County	22	0	0
Finney County	56	1	0
Ford County	15	1	0
Gray County	12	0	5
Haskell County	2	0	0
Hodgeman County	28	0	3
Lane County	27	0	0
Meade County	18	0	0
Seward County	6	0	0

Source: KDA-DWR

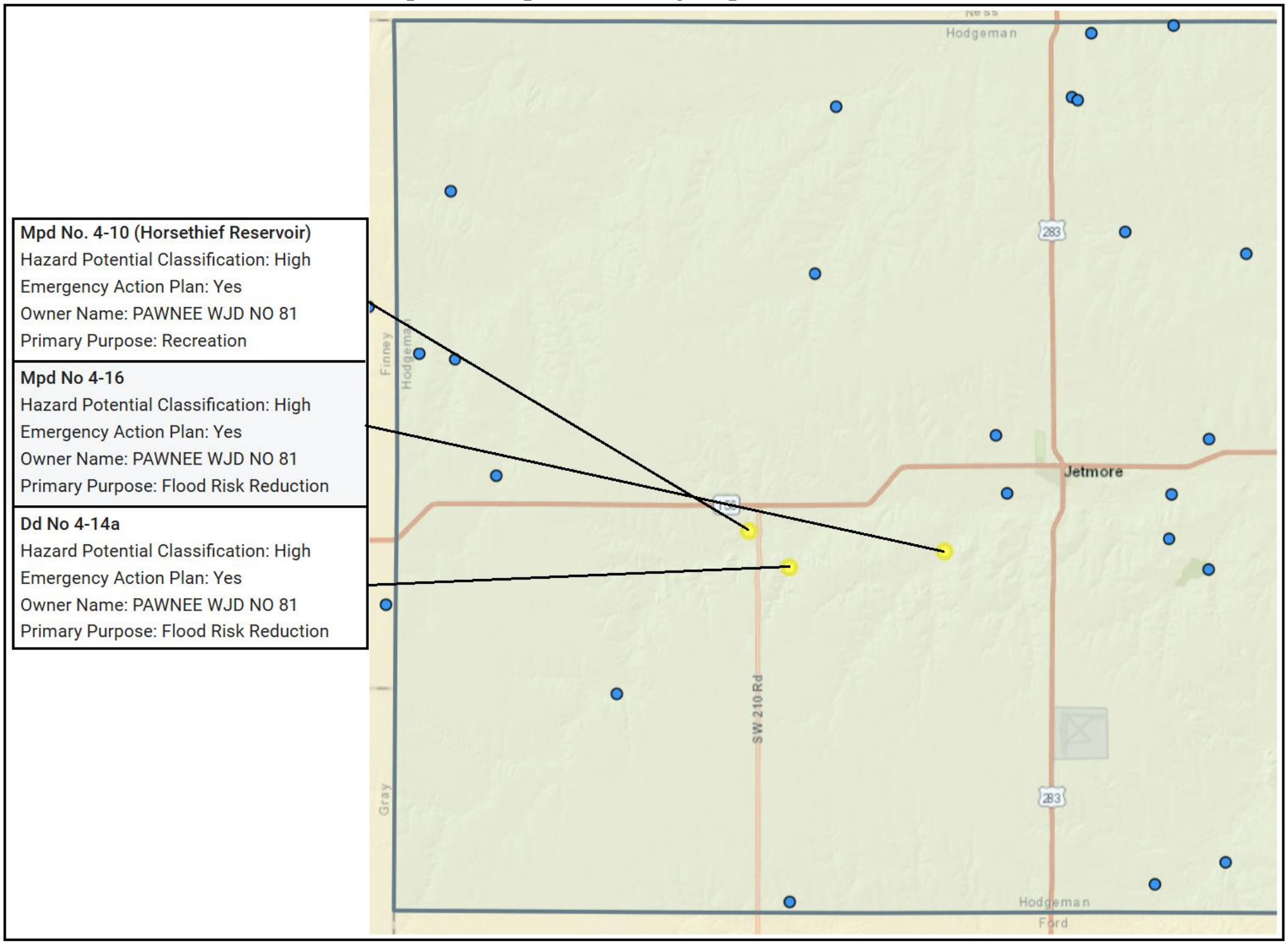
The following map, from the National Inventory of Dams, indicates the location of high hazard dams within Kansas Region D

Map 24: Gray County High Hazard Dams



Source: National Inventory of Dams

Map 25: Hodgeman County High Hazard Dams



Source: National Inventory of Dams

Regulation of levees in the United States involves multiple entities at different levels of government: These entities include:

- **Local Levee Districts:** In many cases, local levee districts or authorities are responsible for the construction, maintenance, and operation of levees. These districts are often formed by communities or landowners in areas prone to flooding, and they assess taxes or fees to fund levee projects.

- **Local Governments:** Local governments, such as city or county governments, may also have roles in regulating and overseeing levees. They may work in coordination with state and federal agencies to ensure that levees comply with applicable regulations and standards.
- **State Agencies**: State agencies play a role in regulating and overseeing levees within their jurisdiction. They may establish standards, guidelines, and regulations for levee construction, maintenance, and inspection. State agencies may also provide technical assistance to local levee districts.
- **Federal Agencies:** The U.S. Army Corps of Engineers (USACE) is a major federal agency involved in levee regulation. The USACE is responsible for evaluating and accrediting levees through the National Levee Safety Program. FEMA also plays a role in floodplain management and mapping. Levees that are accredited by the USACE may influence floodplain mapping and impact flood insurance requirements for communities.

The regulation of levees involves a combination of engineering standards, safety evaluations, and adherence to local, state, and federal regulations. Levee safety is a critical aspect of flood risk management, and ongoing inspection, maintenance, and potential upgrades are essential to their effectiveness.

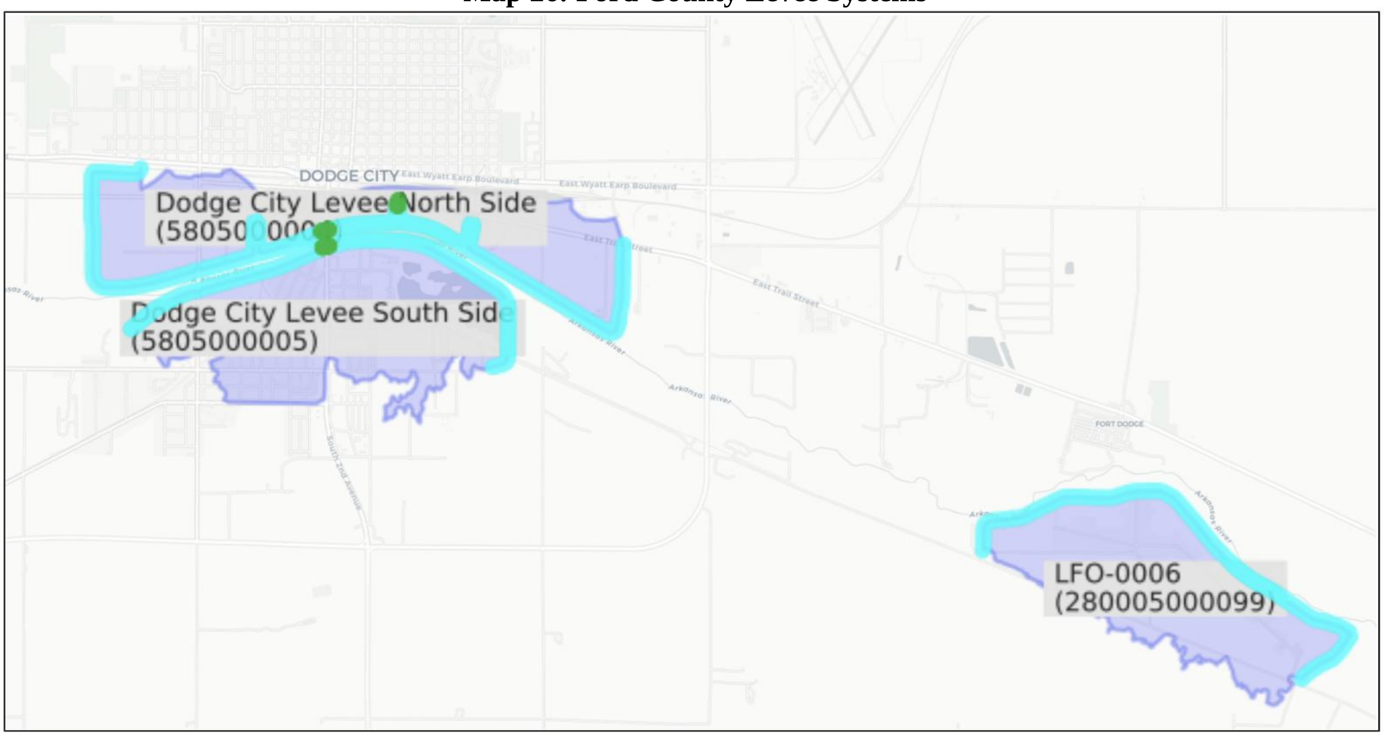
The following table, using data from the USACE National Levee Database, details the location of levee systems in Kansas Region D:

Table 58: Kansas Region D Levee Systems

County	Nearest Jurisdiction	Name	Waterway
Ford	Dodge City	Dodge City Levee North Side	Arkansas River
	Dodge City	Dodge City Levee South Side	Arkansas River
	Dodge City	LFO-0006	Arkansas River

Source: National Levee Database

Map 26: Ford County Levee Systems



Source: National Levee Database

The MPC view dam or levee failure as a local hazard. Discussions with the MPC and a review of all available data indicated that dam or levee failure is a concern only for Grant and Gray Counties. The following provides a narrative of the level of jurisdictional concern:

- **Clark County:** No high hazard dams or levee systems protecting people or structures.
- **Finney County:** No high hazard dams or levee systems protecting people or structures.
- **Ford County:** No high hazard dams, three levee systems protecting people or structures.
- **Gray County:** Five high hazard dams, no levee systems protecting people or structures.
- **Haskell County:** No high hazard dams or levee systems protecting people or structures.
- **Hodgeman County:** Three high hazard dams , no levee systems protecting people or structures.
- **Lane County:** No high hazard dams or levee systems protecting people or structures.
- **Meade County:** No high hazard dams or levee systems protecting people or structures.
- **Seward County** No high hazard dams or levee systems protecting people or structures.

5.9.3 Previous Occurrences

Data from the National Performance of Dams Program at Stanford University indicates Kansas Region D has had no reported dam failure or levee failure incidents.

5.9.4 Probability of Future Incidents

Despite the infrequent historical occurrences of dam failure resulting in an uncontrolled release of the reservoir, there remains a significant concern due to the large number of significant and high hazard dams throughout the region. The probability of dam failure events is not easily measured, but may aligned with:

- The probability of future flood events
- Preventative measure taken by dam owners and operators, maintenance and repair
- Frequent condition inspections
- Proper operating procedures

KDA-DWR conducts routine monitoring and inspection of dams within the state on the previously identified schedule, with priority placed on those dams which pose the greatest potential threat. However, to fully determine the probability of a future event, a full engineering inspection would need to be completed on each dam, something beyond the scope of this plan.

Dams undergoing repair and/or reconstruction are required to be designed to pass at least the 1%-annual-chance rainfall event with one foot of freeboard. The most critical and hazardous dams are required to meet a spillway design standard much higher than passing the runoff from a 1%-annual-chance rainfall event. Although not all the dams have been shown to withstand the 1%-annual-chance rainfall event, most of the dams meet this standard due to original design requirements or recent spillway upgrades.

At present, there is no history of a dam or levee failure of any size in Kansas Region D or its participating jurisdictions. In lieu of any historical events, the next best prediction tool would be based on the structural state of the dam. However, maintenance and structural information on dams or levees was not available for public use. Using the binomial probability equation (number of years with an event divided by total number of years in reporting period) we derive a probability of 0% for a dam or levee failure in a given year. However, it is important to note that the lack of past incidents does not protect against future incidents as both dams and levees may be damaged in future catastrophic regional flood events.

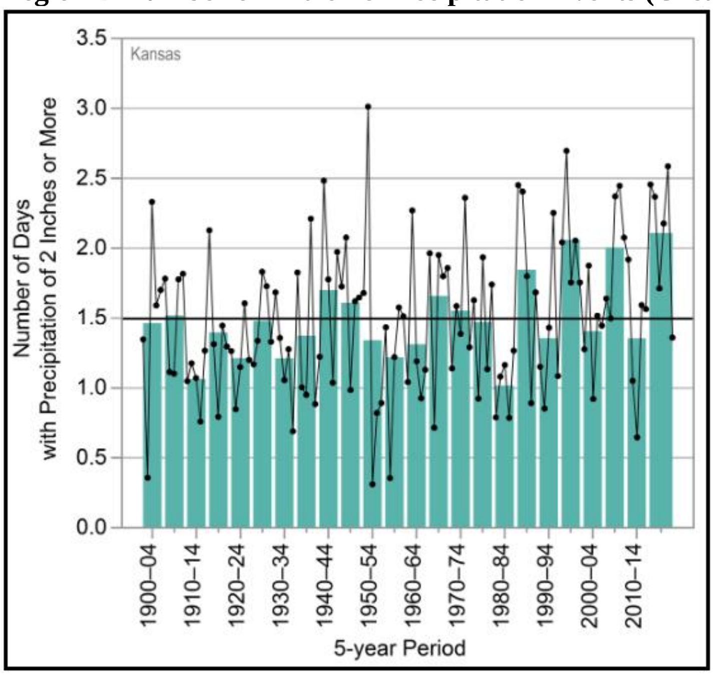
5.9.5 Projected Changes in Hazard Location, Intensity, Frequency, and Duration

The 2018 National Climate Assessment report indicates that much of the water infrastructure in the central portion of the United States, including dams, is nearing the end of its planned life expectancy. As indicated in the report: "Aging and deteriorating dams and levees also represent an increasing hazard when exposed to extreme or, in some cases, even moderate rainfall. Several recent heavy rainfall events have led to dam, levee, or critical infrastructure failures, including the Oroville emergency spillway in California in 2017, Missouri River levees in 2017, 50 dams in South Carolina in October 2015 and 25 more dams in the state in October 2016, and New Orleans levees in 2005 and 2015. The national exposure to this risk has not yet been fully assessed."

A potential outcome of changing climate in Kansas Region D is an increase in extreme precipitation events which may lead to more severe floods and a greater risk of dam failure. Additional projected greater periods of drought conditions and high heat may result in ground cracking, a reduction of soil strength, erosion, and subsidence in earthen dams.

The NOAA NCEI State Climate Summary 2022 for Kansas suggests that the number of extreme precipitation events are projected to increase. These extreme events will likely place increased stress on dams within the State.

Graph 19: Kansas Region D Number of Extreme Precipitation Events (Greater Than 2 Inches)



Source: NOAA NCEI State Climate Summary 2022 for Kansas

At present there is no comprehensive assessment of the climate-related vulnerability and risks to existing dams. Additionally, there are no common design standards concerning the repair or modification of existing dams nor for the designed and construction of new dams operated in the face of changing climate risk.

Land use trends can significantly impact a community's vulnerability to dam or levee failure. The way land is developed and used in proximity to dams and levees can influence the potential consequences of failure, affecting the safety of residents and infrastructure.

Development in flood-prone areas or behind levees without adequate consideration for flood risk increases vulnerability. Increased urbanization and population density near dams and levees can intensify the consequences of failure. Higher population density means more people and assets are at risk, leading to greater potential for loss of life and property damage.

The location of critical infrastructure, such as hospitals, schools, and emergency services, in close proximity to dams or levees can heighten vulnerability. Infrastructure assets may be at risk of damage or disruption, impacting the community's ability to respond effectively to a failure.

5.9.6 Vulnerability and Impact

FEMA NRI

The FEMA NRI does not provide a rating for the dam or levee failure hazard.

Dam Condition Survey

The National Inventory of Dams documents all known dams in Kansas. The USACE is responsible for maintaining the National Inventory of Dams and works in close collaboration with federal and State of Kansas dam regulating agencies to obtain accurate and complete information about dams in the database. The database contains information about a dam's location and condition assessment. The condition assessment describes the condition of the dam based on available information, with the following ratings given:

- **Satisfactory:** No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the minimum applicable state or federal regulatory criteria or tolerable risk guidelines.
- **Fair:** No existing dam safety deficiencies are recognized for normal operating conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action.
- **Poor:** A dam safety deficiency is recognized for normal operating conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Investigations and studies are necessary.
- **Unsatisfactory**: A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.
- **Not Rated:** The dam has not been inspected, is not under state or federal jurisdiction, or has been inspected but, for whatever reason, has not been rated.
- **Not Available:** Dams for which the condition assessment is restricted to approved government users.

The following table details the nearest jurisdiction, dam number, dam names, and condition assessment, and current fill status (determined from satellite photography) of all high hazard dams in Region D:

Table 59: Kansas Region D High Hazard Dams

County	Dam Number	Dam Name	Nearest Jurisdiction	Condition Assessment	Current Fill Status
Gray	KS00781	Carl Strawn Detention Dam	Rural	Not Rated	Dry
Gray	KS02276	Dd No B-1	Cimarron	Poor	Partial
Gray	KS02277	Dd No D-1	Cimarron	Fair	Partial
Gray	KS02275	Dd No A-1	Cimarron	Poor	Full
Gray	KS02278	Dd No E-1	Cimarron	Poor	Dry
Hodgeman	KS09334	Horsethief Reservoir	Rural	Fair	Full
Hodgeman	KS07220	Mpd No 4-16	Rural	Poor	Full
Hodgeman	KS07221	Dd No 4-14a	Rural	Poor	Full

Source: State of Kansas and National Inventory of Dams and Satellite Photography

Population

A dam failure event can have devastating and wide-ranging impacts on both people and communities. The severity of these impacts depends on the volume of water released and the location of the dam in relation to communities, and may include:

- **Loss of Life:** The sudden release of a large volume of water can result in flooding downstream, leading to drowning and casualties. The loss of life can be particularly high if a dam failure occurs in highly populated areas or when people are unable to evacuate in time.
- **Long Term Displacement:** People living downstream may be forced to evacuate their homes leading to displacement and requiring long-term shelter assistance.
- **Economic Consequences:** Both property damage and the disruption of transportation and utilities could affect local economies.
- **Psychological Trauma:** Survivors of dam failure events may experience psychological trauma, including post-traumatic stress disorder and anxiety.

As of this plan, a complete analysis has not been conducted on the potential impact of a dam failure event on the population of Kansas Region D nor were completed Emergency Action Plans available for review. However, the following table utilizing National Inventory of Dams and satellite photograph analysis provides an estimate of the potentially impacted population from a dam failure by jurisdiction:

Table 60: Kansas Region D Potentially Impacted Population, Dam Failure

Jurisdiction	Potentially Impacted Population
Clark County	0
Finney County	0
Ford County	0
Gray County	800
Haskell County	0
Hodgeman County	50
Lane County	0
Meade County	0
Seward County	0

Source: U.S. Census Bureau, satellite photograph analysis

Data from the USACE National Levee Database indicates the following populations vulnerable to a potential levee failure:

Table 61: Kansas Region D Levee Systems Protecting People

County	Jurisdiction	Name	People at Risk
Ford	Dodge City	Dodge City Levee North Side	691
	Dodge City	Dodge City Levee South Side	2,875
	Dodge City	LFO-0006	359

Source: National Levee Database

Additionally, the loss of community lifelines can have a direct economic impact on the population. As an overview, the May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report indicates the following loss values for community lifelines:

Table 62: Economic Impacts of Loss of Service Per Capita Per Day (in 2022 dollars)

Category	Loss
Loss of Electrical Service	$199
Loss of Wastewater Services	$66
Loss of Water Services	$138
Loss of Communications/Information Technology Services	$141

Source: May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report

Buildings and Structures

Any jurisdictional facility within an identified inundation zone of a dam or levee failure will be immediately impacted, potentially causing a cessation of all operations at that location. The extent of the impact depends on multiple factors concerning the extent of the failure, and may include:

- **Structural Damage:** Facilities located downstream could sustain severe structural damage. Floodwater can inundate buildings, causing structural failures, collapsing walls, and damaging foundations. This can render facilities inoperable or unsafe for use.
- **Equipment Damage:** Critical facilities often house valuable and sensitive equipment that can be severely damaged or destroyed by floodwaters and debris carried by the flood. This can include electrical systems, machinery, data centers, and communication equipment.
- **Disruption of Operations:** The flooding caused by a dam failure can disrupt the normal operations of critical facilities, including hospitals, emergency response centers, power plants, and water treatment plants. This disruption can have cascading effects on public services and infrastructure.
- **Long-Term Recovery:** The recovery process could be lengthy and resource intensive. It may involve rebuilding damaged infrastructure, restoring functionality, and implementing measures to prevent future vulnerabilities.

As of this plan, a complete analysis has not been conducted on the potential impact of a dam failure event on the buildings of Kansas Region D nor were completed Emergency Action Plans available for review. However, the following table utilizing National Inventory of Dams and satellite photograph analysis provides an estimate of the potentially impacted population from a dam failure by jurisdiction:

Table 63: Kansas Region D Potentially Impacted Buildings, Dam Failure

Jurisdiction	Potentially Impacted Buildings
Clark County	0
Finney County	0
Ford County	0
Gray County	300
Haskell County	0
Hodgeman County	10
Lane County	0
Meade County	0
Seward County	0

Source: U.S. Census Bureau, satellite photograph analysis

Data from the USACE National Levee Database indicates the following populations vulnerable to a potential levee failure:

Table 64: Kansas Region D Levee Systems Protecting Properties

County	Jurisdiction	Name	Structures at Risk	Property Value
Ford	Dodge City	Dodge City Levee North Side	280	$116,358,570
	Dodge City	Dodge City Levee South Side	1,096	$189,937,350
	Dodge City	LFO-0006	145	$56,301,082

Source: National Levee Database

Governmental Operations

Government operations may be immediately impacted, especially if any facilities are within the inundation area of failure. The extent of the impact depends on multiple factors concerning the extent of the failure, and may include:

- **Emergency Response and Management:** Jurisdictional response agencies may be called upon to respond to a failure event. They must coordinate rescue operations, evacuations, and disaster response efforts to mitigate the immediate risks to human life and property.
- **Public Health and Safety:** Jurisdictional public health agencies would provide support for public health needs during and after a dam failure, including responding to injuries, managing emergency shelters, and addressing potential health risks from contaminants or waterborne diseases.
- **Financial Impact:** A dam failure event can strain state budgets due to the costs associated with emergency response, infrastructure repair, environmental cleanup, and long-term recovery efforts. Local governments may need to allocate additional funds to address these needs.

As of this plan, a complete analysis has not been conducted on the potential impact of a dam failure event on the buildings of Kansas Region D nor were completed Emergency Action Plans available for review. However, no governmental buildings were noted in potential inundation areas

Transportation and Electrical Infrastructure

The failure of a dam can have significant and wide-ranging impacts on transportation infrastructure, affecting roads, bridges, railways, and other critical components of transportation systems. Potential impacts may include:

- Flooding and Erosion: Dam failures can lead to rapid and extensive flooding, causing erosion of roadways and bridge foundations. This can result in the collapse or significant damage to roads and bridges, disrupting transportation routes.
- Extended Downtime: The repair of transportation infrastructure, especially major roads and bridges, can take a significant amount of time. During this period, transportation networks may be partially or entirely unavailable.

The following tables detail downstream transportation infrastructure likely to be impacted by a high hazard dam failure:

Table 65: Gray County, Carl Strawn Detention Dam Impacted Infrastructure

Infrastructure Classification	Name	Direction	Distance (miles)
Road	U.S. Highway 50	South	0.3
Railroad	Railroad	South	0.3

Source: National Inventory of Dams, satellite photograph analysis

Table 66: Gray County, Dd No A-1 Dam Impacted Infrastructure

Infrastructure Classification	Name	Direction	Distance (miles)
Road	U.S. Highway 50	South	0.1
Road	Old Highway 50	South	0.15
Railroad	Railroad	South	0.15

Source: National Inventory of Dams, satellite photograph analysis

Table 67: Gray County, Dd No B-1 Dam Impacted Infrastructure

Infrastructure Classification	Name	Direction	Distance (miles)
Structure	Gray County Fairgrounds	South	0.1
Structure	Gray County Recreation Center	South	0.1
Road	U.S. Highway 50	South	0.2
Road	Dell Street	South	0.2
Road	Old Highway 50 (Egbert Street)	South	0.25
Railroad	Railroad	South	0.25

Source: National Inventory of Dams, satellite photograph analysis

Table 68: Gray County, Dd No D-1 Dam Impacted Infrastructure

Infrastructure Classification	Name	Direction	Distance (miles)
Road	U.S. Highway 50	South	0.25
Road	North 7th Street	South	0.1
Road	Old Highway 50 (Egbert Street)	South	0.25
Railroad	Railroad	South	0.25

Source: National Inventory of Dams, satellite photograph analysis

Table 69: Gray County, Dd No E-1 Dam Impacted Infrastructure

Infrastructure Classification	Name	Direction	Distance (miles)
Road	U.S. Highway 50	South	0.1
Road	Old Highway 50 (19 Road)	South	0.3
Railroad	Railroad	South	0.3

Source: National Inventory of Dams, satellite photograph analysis

Table 70: Hodgeman County, Horsethief Reservoir Dam Impacted Infrastructure

Infrastructure Classification	Name	Direction	Distance (miles)
Road	SW 210 Road	East	0.05
Road	Highway 156	Northeast	0.35

Source: National Inventory of Dams, satellite photograph analysis

Table 71: Hodgeman County, Mpd No4-16 Dam Impacted Infrastructure

Infrastructure Classification	Name	Direction	Distance (miles)
Road	215 Road	North	0.25

Source: National Inventory of Dams, satellite photograph analysis

Table 72: Hodgeman County, Dd No 4-14a Dam Impacted Infrastructure

Infrastructure Classification	Name	Direction	Distance (miles)
Road	Highway 156	North	1.3

A wide variety of data sources, from the Federal Highway Administration to state and federal Departments of Transportation, can be sourced for construction and repair costs. Average per-mile repair costs for local roads, state highways, and interstates can vary widely depending on factors such as the type of repair (resurfacing, reconstruction, or major rehabilitation), local labor and material costs, geographic conditions, and traffic volumes. The following details a range of repair costs for local, state, and interstate roadway systems:

- Local Roads
  - Resurfacing/Repaving: Costs generally range between $20,000 to $100,000 per mile.

    - Major Rehabilitation or Reconstruction: Costs generally range between $150,000 to $1 million per mile.
- State Highways
    - Resurfacing/Repaving: Costs generally range between $100,000 to $300,000 per mile.
    - Major Rehabilitation or Reconstruction: Costs generally range between $500,000 to $2,000,000 per mile.
- Interstates
    - Resurfacing/Repaving: Costs generally range between $250,000 to $1,000,000 per mile.
    - Major Rehabilitation or Reconstruction: Costs generally range between $2,000,000 to $5,000,00 per mile.

Factors affecting roadway construction and repair costs can include:

- **Extent of Damage:** Minor repairs such as resurfacing are cheaper than full-depth reconstruction.
- **Geography and Terrain:** Roads in mountainous or difficult terrains may cost more due to drainage and foundation issues.
- **Traffic Control and Detours:** Roads with heavy traffic may require expensive detour systems and safety measures, especially for interstates and state highways.
- **Urban vs. Rural:** Repairs in urban areas are typically more expensive due to higher labor costs, complex traffic patterns, and higher land costs.
- **Material Costs:** Prices for materials like asphalt, concrete, and steel can vary significantly based on regional supply chains.
- **Environmental and Regulatory Costs:** Permitting, environmental mitigation, and compliance with federal/state regulations can add to the cost.

Bridges crossing rivers can pose significant concerns during flooding events resulting from a dam or levee failure due to the increased risk of structural failure. Floodwater caused by a dam failure can exert powerful hydraulic forces on bridge structures, with the flow of water, debris, and floating objects impacting the bridge's substructure and foundation. Scouring, the removal of soil or sediment around bridge foundations can increase during a flood event, increasing the risk of failure. Floodwater can also cause the deformation and misalignment of bridge components. As water levels rise and fall, the structural elements may undergo stress and strain, potentially leading to long-term damage and misalignment.

A wide variety of data sources, including the Federal Highway Administration and state and federal Departments of Transportation, can be sourced for bridge construction and repair costs. The average construction and repair costs for bridges vary significantly depending on factors like the size and complexity of the bridge, its location, materials used, and the extent of the repairs or construction required. The following details a range of construction costs for bridges:

- **Small Bridge (local, 2-lane bridge over a small waterway or road):** Costs generally range between $150 to $400 per square foot.
- **Medium-Sized Bridge (state highway, spanning larger rivers or railways):** Costs generally range between $300 to $600 per square foot.
- **Large Bridge (interstate or urban multi-lane bridge, often requiring complex engineering):** Costs generally range between $500 to $1,000+ per square foot.

The following details a range of repair costs for bridges:

- **Minor Repairs (deck resurfacing, guardrail fixes, minor structural repairs):** Costs generally range between $50,000 to $500,000.

- **Medium Repairs (replacing sections of the deck, repairing piers or abutments):** Costs generally range between $500,000 to $5,000,000.
- **Major Repairs or Rehabilitation (full deck replacement, structural strengthening, or seismic retrofitting):** Costs generally range between $5,000,000 to $50,000,000.
- **Emergency Repairs (post-disaster or structural failure):** Costs generally range between $10,000,000 to $100,000,000.

Factors affecting bridge construction and repair costs can include:

- **Bridge Type and Design:** Suspension, cable-stayed, truss, arch, or simple beam bridges each have different design requirements and associated costs.
- **Location:** Urban areas or difficult terrains (e.g., over water, in mountainous regions) can significantly increase costs due to land acquisition, permitting, and construction challenges.
- **Materials:** The use of steel, concrete, or composite materials impacts the price. Specialized materials (e.g., weathering steel for durability) increase costs.
- **Traffic Management:** Bridges over busy roads or waterways may require costly traffic diversion plans or temporary structures.
- **Environmental and Regulatory Compliance:** Projects near sensitive areas (rivers, wetlands, protected lands) or those requiring special permits may face higher costs.
- **Labor and Regional Costs:** Labor costs, equipment rates, and material availability can vary widely by region.

The failure of a dam or levee can have significant impacts on power utilities, affecting both the generation and distribution of electrical power. Potential consequences may include:

- **Power Line Disruption:** Dam or levee failures can cause flooding and erosion, potentially damaging power lines and transmission towers. This can result in the disruption of electricity transmission from power generation facilities to distribution networks.
- **Substation Impact: Substation Flooding:** Flooding from a dam or levee failure can impact electrical substations, which play a crucial role in transforming and distributing electricity. Substation failures can lead to widespread power outages.
- **Grid Instability:** The sudden loss of a significant power source can lead to voltage and frequency fluctuations. This instability can affect the overall reliability of the power grid.
- **Emergency Shutdowns:** In the event of a dam or levee failure, power utilities may need to implement emergency shutdowns of affected power plants and electrical infrastructure to prevent further damage and ensure the safety of personnel.

A wide variety of data sources, including the U.S. Energy Information Administration, Federal Energy Regulatory Commission, and the Electric Power Research Institute, can be sourced for construction and repair costs for electrical facilities. The repair costs can vary greatly depending on the type of repair, the size of the locaion, and the specific components that require attention. Typical repairs cost are:

- **Minor Repairs (Routine Maintenance & Component Replacement):** Costs generally range between $10,000 to $100,000.
- **Moderate Repairs (Replacing Medium-Sized Components):** Costs generally range between $100,000 to $1 million.
- **Major Repairs (Structural or Extensive Mechanical/Electrical Work):** Costs generally range between $1,000,000 to $50,000,000, depending on the scale.
- **Emergency Repairs (After Natural Disasters or Accidents):** Costs generally range between $5,000,000 to $100,000,000.

The cost to reconstruct high-capacity (voltage) power transmission lines varies significantly based on several factors, such as the voltage of the line, geographic terrain, regulatory requirements, and environmental considerations. The following present rough cost estimates for construction:

- High-Voltage Alternating Current Transmission Lines:
  - Overhead lines: Costs generally range between $300,000 to $1,000,000 per mile.
  - Underground lines: Costs generally range between $1,000,000 and $10,000,000 per mile.
- High-Voltage Direct Current Transmission Lines:
  - Overhead lines: Costs can range between $500,000 to $2 million per mile.
  - Underground lines: Costs can range between $3,000,000 to $15,000,000 per mile Key Factors Affecting Costs:

The cost to construct neighborhood power distribution lines (rather than large high-capacity transmission lines) depends on whether the lines are overhead or underground, as well as factors like geography, local labor rates, and regulatory requirements. The following present rough cost estimates for construction:

- **Overhead Neighborhood Power Distribution Lines:** Costs generally range between $150,000 to $500,000 per mile.
- **Underground Neighborhood Power Distribution Lines:** Costs generally range between $500,000 to $2,000,000 or more per mile.

The cost to repair high-capacity power transmission lines varies widely depending on the extent of the damage, the location, and the type of transmission line. Here are some general considerations:

- High-Voltage Overhead Transmission Lines:
  - Minor Repairs (fixing or replacing a small section of damaged wire, insulators, or hardware): Costs generally range between $10,000 and $50,000 per mile.
  - Moderate Repairs (replacing several towers or larger segments of lines): Costs generally range between $50,000 and $200,000 per mile.
  - Major Repairs (such as extensive damage from storms, fires, or other disasters requiring multiple towers, wires, and more complex restoration): Costs generally range between $200,000 to over $1,000,000 per mile.
- High-Voltage Underground Transmission Lines:
  - Minor Repairs: Costs generally range between $100,000 to $500,000 per mile.
  - Major Repairs: Costs generally range between $1,000,000 to $5,000,000 or more per mile.

The cost to repair neighborhood power distribution lines, which typically carry lower voltage power than high-capacity transmission lines, also depends on several factors, such as the extent of the damage, whether the lines are overhead or underground, and the location.

- Overhead Neighborhood Distribution Lines:
  - Minor Repairs (such as fixing downed lines, poles, or transformers): Costs generally range between $5,000 to $20,000 per mile.
  - Moderate Repairs (replacing several poles, wires, or small transformers): Costs generally range between $20,000 to $100,000 per mile.
  - Major Repairs (extensive damage from a major storm or accident affecting many poles, transformers, and lines): Costs generally range between $100,000 to $500,000 per mile.

- Underground Neighborhood Distribution Lines:
    - Minor Repairs (fixing small sections of cable or minor equipment malfunctions): Costs generally range between $50,000 to $150,000 per mile.
    - Moderate Repairs (replacing larger segments of underground cable): Costs generally range between $150,000 to $500,000 per mile.
    - Major Repairs (extensive damage to underground systems, possibly caused by floods, storms, or construction accidents): Costs generally range between $500,000 to $2,000,000 per mile.

Factors influencing both reconstruction and repair costs for electrical transmission lines include:

- **Terrain:** Building lines through mountainous or densely populated areas will increase costs.
- **Permitting and Land Acquisition:** Securing permits and land can add significant costs.
- **Environmental and Regulatory Costs:** Meeting environmental impact requirements and complying with local regulations can also influence the final price.
- **Voltage Level:** Higher voltage transmission lines, such as those over 500 kV, are generally more expensive than lower voltage lines.

A review of satellite photography did not indicate any high-capacity transmission lines or any substations within any potential inundation areas. However, local lines were noted near both identified high hazard dams and levees.

Water and Wastewater Utilities
A review of potential inundation areas indicated no water or wastewater facilities within the footprint.

Medical and Response Facilities
A review of potential inundation areas indicated no medical or response facilities within the footprint.

Educational Facilities
A review of potential inundation areas indicated no educational facilities within the footprint.

Communication Systems
Comprehensive mapping of communications systems in inundation areas was available for analysis.

Environmental and Agricultural Impacts
The environmental impact of dam or levee failures depends on the circumstances of the failure. After a failure occurs, the resulting flooding and moving debris can affect wildlife and natural habitats. The spread of pollution and hazardous materials can have negative impacts on the environment. Ecosystems and natural habitats may be destroyed, causing the migration or death of local wildlife. Depending on the timing and location of the failure, it can result in rapid changes in water temperature downstream. This can be harmful to temperature-sensitive aquatic species and ecosystems. Dam failures can disrupt natural ecological processes, such as nutrient cycling, sediment transport, and flow regimes. These disruptions can have cascading effects on ecosystems.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a county level:

- **Clark County:** None.
- **Finney County:** None.

- **Ford County:** Data indicates that 3,529 people, and 1,521 structures (valued at approximately $ 246,354,790) are at risk from levee failure.
- **Gray County:** Data indicates that an estimated 800 people, 300 buildings, numerous roads, one railroad, and two community facilities are vulnerable to a dam failure event.
- **Haskell County:** None.
- **Hodgeman County:** Data indicates that an estimated 50 people, 10 buildings, and numerous roads are vulnerable to a dam failure event.
- **Lane County:** None.
- **Meade County:** None.
- **Seward County:** None.

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with dam failure may include:

- Flooding
- Environmental degradation
- Damage to agricultural lands

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of community and state infrastructure. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 73: Dam or Levee Failure Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Heavy flooding can cause power loss, property damage, injury, and death, and the displacement of populations. Standing water can also pose a public health risk due to the reproduction of disease vectors such as mosquitos.
Impact on Responders	Heavy flooding may cause inaccessibility of roadways for first responders as well as damage of materials and resources. First responders will also have to facilitate evacuation measures to move people from the flooded area.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. Flooding caused by dam failure may create power outages, debris damage, and road closures.
Delivery of Services	Delivery of services may be disrupted due to flood-damaged bridges and roadways. The ability to deliver food, drinking water, and services will be heavily disrupted. Flooding may also interrupt communications and transportation due to power failure and accessibility changes.
Property, Facilities, and Infrastructure	Flooding from failures impact roads and bridges, businesses, hospitals, and other critical entities. Water and sewer systems may also be damaged. Homes and businesses may be completely destroyed if situated close to the failure point.
Impact on Environment	Flooding and moving debris can affect natural areas and wildlife, spreading pollution and hazardous materials. Ecosystems and natural habitats may be completely destroyed, causing migration or death of wildlife.
Economic Conditions	There is a fiscal impact on the government after a failure due to disruption of travel and commerce routes and employee’s ability to travel to work. Recourses at all levels are utilized impacting the ability to access resources long-term.

Table 73: Dam or Levee Failure Consequence Analysis

Subject	Potential Impacts
Public Confidence in Governance	Direct, immediate, and effective actions must be taken in order to maintain public confidence. Response activities must include all levels of government.

5.9.7 Future Development

Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Kansas Region D and the majority of participating jurisdictions have generally seen static to decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also initially slow and then decrease. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, is expected to increase the housing stock. However, adherence to building codes will provide any new construction a degree of hazard resiliency.

Future land use planning should be proactive to address future hazard conditions. Current building codes and zoning ordinances, where adopted and enforced, limit the locating of any new development, structures, or critical facilities and infrastructure within hazard areas.

5.9.8 Jurisdictional Risk and Vulnerability

The following table presents examples of potential actions that can be instituted for mitigating the dam failure hazard.

Table 74: Potential Dam or Levee Failure Mitigation Actions

Category	Example Action
Planning and Regulation	Advise the public about the local dam inundation areas and flood protection measures.
	Require a thorough watershed analysis for all proposed dam or reservoir projects.
	Establish a green infrastructure program to link, manage, and expand existing parks, preserves, greenways, etc.
	Take action to minimize the effects of flooding on people, property, and building contents through measures including flood warning, emergency response, and evacuation planning.
Infrastructure	Implement an inspection, maintenance, and enforcement program to help ensure continued structural integrity of dams.
	Routinely clean debris from support bracing underneath low-lying bridges.
	Remove dam and return to natural system.
Natural Systems	Develop an open space acquisition, reuse, and preservation plan targeting hazard areas.
	Preserve floodplain storage capacity by limiting or prohibiting the use of fill within the floodplain.
	Compensate an owner for partial rights, such as easement or development rights, to prevent a property from being developed.
Education	Educate the public about securing debris, propane tanks, yard items, or stored objects that may otherwise be swept away, damaged, or pose a hazard if picked up and washed away by floodwater.

Table 74: Potential Dam or Levee Failure Mitigation Actions

Category	Example Action
	Use outreach programs to advise homeowners of risks to life, health, and safety.
	Offer GIS hazard mapping online for residents and design professionals.

5.10 Drought

5.10.1 Hazard Description

Drought is defined as 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. It is, however, a normal, seasonal, and recurrent feature of climate that occurs in virtually all climate zones—typically in late spring through early fall. The duration of drought varies widely. There are cases when drought develops relatively quickly and lasts a very short period of time, exacerbated by extreme heat and/or wind, and there are other cases when drought spans multiple years, or even decades. 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

When below average, little or no rain falls, soil can dry out, and plants can die. If unusually dry weather persists and water supply problems develop, the period is defined as a drought. Human activity such as over-farming, excessive irrigation, deforestation, and poor erosion controls can exacerbate a drought's effects. It can take weeks or months before the effects of below average precipitation on bodies of water are observed. Depending upon the region, droughts can happen more quickly, and be noticed sooner, or have their effects naturally mitigated. The more humid and wet an area is, the faster the effects will be realized. A naturally dry region, which typically relies more on subsurface water, will take more time to actualize its effects.

Periods of drought can have significant environmental, agricultural, health, economic, and social consequences. The effects vary depending upon vulnerability and regional characteristics. Droughts can also reduce water quality through a decreased ability for natural rivers and streams to dilute pollutants and increase contamination. The most common effects are diminished crop yield, increased erosion, dust storms, ecosystem damage, reduced electricity production due to reduced flow through hydroelectric dams, shortage of water for industrial production, and increased risk of wildland fires.

5.10.2 Location and Extent

All of Kansas Region D, including all participating jurisdictions, is susceptible to drought conditions. However, the specific susceptibility to drought depends on various factors, including climate patterns, land use practices, and water management strategies.

Water is a critical resource for the residents, farmers, and industries of Kansas Region D. As a semi-arid region with limited natural surface water, the area relies heavily on groundwater for domestic, agricultural, and industrial needs. Understanding the sources of domestic water, its usage patterns, and the challenges faced in maintaining water security is essential for ensuring sustainable water management in the region.

The primary water source for Southwest Kansas is groundwater, primarily drawn from the Ogallala Aquifer, a vast underground reservoir that stretches across eight states. The Ogallala supplies most of the domestic, agricultural, and municipal water needs in the region, as surface water sources are scarce.

Some local rivers and reservoirs, such as the Arkansas River and the Cimarron River, provide additional but limited water supplies. While they contribute to water supply, they are highly dependent on precipitation. Local reservoirs and

ponds provide limited water storage but are primarily used for livestock and irrigation rather than domestic consumption.
Rural households and farms often rely on private wells or rural water districts that distribute water from well fields.

Overuse for irrigation and municipal needs has significantly lowered water levels in some parts of Kansas Region D. Additionally, climate change may exacerbate water shortages in the coming decades as the frequency of droughts will continue to reduce surface water availability and increase reliance on groundwater. The Kansas Water Office and local water districts have implemented long-term plans to reduce excessive groundwater withdrawal and promote sustainable usage.

Droughts are regularly monitored by multiple federal agencies using a number of different indices. One of the best indicators of historic drought periods is provided by the U.S. Drought Monitor. The U.S. Drought Monitor provides a summary of drought conditions across the United States, including Kansas Region D. Often described as a blend of art and science, the map is updated weekly by combining a variety of data-based drought indices and indicators, along with local expert input, into a single composite drought indicator. The following table details the U.S. Drought Monitor categories:

Table 75: U.S. Drought Monitor Categories

Rating	Described Condition	Possible Impacts
None	No drought conditions	None
D0	Abnormally Dry	• Short-term dryness slowing planting, growth of crops • Some lingering water deficits • Pastures or crops not fully recovered
D1	Moderate Drought	• Some damage to crops, pastures • Some water shortages developing • Voluntary water-use restrictions requested
D2	Severe Drought	• Crop or pasture loss likely • Water shortages are common • Water restrictions imposed
D3	Extreme Drought	• Major crop/pasture losses • Widespread water shortages or restrictions
D4	Exceptional Drought	• Exceptional and widespread crop/pasture losses • Shortages of water creating water emergencies

Source: U.S. Drought Monitor

In Kansas, there are 3 phased drought stages (Watch, Warning, and Emergency Stages) that mirror the stages used in the *Kansas 2007 Municipal Water Conservation Plan Guidelines*. Parameters monitored to determine the drought stage include the Standardized Precipitation Index, Percent of Normal Precipitation, Soil Moisture Percentile, Crop Moisture Index, Satellite Vegetative Health Index, and the 7-Day Median Flow Percentile. The stages identified consider impacts along with moisture/water resource conditions. Kansas drought response transitions from primarily local response under a Drought Watch, with increases in the State and Federal roles at the Drought Warning and Drought Emergency stages. The following table shows the drought stage descriptions and impacts as a combination of U.S. Drought Monitor and the Municipal Guidelines.

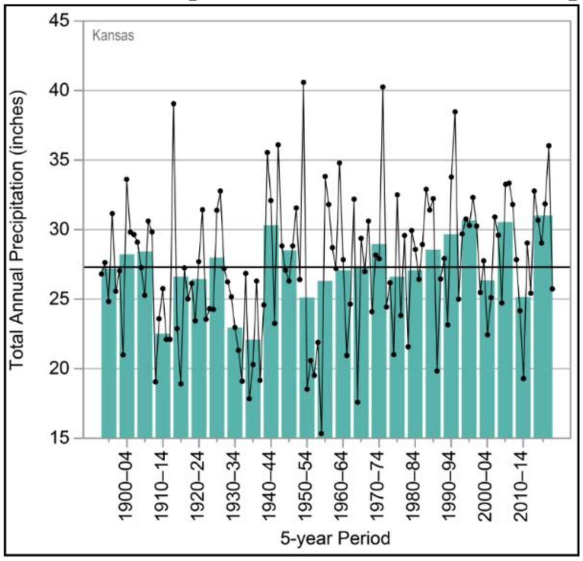
Table 76: Kansas Phased Drought Response Summary

Stage	U.S. Drought Monitor Description	Declared By	Possible Impacts	Response Summary
Drought Watch	Moderate Drought	Governor	Some damage to crops and pastures; high rangeland fire danger, streams or reservoirs low, serious public water system shortage not imminent, but likelihood of shortages growing.	Governor notified by Kansas Water Office, Governor's Drought Response Team activated, public notification, outdoor burning bans may be imposed; public water systems may implement Stage 1 Water Watch phase of municipal water conservation plan, Governor may request USDA disaster Declaration for drought.
Drought Warning	Severe Drought	Governor	Crop or pasture losses likely; some stock water shortages; very high rangeland fire danger; public water system water shortages present; some streamflow targets not met.	Public water systems may implement Stage 2 Water Warning phase of municipal water conservation plan; Hay and Pasture Exchange activated; urgent surplus water contracts from state-controlled storage authorized; Governor may request authorization for haying and grazing of Conservation Reserve Program acres; Governor may request USDA disaster declaration for drought.
Drought Emergency	Extreme and Exceptional Drought	Governor	Crop or pasture losses likely; some stock water shortages; very high rangeland fire danger; public water system water shortages present; some streamflow targets not met. reservoir supplies low.	Governor may declare outdoor burning ban upon advice of Adjutant General; public water systems may implement Stage 3 Water Emergency phase of municipal water conservation plans; emergency surplus water contracts from state-controlled storage authorized; emergency water withdrawals from USACE emergency water assistance; Governor may request Presidential disaster declaration and/or USDA disaster declaration for drought.

Source: Kansas Drought Operations Plan, Governors Drought Team

Precipitation data is collected by the NWS throughout the State of Kansas. Additional rainfall data is also collected by the NWS through citizen weather rainfall sites. The following graph indicates annual precipitation averages for Kansas from 1895 to 2020:

Graph 20: Kansas Region D Observed Annual Precipitation



Source: NOAA NCEI State Climate Summary 2022 for Kansas

The MPC view drought as not only a local or county hazard, but as a regional hazard as well. Discussions with the MPC and a review of all available data indicated that drought is a concern for all participating jurisdictions, with all jurisdictions having similar concerns. The following provides a narrative of the level of jurisdictional concern:

- **Clark County:** Drought identified as a community concern for all participating jurisdictions as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on both the surrounding agricultural community and on potential wildfire conditions.
- **Finney County:** Drought identified as a community concern for all participating jurisdictions as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on both the surrounding agricultural community and on potential wildfire conditions.
- **Ford County:** Drought identified as a community concern for all participating jurisdictions as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on both the surrounding agricultural community and on potential wildfire conditions.
- **Gray County:** Drought identified as a community concern for all participating jurisdictions as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on both the surrounding agricultural community and on potential wildfire conditions.
- **Haskell County:** Drought identified as a community concern for all participating jurisdictions as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on both the surrounding agricultural community and on potential wildfire conditions.
- **Hodgeman County:** Drought identified as a community concern for all participating jurisdictions as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on both the surrounding agricultural community and on potential wildfire conditions.

- **Lane County:** Drought identified as a community concern for all participating jurisdictions as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on both the surrounding agricultural community and on potential wildfire conditions.
- **Meade County:** Drought identified as a community concern for all participating jurisdictions as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on both the surrounding agricultural community and on potential wildfire conditions.
- **Seward County:** Drought identified as a community concern for all participating jurisdictions as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on both the surrounding agricultural community and on potential wildfire conditions.

5.10.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Kansas Region D has experienced no Presidential Disaster Declarations related to drought.

The following detail recent State of Kansas Executive Orders related to drought:

- **2022:** Governor Kelly signed Executive Order 22-03 declaring all counties within the State of Kansas as being in one of the 3 stages of drought.
- **2018:** Gov. Jeff Colyer signed Executive Order 18-11 declaring all counties within the State of Kansas as being in one of the 3 stages of drought.
- **2016**: Gov. Sam Brownback signed Executive Order 16-02 declaring all counties within the State of Kansas Drought Free.
- **2014-2015 –** Executive Order 14-04 declared all 105 counties into one the three stages of drought. This remained in place for over one year, through the end of June 2015. The conditions in 2015 made producers in 44 counties eligible for federal disaster programs due to drought conditions.

Comprehensive data on droughts, drought impacts, and drought forecasting is extremely limited and often inaccurate. Due to the complexity of drought monitoring and the large areas droughts impact, agencies have difficulty quantifying and standardizing drought data. One of the best indicators of historic drought periods is provided by the U.S. Drought Monitor, which lists weekly drought conditions for the Kansas Region D. Historical data was gathered from the U.S. Drought Monitor weekly reports for the 20-year period between 2005 and 2024. This data was compiled and aggregated to provide a yearly estimate of the percentage of Kansas Region D in each Drought Monitor category.

Table 77: Percentage Area in U.S. Drought Monitor Category, 2005 - 2024

Year	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
2024	39.5%	62.4%	34.9%	9.0%	0.1%	0.0%
2023	41.3%	58.7%	47.7%	44.3%	42.4%	38.2%
2022	0.0%	100.0%	100.0%	97.2%	83.4%	39.7%
2021	28.1%	71.9%	49.6%	14.8%	0.0%	0.0%
2020	0.0%	100.0%	91.8%	43.1%	9.0%	0.0%
2019	65.7%	36.2%	22.1%	15.0%	3.0%	0.0%
2018	47.9%	52.1%	47.2%	35.9%	10.9%	0.0%
2017	63.5%	36.5%	29.8%	24.7%	0.%0	0.0%
2016	61.9%	38.1%	20.2%	9.6%	0.0%	0.0%
2015	53.8%	46.2%	38.5%	34.3%	0.0%	0.0%
2014	0.0%	100.0%	100.0%	98.2%	32.0%	0.0%
2013	0.0%	100.0%	100.0%	100.0%	69.8%	60.9%
2012	7.2%	92.8%	75.2%	58.2%	51.3%	46.1%

Table 77: Percentage Area in U.S. Drought Monitor Category, 2005 - 2024

Year	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
2011	1.0%	99.0%	96.1%	74.9%	13.7%	0.0%
2010	81.1%	18.9%	13.3%	1.3%	0.0%	0.0%
2009	73.6%	26.4%	4.9%	0.0%	0.0%	0.0%
2008	10.1%	91.8%	50.1%	22.4%	5.4%	0.0%
2007	65.4%	34.6%	0.3%	0.0%	0.0%	0.0%
2006	9.5%	90.5%	68.1%	20.0%	4.0%	0.0%
2005	94.2%	5.8%	0.0%	0.0%	0.0%	0.0%

Source: U.S. Drought Monitor

The Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans available to producers suffering losses in those counties and in counties that are contiguous to a designated county. USDA Secretarial disaster designations must be requested of the Secretary of Agriculture by a governor or the governor's authorized representative, and there is an expedited process for drought. The following table represents the total number of Secretarial Disaster Declarations, by county, for the Kansas Region D:

Table 78: Secretarial Drought Disaster Declarations, 2019 -2024

County	2024	2023	2022	2021	2020	2019
Clark County	4	2	2	2	1	0
Finney County	5	1	3	1	2	0
Ford County	4	1	2	1	1	0
Gray County	4	1	2	0	2	0
Haskell County	4	1	1	1	3	0
Hodgeman County	3	1	2	0	1	0
Lane County	2	1	3	1	1	0
Meade County	4	2	2	2	4	0
Seward County	3	2	2	1	5	0

Source: USDA Farm Service Agency

The following table, using data from the USDS, indicates the annualized crop insurance paid per county for drought events from 2011-2021 (latest available data):

Table 79: Kansas Region D Total Drought Crop Insurance Paid per County, 2011-2021

Jurisdiction	Total Crop Insurance Paid
Clark County	$22,814,365
Finney County	$78,919,982
Ford County	$41,933,806
Gray County	$46,360,683
Haskell County	$30,964,376
Hodgeman County	$22,774,474
Lane County	$52,134,902
Meade County	$17,125,057
Seward County	$19,071,052

Source: FEMA NRI

5.10.4 Probability of Future Events

Historically, drought has affected Kansas Region D and all participating jurisdictions on a reoccurring basis. In reviewing historical data from the U.S. Drought Monitor weekly reports for Kansas Region D from 2005 through 2024 a weekly average can be created indicating the percentage time in each Drought Monitor category. This average can be used to extrapolate the potential likelihood of future drought conditions.

Table 80: Estimated Weekly Probability of Kansas Region D Being in U.S. Drought Monitor Category

None	D0-D4	D1-D4	D2-D4	D3-D4	D4
41.4%	58.9%	43.6%	28.4%	17.1%	7.1%

Data: U.S. Drought Monitor

The following table, using data from the USDA, indicates the annual crop insurance paid per county for drought events from 2011-2021 (latest available data):

Table 81: Kanas Region D Annual Drought Crop Insurance Paid per County, 2011-2021

Jurisdiction	Annual Crop Insurance Paid
Clark County	$2,281,437
Finney County	$7,891,998
Ford County	4,193,381
Gray County	$4,636,068
Haskell County	$3,096,438
Hodgeman County	$2,277,447
Lane County	$5,213,490
Meade County	$1,712,506
Seward County	$1,907,105

Source: FEMA NRI

Kansas Region D and all participating jurisdictions can experience rapid droughts, with a sudden onset of intense dry periods following a period of normal precipitation. While these conditions may last only a few months, they can result in agricultural losses, water supplies shortages, and low stream and river volume.

While predicting drought provides many challenges, NOAA's National Integrated Drought Information System provides the Drought Early Warning System to improve drought early warning capacity. The system is a network of regional and national partners that share information and coordinate actions to help communities in the Region Dope with drought. Developing and implementing the system allows Kansas and Kansas Region D to quickly respond to emerging drought conditions. Through developing regional systems, the National Integrated Drought Information System is building the foundation for a nationwide system to improve drought forecasting.

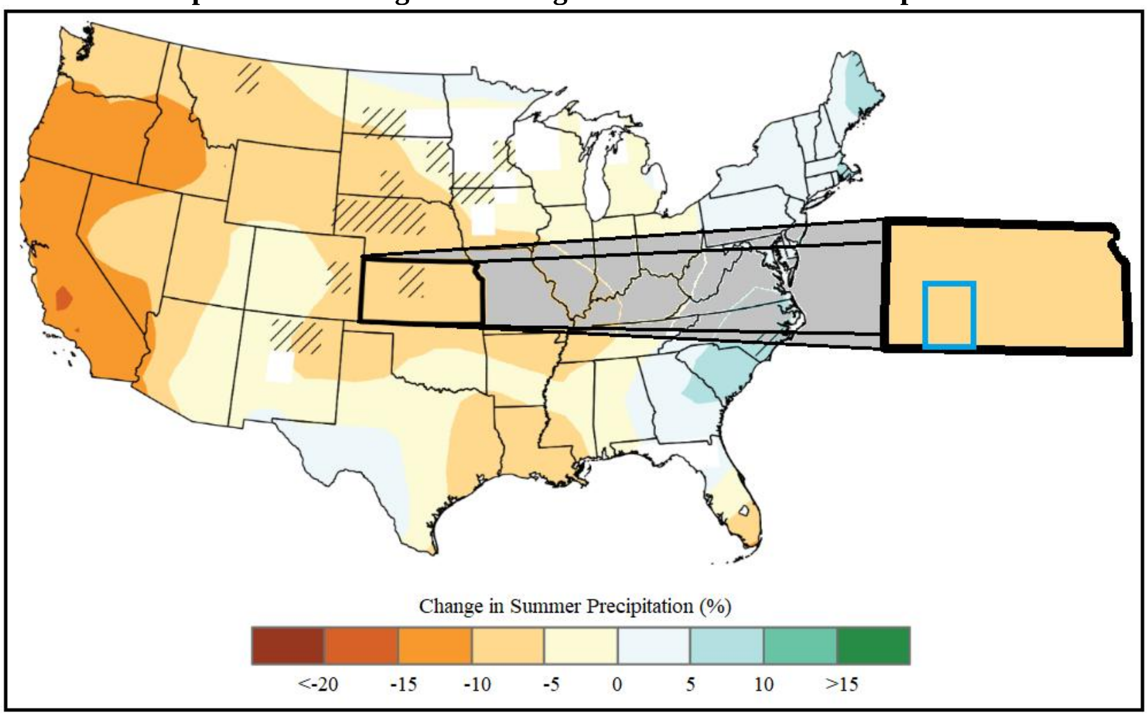
5.10.5 Projected Changes in Hazard Location, Intensity, Frequency, and Duration

According to the National Institutes of Health National Center for Biotechnology Information publication Global Drought Trends and Future Projections "Drought is one of the most difficult natural hazards to quantify and is divided into categories (meteorological, agricultural, ecological and hydrological), which makes assessing recent changes and future scenarios extremely difficult." However, using long term data estimates of future drought conditions can be determined through a combination of climate modeling, historical data analysis, and scientific assessments. This modelling takes into account factors such as temperature, precipitation, soil moisture, and other relevant variables.

Because rainfall plays an important role in the management of Kansas's complex water system, some of the most impactful droughts have coincided with years of abnormally low rainfall. The historical record indicates periodic prolonged wet and dry periods. Drought conditions can be exacerbated by warm temperatures. The record warmth in 2014 and 2015, in combination with multiple years of below average precipitation (, led to one of Kansas's most severe droughts.

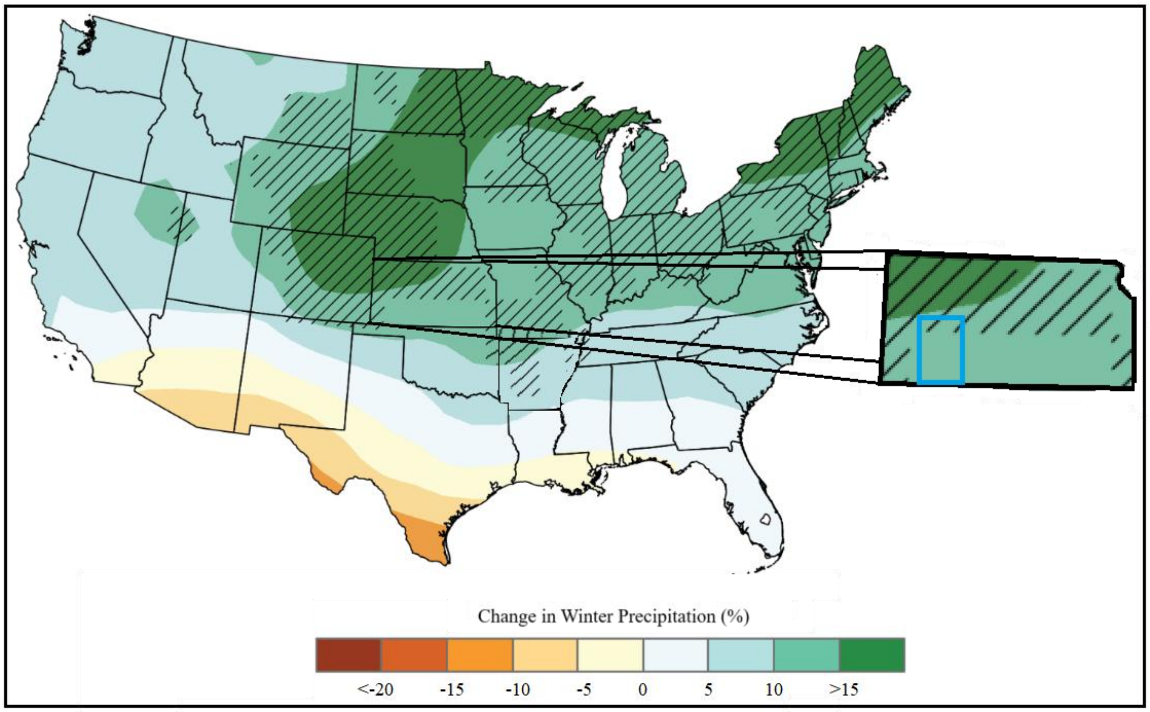
Current modelling from the NOAA State Climate Summary 2022 for Kansas suggests that summer precipitation is expected to decrease slightly while winter precipitation is projected to increase slightly in Kansas Region D and all participating jurisdictions, but these changes are small relative to the natural variability. The following maps indicate these expected precipitation changes for Kansas Region D and all participating jurisdictions:

Map 27: Kansas Region D Change in Annual Summer Precipitation



Source: NOAA NCEI State Climate Summary 2022 for Kansas
Note: Hatching represents areas where the majority of climate models indicate a statistically significant change.

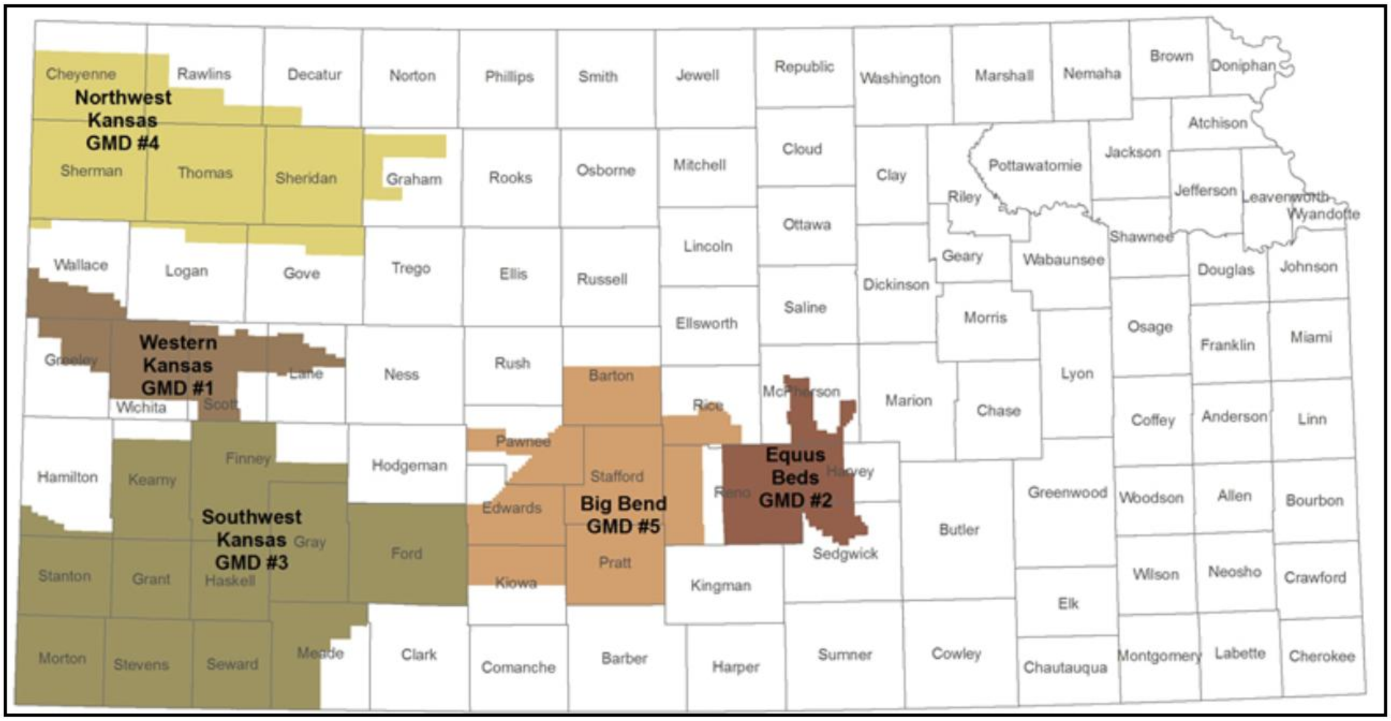
Map 28: Kansas Region D Change in Annual Winter Precipitation



Source: NOAA NCEI State Climate Summary 2022 for Kansas
Note: Hatching represents areas where the majority of climate models indicate a statistically significant change.

Regional Advisory Committees and local water suppliers are working to extend the usable lifetime of the Ogallala Aquifer for at least 25 years through the promotion of multiple Local Enhanced Management Areas, Water Conservation Areas and other incentive-based programs. The stated goal is to slow the depletion of the Ogallala Aquifer by 25% in 10 years, maximizing the opportunity to make use of emerging technologies. Additionally all parties are working to encourage conservation, find additional sources of water, and a place to store water for irrigation and re-charge.

Map 29: Regional Advisory Committees



Source: University of Kansas Institute for Policy and Social Research

5.10.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Kansas Region D and all participating jurisdictions from drought. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Kansas Region D and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 82: Participating Jurisdiction Drought Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Clark County	**All**	**Relatively Low**	**78.7**	**45.5**
Ashland, Englewood, and Minneola	967100	Relatively High	99.0	45.5
Finney County	**All**	**Relatively Moderate**	**96.4**	**58.1**
Holcomb	960100	Relatively High	99.8	59.5
Garden City	960200	Relatively Moderate	95.9	45.2
Garden City	960300	No Rating	0.0	42
Garden City	960401	No Rating	0.0	40.7
Garden City	960403	Very Low	74.0	40.7
Garden City	960404	Relatively Moderate	95.5	41.7
Garden City	960501	Relatively Low	91.9	42
Garden City	960503	Relatively Moderate	93.7	43
Garden City	960505	No Rating	0.0	41.7
Garden City	960507	No Rating	0.0	40.7
Garden City	960508	Very Low	77.7	40.7
Garden City	960600	Relatively Moderate	96.0	45.8

Table 82: Participating Jurisdiction Drought Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Ford County	**All**	**Relatively Moderate**	**91.6**	**41.3**
Spearville	961600	Relatively High	99.0	41
Bucklin and City of Ford	961700	Relatively High	99.3	43
Dodge City	961801	No Rating	0.0	31.2
Dodge City	961802	Relatively Moderate	96.0	31.2
Dodge City	961901	Very Low	77.8	31.2
Dodge City	961902	Relatively Low	92.8	37.5
Dodge City	962000	Relatively Moderate	94.4	32.8
Dodge City	962101	Very Low	80.7	31.2
Dodge City	962102	Relatively Moderate	93.9	31.2
Gray County	**All**	**Relatively Moderate**	**95.9**	**51**
Cimarron and Ingalls	962600	Relatively High	99.4	41
Copeland, Ensign, and Montezuma	962700	Relatively High	99.7	56
Haskell County	**All**	**Relatively Moderate**	**94.5**	**61.1**
Satanta and Sublette	463100	Relatively High	99.7	61.1
Hodgeman County	**All**	**Relatively Low**	**79.9**	**40.1**
Hanston and Jetmore	461100	Relatively High	99.0	40.1
Lane County	**All**	**Relatively Moderate**	**83.8**	**43.3**
Dighton	956600	Relatively High	99.3	43.3
Meade County	**All**	**Relatively Moderate**	**97.7**	**61.2**
Fowler and Plains	966600	Relatively High	99.8	61.4
City of Meade	966700	Relatively Moderate	97.0	55.7
Seward County	**All**	**Relatively Moderate**	**94.3**	**78.1**
Kismet	965600	Relatively High	99.7	78.3
Liberal	965700	Relatively Low	86.4	72.9
Liberal	965800	Relatively Low	92.2	73.5
Liberal	965900	Relatively Low	93.0	73.5
Liberal	966000	Relatively Low	91.2	73.2

Source: FEMA

Table 83: Participating Jurisdiction Drought Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Clark County	**All**	**Relatively Low**	**79.5**	**$235K**
Ashland, Englewood, and Minneola	967100	Relatively High	99.0	$235K
Finney County	**All**	**Relatively Moderate**	**58.1**	**$1.3M**
Holcomb	960100	Relatively High	99.8	$1.2M
Garden City	960200	Relatively Moderate	95.2	$27K
Garden City	960300	No Expected Annual Losses	0	0
Garden City	960401	No Expected Annual Losses	0	0
Garden City	960403	Very Low	73.9	$33
Garden City	960404	Relatively Moderate	94.9	$24K
Garden City	960501	Relatively Low	91.0	$6.8K
Garden City	960503	Relatively Moderate	93.8	$16K
Garden City	960505	No Expected Annual Losses	0	0
Garden City	960507	No Expected Annual Losses	0	0
Garden City	960508	Very Low	76.9	$105
Garden City	960600	Relatively Moderate	94.8	$23K
Ford County	**All**	**Relatively Moderate**	**93.4**	**$863K**

Table 83: Participating Jurisdiction Drought Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Spearville	961600	Relatively High	99.3	$338K
Bucklin and City of Ford	961700	Relatively High	99.5	$461K
Dodge City	961801	No Expected Annual Losses	0	0
Dodge City	961802	Relatively Moderate	95.0	$25K
Dodge City	961901	Very Low	77.3	$124
Dodge City	961902	Relatively Low	92.9	$12K
Dodge City	962000	Relatively Low	93.1	$13K
Dodge City	962101	Very Low	79.3	$225
Dodge City	962102	Relatively Low	31.2	$13K
Gray County	**All**	**Relatively Moderate**	**96.1**	**$1.2M**
Cimarron and Ingalls	962600	Relatively High	99.4	$398K
Copeland, Ensign, and Montezuma	962700	Relatively High	99.7	$778K
Haskell County	**All**	**Relatively Moderate**	**93.3**	**$851K**
Satanta and Sublette	463100	Relatively High	99.7	$851K
Hodgeman County	**All**	**Relatively Low**	**80.9**	**$263K**
Hanston and Jetmore	461100	Relatively High	99.1	$263K
Lane County	**All**	**Relatively Moderate**	**85.2**	**$364K**
Dighton	956600	Relatively High	99.3	$364K
Meade County	**All**	**Relatively Moderate**	**97.6**	**$1.8M**
Fowler and Plains	966600	Relatively High	99.8	$1.7M
City of Meade	966700	Relatively Moderate	97.4	$71K
Seward County	**All**	**Relatively Moderate**	**92.8**	**$802K**
Kismet	965600	Relatively High	99.7	$779K
Liberal	965700	Relatively Low	85.0	$1.2K
Liberal	965800	Relatively Low	91.6	$8.1K
Liberal	965900	Relatively Low	92.0	$9.1K
Liberal	966000	Relatively Low	89.7	$4.7K

Source: FEMA

Population

Droughts are rarely a direct cause of death, though the associated heat, dust, and stress can all contribute to increased mortality. However, 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. Water supply planning is the key to minimizing the effects of drought on the population. Public water suppliers should continue to work to identify vulnerabilities and develop infrastructure, conservation plans, and partnerships to reduce the likelihood of running out of water during a drought.

Additionally, the loss of community lifelines can have a direct economic impact on the population. As an overview, the May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report indicates the following loss values for community lifelines:

Table 84: Economic Impacts of Loss of Service Per Capita Per Day (in 2022 dollars)

Category	Loss
Loss of Wastewater Services	$66
Loss of Water Services	$138

Source: May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report

At greater risk may be the vulnerable populations and equity priority communities, including the especially young, the elderly, and those below the poverty level. Hazard occurrences can exacerbate existing vulnerabilities and create new challenges. Vulnerable populations may have pre-existing health conditions that make them more susceptible to heat-related illnesses and dehydration, both of which can be exacerbated during droughts. People on fixed incomes and with limited resources may face difficulties in adapting their homes to withstand hazard conditions or may lack financial resources to cope with the increased costs of food, water, and energy. Details concerning potentially vulnerable populations may be found in Section 3.4: Socially Vulnerable and At-Risk Populations.

Buildings and Structures

In general, buildings within all jurisdictions are not directly vulnerable to losses as a result of drought. However, there is a potential that building occupants could be impacted by power failures caused by either increased utility demand or damaged power delivery infrastructure. In addition, drinking water infrastructure may be specifically vulnerable to the impacts of drought. Any decrease in groundwater supplies would stress this infrastructure and may cause shortages or rationing.

Governmental Operations

Governmental operations and facilities will likely experience minimal impacts from drought conditions, unless there are substantial power, communications, or water outages. However, reduced water availability would likely have an immediate impact on firefighting efforts in urban and suburban areas as fire suppression equipment requires a minimum level of water pressure to activate.

Transportation and Electrical Infrastructure

Droughts can have numerous impacts on both transportation and electrical distribution systems, often leading to challenges that require proactive management. The impacts of droughts on transportation systems may include:

- **Cracking and Shifting:** Drought conditions can cause soil to dry out and shrink, leading to cracks and shifts in roadways, especially in areas with expansive clay soil. This can result in uneven surfaces, potholes, and damage to the structural integrity of roads, making them unsafe for use.
- **Roadbed Damage:** Low moisture levels can cause subsidence and roadbed instability, requiring more frequent road repairs and maintenance.
- **Soil Subsidence:** The foundations of bridges can be compromised if the surrounding soil dries out and shifts. This can increase the stress on bridge supports, potentially leading to structural issues that require costly repairs.
- **Track Shifting and Damage:** The ground beneath railroad tracks can shift or crack during prolonged droughts, leading to track misalignment or buckling. This increases the risk of derailments and requires more frequent inspection and maintenance.
- **Runway Damage:** The same soil subsidence issues that affect roadways can also impact runways, causing cracks and instability that may need repairs.

Additionally, drought can impact both the electrical generation capacity and transmission. The impacts of droughts on electrical systems may include:

- **Thermal Power Plant (Water-Cooled) Cooling Water Shortages:** Thermal power plants (such as coal, natural gas, and nuclear plants) rely on water for cooling. Drought can reduce the availability of water for these cooling processes, forcing plants to reduce output or shut down temporarily.
- **Damage to Power Lines:** Drought increases the risk of wildfires, which can damage or destroy electrical transmission lines, substations, and other infrastructure.
- **Preemptive Power Shutoffs:** To prevent wildfires, power utilities may preemptively shut down power lines during extreme drought and dry wind conditions to avoid sparking fires. This can lead to significant disruptions for businesses and residents.

- **Transmission Line Sag:** Droughts often coincide with extreme heat, which can cause power as the wires expand. This increases the risk of contact with trees or the ground, potentially leading to power outages or safety hazards.

Mapping concerning transportation and electrical infrastructure may be found in Section 3.9: Critical Infrastructure. Information concerning the costs to repair or reconstruct transportation and electrical infrastructure may be found in Section 5.9.6.

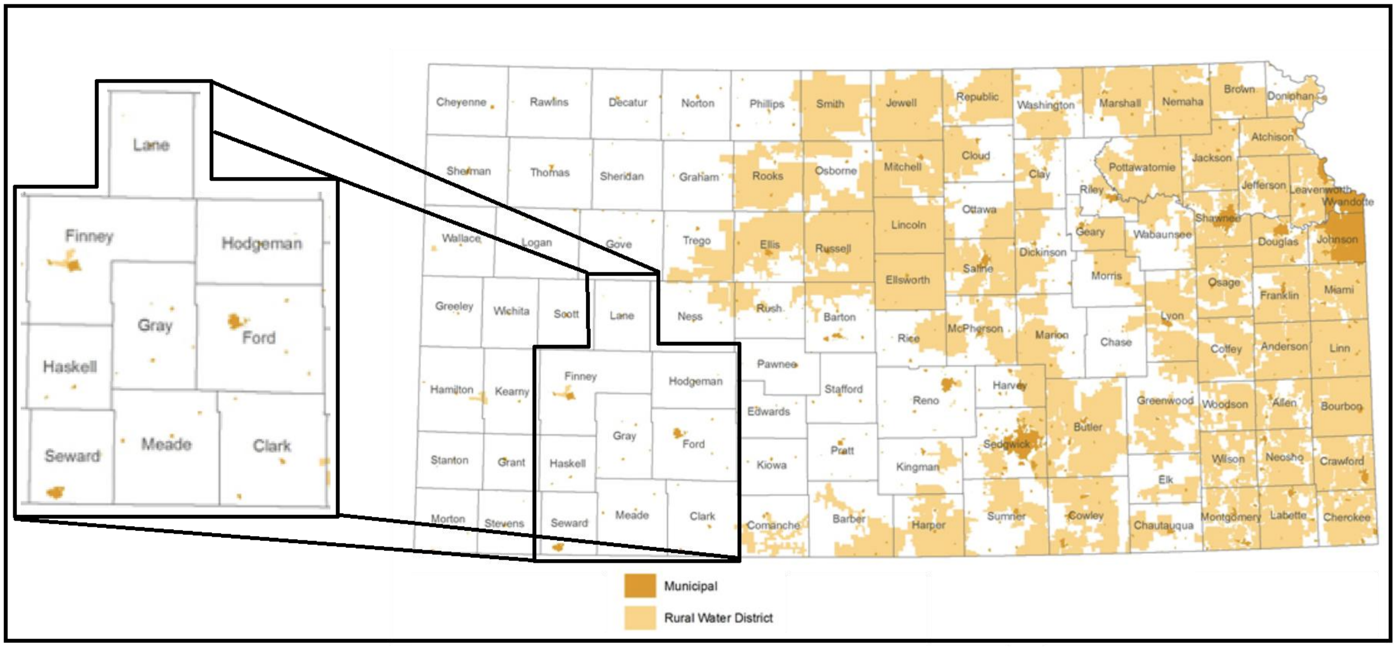
Water and Wastewater Utilities

Water utilities are particularly vulnerable to drought conditions due to the direct impact on both water availability and supply. Water utilities can be affected by drought through:

- **Reduced Water Availability:** The reduction in water availability directly impacts the amount of water that water utilities can draw from local sources.
- **Lower Reservoir Levels**: Lower reservoir levels can affect the ability to meet water demand during periods of high usage.
- **Declining Groundwater** Levels: Lower groundwater levels make it more challenging for utilities to extract water.
- **Water Quality Challenges:** Lower water levels can lead to higher concentrations of contaminants, minerals, and sediments in the available water sources, requiring more extensive and costly treatment processes.
- **Increased Treatment Costs:** Treating water from depleted or lower-quality sources during drought conditions may require additional treatment steps, technologies, or chemicals, leading to increased operational costs for water utilities.
- **Competition for Water Resources:** During droughts, there is increased competition for limited water resources among various users, including agriculture, industry, and households. Water utilities may face challenges in securing sufficient water supplies amid this heightened competition.
- **Impact on Water Infrastructure:** Reduced water flow in rivers and streams can expose water infrastructure, such as pipelines, to the risk of corrosion.
- **Water Use Restrictions:** To conserve water during droughts, authorities may implement water use restrictions and conservation measures.

In the State of Kansas, a public water supply system is defined by Kansas Statutes Annotated (K.S.A.) 65-162a and Kansas Administrative Regulations (K.A.R.) 28-15a-2 as a "system for delivery to the public of piped water for human consumption that has at least 10 service connections or regularly serves at least 25 individuals daily at least 60 days out of the year." These systems are regulated by the state to assure the citizenry safe and pathogen-free drinking water. Private domestic/residential groundwater wells are not considered public water supply systems and are not regulated by the section. The following map, from the University of Kansas Institute for Policy and Social Research, details the location of both municipal and rural water district suppliers:

Map 30: Kansas Region D Municipal and Rural Water District Water Suppliers



Source: University of Kansas Institute for Policy and Social Research

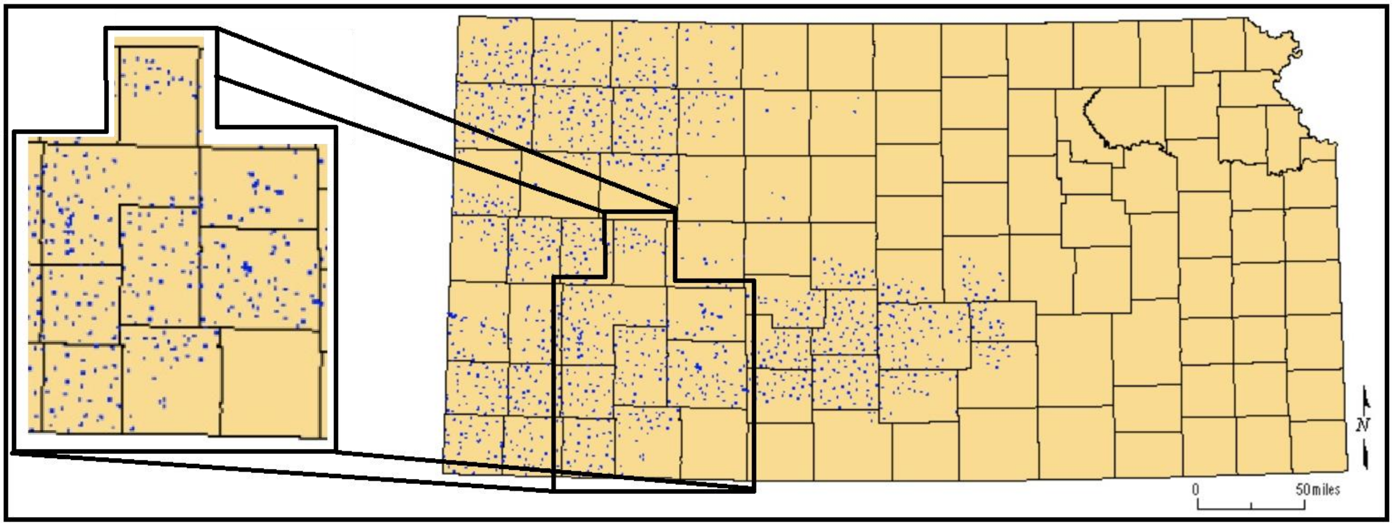
Drought can severely challenge a public water supplier through depletion of the raw water supply and greatly increased customer water demand. Even if the raw water supply remains adequate, problems due to limited treatment capacity or limited distribution system capacity may be encountered. Water supply planning is the key to minimizing the effects of drought on the population. Public water suppliers should continue to work to identify vulnerabilities and develop infrastructure, conservation plans, and partnerships to reduce the likelihood of running out of water during a drought.

Communities and citizens served by private wells rather than water supply districts may be at higher risk to drought conditions, and may see the following impacts:

- **Lowering of Water Table:** Drought conditions can lead to a lowering of the water table, which is the level at which groundwater is located. Private wells that rely on groundwater may experience reduced yields or, in extreme cases, may run dry.
- **Decreased Well Recharge:** Drought reduces the amount of precipitation, leading to decreased recharge of groundwater. Private wells depend on a sustainable recharge rate to maintain a consistent and reliable water supply.
- **Increased Competing Demands:** During a drought, increased water demand for agricultural irrigation, municipal water supply, and other uses can create competition for the available groundwater. Private wells may face challenges due to this increased demand.
- **Water Quality Concerns:** Lower groundwater levels during droughts can lead to changes in water quality. Concentrations of minerals, contaminants, and pollutants may increase, affecting the suitability of water for drinking and other uses.

Should it be required to drill a private well deeper to accommodate for drought conditions impacting the level of the water table, on average, the cost to drill a private water well in the United States can range from $15 to $45 per foot. However, it's important to note that this is a general estimate, and actual costs can vary based on geological and hydrogeological conditions and well depth. The following map, from the Kansas Geological Survey, indicates the location of water wells throughout Kansas Region D:

Map 31: Kansas Region D Water Wells



Source: Kansas Geological Survey

Additionally, drought can impact wastewater treatment facilities, and operations, including:

- **Biological Treatment Efficiency:** Many wastewater treatment plants use biological processes that rely on microorganisms to break down waste. These microorganisms depend on a certain balance of water, oxygen, and waste concentration to function effectively. During droughts, changes in the wastewater's composition and flow can reduce the efficiency of biological treatment systems, requiring process adjustments or additional chemical treatments.
- **Pipe Cracking and Ground Shifts:** Drought causes soil to dry out and shrink, potentially leading to ground shifts that can crack or damage underground sewer pipes. This can result in leaks, blockages, or sewer line failures that require costly repairs.
- **Increased Infiltration and Inflow:** During drought, groundwater levels may drop, and sewer systems can experience increased infiltration of saline or contaminated water, particularly in coastal areas. This can exacerbate the corrosion of pipes and other infrastructure.

The costs to repair or reconstruct water and wastewater utility plants and distribution systems can vary significantly based on factors such as the size of the facility, the extent of the damage, local labor costs, and material availability. However, some general estimates can provide insight into the typical expenses.

- **Water Utility Plants**
  - Minor repairs: These may involve fixes to pumps, valves, or small sections of piping. On average, minor repairs for water treatment facilities can range from $10,000 to $100,000, depending on the scale of the damage and the equipment involved.
  - Moderate repairs: More substantial repairs, such as fixing filtration systems or repairing damaged tanks, can cost anywhere from $500,000 to $2,000,000. These projects often involve replacing large equipment and reconfiguring damaged systems.
  - Major repairs or partial reconstruction: For significant damage, such as structural failures, system-wide overhauls, or upgrades, the cost may rise to $10,000,000. This typically includes substantial replacement of infrastructure, new piping systems, and modernizations to meet current standards.
  - Reconstruction Costs: Complete reconstruction of a water utility plant can be very expensive, often costing between $30,000,000 and $20,000,000, depending on the capacity of the plant and the complexity of the systems involved.

- **Wastewater Treatment Plants**
  - Minor repairs (such as fixing aerators, pumps, or control systems) can cost between $50,000 and $500,000, depending on the facility's size and the severity of the issues.
  - Moderate repairs: Involves fixing critical components like clarifiers or digesters and can range from $1,000,000 to $5,000,000.
  - Major repairs or upgrades: For larger systems, like upgrading an entire section of a plant or replacing significant infrastructure, the costs can escalate to $10,000,000.
  - Reconstruction Costs: Complete reconstruction of wastewater plants typically ranges between $50,000,000 and $30,000,000, depending on the plant's capacity and required technology. Factors such as meeting modern regulatory standards can also drive costs.
- **Distribution Systems (Water and Wastewater)**
  - Water Distribution System Repair Costs: Repairing or replacing damaged pipelines, pumps, or valves in water distribution systems can cost anywhere from $50,000 to $200,000 per mile for minor repairs. More extensive pipe replacement, especially in urban areas where digging and rerouting traffic are involved, can escalate to $500,000 to $2,000,000 per mile.
  - Wastewater Distribution Repair Costs: pipelines (especially those dealing with larger sewage systems) tend to have higher repair costs due to increased complexity. These can range from $1 million to $3 million per mile, especially in densely populated regions or for large diameter pipes.
  - Water Distribution Reconstruction Costs: For water distribution system reconstruction, costs can range from $1,000,000 to $5,000,000 per mile, particularly for high-capacity urban systems with large pipe diameters or advanced technology like smart metering.
  - Wastewater Distribution Reconstruction Costs: For wastewater system reconstruction, particularly for larger pipelines, the cost per mile can range from $3,000,000 to $8,000,000, depending on the urban density, excavation challenges, and regulatory requirements.

Medical and Response Facilities
In general, medical and response facilities are not directly vulnerable to losses as a result of drought. Both operations and facilities will likely experience minimal impacts from drought conditions, unless there are substantial power, communications, or water outages.

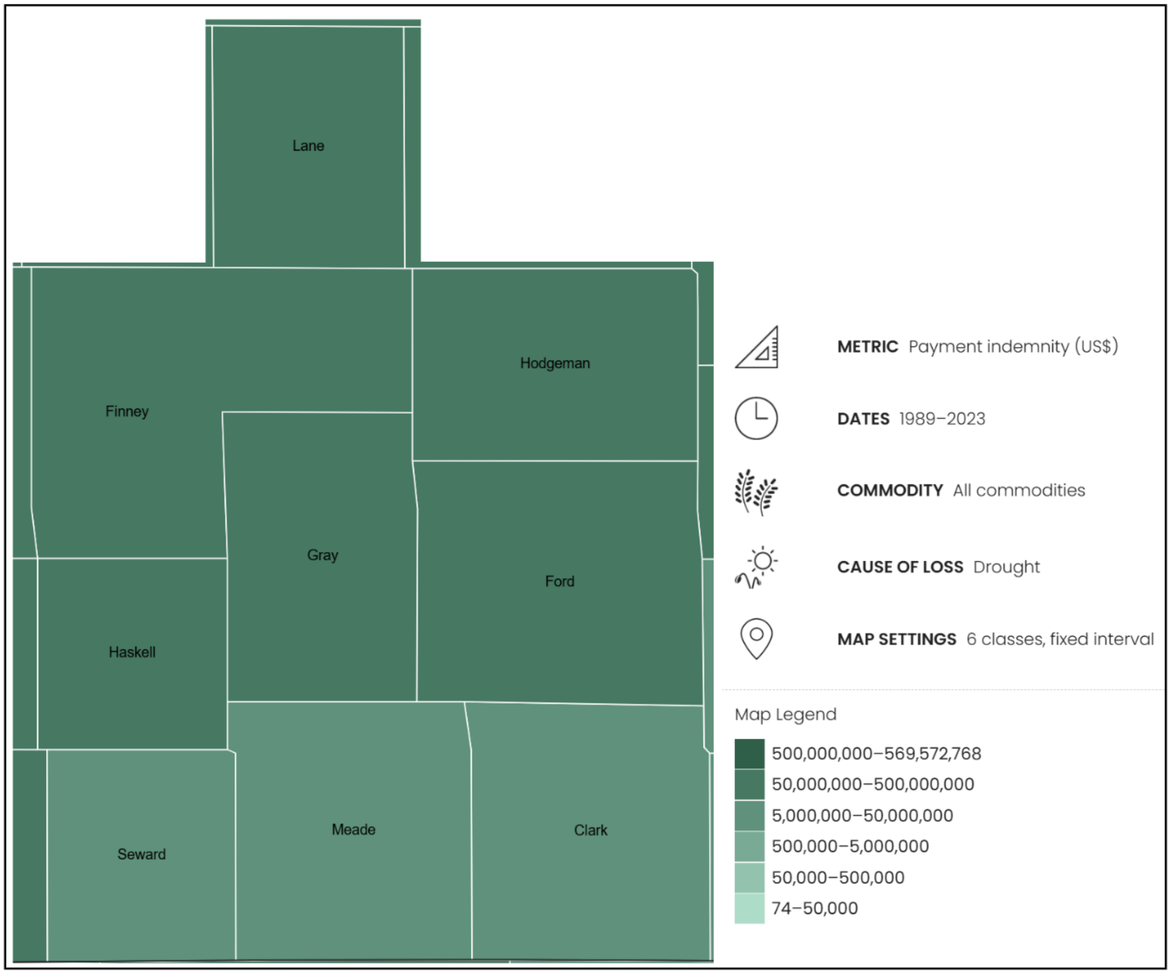
Educational Facilities
Educational facilities will likely experience minimal impacts from drought conditions.

Communication Systems
In general, communications systems are not directly vulnerable to losses as a result of drought, and would likely experience minimal impacts from drought conditions, unless there are substantial power outages.

Environmental and Agricultural Impacts
Drought conditions can cause significant agricultural impacts. In addition to obvious losses in yields in both crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and disease to forests and reduce growth. The incidence of wildfires increases substantially during extended droughts, which in turn places both human and wildlife populations at higher levels of risk.

The following map from the United States Department of Agriculture details total county-wide agricultural losses due to drought conditions from 1989 - 2023:

Map 32: Agricultural Losses Due to Drought Conditions, 1989 - 2023



Source: United States Department of Agriculture

Although environmental losses are difficult to quantify, increasing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects. Environmental losses are the result of damage to plant and animal species, wildlife habitat, and air and water quality, wildfires, degradation of landscape quality, loss of biodiversity, and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from it if it is a temporary aberration. However, the degradation of landscape quality, with increased soil erosion, may lead to a more permanent loss of biological productivity of the landscape.

Jurisdictional Concerns
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** With 10.5% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, with 264 farms, 560,252 acres in agriculture, $186,224,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of drought.

- **Finney County:** With 12.8% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, with 563 farms, 821,433 acres in agriculture, $1,112,314,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of drought.
- **Ford County:** With 11.8% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, 536 farms, 698,533 acres in agriculture, $667,781,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of drought.
- **Gray County:** With 4.6% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, 464 farms, 553,976 acres in agriculture, $1,271,532,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of drought.
- **Haskell County:** With 11.3% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, 199 farms, 334,602 acres in agriculture, $1,636,349,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of drought.
- **Hodgeman County:** With 11.3% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, 439 farms, 518,034 acres in agriculture, $226,540,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of drought.
- **Lane County:** With 12.4% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, 287 farms, 458,845 acres in agriculture, $332,189,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of drought.
- **Meade County:** With 8.7% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, 397 farms, 624,369 acres in agriculture, $390,750,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of drought.
- **Seward County:** With 14.0% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, 292 farms, 392,849 acres in agriculture, $398,022,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of drought.

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with drought may include:

- Decrease in water quality
- Increased wildfire risk
- Environmental degradation
- Land subsidence
- Damage to agricultural lands

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas

Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 85: Drought Consequence Analysis

Subject	Potential Impacts
Impact on the Public	If the drought coincides with warmer months, vulnerable populations may face an increased risk of dehydration, death, heat-related illness, heat stroke. Lower quantities of water may also increase the likelihood of contamination due to higher concentrations of bacteria. During droughts, dry soils and wildfires increase the number of airborne particles, such as pollen and smoke, which can worsen chronic respiratory illnesses.
Impact on Responders	Reduced water availability would likely complicate firefighting efforts in urban and suburban areas where wildfire-fighting tactics such as chemical retardants and controlled burns are less suitable. Some fire suppression equipment requires a minimum level of water pressure to activate. If the drought coincides with warm months, first responders may face increased risk of heat-related injuries or death.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. While the expectation is minimal, this threat may impact an agency's ability to implement their continuity plan based on the hazard's potential to impact power, communications, or water outages. Critical life-saving activities and fire suppression will be directly impacted by these outages.
Delivery of Services	Droughts may impact the delivery of goods and services if there are shortages of raw materials.
Property, Facilities, and Infrastructure	Drought conditions may threaten the levels or quality of municipal public water supplies or impact small communities and/or private potable water wells.
Impact on Environment	The potential of drought-related impacts could have significant impacts on supplies of animal feed, livestock, meat and dairy products, and processed grain products, and on crop production. Drought conditions may also increase the potential for fires. Drought is also associated with insect infestations, plant disease, wind erosion of soil, and decrease in levels of water produced by natural aquifers.
Economic Conditions	The economic impacts from a drought could be significant. Droughts have the potential to drain state, and local resources, which will have a significant fiscal impact on the local government.
Public Confidence in Governance	Droughts can adversely affect the public, first responders, infrastructure, agriculture, economy, and overall operations. Direct, effective, and timely response by all levels of government is required for public confidence in governance, especially in recognizing and mitigating economic impacts of the drought.

5.10.7 Future Development

Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Kansas Region D and the majority of participating jurisdictions have generally seen static to decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also initially slow and then decrease. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, is expected to increase the housing stock. However, adherence to building codes will provide any new construction a degree of hazard resiliency.

5.10.8 Mitigation Opportunities

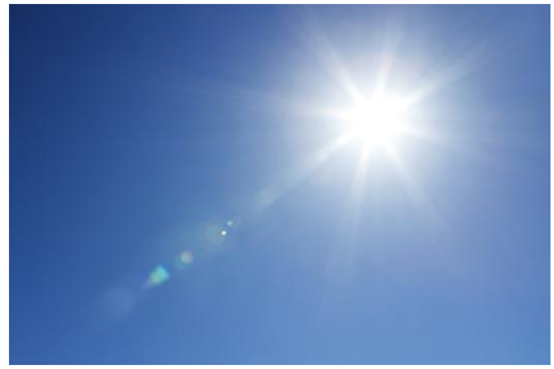
The following table presents examples of potential actions that can be instituted for mitigating the drought hazard.

Table 86: Example Drought Mitigation Actions

Category	Example Action
Planning and Regulation	Gather and analyze water and climate data to gain a better understanding of local climate and drought history.
	Identify available water supplies.
	Improve water supply monitoring.
	Develop a drought emergency plan.
	Develop criteria or triggers for drought-related actions.
	Develop a drought communication plan to facilitate timely communication of relevant information.
	Establish an irrigation time/scheduling program or process so that all agricultural land gets the required amount of water.
	Develop an ordinance to restrict the use of public water resources for non-essential usage.
	Adopt ordinances to prioritize or control water use, particularly for emergency situations like fire fighting
Infrastructure	Design water delivery systems to accommodate drought events.
	Develop new or upgrading existing water delivery systems to eliminate breaks and leaks
Natural Systems	Incorporate drought tolerance practices into landscape ordinances to reduce dependence on irrigation.
	Provide incentives for xeriscaping.
	Use permeable driveways and surfaces to reduce runoff and promote groundwater recharge
Education	Provide information on installing low-flow water saving showerheads and toilets.
	Provide information on adjusting sprinklers to water the lawn and not the sidewalk or street.
	Provide information on installing rain-capturing devices for irrigation.
	Encourage the installation of graywater systems in homes to encourage water reuse

5.11 Extreme Temperatures

5.11.1 Hazard Description



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.

The Centers for Disease Control and Prevention (CDC) identifies the following six groups as being especially vulnerable to extreme temperatures:

- Older Adults (aged 65)
- Infants and Children
- Individuals with Chronic Conditions
- Low-income Individuals
- Athletes
- Outdoor workers

5.11.2 Location & Extent

All of Kansas Region D is vulnerable to extreme temperatures. Based on the non-geographic specific aspect of this hazard, i.e., no one area is at a greater risk, all of the planning area's structural inventory and population is vulnerable.

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.

- **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 temperature norms.

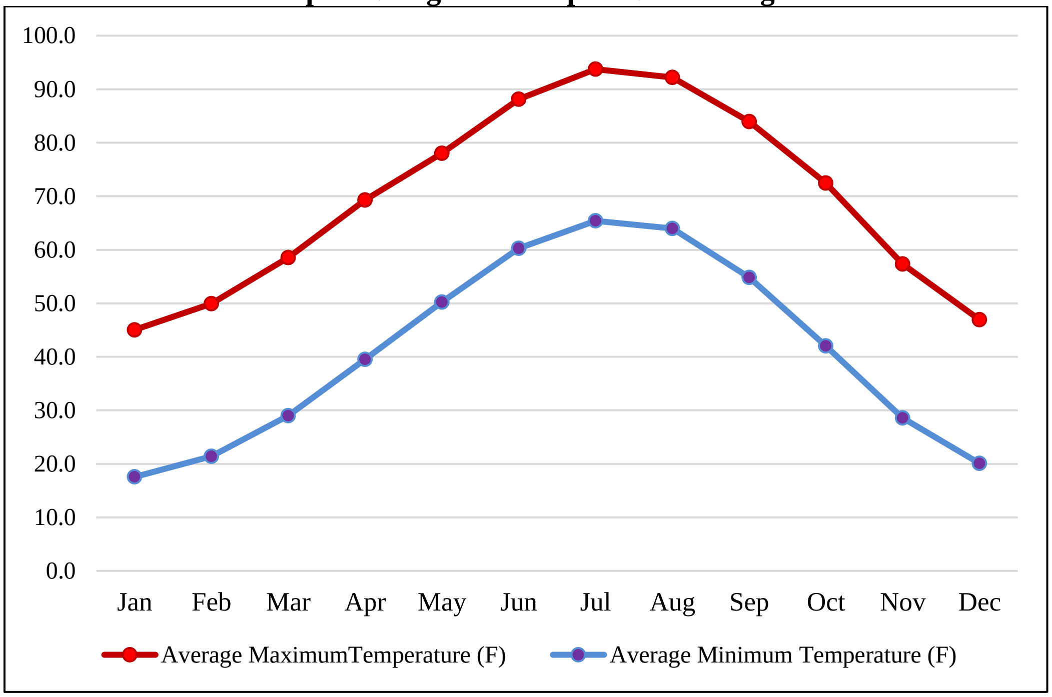
Table 87: Regional Average Temperatures

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Min 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 Max 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

The following graph illustrates the above data:

Graph 21: Regional Temperature Averages



Source: High Plains Regional Climate Center

The MPC view extreme heat as both a local and county-wide hazard. Discussions with the MPC and a review of all available data indicated that while extreme heat is a concern for all participating jurisdictions, some jurisdictions may have a greater concern. The following provides a narrative of the level of jurisdictional concern:

- **Clark County:** Extreme temperatures identified as a community concern for all jurisdictions as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat conditions may increase agricultural losses, drought conditions, and wildfire events.
- **Finney County:** Extreme temperatures identified as a community concern for all jurisdictions as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat conditions may increase agricultural losses, drought conditions, and wildfire events.
- **Ford County:** Extreme temperatures identified as a community concern for all jurisdictions as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat conditions may increase agricultural losses, drought conditions, and wildfire events.
- **Gray County:** Extreme temperatures identified as a community concern for all jurisdictions as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat conditions may increase agricultural losses, drought conditions, and wildfire events.
- **Haskell County:** Extreme temperatures identified as a community concern for all jurisdictions as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat conditions may increase agricultural losses, drought conditions, and wildfire events.
- **Hodgeman County:** Extreme temperatures identified as a community concern for all jurisdictions as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat conditions may increase agricultural losses, drought conditions, and wildfire events.

- **Lane County:** Extreme temperatures identified as a community concern for all jurisdictions as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat conditions may increase agricultural losses, drought conditions, and wildfire events.
- **Meade County:** Extreme temperatures identified as a community concern for all jurisdictions as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat conditions may increase agricultural losses, drought conditions, and wildfire events.
- **Seward County:** Extreme temperatures identified as a community concern for all jurisdictions as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat conditions may increase agricultural losses, drought conditions, and wildfire events.

5.11.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Kansas Region D has experienced no Presidential Disaster Declarations related to extreme heat. The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Kansas Region D has experienced no Emergency Declarations related to extreme heat.

Data from NOAA indicates the following historic temperatures for Kansas Region D and participating jurisdictions:

Table 88: 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

Additionally, data from the NCEI from 1950 through 2024 indicates the following recorded extreme temperature events. As these events tend to cover large areas, they are reported on a regional basis:

Table 89: Kansas Region D Extreme Temperature Events, 1950 - 2024

Event Type	Number of Events	Property Damage	Deaths	Injuries
Extreme Cold	2	$0	0	0
Excessive Heat	0	$0	0	0

Source: NOAA NCEI

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or National Weather Service (NWS) office. When reporting an event, the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Most of the events from NCEI are not associated with a federal emergency or disaster. If the event occurred at the same time as an event that was later determined to be a federal emergency or disaster, it is included with the NCEI data even if it occurred in a county not included in the federal declaration.

The following table, using data from the USDS, indicates the total crop insurance paid per county for extreme temperature events from 2016-2021 (latest available data):

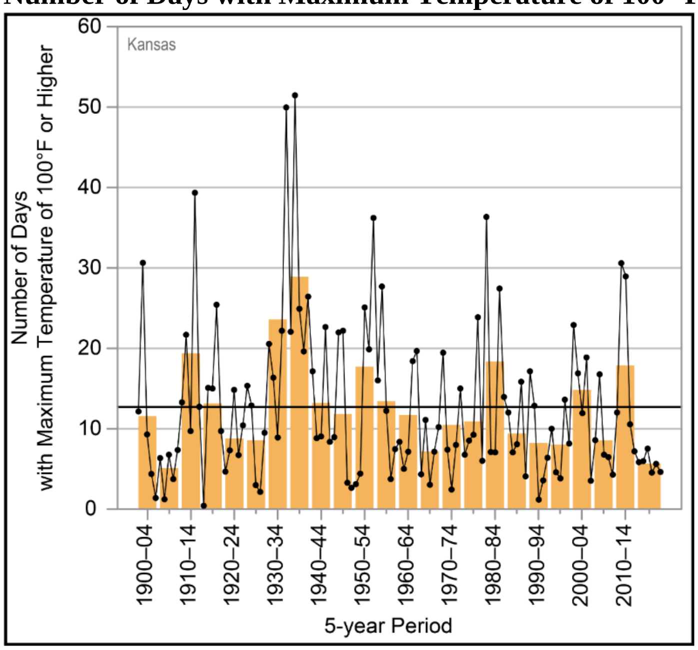
Table 90: Kanas Region D Extreme Temperature Total Crop Insurance Paid per County, 2016-2021

Jurisdiction	Total Crop Insurance Paid
Clark County	$363,790
Finney County	$5,233,634
Ford County	2,085,519
Gray County	$7,548,690
Haskell County	$2,654,834
Hodgeman County	$597,295
Lane County	$1,280,607
Meade County	$1,214,670
Seward County	$2,478,068

Source: FEMA NRI

The following graph details the annual number of hot days (maximum temperature of 100°F or higher) for Kansas from 1900 to 2020. Data indicates that since 2000, Kansas has experienced some of the highest springtime temperatures on record, while summer temperatures have been near to above average. The warmest summers on record were 1934 and 1936.

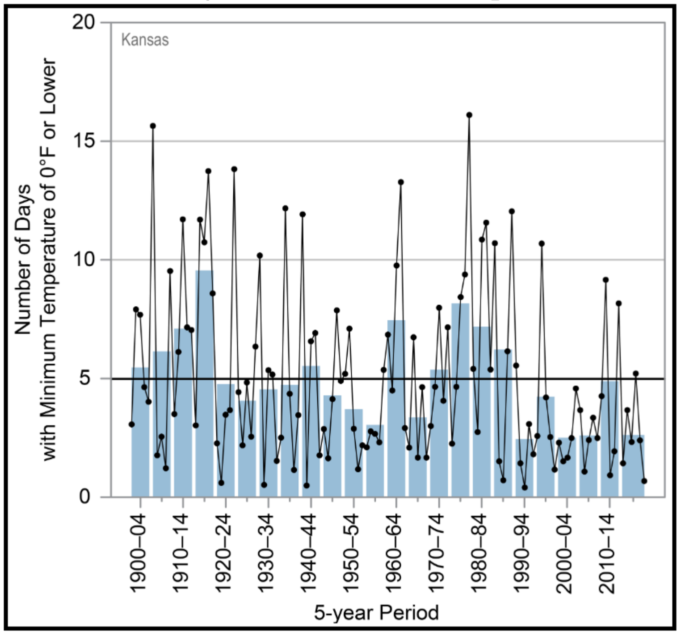
Graph 22: Number of Days with Maximum Temperature of 100° F or Higher



Source: NOAA NCEI State Climate Summary 2022 for Kansas

The following graph details the annual number of very cold days (minimum temperature of 0°F or lower) for Kansas from 1900 to 2020. Since 1990, Kansas has experienced a near to below average number of very cold nights, indicating of overall winter warming in the region:

Graph 23: Number of Days with Minimum Temperature of 0° F or Less

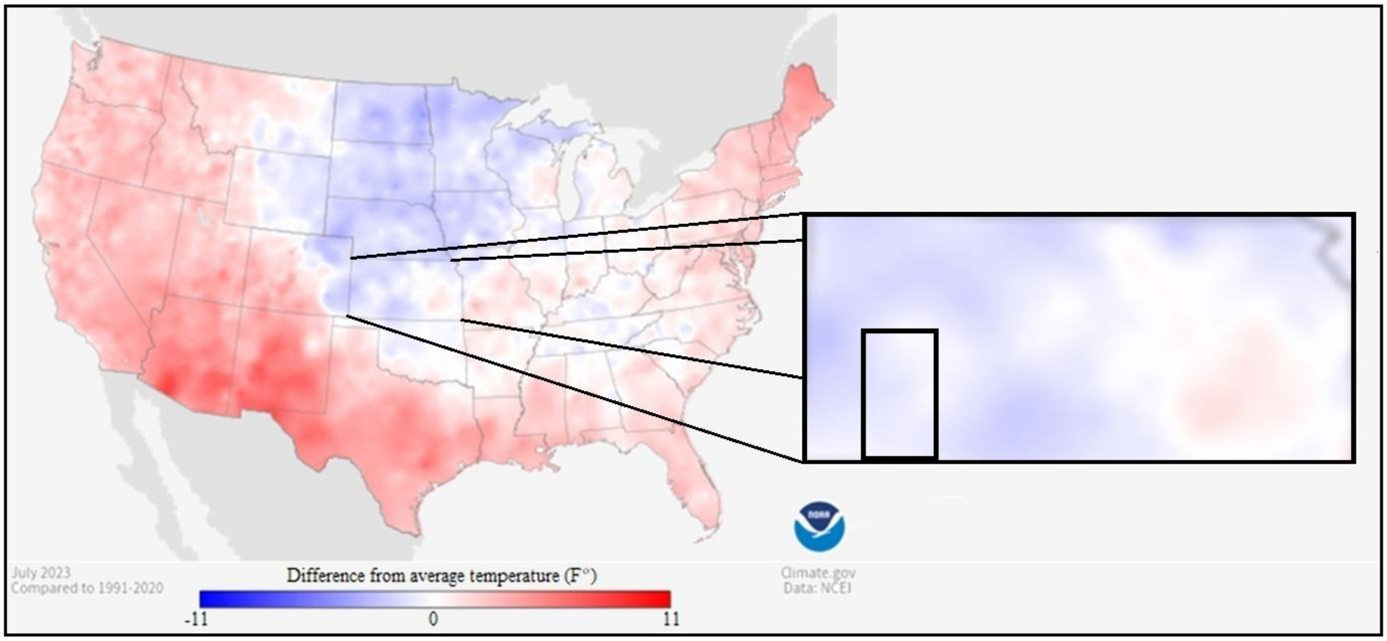


Source: NOAA NCEI State Climate Summary 2022 for Kansas

5.11.4 Probability of Future Events

Predicting the probability of extreme temperature occurrences is tremendously changing due to the large number of factors involved. Available data suggests that both the average high temperatures and the record high temperature will likely increase over the coming years as indicated by the following map:

Map 33: Kansas Region D Temperature Difference from Average, 1990 – 2020



Source: NOAA

Temperatures in Kansas Region D have risen by 1.5° F since the early 1900s, with the number of hot days above the long-term average since the 1990s. There is no long-term trend in very warm nights or extremely hot days, although both were slightly above average during the 2010–2014 period. The number of very cold nights has been mostly below average since 1990.

The following tables, using data from the NCEI, indicate the yearly probability of extreme heat and cold event, the number of deaths or injuries, and estimated property damage for all Kansas Region D participating jurisdictions based on 75 years' worth of reporting data:

Table 91: Kansas Region D NCEI Extreme Temperature Event Probability Summary

Event Type	Number of Events	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Cold	2	<1	0	<0	$0	$0
Heat	0	<0	0	0	$0	$0

Source: NCEI

The following table, using data from the USDA, indicates the annual crop insurance paid per county for extreme temperature events from 2016-2021 (latest available data):

Table 92: Kanas Region D Annual Extreme Temperature Crop Insurance Paid per County, 2016-2021

Jurisdiction	Annual Crop Insurance Paid
Clark County	$60,631
Finney County	$872,272
Ford County	347,587
Gray County	$1,258,115
Haskell County	$442,472
Hodgeman County	$99,549
Lane County	$213,435
Meade County	$202,445
Seward County	$413,022

Source: FEMA NRI

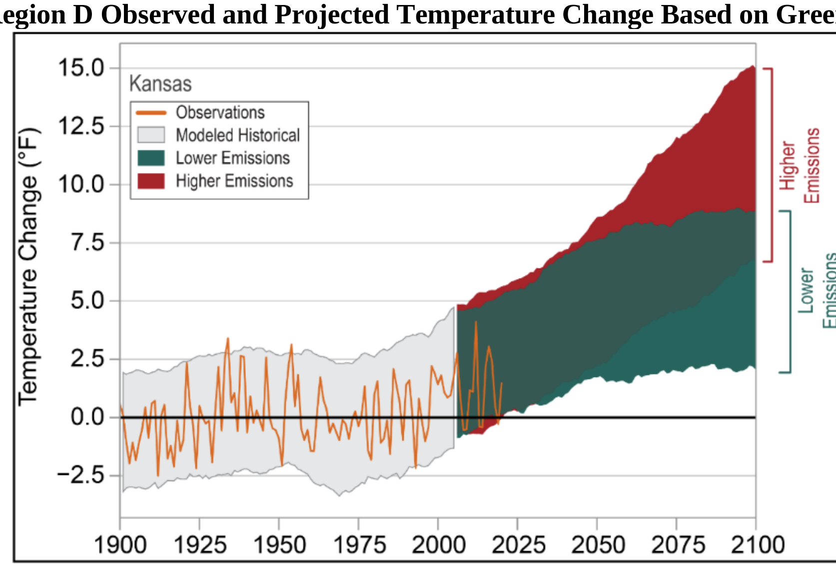
5.11.5 Projected Changes in Location, Intensity, Frequency, and Duration

When discussing extreme temperatures, climate change should be considered as it may markedly change future events. Recent climate modeling results indicate that extreme temperature events may become more common for Kansas Region D, especially heat. Recent multiyear periods have been among some of the warmest on record for Kansas, comparable to the extreme heat of the 1930s, when intense drought exacerbated hot summer conditions. Recent spring temperatures have been above average, which may have implications for crop planting. Summer temperatures have been near or above average since 2000, but there is no long-term trend in very warm nights or extremely hot days, although both are trending slightly above average. The number of very cold nights has been mostly below average since 1990, and the freeze-free season has also lengthened, averaging about nine days longer in this century than the 20th century average.

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. Additionally, rising temperatures can harm air quality and amplify existing threats to human health. Warmer weather can increase the production of ground-level ozone, a pollutant that causes lung and heart problems. Heat stress is expected to increase as climate change brings hotter summer temperatures and more humidity. Certain people are especially vulnerable, including children, the elderly, the sick, and those living below the poverty line.

The following graph indicates the projected temperature change for Kansas Region D utilizing two global climate models. One model utilizes information in which greenhouse gas emissions continue to increase (higher emissions), with the other model utilizing information in which greenhouse gas emissions increase at a slower rate (lower emissions). Temperatures in, detailed by the orange line, have risen 1.5° F since the beginning of the early 1900s. Based on both the higher emission and lower emission models, continued warming is projected throughout this century.

Graph 24: Kansas Region D Observed and Projected Temperature Change Based on Greenhouse Gas Emissions



Source: NOAA NCEI State Climate Summary 2022 for Kansas

5.11.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Kansas Region D and all participating jurisdictions from extreme heat. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Kansas Region D and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 93: Participating Jurisdiction Extreme Heat Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Clark County	**All**	**Very Low**	**20.4**	**0.1**
Ashland, Englewood, and Minneola	967100	Relatively Low	32.4	0.1
Finney County	**All**	**No Rating**	**0.0**	**0.0**
Holcomb	960100	No Rating	0.0	0.0
Garden City	960200	No Rating	0.0	0.0
Garden City	960300	No Rating	0.0	0.0
Garden City	960401	No Rating	0.0	0.0
Garden City	960403	No Rating	0.0	0.0
Garden City	960404	No Rating	0.0	0.0
Garden City	960501	No Rating	0.0	0.0
Garden City	960503	No Rating	0.0	0.0
Garden City	960505	No Rating	0.0	0.0
Garden City	960507	No Rating	0.0	0.0
Garden City	960508	No Rating	0.0	0.0
Garden City	960600	No Rating	0.0	0.0
Ford County	**All**	**No Rating**	**83.9**	**0.0**
Spearville	961600	No Rating	0.0	0.0
Bucklin and City of Ford	961700	No Rating	0.0	0.0
Dodge City	961801	No Rating	0.0	0.0
Dodge City	961802	No Rating	0.0	0.0
Dodge City	961901	No Rating	0.0	0.0
Dodge City	961902	No Rating	0.0	0.0
Dodge City	962000	No Rating	0.0	0.0
Dodge City	962101	No Rating	0.0	0.0
Dodge City	962102	No Rating	0.0	0.0
Gray County	**All**	**No Rating**	**0.0**	**0.0**
Cimarron and Ingalls	962600	No Rating	0.0	0.0
Copeland, Ensign, and Montezuma	962700	No Rating	0.0	0.0
Haskell County	**All**	**No Rating**	**0.0**	**0.0**
Satanta and Sublette	463100	No Rating	0.0	0.0
Hodgeman County	**All**	**No Rating**	**0.0**	**0.0**
Hanston and Jetmore	461100	No Rating	0.0	0.0
Lane County	**All**	**No Rating**	**0.0**	**0.0**
Dighton	956600	No Rating	0.0	0.0
Meade County	**All**	**No Rating**	**0.0**	**0.0**
Fowler and Plains	966600	No Rating	0.0	0.0
City of Meade	966700	No Rating	0.0	0.0
Seward County	**All**	**No Rating**	**0.0**	**0.0**
Kismet	965600	No Rating	0.0	0.0
Liberal	965700	No Rating	0.0	0.0
Liberal	965800	No Rating	0.0	0.0
Liberal	965900	No Rating	0.0	0.0
Liberal	966000	No Rating	0.0	0.0

Source: FEMA NRI

Table 94: Participating Jurisdiction Extreme Heat Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Clark County	**All**	**Very Low**	**22.5**	**$2.7K**
Ashland, Englewood, and Minneola	967100	Relatively Low	32.8	$2.7K
Finney County	**All**	**No Expected Annual Losses**	**0.0**	**0.0**
Holcomb	960100	Very High	0.0	0.0
Garden City	960200	No Expected Annual Losses	0.0	0.0
Garden City	960300	No Expected Annual Losses	0.0	0.0
Garden City	960401	No Expected Annual Losses	0.0	0.0
Garden City	960403	No Expected Annual Losses	0.0	0.0
Garden City	960404	No Expected Annual Losses	0.0	0.0
Garden City	960501	No Expected Annual Losses	0.0	0.0
Garden City	960503	No Expected Annual Losses	0.0	0.0
Garden City	960505	No Expected Annual Losses	0.0	0.0
Garden City	960507	No Expected Annual Losses	0.0	0.0
Garden City	960508	No Expected Annual Losses	0.0	0.0
Garden City	960600	No Expected Annual Losses	0.0	0.0
Ford County	**All**	**No Expected Annual Losses**	**0.0**	**0.0**
Spearville	961600	No Expected Annual Losses	0.0	0.0
Bucklin and City of Ford	961700	No Expected Annual Losses	0.0	0.0
Dodge City	961801	No Expected Annual Losses	0.0	0.0
Dodge City	961802	No Expected Annual Losses	0.0	0.0
Dodge City	961901	No Expected Annual Losses	0.0	0.0
Dodge City	961902	No Expected Annual Losses	0.0	0.0
Dodge City	962000	No Expected Annual Losses	0.0	0.0
Dodge City	962101	No Expected Annual Losses	0.0	0.0
Dodge City	962102	No Expected Annual Losses	0.0	0.0
Gray County	**All**	**No Expected Annual Losses**	**0.0**	**0.0**
Cimarron and Ingalls	962600	No Expected Annual Losses	0.0	0.0
Copeland, Ensign, and Montezuma	962700	No Expected Annual Losses	0.0	0.0
Haskell County	**All**	**No Expected Annual Losses**	**0.0**	**0.0**
Satanta and Sublette	463100	No Expected Annual Losses	0.0	0.0
Hodgeman County	**All**	**No Expected Annual Losses**	**0.0**	**0.0**
Hanston and Jetmore	461100	No Expected Annual Losses	0.0	0.0
Lane County	**All**	**No Expected Annual Losses**	**0.0**	**0.0**
Dighton	956600	No Expected Annual Losses	0.0	0.0
Meade County	**All**	**No Expected Annual Losses**	**0.0**	**0.0**
Fowler and Plains	966600	No Expected Annual Losses	0.0	0.0
City of Meade	966700	No Expected Annual Losses	0.0	0.0
Seward County	**All**	**No Expected Annual Losses**	**0.0**	**0.0**
Kismet	965600	No Expected Annual Losses	0.0	0.0
Liberal	965700	No Expected Annual Losses	0.0	0.0
Liberal	965800	No Expected Annual Losses	0.0	0.0
Liberal	965900	No Expected Annual Losses	0.0	0.0
Liberal	966000	No Expected Annual Losses	0.0	0.0

Table 95: Participating Jurisdiction Cold Wave Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Clark County	**All**	**Relatively Moderate**	**61.8**	**0.3**
Ashland, Englewood, and Minneola	967100	Relatively High	98.9	0.3

Table 95: Participating Jurisdiction Cold Wave Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Finney County	**All**	**Relatively High**	**89.1**	**0.4**
Holcomb	960100	Very High	99.7	0.4
Garden City	960200	Relatively High	96.0	0.4
Garden City	960300	Relatively Moderate	89.2	0.4
Garden City	960401	Relatively Moderate	79.1	0.4
Garden City	960403	Relatively Moderate	85.4	0.4
Garden City	960404	Relatively High	93.0	0.4
Garden City	960501	Relatively Moderate	89.6	0.4
Garden City	960503	Relatively Moderate	85.8	0.4
Garden City	960505	Relatively Moderate	80.9	0.4
Garden City	960507	Relatively Moderate	85.6	0.4
Garden City	960508	Relatively High	90.3	0.4
Garden City	960600	Relatively High	95.7	0.4
Ford County	**All**	**Relatively High**	**83.9**	**0.4**
Spearville	961600	Relatively High	94.9	0.4
Bucklin and City of Ford	961700	Relatively High	98.6	0.4
Dodge City	961801	Relatively High	91.7	0.4
Dodge City	961802	Relatively High	94.9	0.4
Dodge City	961901	Relatively Low	92.3	0.4
Dodge City	961902	Relatively High	91.3	0.4
Dodge City	962000	Relatively High	95.3	0.4
Dodge City	962101	Relatively High	94.5	0.4
Dodge City	962102	Relatively High	91.4	0.4
Gray County	**All**	**Relatively High**	**83.7**	**0.4**
Cimarron and Ingalls	962600	Relatively High	98.6	0.4
Copeland, Ensign, and Montezuma	962700	Very High	99.7	0.4
Haskell County	**All**	**Very High**	**96.9**	**0.4**
Satanta and Sublette	463100	Very High	100.0	0.4
Hodgeman County	**All**	**Relatively Low**	**53.4**	**0.4**
Hanston and Jetmore	461100	Relatively High	97.3	0.4
Lane County	**All**	**Relatively Low**	**48.4**	**0.5**
Dighton	956600	Relatively High	95.2	0.5
Meade County	**All**	**Relatively Moderate**	**81.4**	**0.4**
Fowler and Plains	966600	Very High	99.7	0.4
City of Meade	966700	Relatively Moderate	83.8	0.4
Seward County	**All**	**Relatively High**	**91.8**	**0.4**
Kismet	965600	Very High	99.9	0.4
Liberal	965700	Relatively High	95.2	0.4
Liberal	965800	Relatively High	91.0	0.4
Liberal	965900	Relatively High	96.2	0.4
Liberal	966000	Relatively High	92.8	0.4

Source: FEMA NRI

Table 96: Participating Jurisdiction Cold Wave Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Clark County	**All**	**Relatively Moderate**	**63.5**	**$129K**
Ashland, Englewood, and Minneola	967100	Relatively High	99.0	$129K
Finney County	**All**	**Relatively High**	**87.5**	**$546K**

Table 96: Participating Jurisdiction Cold Wave Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Holcomb	960100	Very High	99.7	$315K
Garden City	960200	Relatively High	94.1	$44K
Garden City	960300	Relatively Moderate	86.1	$18K
Garden City	960401	Relatively Moderate	80.8	$12K
Garden City	960403	Relatively Moderate	84.6	$16K
Garden City	960404	Relatively High	90.8	$29K
Garden City	960501	Relatively Moderate	86.5	$19K
Garden City	960503	Relatively Moderate	85.8	$18K
Garden City	960505	Relatively Moderate	77.8	$9.9K
Garden City	960507	Relatively Moderate	79.4	$11K
Garden City	960508	Relatively Moderate	87.1	$20K
Garden City	960600	Relatively High	92.2	$34K
Ford County	**All**	**Relatively Moderate**	**83.7**	**$405K**
Spearville	961600	Relatively High	96.9	$68K
Bucklin and City of Ford	961700	Relatively High	99.0	$134K
Dodge City	961801	Relatively Moderate	90.6	$28K
Dodge City	961802	Relatively High	91.9	$32K
Dodge City	961901	Relatively Moderate	90.7	$28K
Dodge City	961902	Relatively High	91.4	$31K
Dodge City	962000	Relatively High	92.1	$33K
Dodge City	962101	Relatively High	90.8	$28K
Dodge City	962102	Relatively Moderate	88.3	$22K
Gray County	**All**	**Relatively Moderate**	**83.7**	**$405K**
Cimarron and Ingalls	962600	Relatively High	98.7	$111K
Copeland, Ensign, and Montezuma	962700	Very High	99.6	$294K
Haskell County	**All**	**Relatively Low**	**96.0**	**$1.5M**
Satanta and Sublette	463100	Very High	100.0	$1.5M
Hodgeman County	**All**	**Relatively Low**	**56.2**	**$78K**
Hanston and Jetmore	461100	Relatively High	97.5	$78K
Lane County	**All**	**Relatively Low**	**51.0**	**$55K**
Dighton	956600	Relatively High	95.7	$55K
Meade County	**All**	**Relatively Moderate**	**80.0**	**$324K**
Fowler and Plains	966600	Very High	99.7	$306K
City of Meade	966700	Relatively Moderate	86.2	$19K
Seward County	**All**	**Relatively High**	**89.9**	**$667K**
Kismet	965600	Very High	99.9	$544K
Liberal	965700	Relatively High	92.3	$34K
Liberal	965800	Relatively High	89.2	$24K
Liberal	965900	Relatively High	93.9	$42K
Liberal	966000	Relatively Moderate	88.7	$23K

Source: FEMA

Population

A primary concern with this hazard is human health safety issues, as extreme heat can be a direct cause of death to citizens of all jurisdictions within the county. Specific at-risk groups include outdoor workers, farmers, young children, and senior citizens. Impacts on human health can include:

- **Heat Exhaustion and Heat Stroke:** Prolonged exposure to high temperatures can lead to heat exhaustion, characterized by heavy sweating, weakness, and dizziness. If untreated, it can escalate to heat stroke, a life-threatening condition with symptoms like confusion, high body temperature, and loss of consciousness.
- **Respiratory Issues:** High temperatures can worsen air quality, increasing levels of ozone and allergens, which can exacerbate asthma and other respiratory conditions.
- **Cardiovascular Strain:** Extreme heat can put additional stress on the heart, increasing the risk of heart attacks and other cardiovascular problems, particularly in older adults.
- **Dehydration:** Heat can lead to increased fluid loss through sweating, which can result in dehydration, affecting bodily functions and overall health.

The following table discusses potential impacts on human health related to excessive heat by temperature range:

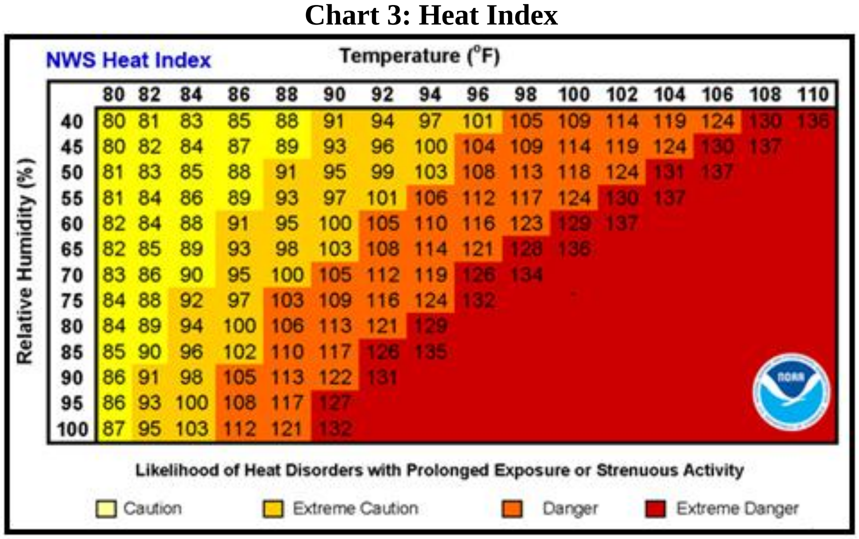
Table 97: Extreme Heat Impacts on Human Health

Heat Index 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
105-130° F	Heatstroke/sunstroke is highly likely with continued exposure

Source: National Weather Service Heat Index Program

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 chart, from the NWS, indicates Heat Index values.

Chart 3: Heat Index



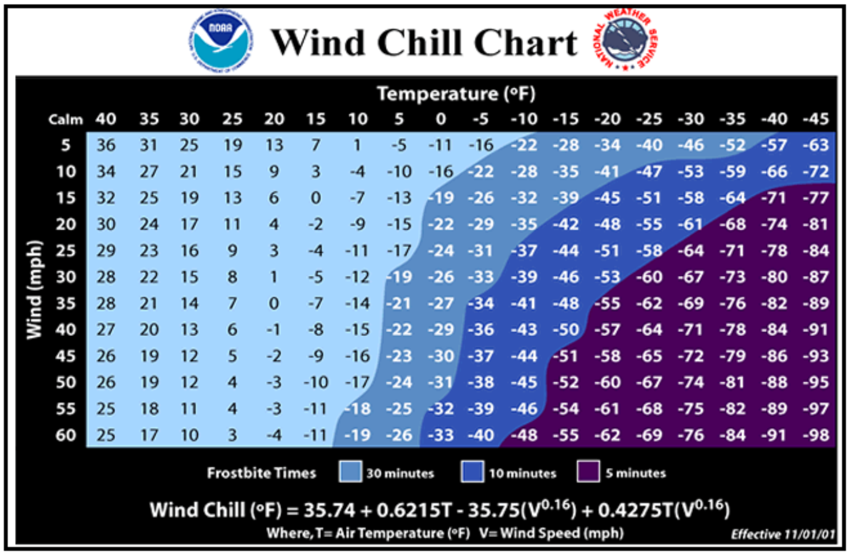
Source: NWS

Extreme cold temperatures can result in a variety of concerns, including:

- **Frostbite:** The freezing of skin and the body tissue just beneath it
- **Hypothermia**: Dangerously low body temperature (and the most common winter weather killer)

When extremely cold temperatures are accompanied by strong winds the result can be potentially lethal wind chills. Wind chill is the temperature your body feels when the air temperature is combined with the wind speed and is based on the rate of heat loss from exposed skin caused by the effects of wind and cold. As the speed of the wind increases, it can carry heat away from your body much more quickly, causing skin temperature to drop. The wind chill chart shows the difference between the actual air temperature and the perceived temperature due to wind, and amount of time until frostbite occurs.

Chart 4: Wind Chill Chart



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

Source: NOAA

Extreme temperatures may disproportionately affect socially vulnerable populations, exacerbating pre-existing inequalities and making recovery more difficult for these groups. Extreme temperatures may disproportionately impact vulnerable populations in the following ways:

- **Elderly Individuals:** Older adults often have reduced physiological resilience to extreme temperatures due to age-related factors and chronic health conditions, making them more susceptible to temperature-related illnesses.
- **Children: Young** children are less able to regulate their body temperature and are at a higher risk to temperature-related illnesses.
- **Low-Income Communities:** Those in low-income neighborhoods may lack access to air conditioning, heating, adequate housing, or resources to stay temperate, increasing their risk during extreme temperature events.
- **People with Chronic Health Conditions:** Individuals with cardiovascular, respiratory, or other chronic health issues may face heightened risks from extreme temperatures, as their bodies may struggle to cope with outside the norm temperatures.
- **Homeless Individuals:** People experiencing homelessness often have limited access to shelter and cooling or heating facilities, making them particularly vulnerable.

All Kansas Region D and participating jurisdictions citizens are vulnerable to the impacts of extreme temperatures. Please see Section 3.3: Population Data and Section 3.4: Socially Vulnerable and At-Risk Populations for data concerning jurisdictional populations.

Buildings and Structures

In general, buildings and structures, including historic buildings, will not be impacted by short-term extreme temperature events. It is possible that long-term temperature events could cause impacts, including:

- **Thermal Expansion:** Outside the norm temperatures can cause building materials, such as metal and concrete, to expand or contract. This can lead to warping, cracking, and structural stress.
- **Roof Damage:** Prolonged exposure to extreme temperatures can deteriorate roofing materials, leading to leaks, reduced lifespan, and increased maintenance costs.
- **Foundation Issues:** Prolonged heat or cold can affect the moisture content in the soil surrounding a building's foundation, potentially leading to shifting or settling.

Transportation and Electrical Infrastructure

Extreme temperatures can have numerous impacts on both transportation and electrical distribution systems, often leading to challenges that require proactive management. The impacts of extreme temperatures on transportation systems may include:

- **Softening of Asphalt:** High temperatures can cause asphalt to soften and become more susceptible to deformation. This leads to the development of ruts and potholes as the road surface loses its stability.
- **Rutting and Raveling:** The combination of high temperatures and heavy traffic loads can result in rutting, where depressions or grooves form in the road surface. Raveling, the disintegration of the asphalt surface, may also occur.
- **Expansion and Contraction:** Materials like concrete and asphalt expand in high temperatures and contract in cooler temperatures. This expansion and contraction can lead to cracking and deterioration of the road surface over time.
- **Freeze-Thaw Cycles:** Fluctuations between freezing and thawing can lead to the formation of ice within the road structure. The expansion of water as it freezes can result in cracks and damage to the road surface.
- **Frost Heaving:** During freeze-thaw cycles, moisture in the soil beneath the road can freeze, causing the ground to heave upward. This can result in uneven surfaces and damage to the road structure.

Extreme temperatures can impact both the electrical generation capacity and transmission. The impacts of extreme temperatures on electrical systems may include:

- **Increased Demand:** Extreme temperatures typically lead to increased use of air conditioning or heating, resulting in a surge in electricity demand that can strain the grid.
- **Transformer Overheating:** Electrical transformers can overheat during extreme heat events, leading to failures or outages.
- **Power Lines:** Extreme heat can cause power lines to sag due to thermal expansion, increasing the risk of contact with trees or other objects, which can result in outages or fires.
- **Substation Performance:** Extreme temperatures can impair the performance of substations, potentially leading to overloads and failures.
- **Energy Efficiency:** Extreme temperatures can reduce the efficiency of power generation, leading to decreased output during peak demand times.
- **Renewable Energy Impact:** While solar panels can generate more energy in high temperatures, their efficiency can drop significantly beyond certain heat thresholds.

Mapping concerning transportation and electrical infrastructure may be found in Section 3.9: Critical Infrastructure. Information concerning the costs to repair or reconstruct transportation and electrical infrastructure may be found in Section 5.9.6.

Water and Wastewater Utilities

Water and wastewater utilities are vulnerable to extreme temperature events due to the potential for plant damages and distribution system damages. Impacts may include:

- **Pipe bursts and leaks:** Extreme temperatures can cause soil to dry and shift, leading to cracks or bursts in aging water distribution pipes. Temperature fluctuations also lead to expansion and contraction in pipes, potentially increasing the risk of failure.
- **Reduced efficiency of equipment:** Pumps, motors, and other mechanical systems in water treatment facilities may become less efficient or experience overheating during prolonged high temperatures.
- **Reduced water availability:** In open water storage or reservoirs, high temperatures lead to greater evaporation, reducing the overall available water supply. This may lead to restrictions or necessitate sourcing from alternative supplies.
- **Changes in treatment efficiency:** Biological treatment processes in wastewater treatment plants can be disrupted due to temperature, impacting the breakdown of organic matter and nutrient removal processes.

Information concerning the costs to repair or reconstruct water and wastewater infrastructure may be found in Section 5.10.6.

Medical and Response Facilities

While extreme temperatures may result in a temporary increase in patients, it is considered unlikely that any influx would overwhelm current medical capabilities. In general, medical and response facilities are not directly vulnerable to losses as a result of extreme temperatures. Both operations and facilities will likely experience minimal impacts from, unless there are substantial power, communications, or water outages.

Educational Facilities

Depending on educational facility capability, extreme temperatures may necessitate the closure of the facility for the duration of the event. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work. First response facilities are expected to be unimpacted.

Communication Systems

Extreme temperatures can disrupt this vital communications system, affecting reliability and functionality. Extreme temperatures can lead to power outages due to down power lines or damaging electrical substations. Communication systems that rely on electricity, such as landline phones, internet routers, and cellular towers, may cease to function during power outages.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. The following data, from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency, indicates cost ranges for communications system components:

Table 98: Summary of Communication System Component Costs

Components	Examples	Cost	Expected Lifespan
Infrastructure	Towers, shelters, commercial and backup power equipment,	$$$–$$$$$	20–25 years
Fixed Station Equipment	Antennas, repeaters, towers on wheels, consoles, mobile stations, servers, computers, physical and electronic security	$$-$$$	3-15 years

Table 98: Summary of Communication System Component Costs

Components	Examples	Cost	Expected Lifespan
	elements (e.g., fencing, cameras, monitors, environmental conditions)		
Devices	Handheld portable radios, cellular phones, satellite phones, mobile data devices	$-$$	2-10 years
Accessories	Holsters, chargers, speakers, lapel microphone extensions, Bluetooth, vehicle kits, air cards, intercoms	$	2-10 years
Features	Encryption to protect against security risks, ruggedization to ensure reliant services, Over-the-Air-Programming, automatic roaming	$-$$$	-
Software and Data Storage	Global information system, emergency notifications, monitoring, call answering, database access, Automatic Vehicle Locator	$-$$	-

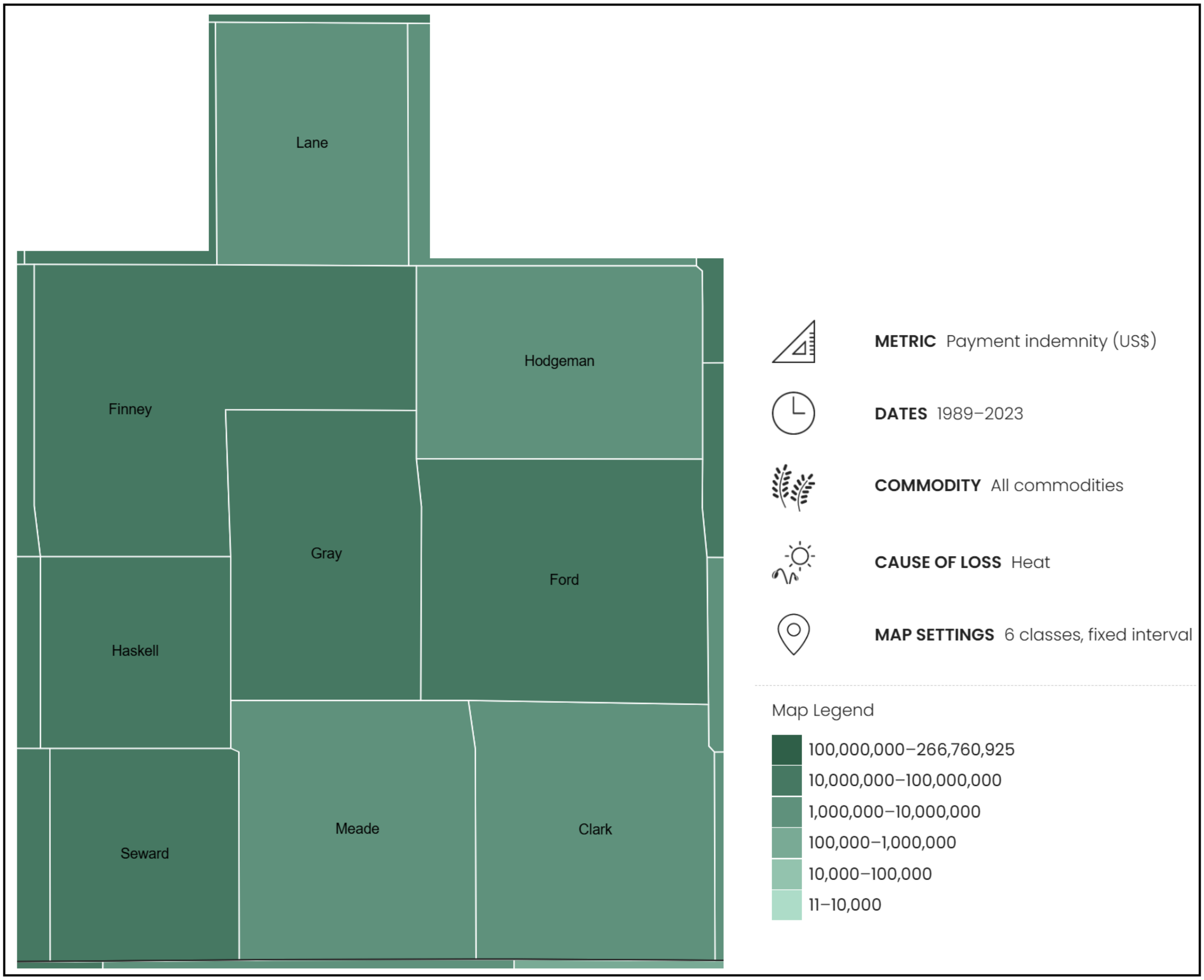
Source: U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency

Environmental and Agricultural Impacts

Extreme temperatures can cause significant damage to the local environment by dehydrating vegetation and wildlife, which may result in cascading effects to the surrounding environment, such as drought, wildfires, mudslides, or landslides. Extreme temperatures may severely decrease the yield of the agricultural sector. The yield of cash crops may be reduced, livestock may be adversely impacted by extreme heat, or grazing losses may be incurred by farmers or ranchers; potentially resulting in decreased food security. In the event of significant agricultural losses caused by extreme temperatures, some assistance may be available to impacted farms or ranches.

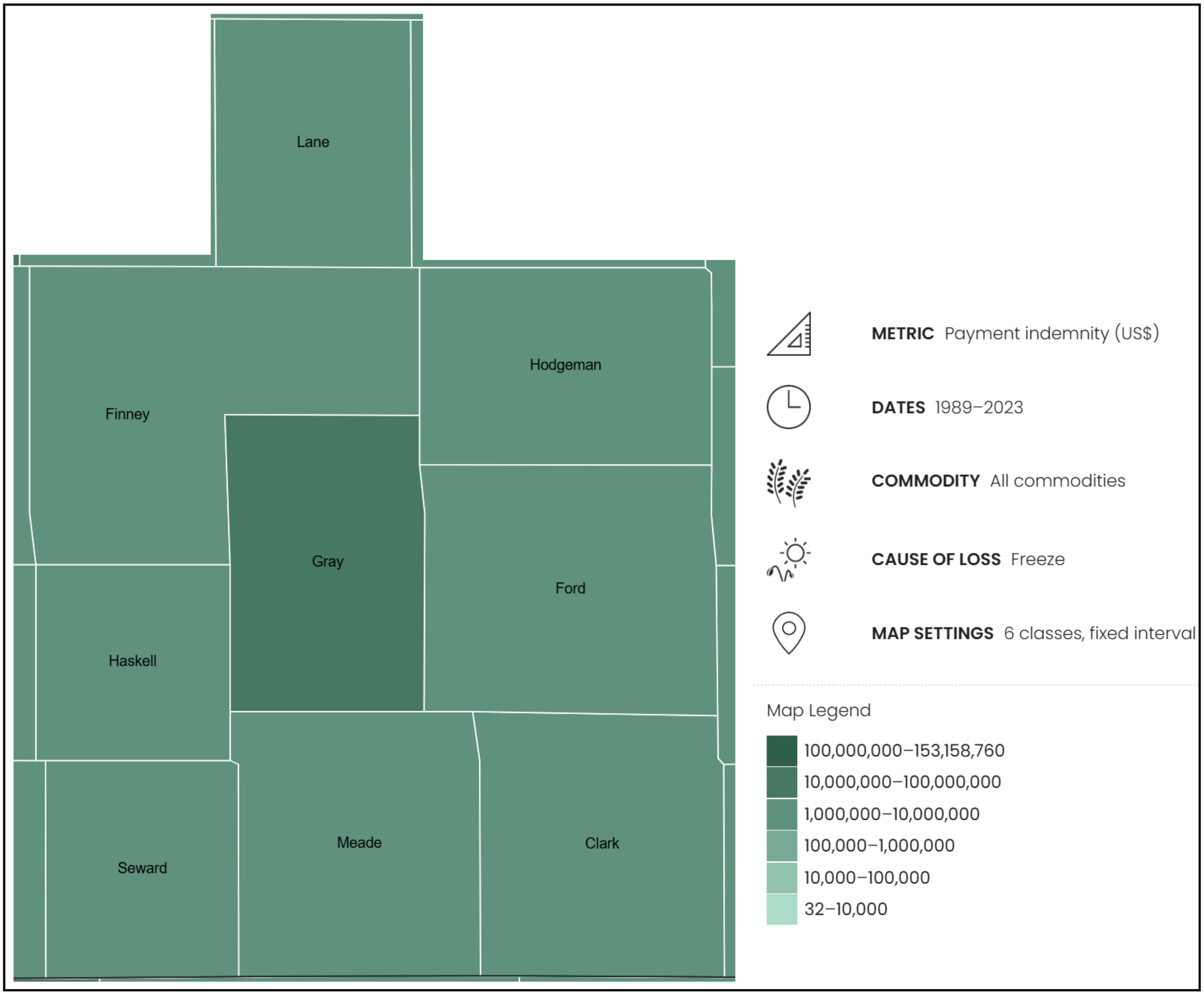
The following map from the United States Department of Agriculture details total county-wide agricultural losses, by county, due to extreme heat and extreme cold conditions from 1989 - 2023:

Map 34: Agricultural Losses Due to Extreme Heat Conditions, 1989 - 2023



Source: United States Department of Agriculture

Map 35: Agricultural Losses Due to Extreme Cold Conditions, 1989 - 2023



Source: United States Department of Agriculture

Jurisdictional Concerns:

As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** With 10.5% of citizens living in poverty, and 23.4% over the age of 65, extreme temperatures are a concern for all jurisdictions. Additionally, with 264 farms, 560,252 acres in agriculture, $186,224,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of extreme temperatures.
- **Finney County:** With 12.8% of citizens living in poverty, and 10.9% over the age of 65, extreme temperatures are a concern for all jurisdictions. Additionally, with 563 farms, 821,433 acres in agriculture, $1,112,314,000

in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of extreme temperatures.

- **Ford County:** With 11.8% of citizens living in poverty, and 10.9% over the age of 65, extreme temperatures are a concern for all jurisdictions. Additionally, with 536 farms, 698,533 acres in agriculture, $667,781,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of extreme temperatures.
- **Gray County:** With 4.6% of citizens living in poverty, and 15.2% over the age of 65, extreme temperatures are a concern for all jurisdictions. Additionally, with 464 farms, 553,976 acres in agriculture, $1,271,532,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of extreme temperatures.
- **Haskell County:** With 11.3% of citizens living in poverty, and 13.7% over the age of 65, extreme temperatures are a concern for all jurisdictions. Additionally, with 199 farms, 334,602 acres in agriculture, $1,636,349,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of extreme temperatures.
- **Hodgeman County:** With 11.3% of citizens living in poverty, and 22.4% over the age of 65, extreme temperatures are a concern for all jurisdictions. Additionally, 439 farms, 518,034 acres in agriculture, $226,540,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of extreme temperatures.
- **Lane County:** With 12.4% of citizens living in poverty, and 21.4% over the age of 65, extreme temperatures are a concern for all jurisdictions. Additionally, 287 farms, 458,845 acres in agriculture, $332,189,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of extreme temperatures.
- **Meade County:** With 8.7% of citizens living in poverty, and 17.4% over the age of 65, extreme temperatures are a concern for all jurisdictions. Additionally, 397 farms, 624,369 acres in agriculture, $390,750,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of extreme temperatures.
- **Seward County:** With 14.0% of citizens living in poverty, and 9.6% over the age of 65, extreme temperatures are a concern for all jurisdictions. Additionally, with 292 farms, 392,849 acres in agriculture, $398,022,000 in products sold, all participating jurisdictions agriculture base will continue to be vulnerable to the impacts of extreme temperatures.

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with extreme may include:

- Drought conditions, or worsening of drought conditions
- Road and rail disruptions
- Heat-related illnesses and mortality
- Power outages
- Water shortage and/or diminished water quality
- Increased wildfires

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 99: Extreme Temperature Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Extreme temperatures can have severe consequences for health, particularly for the elderly and young. Loss of electricity may impact heating or air conditioning leading to poorly tolerated indoor temperatures. Physical effects of extreme heat can cause major health problems and may lead to injury or death.
Impact on Responders	Responders may be susceptible to temperature-related illness. High temperatures may damage instruments or equipment necessary for response activities. Responders may face dangerous road conditions leading to accidents and prolonged response times.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. This hazard may impact an agency’s ability to implement continuity operations due to power outages.
Delivery of Services	Extreme temperatures can impact efficient delivery or inability of goods or services due to potential health impacts on workers. Equipment and vehicles may be damaged, and the delivery of services may be delayed due to poor travel conditions
Property, Facilities, and Infrastructure	Facility integrity is at risk with regards to power cables and stations being overused and limiting operations. This could lead to limits on facility heating or cooling.
Impact on Environment	Extreme temperatures can cause significant damage to the local environment and result in habitat loss, invasive species, and changes in migration. Extreme temperatures may severely decrease the yield of cash crops. Impacts on water supply may include an increase in frequency of harmful algal blooms and occurrence of cyanobacteria.
Economic Conditions	Extreme temperatures may drain local resources. Under some conditions, some of the costs can be recouped through federal grant reimbursements.
Public Confidence in Governance	Governmental response, on all levels, requires direct actions that must be immediate and effective to maintain public confidence.

5.11.7 Future Development

Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Kansas Region D and the majority of participating jurisdictions have generally seen static to decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also initially slow and then decrease. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, is expected to increase the housing stock. However, adherence to building codes will provide any new construction a degree of hazard resiliency.

5.11.8 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the extreme heat hazard.

Table 100: Example Extreme Temperature Mitigation Actions

Category	Example Action
	Adopt and enforce updated building code provisions to properly insulate structures.

Table 100: Example Extreme Temperature Mitigation Actions

Planning and Regulation	Support financial incentives, such as low interest loans or tax breaks, for home and business owners who retrofit their structures to mitigate extreme temperatures.
	Develop an inventory of public buildings that may be used for temperature shelters.
Infrastructure	Encourage installation of green roofs, which provide shade and remove heat from the roof surface and surrounding air.
	Use cool roofing products that reflect sunlight and heat away from a building.
Natural Systems Protection	Increase tree plantings around buildings to shade parking lots and along public rights-of-way.
Education	Develop an outreach program about personal extreme temperature mitigation activities.
	Educate homeowners about retrofitting homes and encouraging retrofit to mitigate heat.

5.12 Flood

5.12.1 Hazard Description

Flooding is the overflow or accumulation of water on normally dry land, often caused by heavy rainfall, snowmelt, or the failure of natural or artificial barriers. Flooding can lead to the inundation of homes, roads, farmland, and other areas, causing damage to property, disruption of daily life, and potential threats to human safety and the environment.

A floodplain is a flat or gently sloping area adjacent to a river, stream, or other water body. These areas act as a buffer during periods of heavy rainfall or snowmelt, absorbing excess water and preventing it from rushing downstream too quickly. In its common usage, a floodplain refers to areas inundated by the 100-year flood, the flood that has a 1% chance of being equaled or exceeded in any given year, and the 500-year flood, the flood that has a 0.2% chance of being equaled or exceeded in any given year. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the NFIP.

5.12.2 Location and Extent

A variety of factors affect the severity of flooding within Kansas Region D. These include topography, weather characteristics, development, and geology. Intense flooding may create extreme damage and disruption in any jurisdiction affected.

Flash Flooding

Flash flooding occurs during heavy or extended periods of rain, generally when the ground is unable to rapidly absorb the water. Most flash flooding in Kansas Region D is caused by intense and stationary storm events and atmospheric rivers. Heavy sustained rain can create rapid flooding very quickly, and flooding can occur miles away from where the rain fell. Factors that can contribute to the severity of flash flooding include rainfall intensity, duration, drainage condition, and ground conditions (paved or unpaved). Flash floods are particularly dangerous to people and property, as six inches of moving water can knock a person down and two feet can lift a vehicle. As there is often little warning of a flash flood event, they are the cause of most flood fatalities.

Riverine Flooding

Riverine flooding refers to the overflow of water from a river or a stream onto adjacent land areas. This type of flooding occurs when the water level in a river or stream rises significantly and exceeds its banks, inundating the surrounding areas. The severity of riverine flooding can be influenced by the amount and intensity of rainfall in the watershed, the size, shape, and slope of the river or stream channel, and the presence of dams on the river system.

Urban Flooding

FEMA defines urban flooding as ‘the inundation of property in a built environment, particularly in more densely populated areas, caused by rain falling on increased amounts of impervious surfaces and overwhelming the capacity of drainage systems.” In Kansas Region D, urban flooding has consistently increased due to a number of factors, including the filling for development of natural wetlands and waterways, the reduction of permeable surfaces, and the aging and insufficient capacity of stormwater systems.

To establish floodplains, FEMA adopted the Base Flood Elevation (BFE), which is the computed elevation that floodwater is anticipated to rise during a flood that has a 1% chance of occurring in any given year. The BFE establishes the regulatory requirement for the elevation or floodproofing of structures, and the relationship between the BFE and a given structure's elevation determines the flood insurance premium through the NFIP.

FEMA, through the Risk Mapping, Assessment, and Planning (Risk MAP) program, works with partners to assess and map these flood risks producing Flood Insurance Rate Maps (FIRMs). As an additional benefit, the FIRMs serve as the basis for NFIP regulations and flood insurance purchase requirements.

SFHAs are defined as the area that will be inundated by the flood event having a 1% chance of being equaled or exceeded in any given year. The 1% annual chance flood is also referred to as the base flood or 100-year flood. The FIRM depicts the SFHA, including the 1%-annual-chance flood. These areas are labeled on the map as zone, as explained in the following table:

The following table details FEMA's FIRM flood zone classifications.

Table 101: Flood Zone Classifications

Zone	Description
A	The 1%-annual-chance or base floodplain. There are six (6) types of A Zones.
AE	The base floodplain where base flood elevations are provided.
AH	Shallow flooding base floodplain. BFEs are provided.
AO	The base floodplain with sheet flow, ponding, or shallow flooding. Base flood depths (feet above ground) are provided.
AR	The base floodplain that results from the decertification of a previously accredited flood protection system that is in the process of being restored to provide a 1%-annual-chance or greater level of flood protection.
A99	Area to be protected from base flood by levees or Federal Flood Protection Systems under construction. BFEs are not determined.
B or Shaded X	Areas between the limits of the base flood and the 0.2% annual-chance (or 500-year) flood.
C or Unshaded X	Areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2% annual-chance flood

Source: FEMA

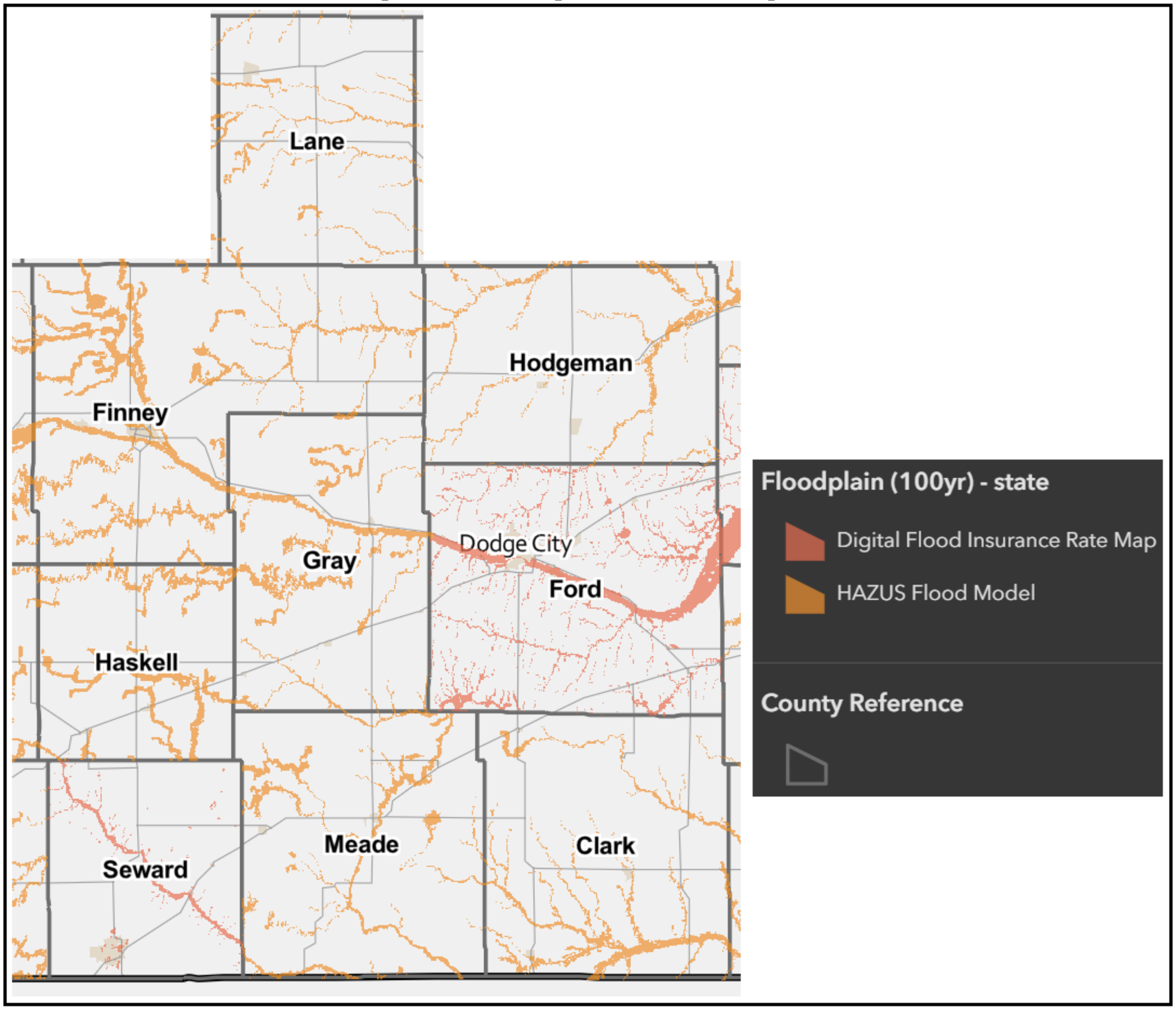
FEMA's National Flood Hazard Layer viewer was researched to determine the current mapping status of each Kansas Region D County. The following table indicates mapping status as of this plan:

Table 102: Kanas Region D Flood Insurance Rate Map Availability

Jurisdiction	Mapping Status
Clark County	Unmapped
Finney County	Partially mapped, no digital data available
Ford County	Digitally mapped
Gray County	Unmapped
Haskell County	Unmapped
Hodgeman County	Partially mapped, no digital available
Lane County	Unmapped
Meade County	Partially mapped, no digital available
Seward County	Digitally mapped

Source: FEMA NRI

Map 36: Kansas Region D FEMA Floodplains

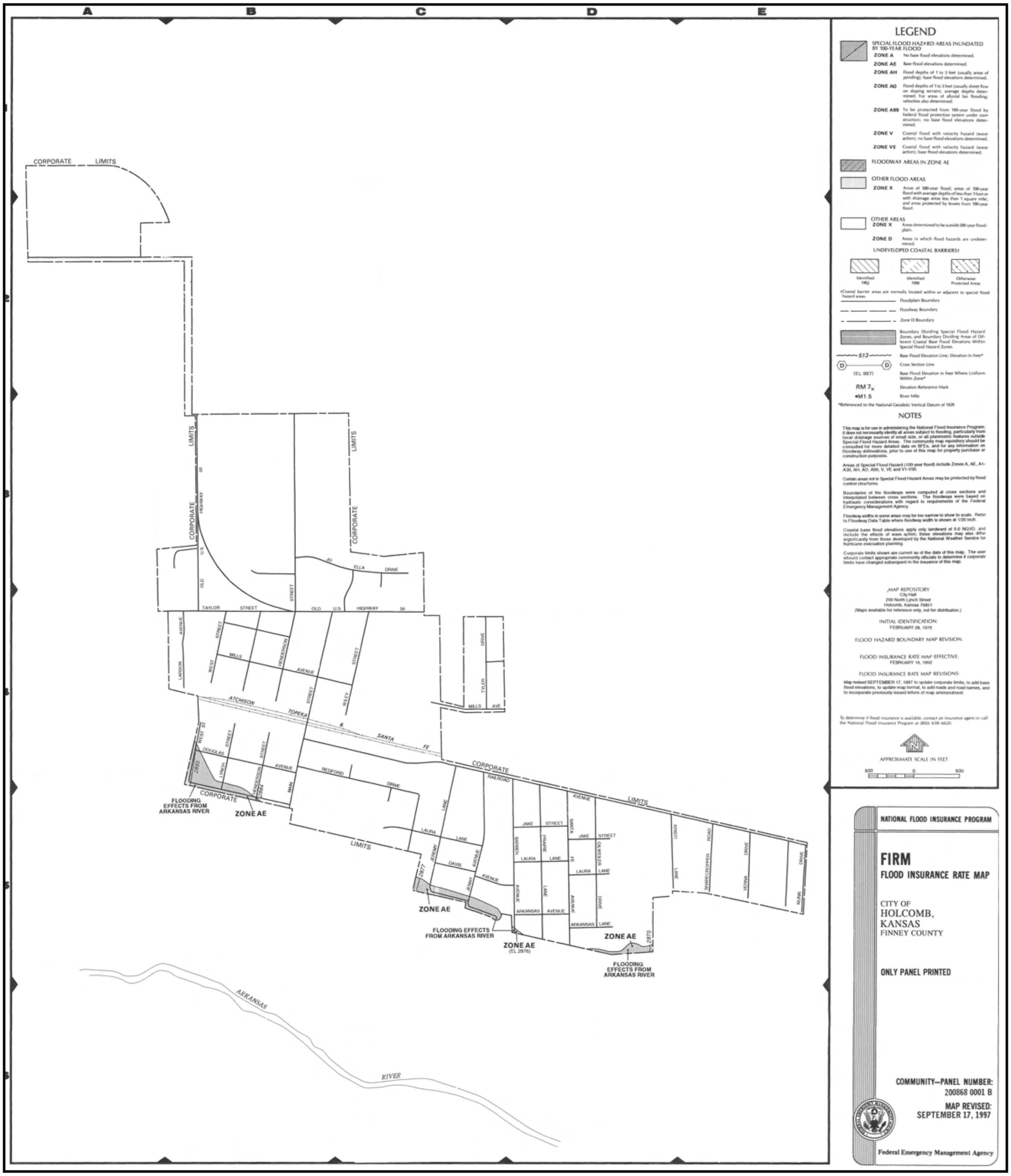


Source: KDEM EOPmapper

Map 37: Finney County, Garden City FIRM

Source: FEMA

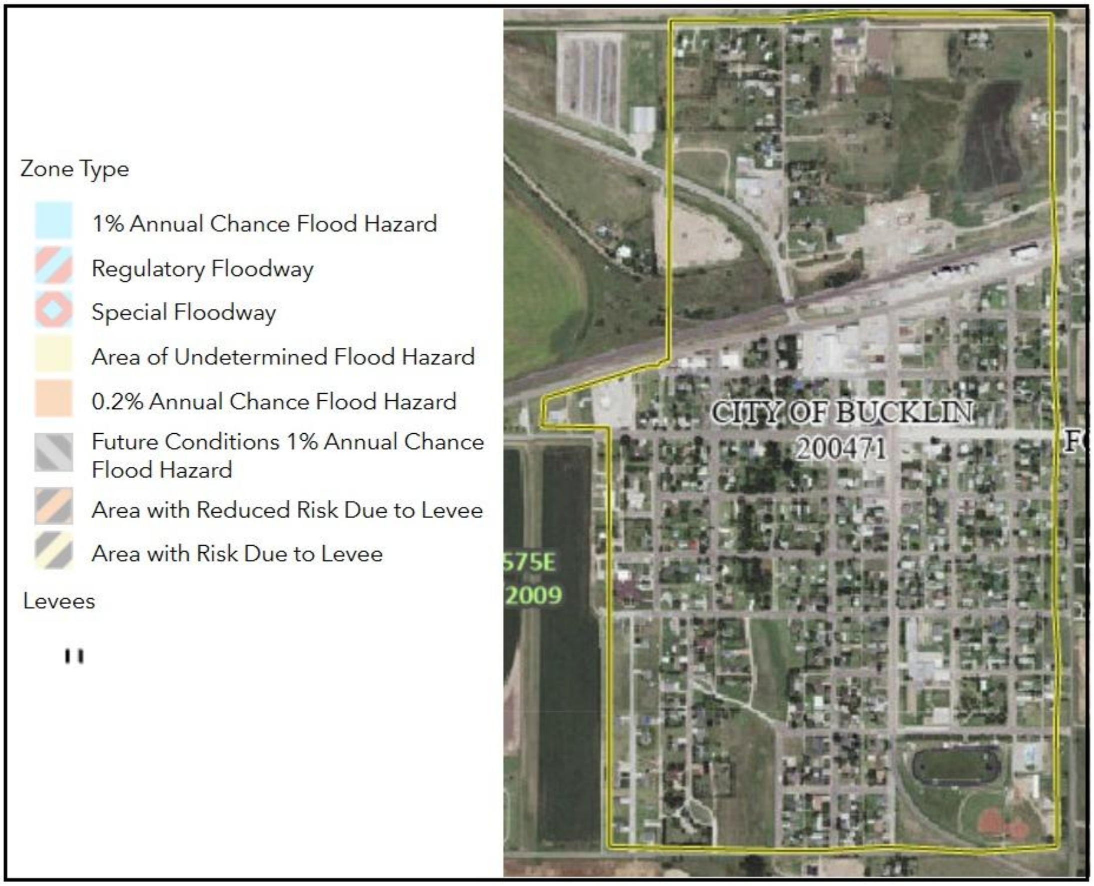
Map 38: Finney County, City of Holcomb FIRM



LEGEND
SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD
ZONE A No base flood elevations determined.
ZONE AE Base flood elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding; velocities also determined.
ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.
ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.
FLOODWAY AREAS IN ZONE AE
OTHER FLOOD AREAS
ZONE X Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.
OTHER AREAS
ZONE X Areas determined to be outside 500-year floodplain.
ZONE D Areas in which flood hazards are undetermined.
UNDEVELOPED COASTAL BARRIERS†
Identified 1983
Identified 1990
Otherwise Protected Areas
†Coastal barrier areas are normally located within or adjacent to special flood hazard areas.
Floodplain Boundary
Floodway Boundary
Zone D Boundary
Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.
513
Base Flood Elevation Line; Elevation in Feet*
Cross Section Line
(EL 987)
Base Flood Elevation in Feet Where Uniform Within Zone*
RM 7
Elevation Reference Mark
•M1.5
River Mile
*Referenced to the National Geodetic Vertical Datum of 1929
NOTES
This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for more detailed data on BFEs, and for any information on floodway delineations, prior to use of this map for property purchase or construction purposes.
Areas of Special Flood Hazard (100-year flood) include Zones A, AE, A1-A30, AH, AO, A99, V, VE and V1-V30.
Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.
Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.
Floodway widths in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown at 1/20 inch.
Coastal base flood elevations apply only landward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.
Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.
MAP REPOSITORY
City Hall
200 North Lynch Street
Holcomb, Kansas 76851
(Maps available for reference only, not for distribution.)
INITIAL IDENTIFICATION:
FEBRUARY 28, 1978
FLOOD HAZARD BOUNDARY MAP REVISION:
FLOOD INSURANCE RATE MAP EFFECTIVE:
FEBRUARY 19, 1992
FLOOD INSURANCE RATE MAP REVISIONS:
Map revised SEPTEMBER 17, 1997 to update corporate limits, to add base flood elevations, to update map format, to add roads and road names, and to incorporate previously issued letters of map ammendment.
To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.
APPROXIMATE SCALE IN FEET
500
0
500
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CITY OF
HOLCOMB,
KANSAS
FINNEY COUNTY
ONLY PANEL PRINTED
COMMUNITY—PANEL NUMBER:
200868 0001 B
MAP REVISED:
SEPTEMBER 17, 1997
Federal Emergency Management Agency
A
B
C
D
E
CORPORATE LIMITS
TAYLOR STREET
OLD U.S. HIGHWAY 50
ELLA DRIVE
MILLS AVENUE
ATCHISON TOPEKA & SANTA FE RAILROAD
DOUGLAS AVENUE
REDFORD DRIVE
LAURA LANE
DAVIS
JAKE STREET
ARKANSAS AVENUE
ARKANSAS LANE
ZONE AE
(EL 2876)
FLOODING EFFECTS FROM ARKANSAS RIVER
ARKANSAS RIVER

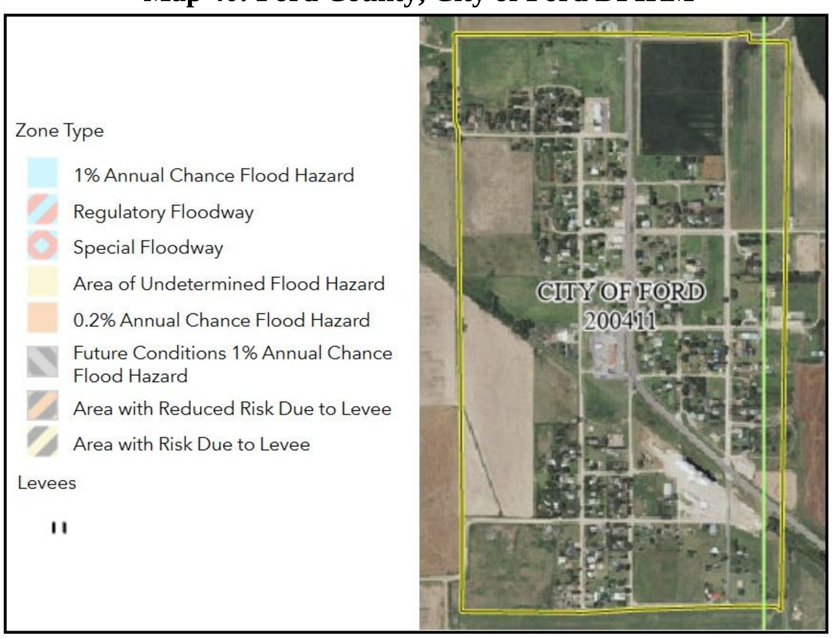
Source: FEMA

Map 39: Ford County, City of Bucklin DFIRM



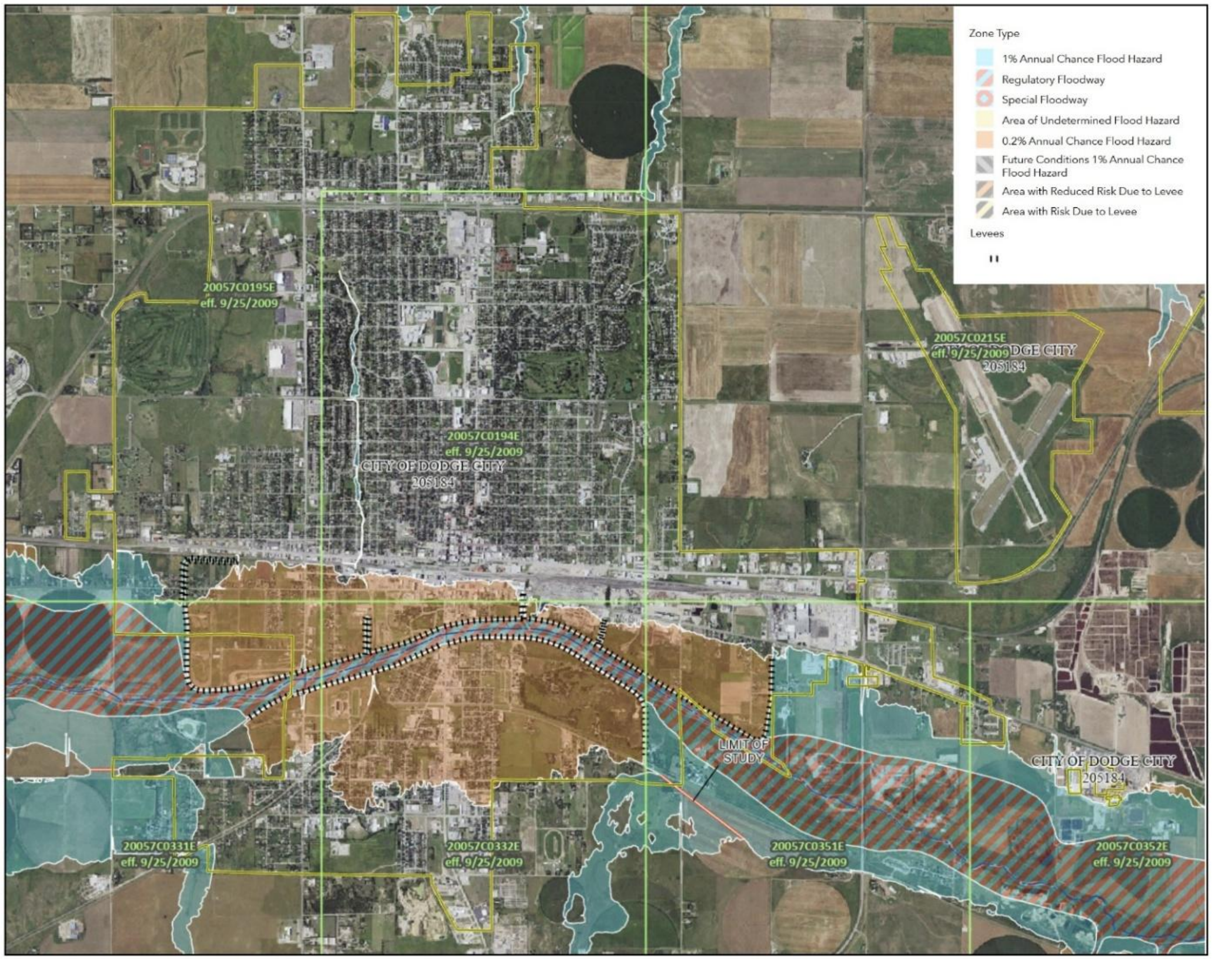
Source: FEMA

Map 40: Ford County, City of Ford DFIRM



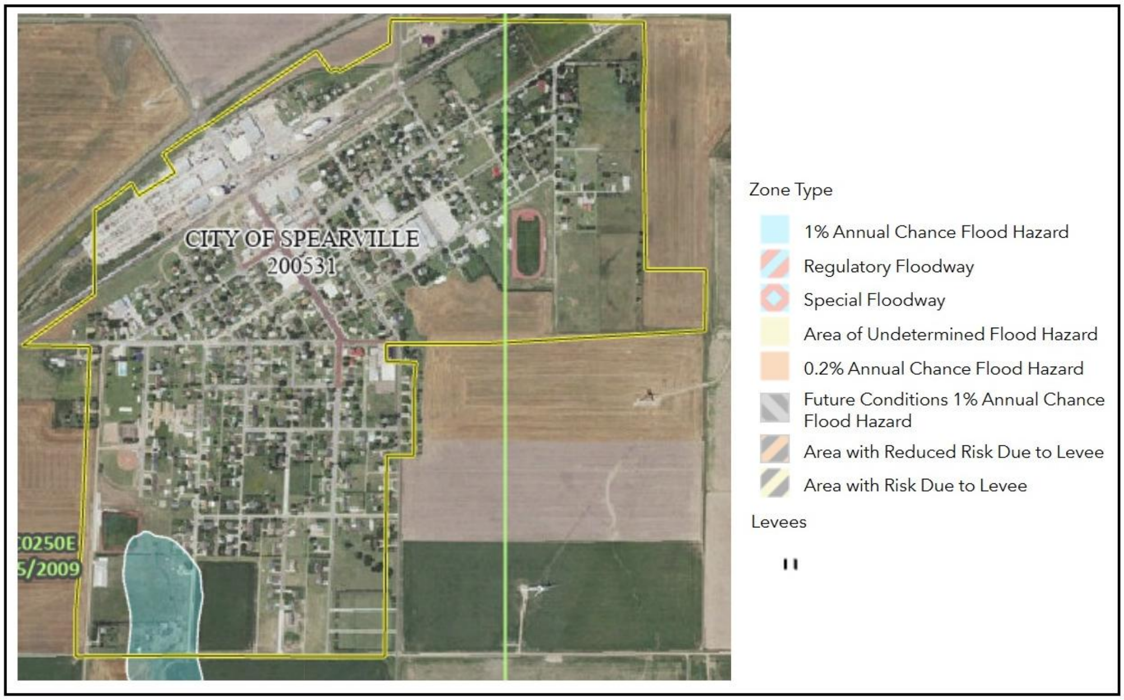
Source: FEMA

Map 41: Ford County, Dodge City DFIRM



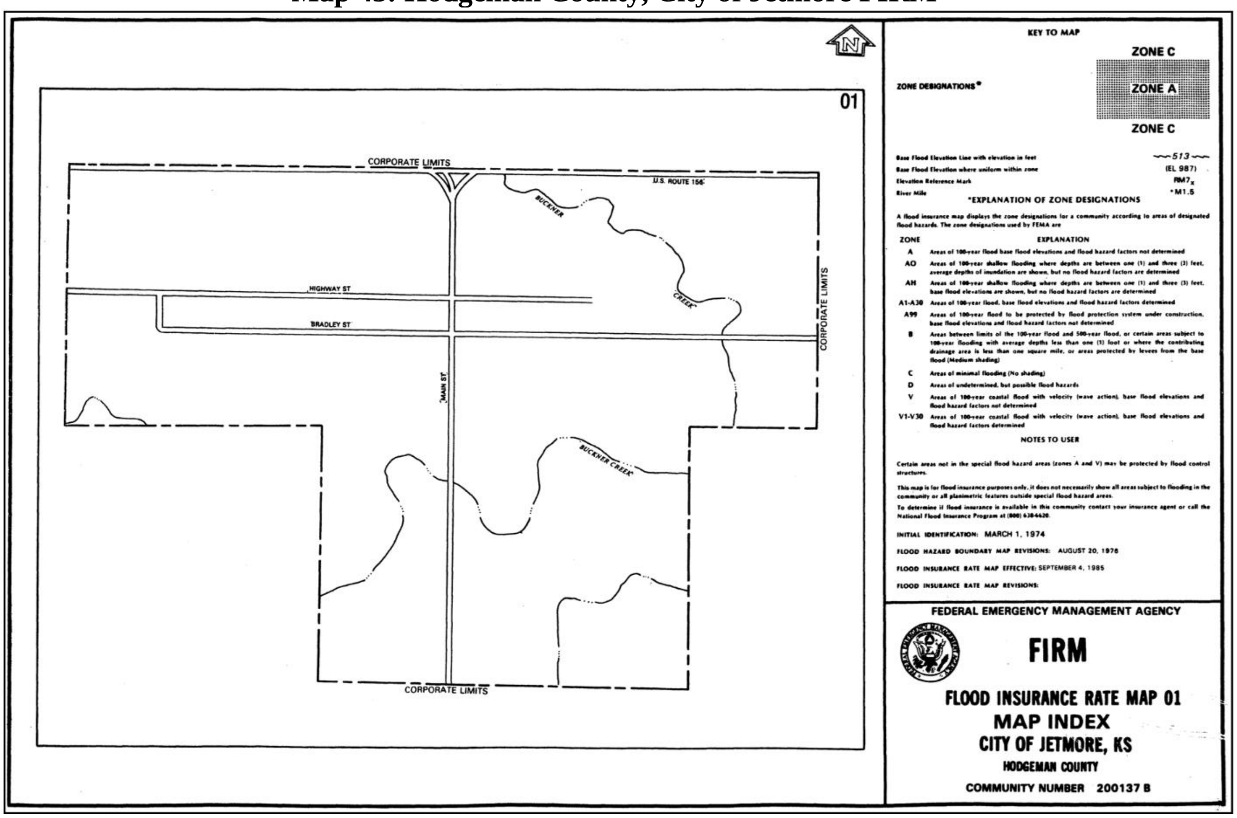
Source: FEMA

Map 42: Ford County, City of Spearville DFIRM



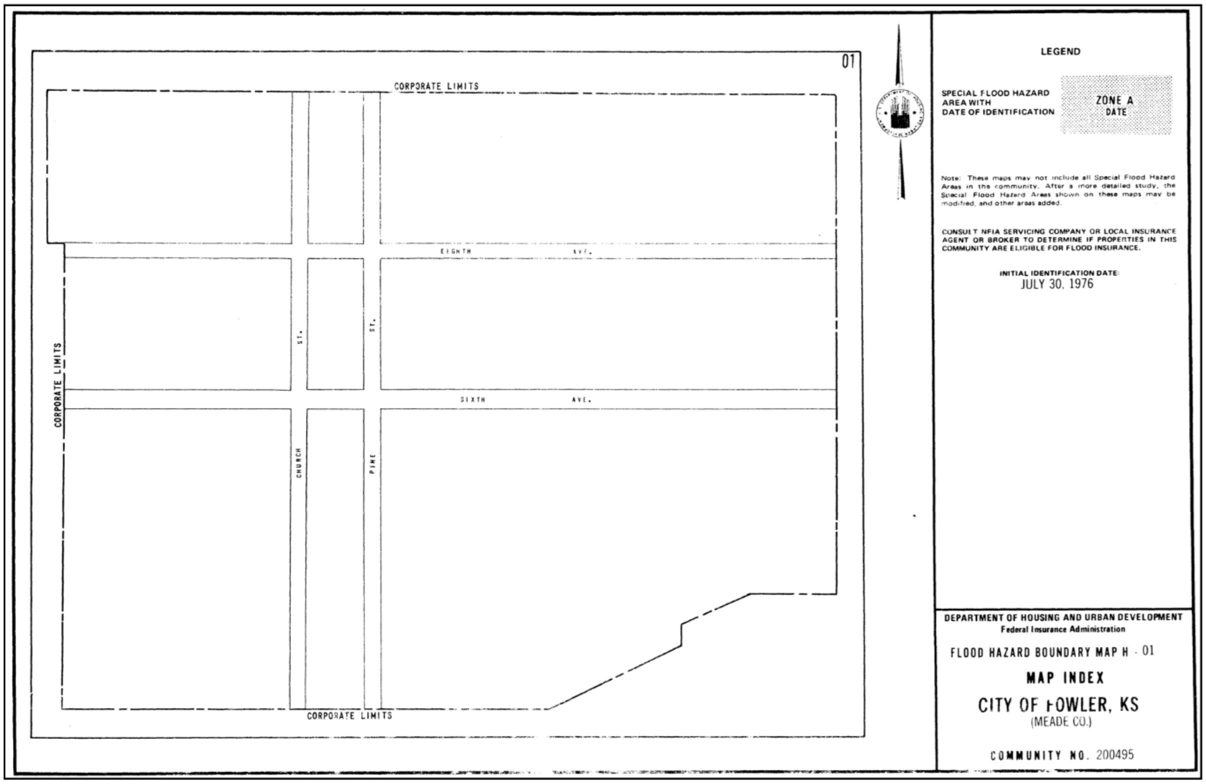
Source: FEMA

Map 43: Hodgeman County, City of Jetmore FIRM



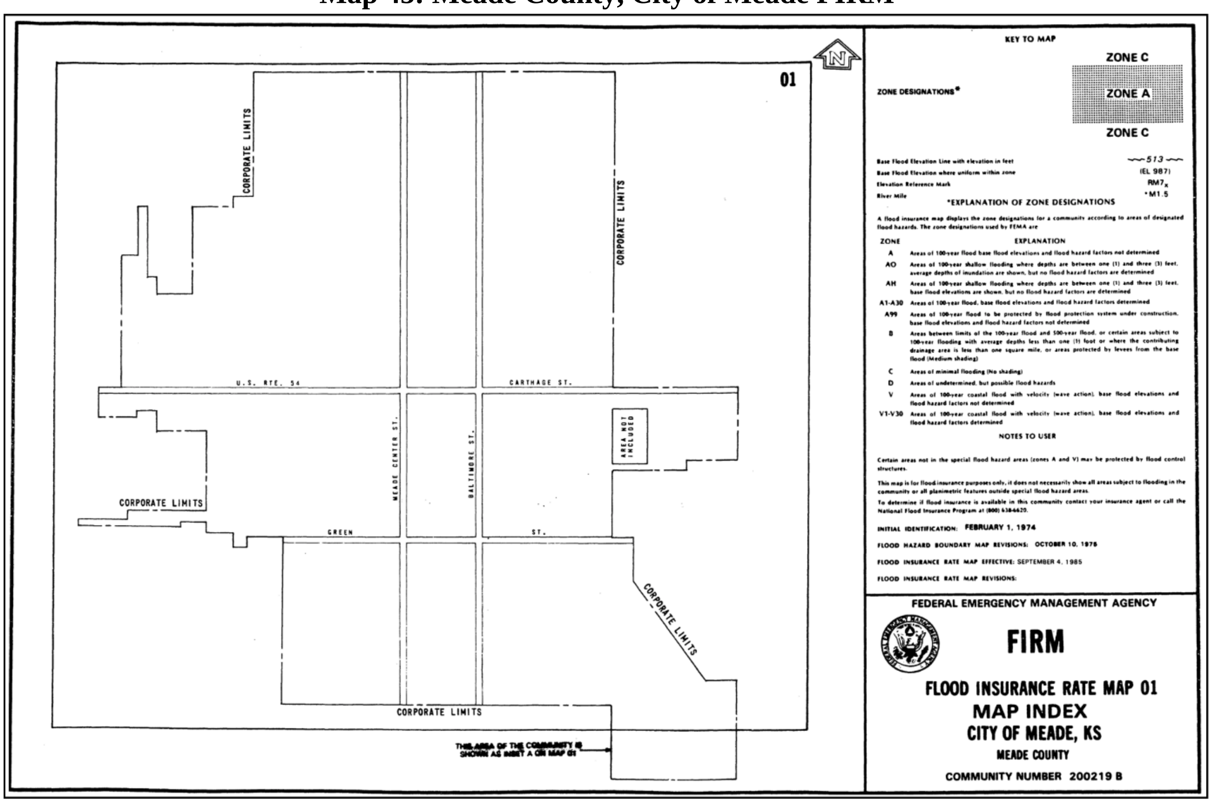
Source: FEMA

Map 44: Meade County, City of Fowler FIRM



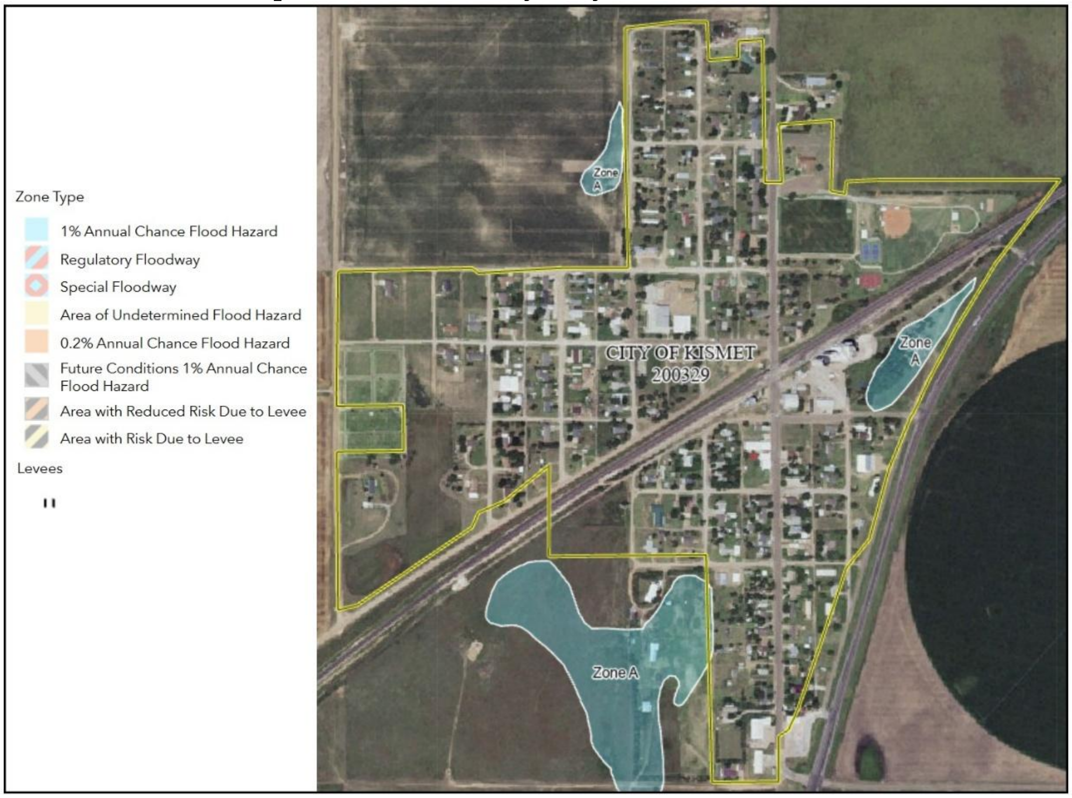
Source: FEMA

Map 45: Meade County, City of Meade FIRM



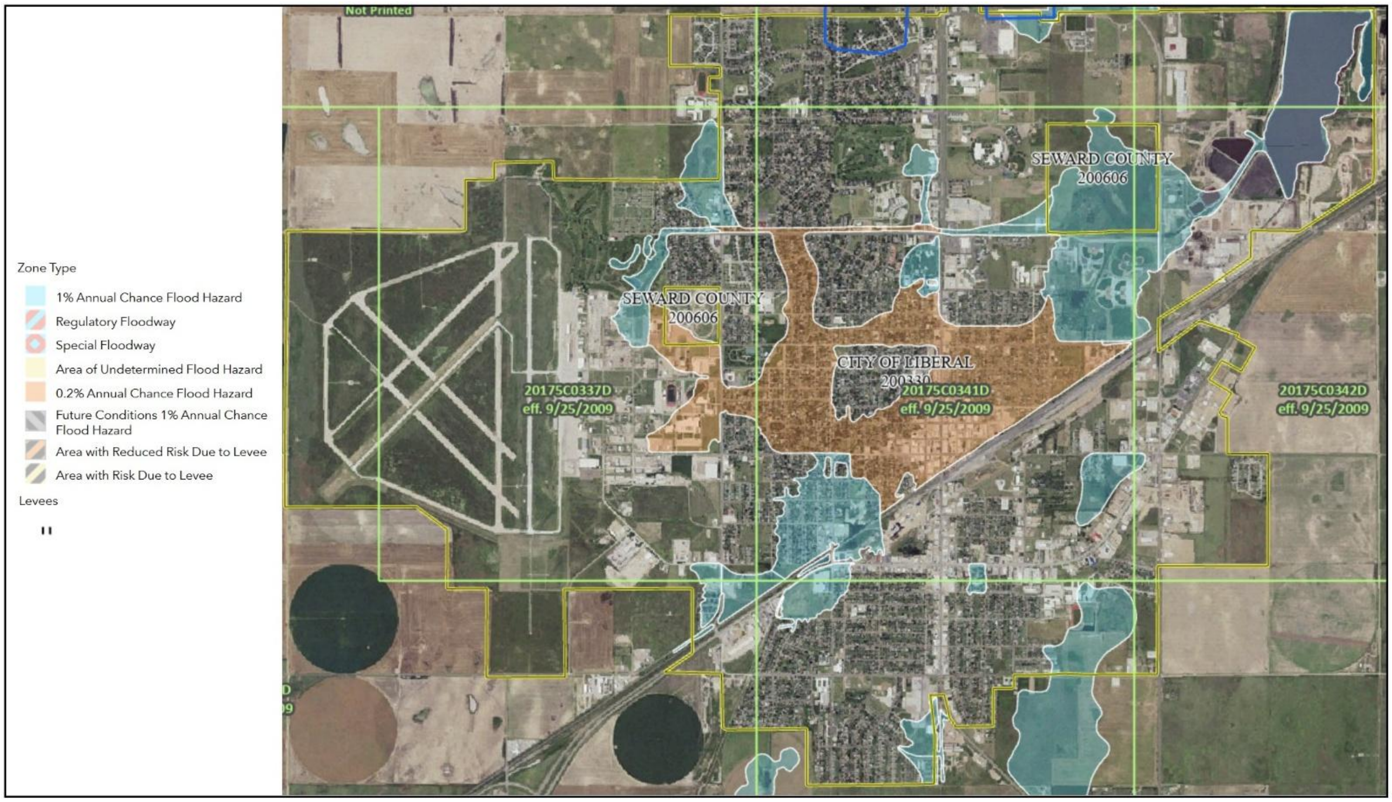
Source: FEMA

Map 46: Seward County, City of Kismet DFIRM



Source: FEMA

Map 47: Seward County, City of Liberal DFIRM



Source: FEMA

Discussions with the MPC and a review of all available data indicated that while flooding is a concern for all participating jurisdictions, levels of concern may vary. The following provides a narrative of the level of jurisdictional concern:

Jurisdiction	Mapping Status
Clark County	Unmapped
Finney County	Partially mapped, no digital data available
Ford County	Digitally mapped
Gray County	Unmapped
Haskell County	Unmapped
Hodgeman County	Partially mapped, no digital available
Lane County	Unmapped
Meade County	Partially mapped, no digital available
Seward County	Digitally mapped

Source: FEMA NRI

- **Clark County** All jurisdictions are unmapped. While basic mapping indicating potential flood areas is available through the State of Kansas, no FIRMs have been completed. However, information from the MPC indicates that all jurisdictions are potentially vulnerable to flood events.
- **Finney County:** Only Holcomb and Garden City are mapped. Available mapping indicates that both jurisdictions have identified flood hazard areas.
- **Ford County:** Available FIRM mapping indicates flood hazard areas in both the county and in Dodge City and Spearville.

- **Gray County:** All jurisdictions are unmapped. While basic mapping indicating potential flood areas is available through the State of Kansas, no FIRMs have been completed. However, information from the MPC indicates that all jurisdictions are potentially vulnerable to flood events.
- **Haskell County:** All jurisdictions are unmapped. While basic mapping indicating potential flood areas is available through the State of Kansas, no FIRMs have been completed. However, information from the MPC indicates that all jurisdictions are potentially vulnerable to flood events.
- **Hodgeman County:** On y the City of Jetmore is mapped, with no flood hazard indicated.
- **Lane County:** All jurisdictions are unmapped. While basic mapping indicating potential flood areas is available through the State of Kansas, no FIRMs have been completed. However, information from the MPC indicates that all jurisdictions are potentially vulnerable to flood events.
- **Meade County:** Only Fowler and the City of Meade are mapped. Available mapping indicates that both jurisdictions have no identified flood hazard areas.
- **Seward County** All jurisdictions are unmapped. While basic mapping indicating potential flood areas is available through the State of Kansas, no FIRMs have been completed. However, information from the MPC indicates that all jurisdictions are potentially vulnerable to flood events.

5.12.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Kansas Region D has experienced 15 Presidential Disaster Declarations related to flooding, reflected in the following table.

Table 103: Kansas Region D Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Counties	Individual and Public Assistance	Mitigation Grants
DR-4824-KS	9/24/2024	Severe Storms, Straight-Line Winds, Tornadoes, and **Flooding**	Clark, Finney, Gray, Meade	-	DR-4824-KS
DR-4811-KS	8/20/2024	Severe Storm, Straight-line Winds, Tornadoes, and **Flooding**	Hodgeman	-	DR-4811-KS
DR-4747-KS	10/26/2023	Severe Storms, Straight-Line Winds, Tornadoes, and **Flooding**	Clark, Finney, Ford	-	DR-4747-KS
DR-4449-KS	8/14/2019	Severe Storms, Straight-Line Winds, **Flooding,** Tornadoes, Landslides, and Mudslides	Clark, Hodgeman, Meade	$51,157,548	DR-4449-KS
DR-4319-KS	6/16/2017	Severe Winter Storm, Snowstorm, Straight-Line Winds, and **Flooding**	Finney, Haskell, Lane, Seward	$40,146,036	DR-4319-KS
DR-4230-KS	7/20/2015	Severe Storms, Tornadoes, Straight-Line Winds and **Flooding**	Gray, Haskell, Hodgeman, Meade	$11,018,053	DR-4230-KS
DR-4063-KS	5/24/2012	Severe Storms, Tornadoes, Straight-Line Winds and **Flooding**	Hodgeman	$4,883,034	DR-4063-KS
DR-1849-KS	6/25/2009	Severe Storms, **Flooding**, Straight-Line Winds, and Tornadoes	Finney	$11,534,818	DR-1849-KS

Table 103: Kansas Region D Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Counties	Individual and Public Assistance	Mitigation Grants
DR-1776-KS	7/9/2008	Severe Storms, **Flooding**, and Tornadoes	Clark, Haskell, Hodgeman, Lane, Seward	$55,300,511	DR-1776-KS
DR-1579-KS	2/8/2005	Severe Winter Storm, Heavy Rains, and **Flooding**	Clark	$82,381,461	DR-1579-KS
DR-1254-KS	10/14/1998	Severe Storms, **Flooding**, and Tornadoes	Seward	$6,640,272	DR-1254-KS
DR-1000-KS	7/22/1993	**Flooding**, Severe Storms	Hodgeman, Lane	-	DR-1000-KS
DR-378-KS	5/2/1973	Severe Storms, **Flooding**	Clark, Ford, Gray, Haskell, Hodgeman, Meade, Seward	-	DR-378-KS
DR-229-KS	7/18/1967	Tornadoes, Severe Storms, **Flooding**	Finney	-	DR-229-KS
DR-201-KS	6/23/1965	**Flooding**	Finney, Ford, Gray	-	DR-201-KS

Source: FEMA
-: Not reported

The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Kansas Region D has experienced no Emergency Declarations related to flooding.

In addition to the above, the following table presents NCEI identified flood events in Kansas Region D from 1950 to 2024:

Table 104: Kansas Region D NCEI Flood Events, 1950 - 2023

County	Event Type	Number of Days with Events	Property Damage	Deaths and Injuries
Clark	Flood	6	$0	0
	Flash Flood	5	$0	0
Finney	Flood	4	$0	0
	Flash Flood	9	$10,000	0
Ford	Flood	13	$40,000	0
	Flash Flood	22	$2,100,000	0
Gray	Flood	4	$0	0
	Flash Flood	6	$0	0
Haskell	Flood	3	$0	0
	Flash Flood	4	$500,000	0
Hodgeman	Flood	11	$12,000	0
	Flash Flood	5	$3,000,000	0
Lane	Flood	6	$0	0
	Flash Flood	1	$0	0
Meade	Flood	2	$0	0
	Flash Flood	12	$1,000,000	0
Seward	Flood	3	$0	0
	Flash Flood	9	$1,000,000	0

Source: NCEI

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

- **May 5, 2019 Meade County, Fowler:** 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 $3,000,000.
- **May 27, 2015 Haskell County:** Several county roads were washed out by flash flooding. Property damage was recorded at $500,000.
- **May 27, 2015 Hodgeman County, Jetmore:** Numerous county roads were washed out by flash flooding. Property damage was recorded at $3,000,000.
- **October 1, 1998 Seward County, Liberal:** Heavy rain fell across the liberal area for 24 hours with the heaviest rain falling between 8 AM and 5 PM CDT. Five to eight inches were reported with one unofficial report indicating 10 inches! Streets were flooded that had never flooded before. A local disaster was declared. Property damage was recorded at $1,000,000.
- **September 13, 1997 Ford County, Dodge City:** Seven to 10 inches of rain fell in about a four hour period causing extensive flash flooding across the southern portion of Dodge City. 200 homes and businesses were flooded. 1000 people were evacuated from their homes. Property damage was recorded at $2,000,000.

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or NWS office. When reporting an event oftentimes the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages.

The Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans available to producers suffering losses in those counties and in counties that are contiguous to a designated county. USDA Secretarial disaster designations must be requested of the Secretary of Agriculture by a governor or the governor’s authorized representative, and there is an expedited process for drought. The following table represents the total number of Secretarial Disaster Declarations, by county, for the Kansas Region D:

Table 105: Secretarial Flood Disaster Declarations, 2019 -2024

County	2024	2023	2022	2021	2020	2019
Clark County	0	0	0	0	0	0
Finney County	0	0	0	0	0	0
Ford County	0	0	0	0	0	0
Gray County	0	0	0	0	0	0
Haskell County	0	0	0	0	0	0
Hodgeman County	0	0	0	0	0	0
Lane County	0	0	0	0	0	0
Meade County	0	0	0	0	0	0
Seward County	0	0	0	0	0	0

Source: USDA Farm Service Agency

5.12.4 Probability of Future Incidents

Based on historical occurrences, Kansas Region D will continue to experience flood events on an annual basis. The definition of each flood zone’s classification is used for the purpose of calculating the yearly probability of a riverine flood. Jurisdictions with property in a 100-year floodplain can expect a 1% annual chance of flooding within the designated areas. Jurisdictions with property in a 500-year floodplain can expect a 0.2% annual chance of flooding within the designated areas. FEMA FIRMs can be consulted to provide assistance in determining flooding probability for jurisdictions within Kansas Region D.

The following tables, using data from the NCEI, indicate the yearly probability of a flood or flash flood event, the number of deaths or injuries, and estimated property damage for each county in Kansas Region D.

Table 106: Kansas Region D NCEI Flood Event Probability Summary

County	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Clark	6	<1	0	0	$0	$0
Finney	4	<1	0	0	$0	$0
Ford	13	<1	0	0	$40,000	$533
Gray	4	<1	0	0	$0	$13
Haskell	3	<1	0	0	$0	$0
Hodgeman	11	<1	0	0	$12,000	$160
Lane	6	<1	0	0	$0	$0
Meade	2	<1	0	0	$0	$0
Seward	3	<1	0	0	$0	$0

Source: NCEI

Table 107: Kansas Region D NCEI Flash Flood Event Probability Summary

County	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Clark	5	<1	0	0	$0	$0
Finney	9	<1	0	0	$10,000	$133
Ford	22	<1	0	0	$2,100,000	$28,000
Gray	6	<1	0	0	$0	$13
Haskell	4	<1	0	0	$500,000	$6,667
Hodgeman	5	<1	0	0	$3,000,000	$40,000
Lane	1	<1	0	0	$0	$0
Meade	12	<1	0	0	$1,000,000	$13,333
Seward	9	<1	0	0	$1,000,000	$13,333

Source: NCEI

5.12.5 Projected Changes in Location, Intensity, Frequency, and Duration

The location, intensity, frequency, and duration of flooding are influenced by a combination of natural and human-induced factors. Continued urbanization, deforestation, and changes in land use can alter natural drainage patterns. The conversion of natural landscapes to impervious surfaces, such as roads and buildings, reduces the ability of the land to absorb water, leading to increased runoff and the potential for urban flooding. Alterations to river channels, including channelization and dam construction, can influence the flow of water. Modifications may lead to changes in river behavior, affecting the potential for both upstream and downstream flooding. Poorly planned infrastructure, inadequate stormwater management, and the lack of effective drainage systems in urban areas can contribute to localized flooding. The increase in impervious surfaces reduces natural infiltration, leading to more runoff during rainfall events.

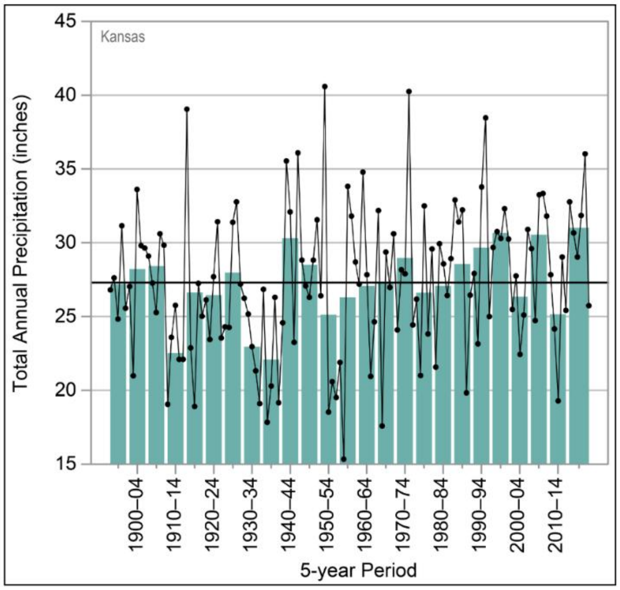
Potentially impacting the future of flood events, the NOAA NCEI State Climate Summary 2022 for Kansas indicates:

- Precipitation is highly variable from year to year.
- The majority of precipitation falls during the warm-season months.

- Throughout the period of record (1895–2020), total annual precipitation has generally been above average since 1985.
- The wettest consecutive 5-year interval was 2015–2019.
- The frequency of extreme precipitation events has been highly variable but shows a general increase.
- The number of 2-inch precipitation events was well above average during the 2015–2020 period.
- The increase in extreme precipitation events has been more pronounced in the eastern part of the state.

The following graph details the annual precipitation and extreme precipitation events for Kansas Region D:

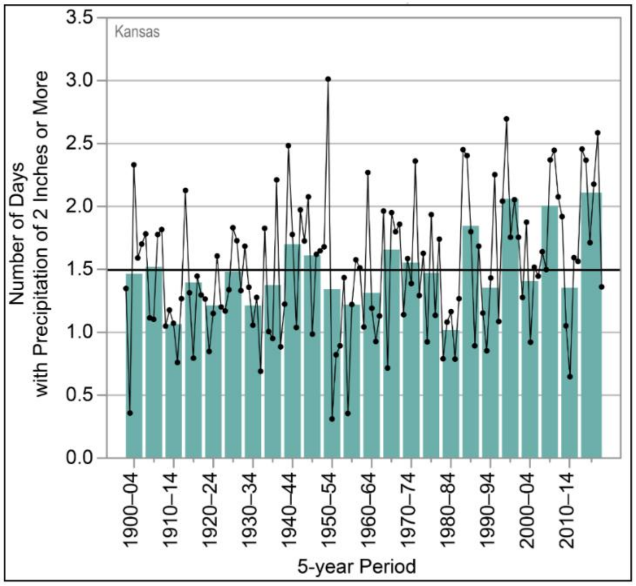
Graph 25: Kansas Total Annual Precipitation



Source: NOAA NCEI Summary 2022 for Kansas

Additionally, the NOAA NCEI State Climate Summary 2022 for Kansas suggests that the number of extreme precipitation events are projected to increase. These extreme events will likely increase the incidence of flooding within Kansas Region D.

Graph 26: Kansas Region D Number of Extreme Precipitation Events (Greater Than 2 Inches)



Source: NOAA NCEI State Climate Summary 2022 for Kansas

5.12.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Kansas Region D and all participating jurisdictions from riverine flooding. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Kansas Region D and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 108: Participating Jurisdiction Flood Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Clark County	**All**	**Very Low**	**4.7**	**0.3**
Ashland, Englewood, and Minneola	967100	Relatively Low	38.7	0.3
Finney County	**All**	**Relatively Low**	**35.2**	**0.4**
Holcomb	960100	Relatively Moderate	89.2	0.4
Garden City	960200	No Rating	0.0	0.0
Garden City	960300	No Rating	0.0	0.0
Garden City	960401	No Rating	0.0	0.0
Garden City	960403	No Rating	0.0	0.0
Garden City	960404	Very Low	27.7	0.4
Garden City	960501	Very Low	32.2	0.4
Garden City	960503	Relatively Moderate	70.9	0.4
Garden City	960505	Very Low	30.8	0.4
Garden City	960507	No Rating	0.0	0.0
Garden City	960508	No Rating	0.0	0.0
Garden City	960600	Relatively Moderate	72.6	0.4
Ford County	**All**	**Relatively Low**	**61.5**	**1.1**
Spearville	961600	Relatively Moderate	73.8	1.1
Bucklin and City of Ford	961700	Relatively Moderate	81.8	1.1
Dodge City	961801	No Rating	0.0	0.0

Table 108: Participating Jurisdiction Flood Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Dodge City	961802	Relatively Low	50.6	1.1
Dodge City	961901	Relatively Low	41.9	1.1
Dodge City	961902	Very Low	31.2	1.1
Dodge City	962000	Relatively High	94.6	1.1
Dodge City	962101	Relatively Moderate	72.9	1.1
Dodge City	962102	Relatively High	93.9	1.1
Gray County	**All**	**Very Low**	**9.4**	**0.4**
Cimarron and Ingalls	962600	Relatively Low	62.9	0.4
Copeland, Ensign, and Montezuma	962700	Very Low	26.4	0.4
Haskell County	**All**	**No Rating**	**0.0**	**0.0**
Satanta and Sublette	463100	No Rating	0.0	0.0
Hodgeman County	**All**	**Very Low**	**9.5**	**0.7**
Hanston and Jetmore	461100	Relatively Low	62.9	0.7
Lane County	**All**	**No Rating**	**0.0**	**0.0**
Dighton	956600	No Rating	0.0	0.0
Meade County	**All**	**Very Low**	**10.7**	**0.5**
Fowler and Plains	966600	Very Low	33.9	0.5
City of Meade	966700	Relatively Low	65.9	0.5
Seward County	**All**	**Relatively Low**	**49.8**	**0.4**
Kismet	965600	Relatively Low	58.4	0.4
Liberal	965700	Relatively Moderate	83.3	0.4
Liberal	965800	Relatively Moderate	77.4	0.4
Liberal	965900	Relatively High	93.0	0.4
Liberal	966000	Relatively Moderate	77.3	0.4

Source: FEMA

Table 109: Participating Jurisdiction Flood Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Clark County	**All**	**Very Low**	**4.9**	**$2.2K**
Ashland, Englewood, and Minneola	967100	Relatively Low	38.6	$2.2K
Finney County	**All**	**Relatively Low**	**34.7**	**$181K**
Holcomb	960100	Relatively Moderate	89.0	$130K
Garden City	960200	No Expected Annual Losses	0	$0
Garden City	960300	No Expected Annual Losses	0	$0
Garden City	960401	No Expected Annual Losses	0	$0
Garden City	960403	No Expected Annual Losses	0	$0
Garden City	960404	Very Low	27.4	$84
Garden City	960501	Very Low	31.0	$526
Garden City	960503	Relatively Moderate	70.5	$30K
Garden City	960505	Very Low	30.1	$383
Garden City	960507	No Expected Annual Losses	0	$0
Garden City	960508	No Expected Annual Losses	0	$0
Garden City	960600	Relatively Low	64.8	$20K
Ford County	**All**	**Relatively Low**	**56.6**	**$541K**

Table 109: Participating Jurisdiction Flood Expected Annual Loss

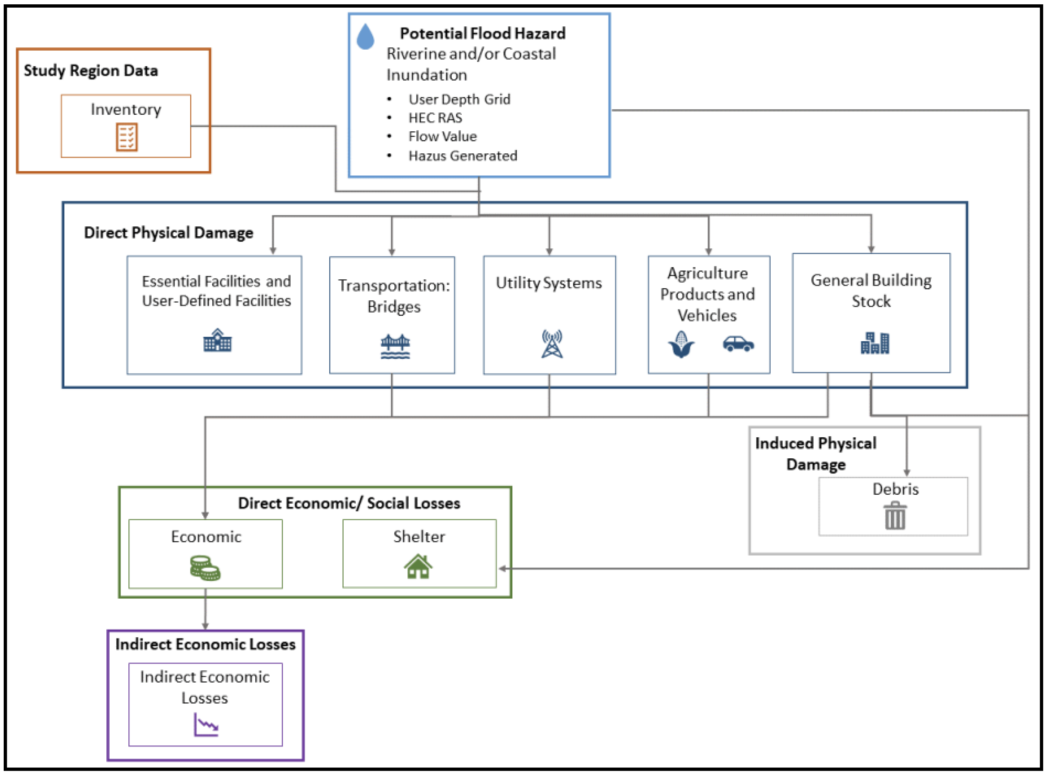
Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Spearville	961600	Relatively Moderate	78.4	$51K
Bucklin and City of Ford	961700	Relatively Moderate	84.3	$83K
Dodge City	961801	No Expected Annual Losses	0	$0
Dodge City	961802	Relatively Low	45.5	$4.6K
Dodge City	961901	Relatively Low	39.8	$2.6K
Dodge City	961902	Very Low	31.2	$553
Dodge City	962000	Relatively High	92.1	$189K
Dodge City	962101	Relatively Low	65.5	$21K
Dodge City	962102	Relatively High	92.0	$189K
Gray County	**All**	**Very Low**	**10.6**	**$17K**
Cimarron and Ingalls	962600	Relatively Low	62.4	$17K
Copeland, Ensign, and Montezuma	962700	Very Low	26.3	$20
Haskell County	**All**	**No Expected Annual Losses**	**0.0**	**$0**
Satanta and Sublette	463100	No Expected Annual Losses	0.0	$0
Hodgeman County	**All**	**Very Low**	**10.9**	**$18K**
Hanston and Jetmore	461100	Relatively Low	62.9	$18K
Lane County	**All**	**No Expected Annual Losses**	**0**	**$0**
Dighton	956600	No Expected Annual Losses	0	$0
Meade County	**All**	**Very Low**	**12.6**	**$26K**
Fowler and Plains	966600	Relatively High	33.1	$908
City of Meade	966700	Relatively Low	68.2	$25K
Seward County	**All**	**Relatively Low**	**43.9**	**$289K**
Kismet	965600	Relatively Low	55.6	$11K
Liberal	965700	Relatively Moderate	78.4	$51K
Liberal	965800	Relatively Moderate	$39K	$39K
Liberal	965900	Relatively Moderate	90.6	$157K
Liberal	966000	Relatively Moderate	70.8	$30K

Source: FEMA

FEMA Hazus

For purposes of this plan, a Hazus Flood Model was generated to provide an estimate of the consequences to a flood. The resulting loss estimate generally describes the scale and extent of damage and disruption that may result from the modeled flood event. The Hazus software uses GIS technologies for performing analyses with inventory data and displaying losses and consequences on applicable tables and maps. The following figure provides a graphic representation of the modules that the Hazus Flood Model Methodology is composed of, and their interrelation in deriving estimates.

Figure 8: Hazus Flood Model Methodology



Source: FEMA

The results of the Hazus analysis were utilized to estimate potential losses for 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 ten square miles or more.

Hazus determines the displaced population based on the inundation area, not necessarily impacted buildings. As a result, there may be a 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 percentage classes are grouped by 10% increments up to 50%. Buildings that sustain more than 50% damage are considered to be substantially damaged.

The Hazus analysis also provides an estimate of 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 weigh 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 damaged buildings, destroyed buildings, and total economic loss for Kansas Region D:

Table 110: Kansas Region D Hazus Flood Scenario Economic Impacts

County	Damaged Buildings	Destroyed Buildings	Total Economic Loss
Clark	0	0	$1,380,000
Finney	278	3	$270,900,000
Ford	222	0	$119,470,000
Gray	1	0	$3,710,000
Haskell	0	0	$1,270,000
Hodgeman	0	0	$2,540,000
Lane	3	0	$16,880,000
Meade	3	0	$4,240,000
Seward	70	1	$103,440,000

Source: FEMA Hazus

The following table provides the HAZUS results for displaced households, damaged buildings, destroyed buildings, and total economic loss for Kansas Region D:

Table 111: Kansas Region D Hazus Flood Scenario Economic Impacts

County	Displaced Households	Displaced Population	Persons Seeking Shelter
Clark	16	49	2
Finney	2,030	6,091	300
Ford	1,107	3,320	125
Gray	41	123	4
Haskell	33	100	1
Hodgeman	33	99	9
Lane	82	246	8
Meade	20	60	1
Seward	892	2,675	96

Source: FEMA Hazus

The Hazus model indicated that the following number of critical facilities are estimated to be damaged or suffer loss of use from the flood scenario.

Table 112: Kansas Region D Hazus Flood Scenario Number of Critical Facilities Damaged or Impacted

County	Emergency Operations Centers	Fire Stations	Hospitals	Police Stations	Schools
Grant	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
Hodgeman	0	0	0	0	0
Lane	0	0	0	0	0
Meade	0	0	0	0	0
Seward	0	0	0	0	0

Source: FEMA Hazus

Population

A primary concern with this hazard is human health safety issues, as extreme heat can be a direct cause of death. Specific at-risk groups include outdoor workers, farmers, young children, and senior citizens. Impacts on human health can include:

- **Loss of Life**: Flooding is one of the leading causes of weather-related fatalities worldwide. Fast-rising floodwaters can lead to drowning and other water-related accidents, resulting in the tragic loss of lives.
- **Injuries:** Floods can cause injuries due to waterborne diseases, contaminated floodwaters, debris, and accidents during evacuation or rescue operations.
- **Displacement:** Many people may be forced to evacuate their homes during floods and will require emergency shelter or temporary housing. Prolonged displacement can be emotionally and economically challenging.
- **Health Risks:** Floodwaters often contain pollutants, sewage, and hazardous materials. Exposure to contaminated water can lead to waterborne diseases, infections, and other health risks.
- **Mental Health Effects:** Survivors of floods may experience a range of emotional and psychological challenges, including post-traumatic stress disorder, anxiety, depression, and grief.
- **Food and Water Shortages:** Floods can contaminate water supplies and disrupt the distribution of food. This can lead to shortages of clean drinking water and essential food items.
- **Impact on Vulnerable Populations:** Vulnerable populations, including the elderly, children, people with disabilities, and those living in poverty, are often disproportionately affected by floods due to limited resources and mobility challenges.

Especially critical is timely evacuation orders, and adherence to those orders. If evacuation is not heeded, or flood waters rise quickly enough, citizens could drown or become trapped for extended periods of time with no access to services or medical care. Of special concern are long-term care and medical facilities where it can take longer to evacuate, or evacuation may be impossible. Additionally, lower income citizens may not have the means to relocate, whether it be lack of transportation or lack of resources to afford temporary shelter.

Buildings and Structures

Floods can have significant and often costly impacts on buildings and structures. These impacts can disrupt essential services, damage infrastructure, and pose safety risks. The extent of the impact depends on factors such as the severity of the flood, the preparedness of the infrastructure, and the effectiveness of flood management measures. Here are some of the common impacts of floods on facilities and critical infrastructure:

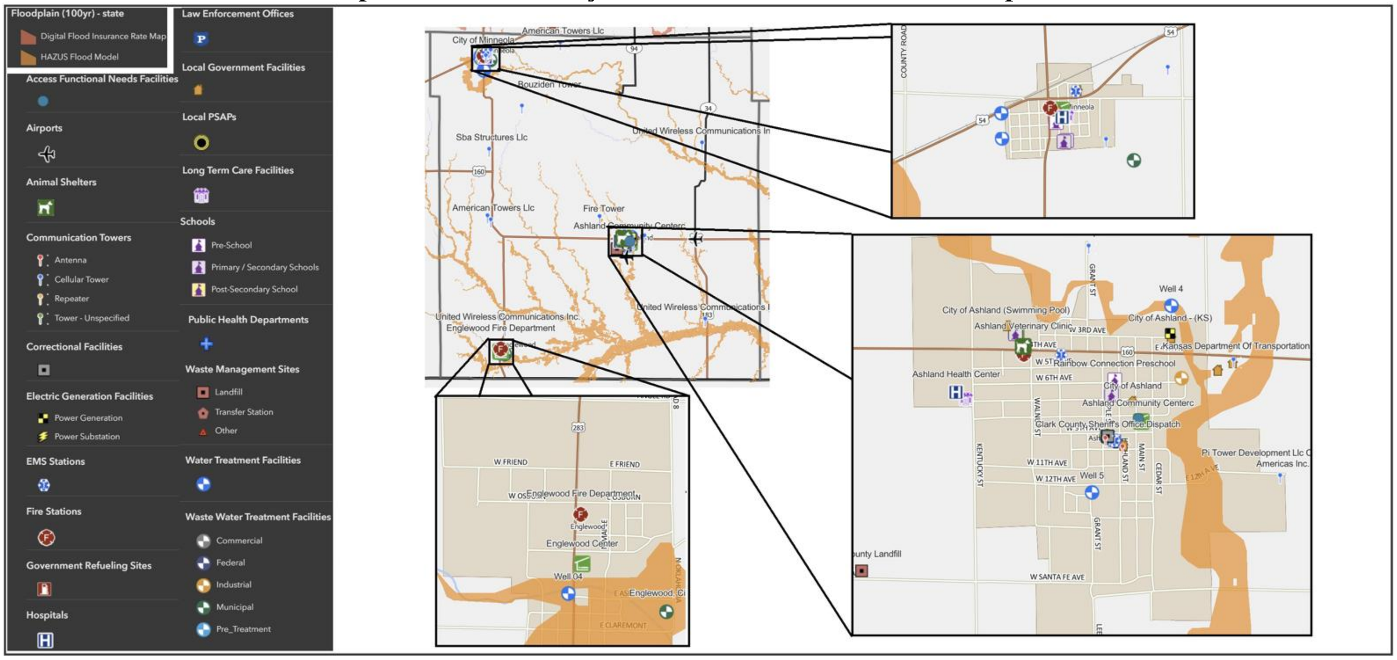
- **Foundation Damage:** Floodwaters can erode the soil supporting the foundation, leading to settling, cracks, or even collapse. Scouring and soil liquefaction during floods may undermine the stability of buildings, especially those on weak soils.
- **Wall and Floor Damage:** High water pressure, especially from fast-moving floods, can crack walls, warp floors, and cause floors to collapse.
- **Building Collapse:** If the foundation is significantly compromised, or if water levels rise too quickly, entire buildings may collapse, especially older structures or those not designed for flood resilience.
- **Water Seepage:** Even shallow flooding can cause water to seep into the building's structure, leading to rotting of wooden frames, mold growth, and damage to insulation and electrical systems.
- **Interior Damage:** Drywall, carpets, furniture, and appliances may all be ruined by prolonged exposure to floodwater, which often carries contaminants like sewage and chemicals.
- **Electrical Short Circuits and Fire:** Floodwaters can cause electrical systems to short-circuit, posing risks of fire or electrocution.
- **HVAC and Plumbing System Damage:** Heating, ventilation, and air conditioning systems, as well as plumbing systems, are vulnerable to water damage, potentially leading to the loss of potable water and proper sanitation in the building.
- **Mold:** After the floodwaters recede, mold and mildew can quickly develop in damp environments. This can lead to respiratory problems for occupants and further deterioration of the building materials.
- **Wood Rot and Corrosion:** Prolonged exposure to water can cause wooden materials to rot and metal components, like steel reinforcements, to corrode, weakening the building over time.

Due to the lack of digital data (DFIRMs), an estimate of structures in floodplains could not be completed.

Critical Infrastructure In Floodplain Mapping

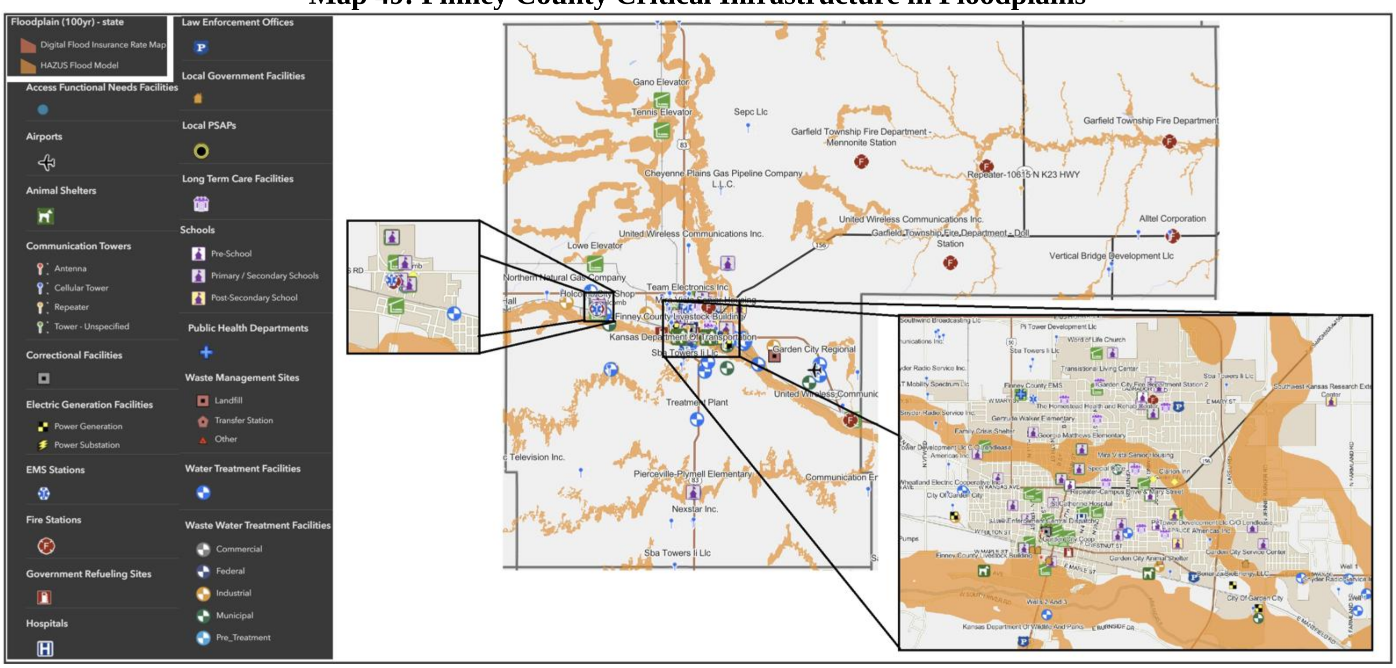
Utilizing the State of Kansas EOPmapper system, which utilizes FEMA Hazus data and/or DFIRM data (when available), the following maps were generated to illustrate critical facilities in potential floodplains.

Map 48: Clark County Critical Infrastructure in Floodplains



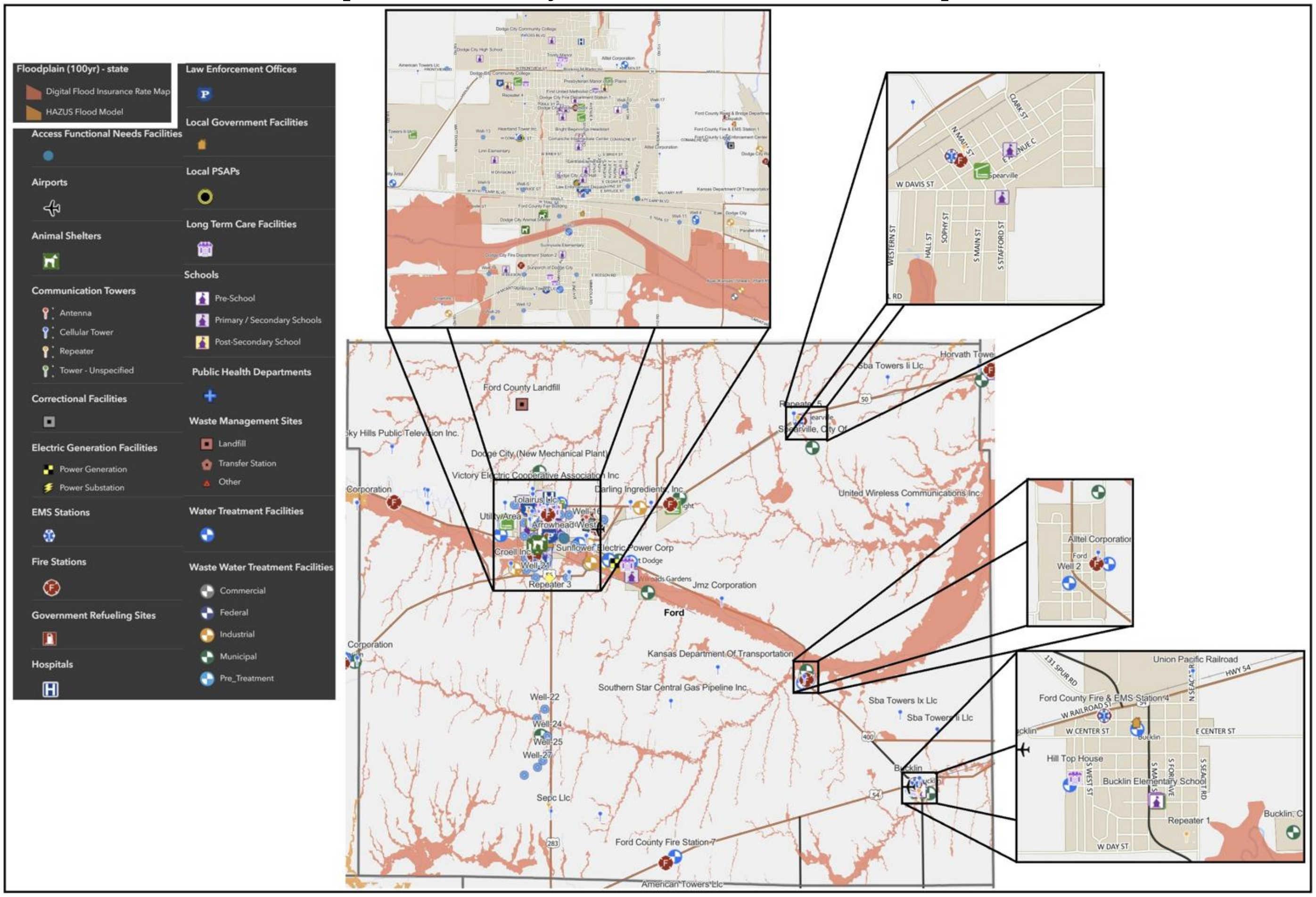
Source: EOPmapper

Map 49: Finney County Critical Infrastructure in Floodplains



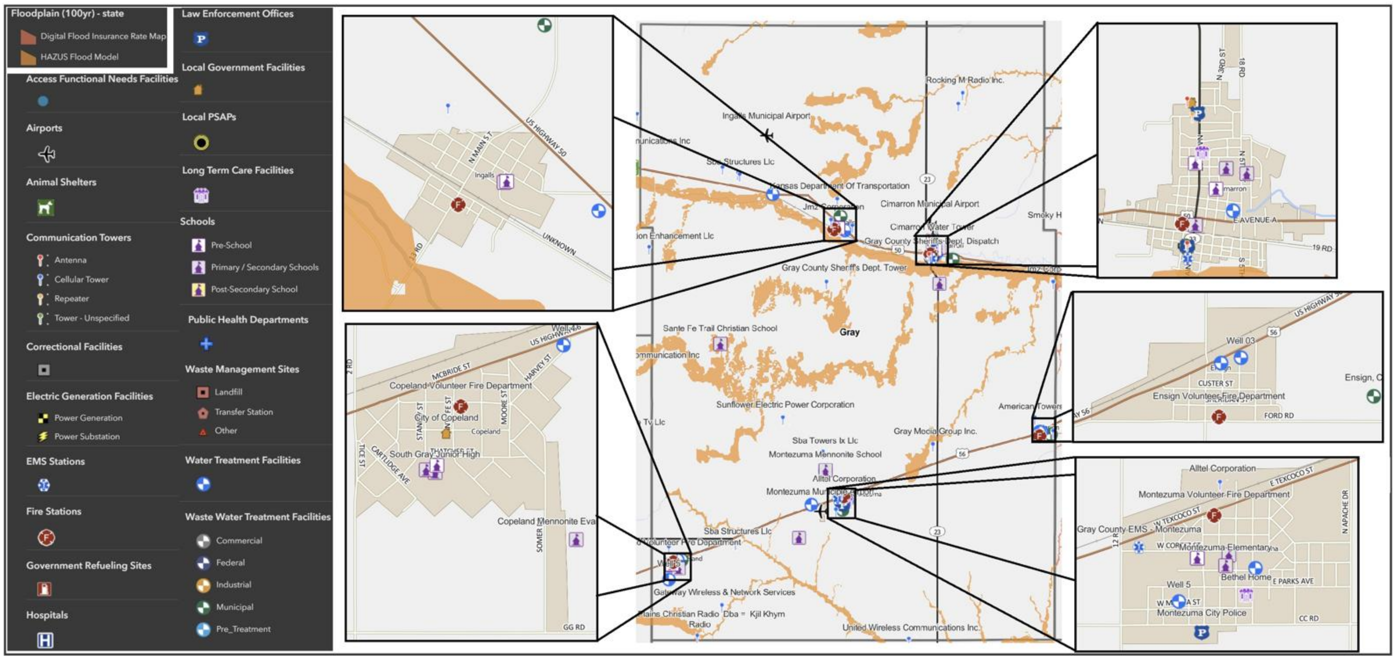
Source: EOPmapper

Map 50: Ford County Critical Infrastructure in Floodplains



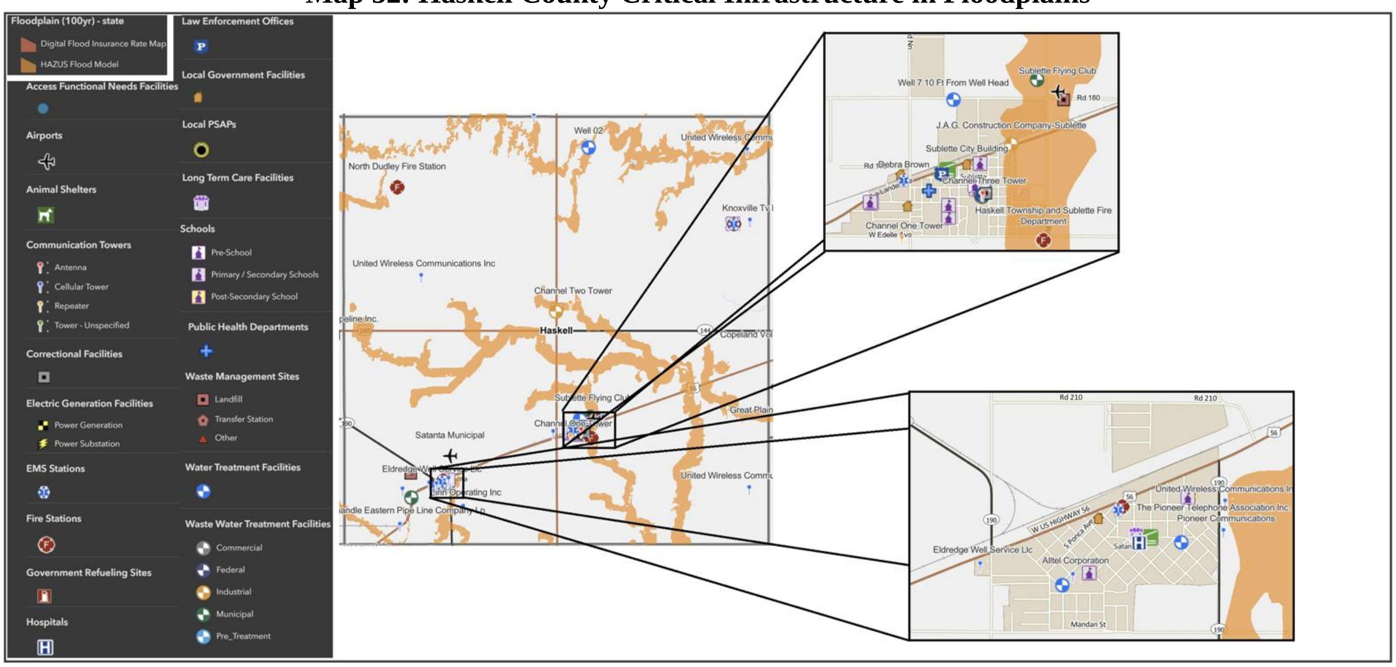
Source: EOPmapper

Map 51: Gray County Critical Infrastructure in Floodplains



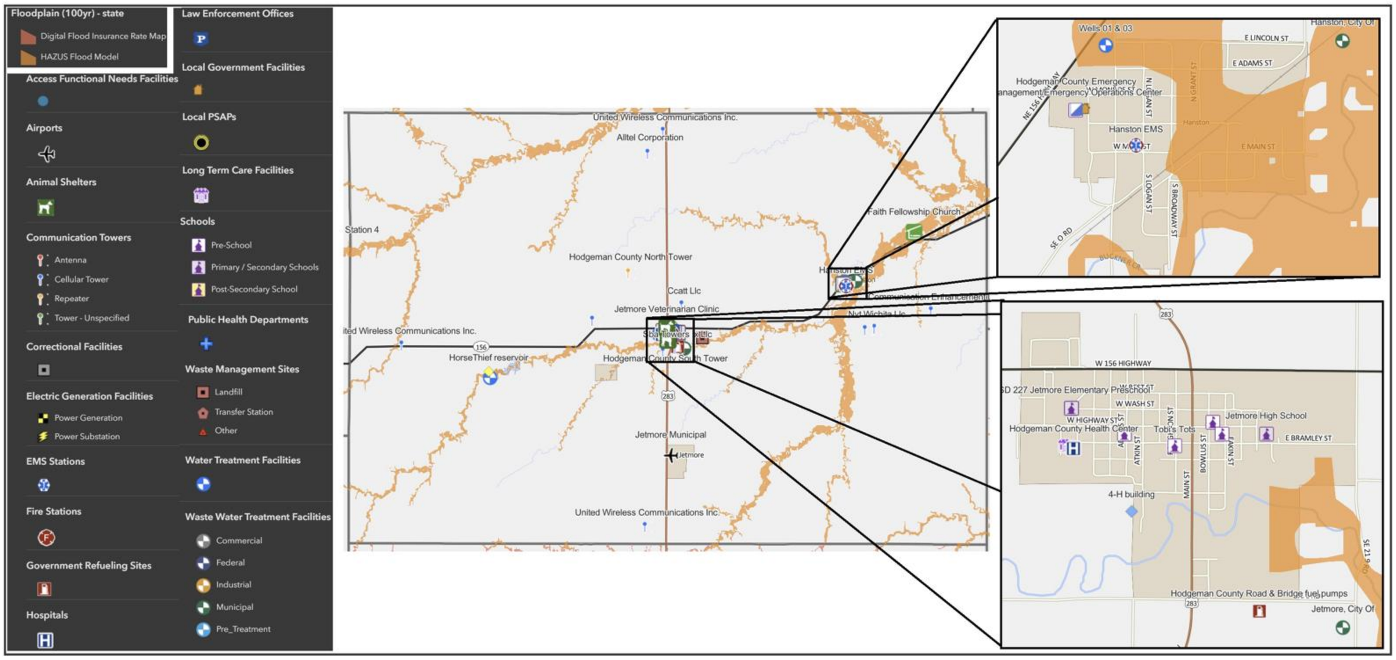
Source: EOPmapper

Map 52: Haskell County Critical Infrastructure in Floodplains



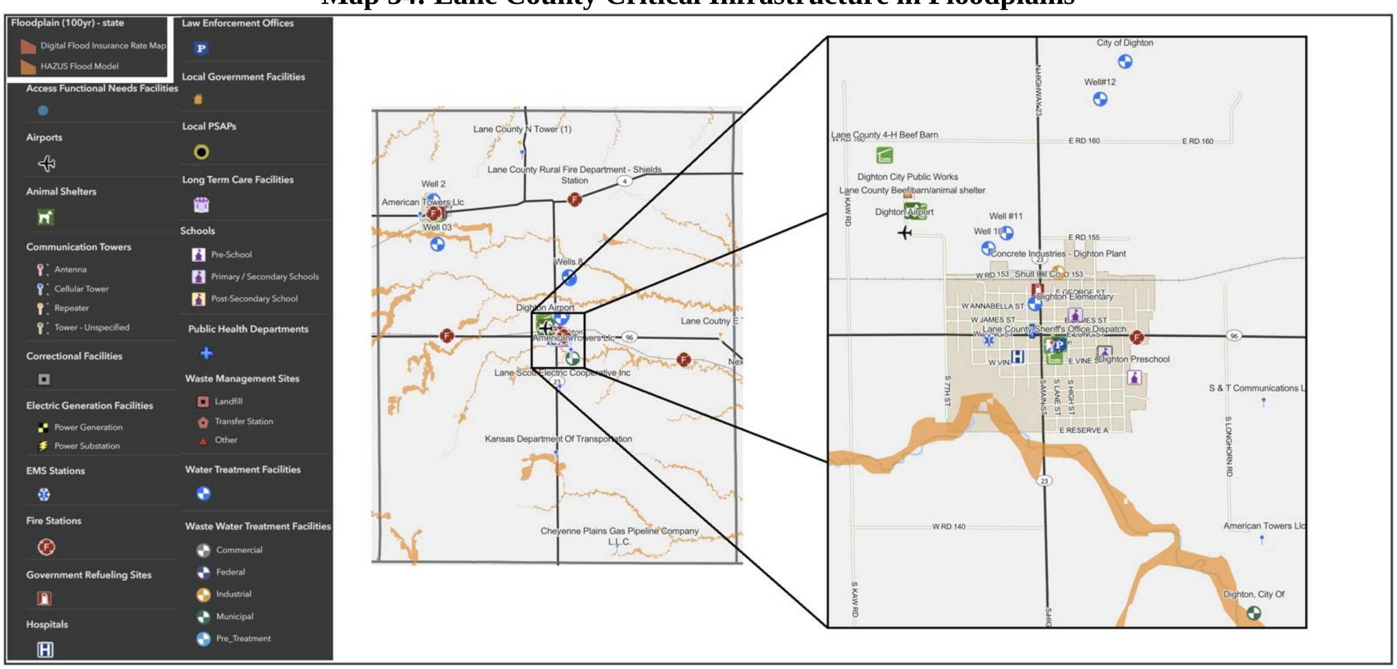
Source: EOPmapper

Map 53: Hodgeman County Critical Infrastructure in Floodplains



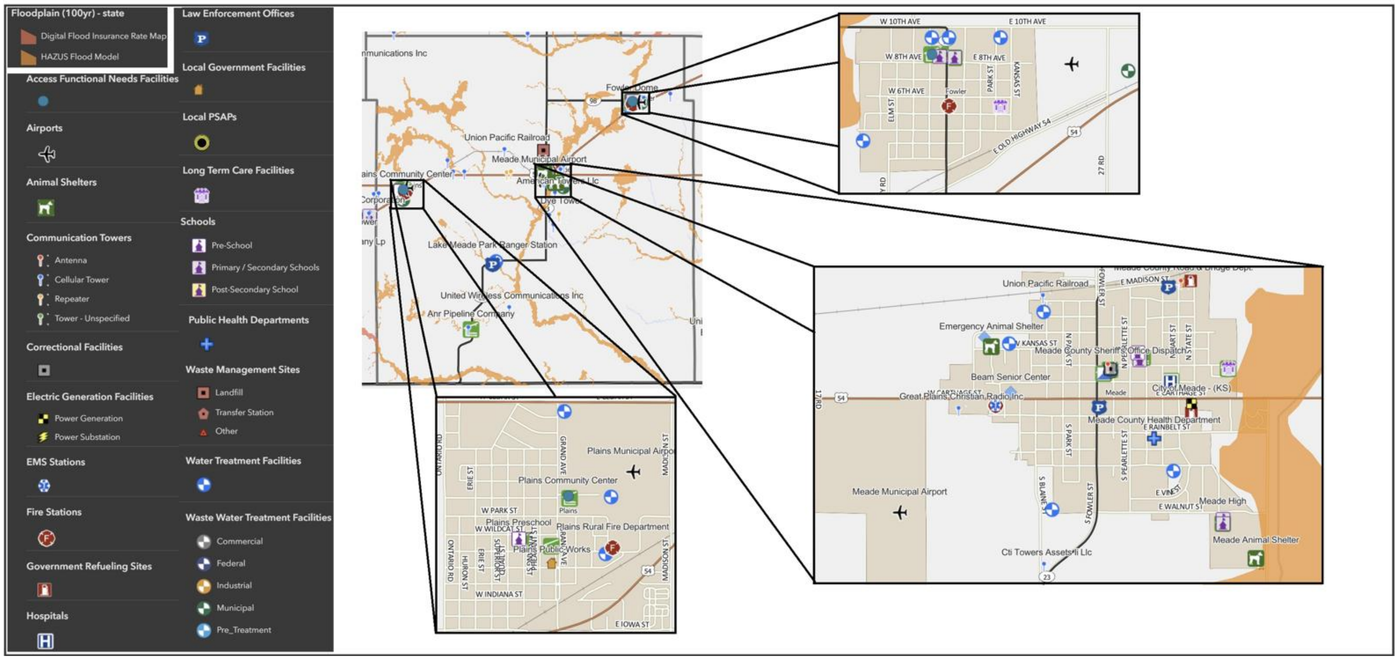
Source: EOPmapper

Map 54: Lane County Critical Infrastructure in Floodplains



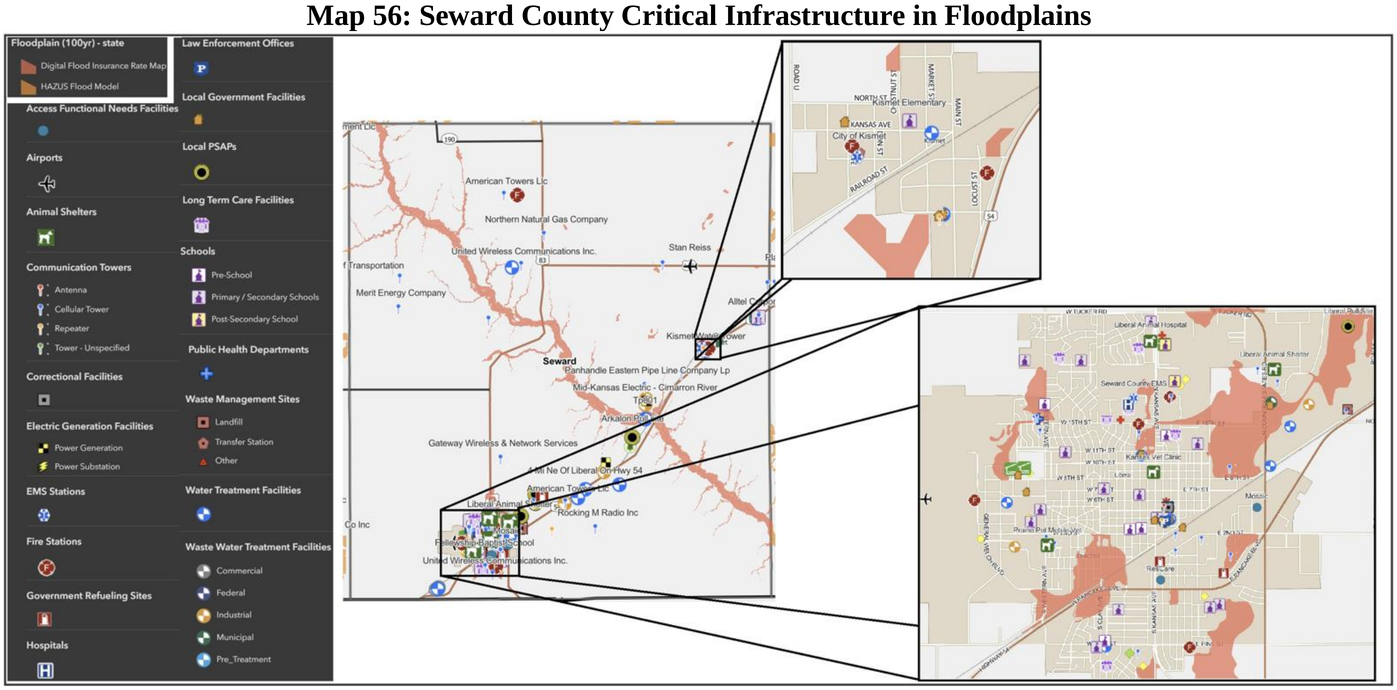
Source: EOPmapper

Map 55: Meade County Critical Infrastructure in Floodplains



Source: EOPmapper

Map 56: Seward County Critical Infrastructure in Floodplains



Source: EOPmapper

The following sections detail potential impacts on these facilities and systems.

Transportation and Electrical Infrastructure
Flooding can have numerous impacts on both transportation and electrical distribution systems. The impacts of flooding on transportation systems may include:

- **Scour and Erosion:** Floodwaters can wash away the supporting soil around and beneath roads, a process known as scour. This can lead to the collapse of the roadbed and destabilization of bridges and overpasses.
- **Undermining of Pavement:** Prolonged exposure to floodwaters can weaken the pavement structure, leading to cracks, potholes, and eventual failure of the roadway. Roads not designed for water drainage are especially susceptible to being washed out.
- **Potholes and Cracks:** Water penetrates cracks in the pavement, weakening the sublayers. Once the floodwaters recede and the weight of vehicles passes over, potholes can quickly form, creating hazards for drivers.
- **Surface Damage:** Asphalt roads, in particular, can become brittle after repeated water exposure, resulting in chunks of road surface breaking off.
- **Bridge Collapse:** Flooding can damage the support structures of bridges, particularly if water levels rise to exert pressure on the bridge's piers. Debris carried by floodwaters can accumulate around bridge structures, further stressing them.
- **Blocked or Collapsed Culverts:** Culverts, which allow water to pass beneath roads, can become blocked by flood debris, leading to water pooling on roads or forcing water to erode the roadbed around the culvert.
- **Road Inundation:** Flash floods or slow-rising waters can make roads impassable, either because of deep standing water or swift currents.
- **Landslides:** In hilly or mountainous regions, flooding increases the risk of mudslides and landslides, which can bury roads and highways under tons of debris, blocking transportation routes and requiring significant cleanup.
- **Debris Flows:** Heavy rains can wash debris, rocks, and soil onto roads, making them impassable and causing further damage to the road surface.
- **Foundation Weakening:** Repeated flooding over time can weaken the structural foundation of roads, even if the damage isn’t immediately apparent. This could lead to long-term deterioration of highways and bridges, requiring expensive repairs or reconstruction.

Flooding can impact both the electrical generation capacity and transmission. The impacts of extreme heat on electrical systems may include:

- **Flooding of Substations:** Electrical substations, particularly those located in low-lying or flood-prone areas, are vulnerable to flooding. Water ingress into substations can cause short circuits and failures of critical equipment such as transformers, circuit breakers, and switchgear. If a substation is taken offline, large areas could lose power.
- **Transformer Damage:** Floodwaters can compromise oil-insulated transformers by causing leaks or mixing with the oil, which is essential for cooling and insulation. This can lead to transformer failures and extended outages.
- **Downed Power Lines:** Strong flood currents, debris, or trees falling due to saturated soil can bring down power lines, leading to localized or widespread outages.
- **Foundation Erosion:** Transmission towers and utility poles are susceptible to soil erosion during floods, which can undermine their foundations and cause structural instability or collapse.
- **Corrosion of Equipment:** Prolonged exposure to floodwaters can lead to the corrosion of metal components in transmission and distribution systems, shortening the lifespan of equipment and increasing the risk of failure.

- **Water Infiltration:** Electrical equipment, including power meters, transformers, and underground cabling, can experience short circuits if water infiltrates, leading to power outages and potential safety hazards. For example, underground electrical vaults can flood, damaging cables and transformers, and posing fire and electrocution risks.

Water and Wastewater Facilities
Water and wastewater utilities are vulnerable to flood events due to the potential for plant damages and distribution system damages. Impacts may include:

- **Damage to Water Treatment Plants:** Floodwaters can inundate water treatment plants, damaging pumps, electrical systems, and filtration equipment. This can prevent the proper treatment of drinking water, leading to unsafe water supplies.
- **Damage to Wastewater Treatment Plants:** Wastewater facilities may experience flooding that overwhelms the capacity to treat sewage, leading to raw or partially treated sewage being discharged into nearby water bodies, contaminating them.
- **Damage to Pumping Stations:** Flooded pumping stations can fail, leading to service interruptions in both water distribution and sewage removal. These failures may require costly repairs or replacements.
- **Drinking Water Contamination:** Floodwaters often carry contaminants such as chemicals, sewage, and industrial waste. If this water infiltrates drinking water systems through broken pipes or overwhelmed treatment systems, it can lead to widespread contamination.
- **Backflow of Sewage:** In severe flooding, sewage can backflow into homes, streets, and businesses through overwhelmed or broken sewer systems. This not only poses health risks but also results in costly cleanup.
- **Increased Flow in Sewer Systems:** During floods, combined sewer systems (which handle both stormwater and sewage) can be overwhelmed by the sheer volume of water. This leads to combined sewer overflows where untreated sewage is discharged directly into rivers, harming the environment and public health.
- **Overwhelmed Stormwater Systems:** Flooding can overwhelm stormwater management systems, causing backups that flood streets and neighborhoods. In older urban areas, this may also overwhelm the sewer system, as stormwater and sewage often share the same infrastructure.

Medical and Response Facilities
A GIS analysis of medical, educational, and response facilities within the 100-year floodplain indicates the following may be found in the mapping above.

Any response facility located in areas of flooding may be impacted, resulting in delayed response times. Impacts may include:

- **Physical Damage to Infrastructure:** Flood waters can cause physical damage to facilities. This damage can result in interruptions or complete failure of response services.
- **Power Outages:** Flood waters can lead to power outages by knocking down power lines or damaging electrical substations. Dispatch systems that rely on electricity may be impacted, disrupting services.

While flooding may result in a temporary increase in patients, it is considered unlikely that any influx would overwhelm current medical capabilities.

Educational Facilities
Depending on the educational facility capability and location, flooding may necessitate the closure of the facility for the duration of the event due to damages or lack of access. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

Communication Systems

No comprehensive mapping of communications systems was available for review to compare against known flood hazard areas. However, it is assumed that communications lines and towers are in known hazard areas. Flooding can disrupt this vital communications system, affecting reliability and functionality. Some of the key vulnerabilities include:

- **Physical Damage to Infrastructure:** Flood waters can cause physical damage to communication infrastructure such as cell towers, antennas, satellite dishes, and power lines. This damage can result in interruptions or complete failure of communication services.
- **Power Outages:** Flood waters can lead to power outages by knocking down power lines or damaging electrical substations. Communication systems that rely on electricity, such as landline phones, internet routers, and cellular towers, may cease to function during power outages.
- **Structural Instability:** Flood waters can cause structural instability in communication towers and buildings housing communication equipment. If these structures are not properly reinforced, they may collapse or sustain damage, disrupting communication services.

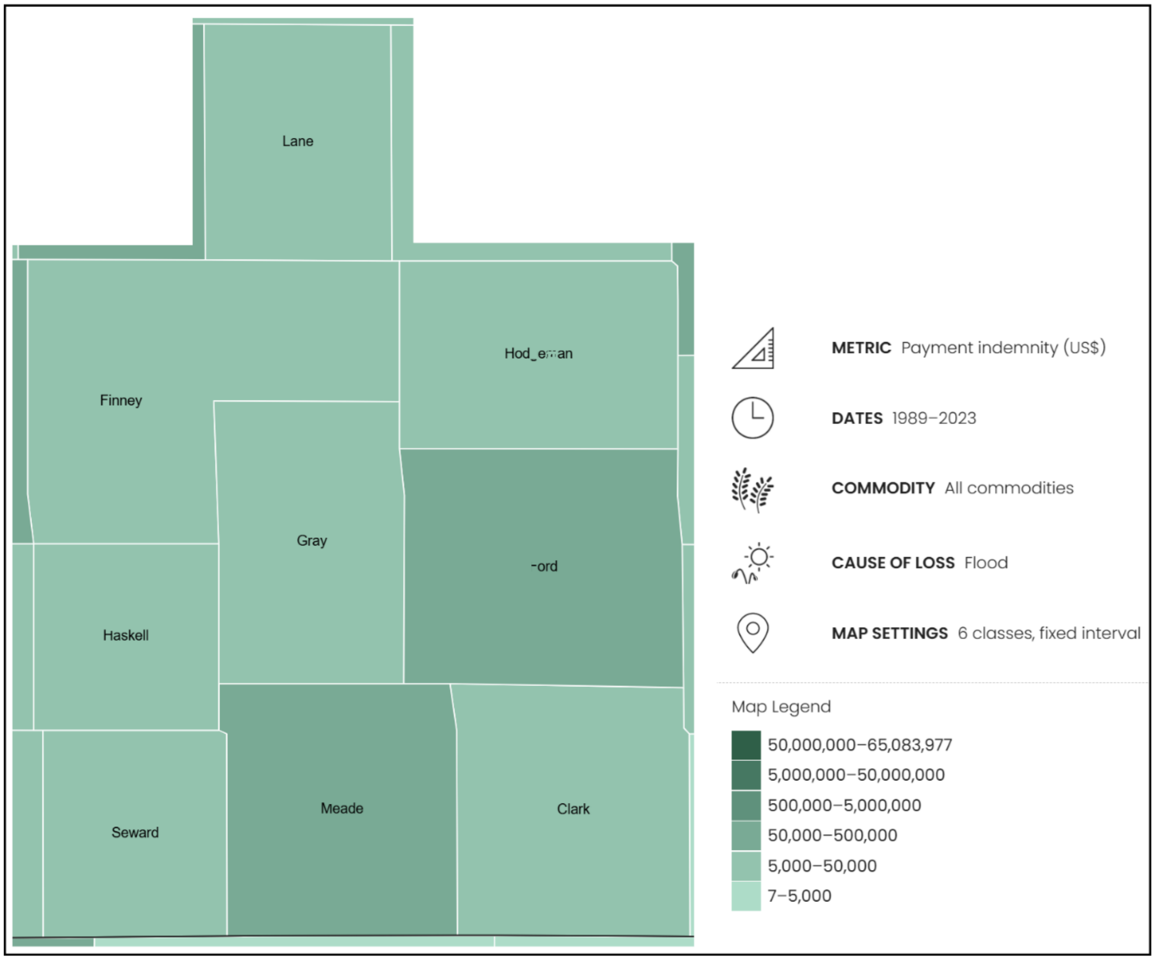
The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. Estimated repair cost from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency may be found in Section 5.11.6.

Environmental and Agricultural Impacts

Environmental impacts from flooding can be far reaching. Of particular concern is flood related runoff, potentially carrying sewage, pesticides, or hazardous chemicals, which can cause long lasting environmental harm. Expected negative outcomes could include changes in habitat, a decrease of available food, and an increase in the spread of vector-associated disease due to standing water.

Flooding can cause significant agricultural impacts. The following map from the United States Department of Agriculture details total county-wide agricultural losses, by county, due to flooding from 1989 - 2023:

Map 57: Agricultural Losses Due to Flooding, 1989 - 2023



Source: United States Department of Agriculture

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** With 10.5% of citizens living in poverty, 23.4% over the age of 65, and 18.1% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage. Additionally, some critical infrastructure has been identified in areas of potential flooding (see above mapping).
- **Finney County:** With 12.8% of citizens living in poverty, 10.9% over the age of 65, and 13.7% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage. Additionally, some critical infrastructure has been identified in areas of potential flooding (see above mapping).
- **Ford County:** With 11.8% of citizens living in poverty, 10.9% over the age of 65, and 11.1% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due

to lack of insurance coverage. Additionally, some critical infrastructure has been identified in areas of potential flooding (see above mapping).

- **Gray County:** With 4.6% of citizens living in poverty, 15.2% over the age of 65, and 7.8% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage. Additionally, some critical infrastructure has been identified in areas of potential flooding (see above mapping).
- **Haskell County:** With 11.3% of citizens living in poverty, 13.7% over the age of 65, and 9.9% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage. Additionally, some critical infrastructure has been identified in areas of potential flooding (see above mapping).
- **Hodgeman County:** With 11.3% of citizens living in poverty, 22.4% over the age of 65, and 13.1% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage. Additionally, some critical infrastructure has been identified in areas of potential flooding (see above mapping).
- **Lane County:** With 12.4% of citizens living in poverty, 21.4% over the age of 65, and 18.6% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage. Additionally, some critical infrastructure has been identified in areas of potential flooding (see above mapping).
- **Meade County:** With 8.71% of citizens living in poverty, 17.4% over the age of 65, and 12.6% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage. Additionally, some critical infrastructure has been identified in areas of potential flooding (see above mapping).
- **Seward County:** With 14.0% of citizens living in poverty, 9.6% over the age of 65, and 10.7% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage. Additionally, some critical infrastructure has been identified in areas of potential flooding (see above mapping).

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with extreme may include:

- Infrastructure and utility failure
- Economic disruption
- Flood related illnesses and mortality
- Power outages
- Population displacement
- Environmental degradation

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas

Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 113: Flood Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Significant flooding events can lead to the damage and loss of homes, property, and businesses. Flash flooding and excessive rainfall may lead to dangerous conditions on roadways. Closures of medical facilities is a major public health concern if flooding damages those facilities. Water sources may become contaminated, and water or sewer systems may be disrupted. Vector-associated disease may increase.
Impact on Responders	Emergency responders may be called on to evacuate people from impacted areas, as well as close roads, attend to the injured, and direct traffic. First responders may face challenges with transportation and access to a location. Flash floods and mudslides due to heavy rainfall can also injure first responders, as well as delay response operations.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. This threat may impact an agency’s ability to maintain continuity of operations based on the incidents impact on power, communications and the potential to damage equipment and records within primary and alternate facilities.
Delivery of Services	Flooding can cause road and bridge closures, as well as disrupt transit services, impacting the ability to deliver goods and services. Exposure to flood waters may also damage or destroy physical goods such as food, clothing, and hygiene products.
Property, Facilities, and Infrastructure	Flooding can cause significant property destruction. Floods can disrupt normal daily activities due to the potential impact on schools, hospitals, and other public infrastructure. Transportation infrastructure can be damaged which could impact the freedom of movement or provision of utilities. Water sources can become contaminated. Water and sewer systems may be disrupted. Solid-waste collection and disposal may also be impacted, causing dangerous public health risks.
Impact on Environment	Rising waters from flooding impact the environment by spreading pollution, inundating water and wastewater treatment plants, and disrupting wildlife. Standing water following a flood event can facilitate the spread of vector-associated diseases.
Economic Conditions	Significant and repeated flooding can lower property value throughout the state, which can have a deleterious effect on the tax base. Furthermore, flooding drains response resources, which can be costly during a large flooding event for disaster reimbursement
Public Confidence in Governance	Ineffective flooding response can decrease the public’s confidence in the ability to respond and govern. Multi-level government response requires direct actions that must be immediate and effective to maintain public confidence. Efficiency in response and recovery operations is critical in keeping public confidence high.

5.12.7 Future Development

Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Kansas Region D and the majority of participating jurisdictions have generally seen static to decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also initially slow and then decrease. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, is expected to increase the housing stock. However, adherence to building codes will provide any new construction a degree of hazard resiliency.

Future land use planning should be proactive to address future hazard conditions. Current building codes, floodplain ordinances, and zoning ordinances, where adopted and enforced, limit the locating of any new development, structures, or critical facilities and infrastructure within hazard areas.

5.12.8 National Flood Insurance Program Communities

The NFIP is a federal program, managed by FEMA, which 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 NFIP participating communities:

Table 114: 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	05/17/1974	-	(NSFHA)
Englewood (DNP)	07/17/1976	-	07/17/1976
Minneola	02/08/1974	-	(NSFHA)
Finney County			
Finney County	02/28/78	09/03/1997	09/25/2009
Garden City	03/03/73	03/24/1971	09/25/2009
Holcomb	-	02/19/1992	09/25/2009
Ford County			
Ford County	12/6/1977	07/03/1986	09/25/2009
Bucklin	-	09/25/2009	(NSFHA)
Dodge City	05/19/1972	05/19/1972	09/25/2009
City of Ford	03/26/1976	09/25/2009	(NSFHA)
Spearville (DNP)	09/19/1975	09/25/2009	09/25/2009
Gray County			
Cimarron	05/31/1974	09/06/1989	09/06/1989
Copeland	06/17/1977	-	(NSFHA)
Ensign (DNP)	03/26/1976	-	03/26/1976
Ingalls (DNP)	12/20/1974	-	12/20/1974
Montezuma	7/05/1977	-	(NSFHA)
Haskell County			
Satanta	06/07/1974		(NSFHA)
Hodgeman County			
Hanston	12/27/1974	09/04/1985	09/04/1985(M)
Jetmore (DNP)	03/01/1974	09/04/1985	19/04/1985(S)
Lane County			
Lane County	-	-	04/26/2011(E)
Dighton	-	-	04/26/2011(E)
Meade County			
Fowler (DNP)	07/30/1976	-	07/30/1976
Meade (DNP)	02/01/1974	09/04/1985	09/04/1985(S)
Seward County			

Table 114: Kansas Region D NFIP Communities

Community	Initial Flood Hazard Boundary Map Identified	Initial Flood Insurance Rate Map Identified	Current Effective Map Date
Seward County	09/13/1977	05/01/1999	09/25/2009
Kismet	11/22/1974	09/25/2009	09/25/2009
Liberal	03/01/1974	09/28/1990	09/25/2009

Notes: NSFHA: No Special Flood Hazard Area - All Zone C
(E): Entry In Emergency Program
(M): No elevation determined - All Zone A, C and X
(S): Suspended Community
DNP: Does not participate

The Community Rating System (CRS) is a voluntary program within the NFIP that provides insurance premium discounts to policy holders based on a jurisdiction's adherence to floodplain management activities that exceed minimum NFIP requirements. As of this plan, no participating jurisdictions within Kansas Region D are CRS participants.

5.12.9 FEMA Flood Policy and Loss Data

Kansas Region D flood policy information was sourced from FEMA's Flood Insurance Data and Analytics. The number of flood insurance policies in effect may not include all structures at risk of flooding, and it is likely that 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 statistics for Kansas Region D:

Table 115: Kansas Region D NFIP Policy Statistics

Jurisdiction	Number of Policies in Force	Insurance in Force	Number of Closed Losses	Total Payments
Clark County				
Ashland	0	$0	0	$0
Minneola	0	$0	0	$0
Finney County				
Finney County	10	$2,927,500	1	$10,871
Garden City	15	$2,396,100	6	$15,553
Holcomb	4	$775,000	1	$3,234
Ford County				
Ford County	37	$5,521,400	8	$38,557
Bucklin	0	$0	0	$0
Dodge City	12	$2,571,900	19	105,595
City of Ford	0	$0	0	$0
Gray County				
Cimarron	1	$111,300	0	$0
Copeland	0	$0	0	$0
Montezuma	0	$0	0	$0
Haskell County				
Satanta	1	$350,000	0	$00
Hodgeman County				
Hanston	0	$0	1	$2,493
Lane County				
Lane County	0	$0	0	$0
Dighton	0	$0	0	$0
Seward County				

Table 115: Kansas Region D NFIP Policy Statistics

Jurisdiction	Number of Policies in Force	Insurance in Force	Number of Closed Losses	Total Payments
Seward County	1	$275,000		$0
Kismet	0	0	0	$0
Liberal	31	$5,003,700	0	$0

The following table details the change in NFIP coverage from 2019 to 2025 for Kansas Region D:

Table 116: Kansas Region D NFIP Coverage Changes

Jurisdiction	Policies in Force 2019	Policies in Force 2025	Change in Policies, 2019 - 2025	Total Coverage 2019	Total Coverage 2025	Change in Coverage, 2019 - 2025
Ashland	0	0	0	$0	$0	$0
Bucklin	0	0	0	$0	$0	$0
Cimarron	4	1	-3	$506,000	$111,300	($394,700)
City of Ford	0	0	0	$0	0	$0
Copeland	0	0	0	$0	$0	$0
Dighton	0	0	0	$0	$0	$0
Dodge City	22	12	-10	$4,052,100	$2,571,900	($1,480,200)
Finney County	13	10	-3	$3,124,800	$2,927,500	($197,300)
Ford County	62	37	-25	$7,092,800	$5,521,400	($1,571,400)
Garden City	24	15	-9	$3,356,100	$2,396,100	($960,000)
Hanston	0	0	0	$0	$0	$0
Holcomb	6	4	-2	$878,000	$775,000	($103,000)
Kismet	0	0	0	$0	$0	$0
Lane County	2	0	-2	$200,000	$0	($200,000)
Liberal	43	31	-12	$6,487,800	$5,003,700	($1,484,100)
Minneola	0	0	0	$0	$0	$0
Montezuma		0	0	$0	$0	$0
Satanta	0	1	1	$0	$350,000	$350,000
Seward County	2	1	-1	$1,201,000	$275,000	($926,000)

Source: FEMA

5.12.10 Repetitive Loss Structures

The NFIP defines a Repetitive Loss 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. A Severe Repetitive Loss 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. The following table details Kansas Region D Repetitive Loss properties:

Table 117: Kansas Region D Repetitive Loss Properties

County	Community Name	Occupancy	Total Losses	Mitigated	NFIP Insured
Ford	Dodge City	Single Family	2	No	No
Ford	Dodge City	Other Non-Residential	2	No	No
Ford	Dodge City	Single Family	2	No	No
Seward	Liberal	No	2	No	No

No Severe Repetitive Loss properties were noted in Kansas Region D.

5.12.11 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the flood hazard.

Table 118: Example Flood Mitigation Actions

Category	Example Action
Planning and Regulation	Determine and enforcing acceptable land uses to alleviate the risk of damage by limiting exposure in flood hazard areas. Floodplain and coastal zone management can be included in comprehensive planning.
	Develop a floodplain management plan and updating it regularly.
	Establish a green infrastructure program to link, manage, and expand existing parks, preserves, greenways, etc.
	Prohibit or limiting floodplain development through regulatory and/or incentive-based measures.
	Limit the percentage of allowable impervious surface within developed parcels.
	Encourage the use of porous pavement, vegetative buffers, and islands in large parking areas.
	Complete a stormwater drainage study for known problem areas.
	Develop engineering guidelines for drainage from new development.
	Design a “natural runoff” or “zero discharge” policy for stormwater in subdivision design.
	Regularly calculate and document the amount of flood-prone property preserved as open space.
	Conduct NFIP community workshops to provide information and incentives for property owners to acquire flood insurance.
	Revise the floodplain ordinance to incorporate cumulative substantial damage requirements.
Infrastructure	Install, re-route, or increase the capacity of a storm drainage system.
	Increase capacity of stormwater detention and retention basins.
	Require developers to construct on-site retention basins for a firefighting water source.
	Routinely clean debris from support bracing underneath low-lying bridges.
	Elevate structures so that the lowest floor, including the basement, is raised above the base flood elevation.
	Raise utilities or other mechanical devices above expected flood levels.
	Elevate roads and bridges above the base flood elevation to maintain dry access.
	Floodproof water and wastewater treatment facilities located in flood hazard areas.
	Require that all critical facilities including emergency operations centers, police stations, and fire department facilities be located outside of flood-prone areas.
Natural Systems	Establish and managing riparian buffers along rivers and streams.
	Protect and preserve wetlands to help prevent flooding in other areas.
	Develop an open space acquisition, reuse, and preservation plan targeting hazard areas.

Table 118: Example Flood Mitigation Actions

	Protect and enhance landforms that serve as natural mitigation features
Education	Encourage homeowners to purchase flood insurance.
	Annually distribute flood protection safety pamphlets or brochures to the owners of flood-prone property.
	Educate citizens about safety during flood conditions.
	Encourage homeowners to install backflow valves to prevent reverse-flow flood damages.

5.13 Severe Weather

5.13.1 Hazard Description

Severe weather comprises the hazardous and damaging weather effects often found in violent storm fronts and severe winter storms. They can occur together or separate, they are common and usually not hazardous, but on occasion they can pose a threat to life and property.

This plan defines severe weather as a combination of the following as defined by NOAA and the NWS:

- **Hail:** Precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter, falling from a cumulonimbus cloud.
- **Lightning:** A visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground or between the ground and a cloud.
- **Thunderstorm Winds:** The same classification as high or strong winds but accompanies a thunderstorm. It is also referred to as a straight-line wind to differentiate from rotating or tornado associated wind. Additionally, these winds can rapidly create dust storms that severely impact visibility.

Severe weather has been so consistent throughout modern history that much of the vulnerability is mitigated. However, this section is not concerned with everyday wind, lightning, or mild precipitation. This section is concerned with common storm elements when they behave such that they pose a threat to property and life.

5.13.2 – Location and Extent

All of Kansas Region D is vulnerable to severe weather events. Based on the non-geographic specific aspect of this hazard, i.e., no one area is at a greater risk, all of the planning area's structural inventory and population is vulnerable. Severe weather can rapidly descend on an area, but in many cases is predictable. Most weather forecasts focus on changing conditions that may lead to the onset of severe storms. All of Kansas Region D, including all participating jurisdictions, is susceptible to severe weather, but occurrence is infrequent.

The NWS classifies thunderstorms, often the generator of hail, lightning and high winds, using the following categories.

- **Marginal:** Isolated severe weather, 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

In the United States, hail causes billions of dollars in damage to property each year. Vehicles, roofs of buildings and homes, and landscaping are most commonly damaged by hail. Hail has been known to cause injury and the occasional fatality to humans, often associated with traffic accidents.

Based on information provided by the National Weather Service concerning size, the following table describes potential damage impacts of the various sizes of hail.

Table 119: Hail Size Comparison and Damage Descriptions

Diameter (inches)	Size Description	Potential Damage Impacts
1/4	Pea Size	No damage
1/2	Mothball, peanut, USB Plug	Slight damage to vegetation

Table 119: Hail Size Comparison and Damage Descriptions

Diameter (inches)	Size Description	Potential Damage Impacts
3/4	Penny Size	Increased damage to crops and vegetation
7/8	Nickel Size	Severe damage to crops and vegetation, damage begins to glass and plastic
1	Quarter Size	Increased glass damage, damage begins to bodies of vehicles
1 1/4	Half Dollar Size	Large scale glass damage, begin roof damage, risk of injury to exposed persons
1 1/2	Ping Pong Ball Size	Large scale glass damage, begin roof damage, increased risk of injury to exposed persons
1 3/4	Golf Ball Size	Severe roof damage, risk of serious injuries to exposed persons
2	Lime or Medium Sized Hen Egg	Potential structural damage, risk of very severe injuries to exposed persons
2 1/2	Tennis Ball Size	Extensive structural damage, risk of very severe injuries or death to exposed persons

Source: National Weather Service

A recent report by the Insurance Information Institute says lightning strikes caused $1,300,000,000 in damage across the United States in 2021. There is currently no scale to indicate the severity of a lightning strike, but data from NOAA indicates that there approximately 25,000,000 cloud-to-ground lightning strikes per year in the United States.

To measure wind speed and its correlating potential for damage, experts use the Beaufort scale as shown below.

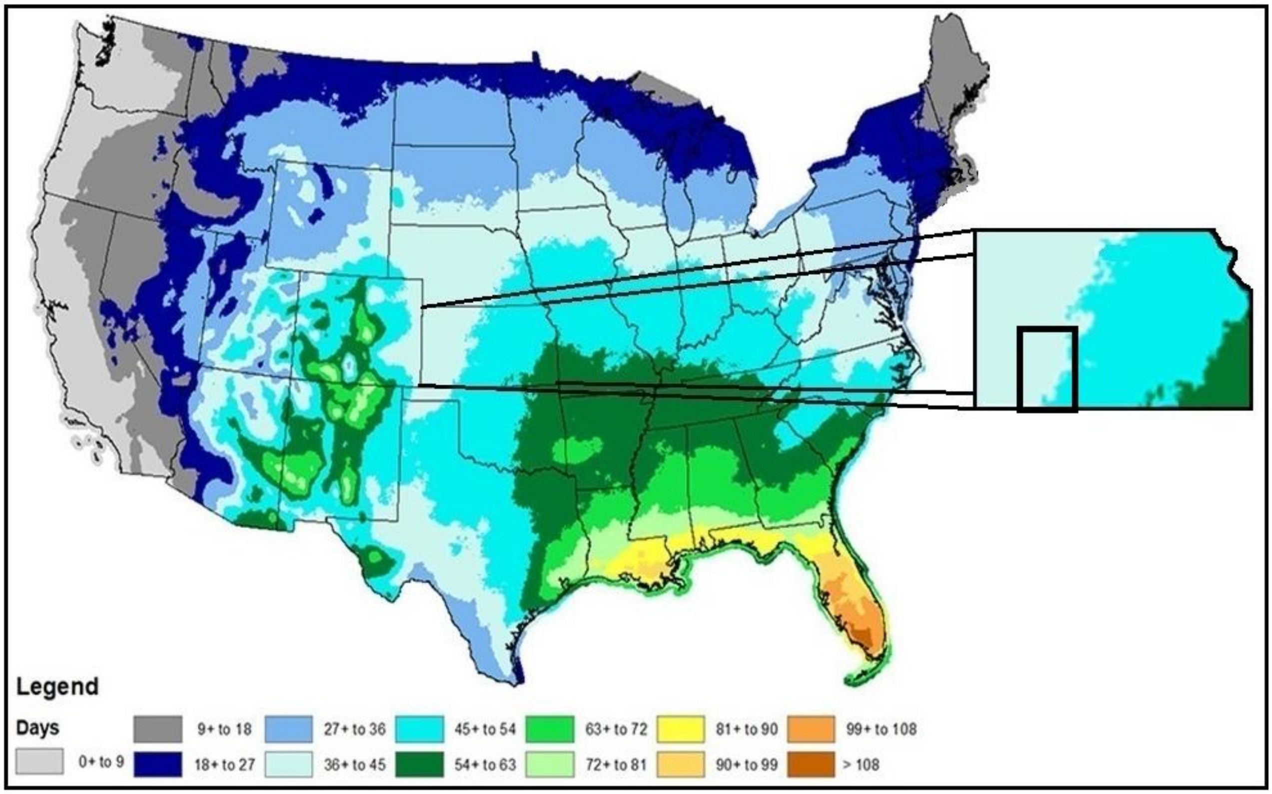
Table 120: Beaufort Scale

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

Source: NOAA

The infrequent nature of thunderstorms makes hail, lightning, and high wind a relatively uncommon occurrence for Kansas Region D. The following map, from NOAA, indicates annual mean thunderstorm days from 1993 to 2018.

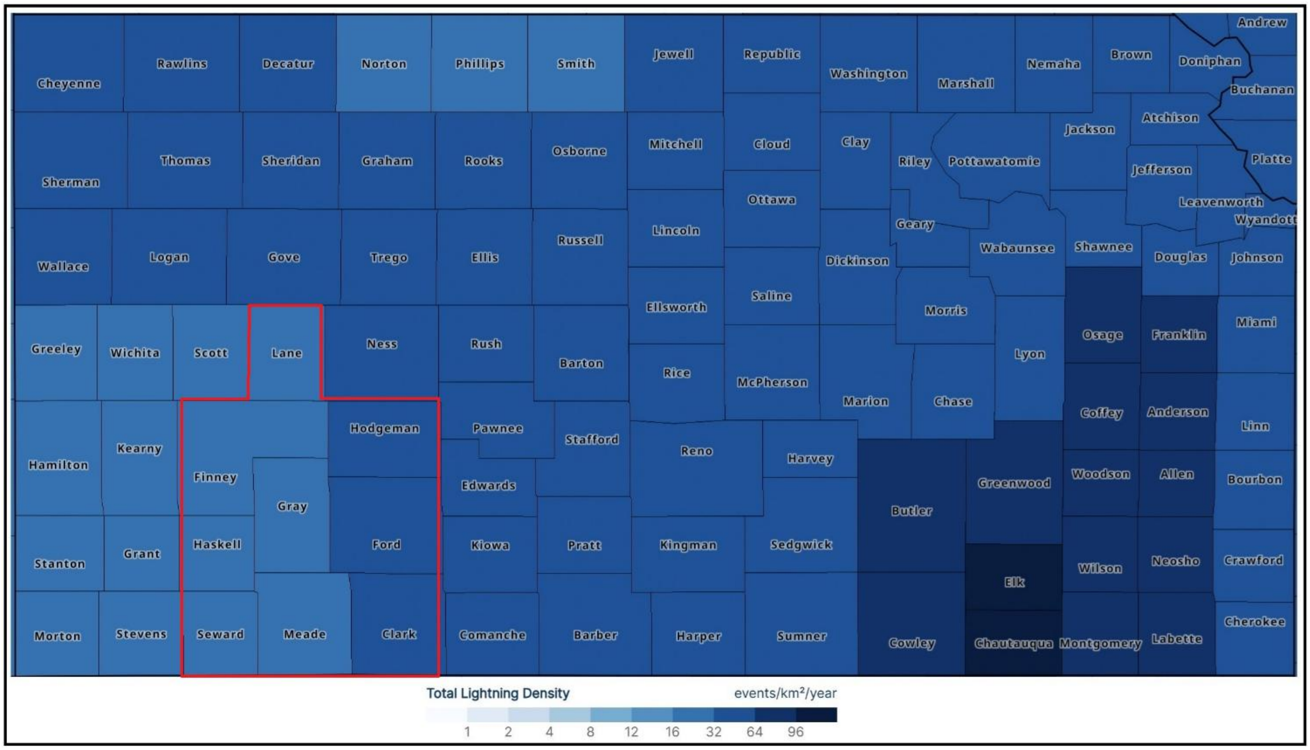
Map 58: Annual Mean Thunderstorm Days, 1993-2018



Source: NOAA

The following map, from Vaisala, indicates the average annual light events per square kilometer per year for Kansas Region D:

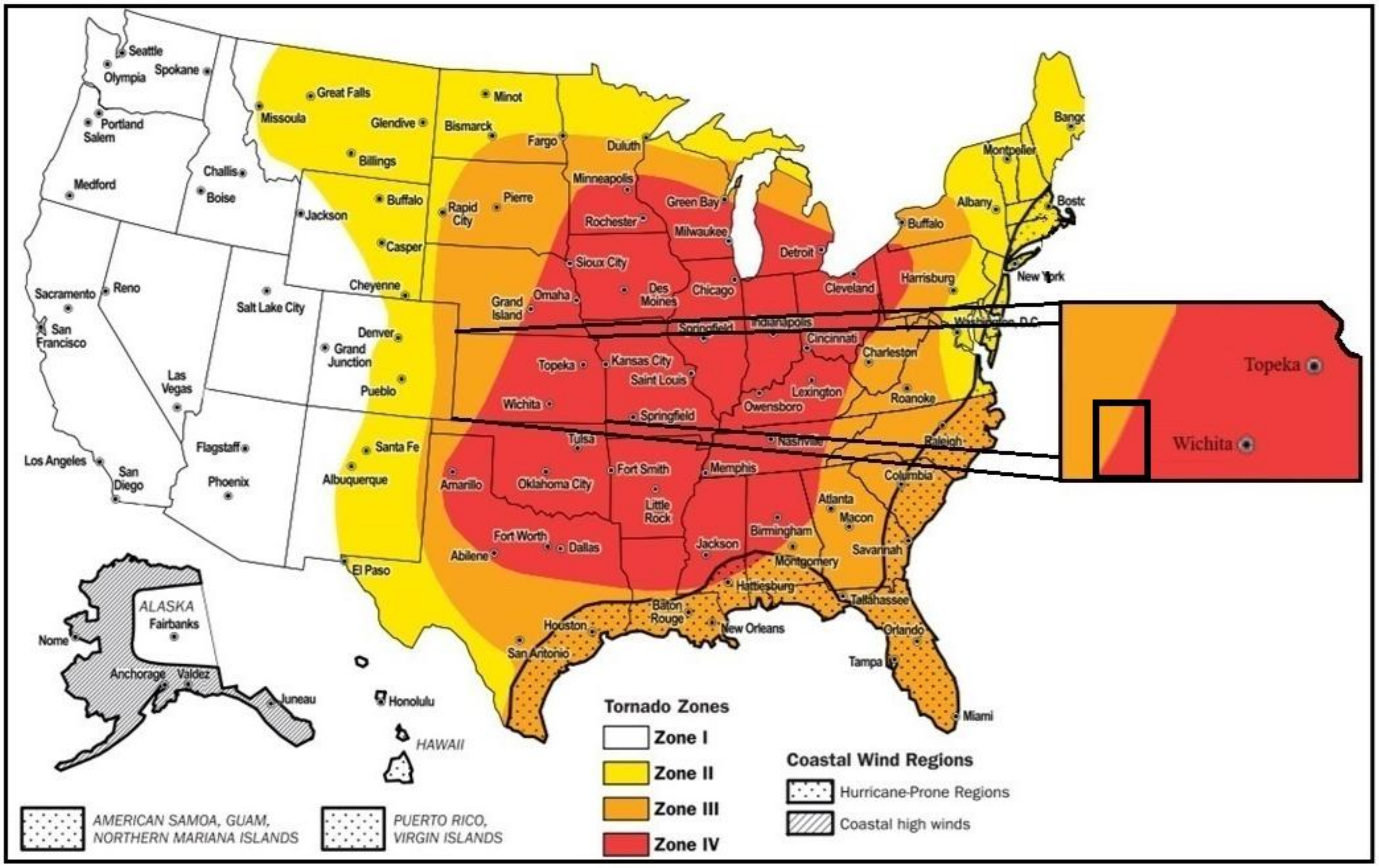
Map 59: Average Annual Lightning Events per Square Kilometer per Year, 2016 - 2023



Source: Vaisala

The following map from FEMA indicates the highest possible expected wind speeds for Kansas Region D.

Map 60: Wind Zones



Source: FEMA

The MPC views severe weather as a local, county-wide, and regional hazard. Discussions with the MPC and a review of all available data indicated severe weather is a community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Clark County** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Continuing climate change may result in an increase in their intensity, raising community concern. **Finney County:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Continuing climate change may result in an increase in their intensity, raising community concern.
- **Ford County:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Continuing climate change may result in an increase in their intensity, raising community concern.
- **Gray County:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Continuing climate change may result in an increase in their intensity, raising community concern.
- **Haskell County:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Continuing climate change may result in an increase in their intensity, raising community concern.
- **Hodgeman County:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Continuing climate change may result in an increase in their intensity, raising community concern.
- **Lane County:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Continuing climate change may result in an increase in their intensity, raising community concern.

- **Meade County:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Continuing climate change may result in an increase in their intensity, raising community concern.
- **Seward County** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Continuing climate change may result in an increase in their intensity, raising community concern.

5.13.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Kansas Region D has experienced 16 Presidential Disaster Declarations related to severe weather events reflected in the following table:

Table 121: Kansas Region D Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Counties	Individual and Public Assistance	Mitigation Grants
DR-4824-KS	9/24/2024	**Severe Storms**, **Straight-Line Winds**, Tornadoes, and Flooding	Clark, Finney, Gray, Meade		DR-4824-KS
DR-4811-KS	8/20/2024	**Severe Storm**, **Straight-Line Winds**, Tornadoes, and Flooding	Hodgeman	-	DR-4811-KS
DR-4747-KS	10/26/2023	**Severe Storms**, **Straight-Line Winds**, Tornadoes, and Flooding	Clark, Finney, Ford	-	DR-4747-KS
DR-4654-KS	5/25/2022	**Severe Storms** and **Straight-Line-Winds**	Clark, Ford, Gray, Hodgeman, Lane	$399,671	DR-4654-KS
DR-4640-KS	3/22/2022	**Severe Storms** and **Straight-Line Winds**	Ford, Gray, Haskell, Hodgeman, Lane, Lincoln, Logan, Meade, Mitchell	$12,159,785	DR-4640-KS
DR-4449-KS	8/14/2019	**Severe Storms**, **Straight-Line Winds**, Flooding, Tornadoes, Landslides, and Mudslides	Clark, Hodgeman, Meade	$51,157,548	DR-4449-KS
DR-4319-KS	6/16/2017	Severe Winter Storm, Snowstorm, **Straight-Line Winds**, and Flooding	Finney, Haskell, Lane, Seward	$40,146,036	DR-4319-KS
DR-4230-KS	7/20/2015	**Severe Storms**, Tornadoes, **Straight-Line Winds** and Flooding	Gray, Haskell, Hodgeman, Meade	$11,018,053	DR-4230-KS
DR-4150-KS	10/22/2013	**Severe Storms**, **Straight-Line Winds**, Tornadoes	Clark, Hodgeman, Lane, Meade	$10,135,201	DR-4150-KS
DR-4063-KS	5/24/2012	**Severe Storms**, Tornadoes, **Straight-Line Winds** and Flooding	Hodgeman	$4,883,034	DR-4063-KS
DR-1849-KS	6/25/2009	**Severe Storms**, Flooding, **Straight-Line Winds**, and Tornadoes	Finney	$11,534,818	DR-1849-KS
DR-1776-KS	7/9/2008	**Severe Storms**, Flooding, and Tornadoes	Clark, Haskell, Hodgeman, Lane, Seward	$55,300,511	DR-1776-KS
DR-1254-KS	10/14/1998	**Severe Storms**, Flooding and Tornadoes	Seward	$6,640,272	DR-1254-KS

Table 121: Kansas Region D Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Counties	Individual and Public Assistance	Mitigation Grants
DR-1000-KS	7/22/1993	Flooding, **Severe Storms**	Hodgeman, Lane	-	DR-1000-KS
DR-378-KS	5/2/1973	**Severe Storms**, Flooding	Clark, Ford, Gray, Haskell, Hodgeman, Meade, Seward	-	DR-378-KS
DR-229-KS	7/18/1967	Tornadoes, **Severe Storms**, Flooding	Finney	-	DR-229-KS

Source: FEMA
-: Not reported

The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Kansas Region D has experienced no Emergency Declarations related to severe weather or severe winter weather events.

Additionally, the following table presents NCEI identifies severe weather events and the resulting damage totals in Kansas Region D from 1950 to 2024:

Table 122: NCEI Kansas Region D Severe Weather Events, 1950 - 2024

County	Event Type	Number of Days with Events	Property Damage	Deaths and Injuries
Clark	Hail	202	$2,234,000	0
	Lightning	2	$50,000	0
	Thunderstorm Winds	100	$41,000	0
Finney	Hail	229	$63,063,000	0
	Lightning	3	$82,500	1
	Thunderstorm Winds	286	$4,703,000	3
Ford	Hail	135	$68,950	1
	Lightning	0	$0	0
	Thunderstorm Winds	108	$968,950	6
Gray	Hail	105	$500,000	0
	Lightning	0	$0	0
	Thunderstorm Winds	159	$4,935,000	0
Haskell	Hail	141	$78,000	0
	Lightning	0	$0	0
	Thunderstorm Winds	96	$2,709,000	0
Hodgeman	Hail	195	$1,800	0
	Lightning	0	$0	0
	Thunderstorm Winds	124	$488,100	0
Lane	Hail	153	$1,840,000	0
	Lightning	0	$0	0
	Thunderstorm Winds	84	$399,000	1
Meade	Hail	229	$118,000	0
	Lightning	0	$0	0
	Thunderstorm Winds	112	$1,849,000	0
Seward	Hail	208	$2,201,000	0
	Lightning	1	$50,000	0

Table 122: NCEI Kansas Region D Severe Weather Events, 1950 - 2024

County	Event Type	Number of Days with Events	Property Damage	Deaths and Injuries
	Thunderstorm Winds	145	$8,747,000	7

Source: NCEI

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or NWS office. When reporting an event, the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Additionally, deaths and injuries may be underreported as they may be a result of a concurrent event, such as a person driving unsafely during heavy rain and passing away.

Recent notable events include:

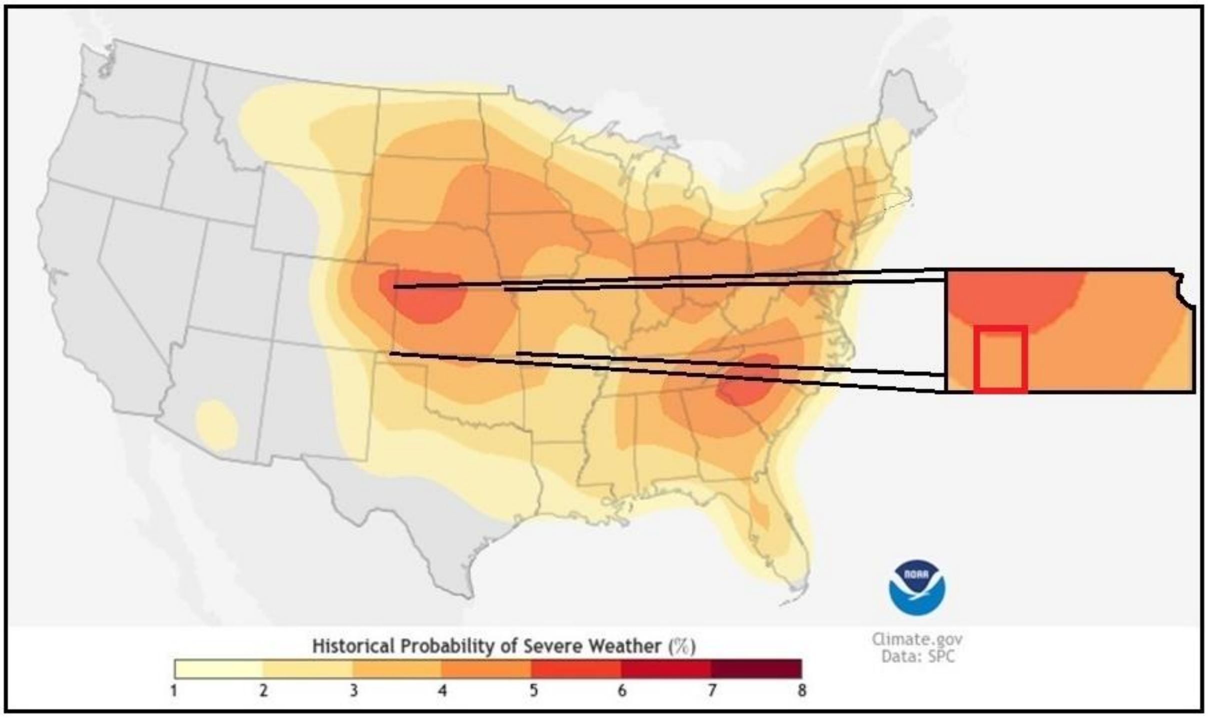
- **September 10, 2023 Kearny County, Deerfield:** Tennis ball sized hail pulverized the City of Deerfield While damage estimates were not recorded in the by NCEI, every roof in town ended up having to be replaced, approximately 60 windows at the school were broken. It is estimated that damages totaled over $3,000,000.
- **August 29, 2022 Ford County:** Several large grain bins were destroyed and there was a stretch of power poles broken over by the high wind. Damages were reported at $500,000.
- **October 26, 2021 Hodgeman County, Jetmore:** A pivot irrigation sprinkler was overturned by the high wind. There was also a large tree blown down and damage was done to a shed. Damages were reported at $55,000.
- **August 1, 2020 Lane County: A** building was heavily damaged from an apparent microburst. Blowing gravel broke out the windows of a vehicle and injured the occupant of the vehicle. There were also power poles blown down in this location.
- **May 28, 2018 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. Damages were reported at $700,000.
- **November 17, 2011 Haskell County, Sublette:** 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 gust-nadoes observed on the leading edge of the wall of dirt that was picked up. Damages were reported at $1,800,000.
- **August 7, 2011 Ford County, Ford City:** A strong thunderstorm wind gusts blew down several large tents at the Dodge City Days Rodeo. Six persons were injured from flying debris or falling tents.
- **June 14, 2009 Gray County, Copeland:** In a 7 mile long stretch by 3 miles wide there were 10 pivot irrigation sprinklers overturned by down burst winds. In addition there were two trailers turned over and numerous tree limbs broken in this area. Damages were reported at $750,000.
- **June 12, 2009 Gray County, Cimarron:** Hail was accompanied by 70 to 90 mph winds and did extensive damage to vehicles, buildings, crops and wildlife. The largest stones were a bit bigger than a baseball with the majority golf ball sized. At one location 2 miles southeast of Cimarron the siding was stripped off a house. Many fields of alfalfa and wheat were completely mowed down by the wind and hail. Numerous rabbits and birds were laying dead where cover had once stood. Also, there were 5 pivot irrigation sprinklers overturned and several trees uprooted. Trees that were not uprooted were completely stripped of leaves and even pine trees were stripped of their needles in some cases. Hail resulted in $500,000 in damages.
- **June 9, 2009 Ford County:** A male on a motorcycle was injured by the large hail and was completely bruised. He said he would have been killed without having a helmet.
- **August 20, 2007 Finney County, Holcomb:** Significant roof damage occurred at the Holcomb High School. Damages were reported at $1,500,000.

- **June 28, 2003 Seward County, Liberal:** A tremendous storm rolled in from the east (HP supercell). The combination of the 80 to 100 mph wind and hail bigger than golf balls. Damages were reported at $8,000,000.
- **May 15, 2003 Seward County:** A tremendous hail storm pounded Kismet, lasting for more than 30 minutes. Every structure in the town received significant damage. Trees were stripped bare of leaves, even cedar trees! Nearly all windows were broken in vehicles and homes. Damages were reported at $2,000,000.
- **July 1, 1999 Finney County, Garden City:** Widespread golf ball to softball size hail produced a tremendous amount of damage but miraculously there were no injuries. Almost every house in Garden City sustained damage and all vehicles left in the elements received hail dents or broken windows. Several stories of hail bouncing through rooms were received. The severity of the storm was also unique in that it occurred well after midnight. Damages were reported at $53,000,000.
- **June 22, 1999 Finney County, Garden City, Lakin:** Lightning struck the chimney, travelled down the phone line and burnt the ear of the resident talking on the phone when the handset exploded. Also, the charge blew the hinged fireplace doors 20 feet into the living room.
- **May 24, 1998 Meade County:** Eleven irrigation sprinklers damaged along with ten power poles. At least 80 mph wind occurred with the Rear Flank Downdraft. Wheat and corn were destroyed in the area. Damages were reported at $1,650,000.
- **August 20, 1977 Clark County, Minneola:** Nearly every window in the small community were broken with siding destroyed on many homes. Cars received considerable damage too. Shingles were also torn off. Skylights broken at the school. Damages were reported at $2,000,000.
- **June 12, 1997 Finney County, Holcomb:** Sunflower electric reported damage as greater than 60 knot thunderstorm wind passed through. A six story coal stacker was moved 240 feet! Damage was done to the stacker and coal cars. Damages were reported at $1,000,000.
- **May 9, 1996 Lane County:** Hail and wind cut a path 2 miles wide along highway 96 across the entire county. Hail was piled six inches deep and was visible for several days after. Siding was extensively damaged on many homes, roofs were damaged, trees had bark stripped off. Eight power poles were broken along highway K96. Property damage across the entire county was more than $1,840,000.
- **May 16, 1995 Finney County, Garden City:** Numerous houses and automobiles damaged or destroyed from baseball to softball size hail. Damages were reported at $4,900,000.
- **September 18, 1993 Finney County, Holcomb:** Hail resulted in $5,000,000 in damages

5.13.4 Probability of Future Events

Predicting the probability of severe weather occurrences is tremendously changing due to the large number of factors involved and the random nature of formation. Data and mapping from NOAA indicate that Kansas Region D can expect between 36 – 45 severe weather events per year. Additionally, the following map from NOAA provides a snapshot for the probability of a severe weather event on a summer day.

Map 61: Historic Probability of a Severe Weather Summer Event in Kansas Region D



Source: NOAA

Based on historical occurrences, Kansas Region D will continue to experience severe weather events on an annual basis. The following tables, using data from the NCEI, indicate the yearly probability of a severe weather component event, the number of deaths or injuries, and estimated property damage for each county in Kansas Region D:

Table 123: Kansas Region D NCEI Hail Event Probability Summary

County	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Clark	229	3	0	0	$2,234,000	$29,787
Finney	135	2	1	<1	$63,063,000	$840,840
Ford	105	1	0	0	$68,950	$919
Gray	141	2	0	0	$500,000	$6,667
Haskell	195	3	0	0	$78,000	$1,040
Hodgeman	153	2	0	0	$1,800	$24
Lane	229	3	0	0	$1,840,000	$24,533
Meade	208	3	0	0	$118,000	$1,573
Seward	229	3	0	0	$2,201,000	$29,347

Source: NCEI

Table 124: Kansas Region D NCEI Lightning Event Probability Summary

County	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Clark	2	0	0	0	$50,000	$667
Finney	3	0	1	<1	$82,500	$1,100
Ford	0	0	0	0	$0	$0

Table 124: Kansas Region D NCEI Lightning Event Probability Summary

County	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
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	1	0	0	0	$50,000	$667

Source: NCEI

Table 125: Kansas Region D NCEI Strong Wind Event Probability Summary

County	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Clark	100	1	0	0	$41,000	$547
Finney	286	4	3	<1	$4,703,000	$62,707
Ford	108	1	6	<1	$968,950	$12,919
Gray	159	2	0	0	$4,935,000	$65,800
Haskell	96	1	0	0	$2,709,000	$36,120
Hodgeman	124	2	0	0	$488,100	$6,508
Lane	84	1	1	<1	$399,000	$5,320
Meade	112	1	0	0	$1,849,000	$24,653
Seward	145	2	7	<1	$8,747,000	$116,627

Source: NCEI

5.13.5 Projected Changes in Location, Intensity, Frequency, and Duration

Climate change can have several impacts on severe weather, although the precise details can vary depending on regional climate patterns and other factors. In general, it is believed that climate change can alter the timing and seasonality of severe weather. In some cases, this may mean more severe weather events occurring earlier or later in the year.

Climate change can lead to increased temperatures and moisture levels in the atmosphere, which can provide favorable conditions for the development of severe weather. This can result in a higher frequency of severe weather events and an increase in their intensity. As a result of increased temperatures, warmer air can hold more moisture, leading to increased rainfall during severe weather. This can elevate the risk of flash flooding, particularly in areas prone to heavy precipitation. Changes in atmospheric circulation patterns associated with climate change can lead to stronger winds within thunderstorms. This can result in more powerful wind gusts, increasing the risk of wind damage and downed trees and power lines.

Climate change can influence the conditions necessary for hail formation. Warmer temperatures at the surface and greater instability in the atmosphere can contribute to larger and more damaging hailstones. Additionally, changes in atmospheric conditions can affect the frequency and distribution of lightning strikes. More lightning can increase the risk of wildfires in dry regions.

It is important to note that while there is evidence linking climate change to changes in weather patterns that can influence severe weather, predicting specific events remains changing. Climate models provide valuable insights into long-term trends, but individual severe weather events are influenced by a complex interplay of factors.

5.13.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Kansas Region D and all participating jurisdictions from severe weather. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Kansas Region D and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 126: Participating Jurisdiction Hail Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Clark County	**All**	**Relatively Moderate**	**81.4**	**10.9**
Ashland, Englewood, and Minneola	967100	Very High	99.5	10.9
Finney County	**All**	**Relatively High**	**97.7**	**11**
Holcomb	960100	Very High	99.7	11
Garden City	960200	Very High	99.4	10.8
Garden City	960300	Very High	99.1	10.8
Garden City	960401	Relatively High	92.9	10.8
Garden City	960403	Relatively High	96.6	10.8
Garden City	960404	Very High	98.7	10.8
Garden City	960501	Very High	98.8	10.8
Garden City	960503	Relatively High	93.4	11.2
Garden City	960505	Relatively High	96.7	10.8
Garden City	960507	Very High	99.4	10.8
Garden City	960508	Relatively High	94.8	10.8
Garden City	960600	Very High	99.8	11
Ford County	**All**	**Relatively High**	**96.5**	**11.8**
Spearville	961600	Relatively High	94.8	11.8
Bucklin and City of Ford	961700	Relatively High	96.8	11.7
Dodge City	961801	Very High	98.0	11.9
Dodge City	961802	Very High	99.1	11.9
Dodge City	961901	Relatively High	95.7	11.9
Dodge City	961902	Very High	97.6	11.9
Dodge City	962000	Very High	98.7	11.9
Dodge City	962101	Very High	99.8	11.9
Dodge City	962102	Very High	98.2	11.9
Gray County	**All**	**Relatively Moderate**	**85.4**	**11.6**
Cimarron and Ingalls	962600	Very High	98.3	11.6
Copeland, Ensign, and Montezuma	962700	Very High	99.1	11.6
Haskell County	**All**	**Very Low**	**22.2**	**10.9**
Satanta and Sublette	463100	Relatively Moderate	82.9	10.9
Hodgeman County	**All**	**Relatively Moderate**	**90.0**	**12**
Hanston and Jetmore	461100	Very High	99.9	12
Lane County	**All**	**Relatively Moderate**	**89.7**	**10.7**
Dighton	956600	Very High	99.9	10.7
Meade County	**All**	**Relatively Low**	**52.3**	**10.8**
Fowler and Plains	966600	Relatively High	93.5	10.8
City of Meade	966700	Relatively Low	68.6	11.1
Seward County	**All**	**Relatively Moderate**	**91.3**	**10.3**

Table 126: Participating Jurisdiction Hail Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Kismet	965600	Very High	98.8	10.4
Liberal	965700	Very High	98.6	10.5
Liberal	965800	Relatively High	96.5	9.6
Liberal	965900	Relatively High	96.7	9
Liberal	966000	Relatively High	96.9	9

Source: FEMA NRI

Table 127: Participating Jurisdiction Hail Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Clark County	**All**	**Relatively Moderate**	**81.8**	**$498K**
Ashland, Englewood, and Minneola	967100	Very High	99.5	$498K
Finney County	**All**	**Relatively High**	**96.8**	**$3.1M**
Holcomb	960100	Very High	99.6	$584K
Garden City	960200	Very High	99.0	$362K
Garden City	960300	Very High	98.4	$288K
Garden City	960401	Relatively High	93.7	$104K
Garden City	960403	Relatively High	96.2	$167K
Garden City	960404	Very High	97.8	$245K
Garden City	960501	Very High	97.9	$249K
Garden City	960503	Relatively High	93.4	$99K
Garden City	960505	Relatively High	95.6	$147K
Garden City	960507	Very High	98.5	$301K
Garden City	960508	Relatively High	92.8	$91K
Garden City	960600	Very High	99.3	$435K
Ford County	**All**	**Relatively High**	**95.3**	**$2.1M**
Spearville	961600	Relatively High	96.5	$177K
Bucklin and City of Ford	961700	Very High	97.6	$228K
Dodge City	961801	Very High	97.3	$215K
Dodge City	961802	Very High	98.0	$255K
Dodge City	961901	Relatively High	94.6	$123K
Dodge City	961902	Very High	97.6	$228K
Dodge City	962000	Relatively High	97.1	$201K
Dodge City	962101	Very High	99.4	$470K
Dodge City	962102	Relatively High	97.0	$197K
Gray County	**All**	**Relatively Moderate**	**85.3**	**$643K**
Cimarron and Ingalls	962600	Very High	98.3	$278K
Copeland, Ensign, and Montezuma	962700	Very High	99.0	$365K
Haskell County	**All**	**Very Low**	**22.8**	**$21K**
Satanta and Sublette	463100	Relatively Moderate	81.9	$21K
Hodgeman County	**All**	**Relatively Moderate**	**90.4**	**$1.1M**
Hanston and Jetmore	461100	Very High	99.9	$1.1M
Lane County	**All**	**Relatively Moderate**	**90.3**	**$1.1M**
Dighton	956600	Very High	99.9	$1.1M
Meade County	**All**	**Relatively Low**	**52.5**	**$97K**
Fowler and Plains	966600	Relatively High	92.7	$89K
City of Meade	966700	Relatively Low	71.3	$8K
Seward County	**All**	**Relatively Moderate**	**88.8**	**$881K**
Kismet	965600	Very High	98.3	$286K

Table 127: Participating Jurisdiction Hail Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Liberal	965700	Relatively High	97.1	$202K
Liberal	965800	Relatively High	95.5	$145K
Liberal	965900	Relatively High	94.8	$125K
Liberal	966000	Relatively High	94.6	$122K

Source: FEMA

Table 128: Participating Jurisdiction Lightning Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Clark County	**All**	**Very Low**	**5.4**	**51.9**
Ashland, Englewood, and Minneola	967100	Relatively Moderate	66.5	51.9
Finney County	**All**	**Relatively Low**	**38.9**	**29.8**
Holcomb	960100	Relatively Moderate	55.0	30
Garden City	960200	Relatively Moderate	71.5	24.1
Garden City	960300	Relatively Moderate	48.5	25.6
Garden City	960401	Relatively Low	28.2	25.6
Garden City	960403	Relatively Low	39.5	26.2
Garden City	960404	Relatively Moderate	57.2	27.6
Garden City	960501	Relatively Moderate	47.7	28.7
Garden City	960503	Relatively Low	23.7	29
Garden City	960505	Relatively Low	33.0	27.7
Garden City	960507	Relatively Low	43.4	27.2
Garden City	960508	Relatively Moderate	52.4	28.5
Garden City	960600	Relatively Moderate	70.4	28
Ford County	**All**	**Relatively Low**	**65.9**	**47.2**
Spearville	961600	Relatively Moderate	50.2	47.4
Bucklin and City of Ford	961700	Relatively Moderate	55.1	47.4
Dodge City	961801	Relatively High	83.5	46.9
Dodge City	961802	Relatively High	90.0	45.9
Dodge City	961901	Relatively High	83.8	45.4
Dodge City	961902	Relatively High	76.3	44.3
Dodge City	962000	Relatively High	91.0	45.2
Dodge City	962101	Relatively High	91.9	45.6
Dodge City	962102	Relatively High	79.9	46.5
Gray County	**All**	**Very Low**	**10.5**	**35.8**
Cimarron and Ingalls	962600	Relatively Moderate	60.3	35.1
Copeland, Ensign, and Montezuma	962700	Relatively Moderate	65.8	36.1
Haskell County	**All**	**Very Low**	**4.1**	**27.6**
Satanta and Sublette	463100	Relatively Moderate	59.5	27.6
Hodgeman County	**All**	**Very Low**	**3.0**	**41.8**
Hanston and Jetmore	461100	Relatively Moderate	53.8	41.8
Lane County	**All**	**Very Low**	**2.1**	**32.2**
Dighton	956600	Relatively Low	43.6	32.2
Meade County	**All**	**Very Low**	**9.0**	**44.4**
Fowler and Plains	966600	Relatively Moderate	69.4	44.4
City of Meade	966700	Relatively Low	45.0	43.7
Seward County	**All**	**Relatively Low**	**43.3**	**36.5**
Kismet	965600	Relatively Moderate	54.9	36.5

Table 128: Participating Jurisdiction Lightning Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Liberal	965700	Relatively High	82.6	39.6
Liberal	965800	Relatively Moderate	74.9	36.9
Liberal	965900	Relatively High	87.6	38
Liberal	966000	Relatively High	82.7	41.4

Source: FEMA NRI

Table 129: Participating Jurisdiction Lightning Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Clark County	**All**	**Very Low**	**5.8**	**$9.6K**
Ashland, Englewood, and Minneola	967100	Relatively Moderate	66.3	$9.6K
Finney County	**All**	**Relatively Low**	**31.9**	**$453B**
Holcomb	960100	Relatively Moderate	52.2	$6.1K
Garden City	960200	Relatively Moderate	62.3	$8.5K
Garden City	960300	Relatively Low	40.1	$3.9K
Garden City	960401	Relatively Low	30.3	$2.5K
Garden City	960403	Relatively Low	36.8	$3.4K
Garden City	960404	Relatively Moderate	48.3	$5.3K
Garden City	960501	Relatively Low	39.1	$3.7K
Garden City	960503	Relatively Low	23.4	$1.7K
Garden City	960505	Relatively Low	28.0	$2.2K
Garden City	960507	Relatively Low	31.6	$2.6K
Garden City	960508	Relatively Low	42.7	$4.3K
Garden City	960600	Relatively Moderate	54.5	$6.6K
Ford County	**All**	**Relatively Low**	**60.7**	**$122K**
Spearville	961600	Relatively Moderate	59.2	$7.7K
Bucklin and City of Ford	961700	Relatively Moderate	60.2	$7.9K
Dodge City	961801	Relatively high	80.8	$16K
Dodge City	961802	Relatively high	82.2	$17K
Dodge City	961901	Relatively high	79.7	$15K
Dodge City	961902	Relatively high	77.0	$14K
Dodge City	962000	Relatively high	82.3	$17K
Dodge City	962101	Relatively high	83.2	$17K
Dodge City	962102	Relatively Moderate	71.4	$11K
Gray County	**All**	**Very Low**	**10.8**	**$16K**
Cimarron and Ingalls	962600	Relatively Moderate	59.6	$7.8K
Copeland, Ensign, and Montezuma	962700	Relatively Moderate	63.1	$8.7K
Haskell County	**All**	**Very Low**	**3.6**	**$6.5K**
Satanta and Sublette	463100	Relatively High	54.1	$6.5K
Hodgeman County	**All**	**Very Low**	**3.5**	**$6.5K**
Hanston and Jetmore	461100	Relatively Moderate	54.0	$6.5K
Lane County	**All**	**Very Low**	**2.2**	**$4.6K**
Dighton	956600	Relatively Low	44.2	$4.6K
Meade County	**All**	**Very Low**	**9.3**	**$15K**
Fowler and Plains	966600	Relatively Moderate	65.0	$9.2K
City of Meade	966700	Relatively Moderate	48.9	$5.4K
Seward County	**All**	**Relatively Low**	**34.4**	**$54K**
Kismet	965600	Relatively Moderate	49.2	$5.5K
Liberal	965700	Relatively Moderate	72.0	$12K

Table 129: Participating Jurisdiction Lightning Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Liberal	965800	Relatively Moderate	69.5	$11K
Liberal	965900	Relatively Moderate	79.7	$15K
Liberal	966000	Relatively Moderate	71.1	$11K

Source: FEMA

Table 130: Participating Jurisdiction Strong Winds Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Clark County	**All**	**Very Low**	**16.1**	**4.8**
Ashland, Englewood, and Minneola	967100	Relatively High	91.0	4.8
Finney County	**All**	**Relatively High**	**89.4**	**4.8**
Holcomb	960100	Very High	97.8	4.8
Garden City	960200	Very High	98.8	4.7
Garden City	960300	Very High	96.4	4.7
Garden City	960401	Relatively High	83.9	4.7
Garden City	960403	Relatively High	91.7	4.7
Garden City	960404	Very High	96.9	4.7
Garden City	960501	Relatively High	95.4	4.7
Garden City	960503	Relatively Moderate	80.7	4.9
Garden City	960505	Relatively High	89.8	4.7
Garden City	960507	Very High	96.4	4.7
Garden City	960508	Relatively High	93.5	4.7
Garden City	960600	Very High	99.2	4.8
Ford County	**All**	**Relatively Moderate**	**86.1**	**5**
Spearville	961600	Relatively High	83.4	5
Bucklin and City of Ford	961700	Relatively High	86.8	5
Dodge City	961801	Very High	96.3	5
Dodge City	961802	Very High	98.1	5
Dodge City	961901	Very High	96.3	5
Dodge City	961902	Relatively High	94.5	5
Dodge City	962000	Very High	98.3	5
Dodge City	962101	Very High	98.8	5
Dodge City	962102	Very High	95.7	5
Gray County	**All**	**Relatively Moderate**	**74.1**	**5**
Cimarron and Ingalls	962600	Very High	99.4	5
Copeland, Ensign, and Montezuma	962700	Very High	99.8	5
Haskell County	**All**	**Relatively Low**	**56.5**	**4.9**
Satanta and Sublette	463100	Very High	99.8	4.9
Hodgeman County	**All**	**Relatively Moderate**	**60.4**	**5.3**
Hanston and Jetmore	461100	Very High	99.8	5.3
Lane County	**All**	**Relatively Low**	**58.3**	**5.1**
Dighton	956600	Very High	99.8	5.1
Meade County	**All**	**Relatively Moderate**	**65.8**	**4.9**
Fowler and Plains	966600	Very High	99.8	4.9
City of Meade	966700	Very High	96.7	5
Seward County	**All**	**Relatively High**	**90.6**	**4.7**
Kismet	965600	Very High	99.4	4.8
Liberal	965700	Very High	99.9	4.8
Liberal	965800	Very High	99.2	4.1

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Liberal	965900	Very High	99.2	3.7
Liberal	966000	Very High	99.3	3.7

Source: FEMA NRI

Table 131: Participating Jurisdiction Strong Winds Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Clark County	**All**	**Relatively Low**	**19.7**	**$74K**
Ashland, Englewood, and Minneola	967100	Relatively High	91.3	$74K
Finney County	**All**	**Relatively Moderate**	**85.7**	**$1.2M**
Holcomb	960100	Very High	97.5	$164K
Garden City	960200	Very High	97.8	$175K
Garden City	960300	Relatively High	94.4	$100K
Garden City	960401	Relatively High	86.2	$51K
Garden City	960403	Relatively High	91.0	$72K
Garden City	960404	Relatively High	95.2	$111K
Garden City	960501	Relatively High	92.9	$86K
Garden City	960503	Relatively Moderate	80.7	$37K
Garden City	960505	Relatively High	86.7	$52K
Garden City	960507	Relatively High	92.7	$84K
Garden City	960508	Relatively High	90.1	$67K
Garden City	960600	Very High	97.5	$162K
Ford County	**All**	**Relatively Moderate**	**81.3**	**$939K**
Spearville	961600	Relatively high	88.8	$61K
Bucklin and City of Ford	961700	Relatively high	89.8	$65K
Dodge City	961801	Relatively high	95.6	$117K
Dodge City	961802	Very High	96.2	$127K
Dodge City	961901	Relatively high	95.1	$109K
Dodge City	961902	Relatively high	94.7	$105K
Dodge City	962000	Very High	96.0	$125K
Dodge City	962101	Very High	96.8	$141K
Dodge City	962102	Relatively High	93.2	$88K
Gray County	**All**	**Relatively Moderate**	**74.8**	**$699K**
Cimarron and Ingalls	962600	Very High	99.4	$309K
Copeland, Ensign, and Montezuma	962700	Very High	99.7	$390K
Haskell County	**All**	**Relatively Low**	**54.8**	**$360K**
Satanta and Sublette	463100	Very High	99.6	$360K
Hodgeman County	**All**	**Very Moderate**	**64.5**	**$489K**
Hanston and Jetmore	461100	Very High	99.9	$489K
Lane County	**All**	**Relatively Moderate**	**63.0**	**$467K**
Dighton	956600	Very High	99.8	$467K
Meade County	**All**	**Relatively Moderate**	**67.5**	**$532K**
Fowler and Plains	966600	Very High	99.6	$363K
City of Meade	966700	Very Low	97.7	$169K
Seward County	**All**	**Relatively High**	**86.1**	**$1.2M**
Kismet	965600	Very High	99.1	$255K
Liberal	965700	Very High	99.6	$343K
Liberal	965800	Very High	98.7	$226K
Liberal	965900	Very High	98.0	$184K

Table 131: Participating Jurisdiction Strong Winds Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Liberal	966000	Very High	98.1	$186K

Source: FEMA

Population

Severe weather can have a wide range of effects on all jurisdictional citizens, often posing significant risks to life, property, and general well-being. In the absence of proper shelter, hail, lightning, and high winds can cause serious injury. In general, if potentially exposed persons take shelter in a solid, well-constructed structure protection from these severe weather components would be provided. However, old or poorly constructed facilities may be more prone to damage, potentially increasing the impact on economically disadvantaged populations. Some of the potential effects of severe weather on people may include:

- **Death and Injury:** Severe weather can produce lightning and strong winds driving debris. Both of these elements can cause injuries or fatalities.
- **Power Outages:** Lightning strikes, strong winds, and falling trees can lead to power outages, disrupting daily life, and potentially affecting essential services, such as medical equipment and refrigeration.
- **Mental Health Impact:** Severe weather can be frightening and stressful, leading to anxiety and post-traumatic stress disorder in some individuals. The emotional toll of property damage and loss can also be significant.
- **Displacement:** People may need to evacuate their homes or be temporarily displaced due to storm damage, requiring emergency shelter and support.
- **Economic Costs:** Severe weather results in economic costs, including repair and recovery expenses, insurance claims, and potential loss of income due to property damage or work disruptions.
- **Public Safety Response:** Severe weather can strain public safety resources, including emergency services, law enforcement, and medical facilities.

At greater risk may be the vulnerable populations and equity priority communities, including the especially young, the elderly, and those below the poverty level. Hazard occurrences can exacerbate existing vulnerabilities and create new challenges.

Kansas Region D and all participating jurisdiction populations are vulnerable to the impacts of severe weather. Please see Section 3.3: Population Data and Section 3.4: Socially Vulnerable and At-Risk Populations for data concerning jurisdictional populations.

Buildings and Structures

All buildings and structures within Kansas Region D and all participating jurisdictions, including historic buildings, can be impacted by severe weather. However, the location and construction of the facility will have a significant impact on the vulnerability. In general, older structures would be at higher risk of negative impacts. Some of the potential impacts include:

- **Electrical Infrastructure Damage:** Severe weather can damage electrical infrastructure, including power lines, transformers, and substations. This can result in widespread power outages, affecting homes, businesses, hospitals, and other critical facilities.
- **Communication Disruptions:** Severe weather can disrupt telecommunications infrastructure, including cell towers, data centers, and communication networks. This can impact emergency communication and coordination efforts.
- **Safety Risks:** Damage to infrastructure can pose safety risks to workers and the public. Fallen power lines, damaged buildings, and debris can be hazardous.

- **Building Damage:** Heavy snow or ice loads can cause damage to the building.

Governmental Operations

Severe weather can pose various risks to government operations. These risks can have significant economic and operational consequences, and can include:

- **Power Outages:** Severe weather can lead to power outages by damaging electrical infrastructure such as power lines and substations. Government buildings may lose power, affecting critical operations and services.
- **Flooding:** Heavy rainfall during severe weather can lead to flooding, which can damage government buildings and disrupt operations. Flood damage may require extensive repairs and cleanup.
- **Communication Disruptions:** Severe weather can damage communication equipment, including telephone lines and computer systems. This can hinder communication between government agencies and the public.
- **Transportation Disruptions:** Severe weather can make roads impassable due to flooding or debris. This can impact the ability of government employees to commute to work.
- **Budgetary Impact:** The costs associated with repairing and restoring government buildings and infrastructure after severe weather can strain budgets.

Transportation and Electrical Infrastructure

In general, severe weather components do not have a large impact on transportation infrastructure, with the exception of power loss disrupting signaling and poor conditions impacting driving conditions.

Severe weather can have significant impacts on electrical utilities, leading to disruptions in power supply and potential damage to infrastructure. Severe weather can affect electrical utilities in the following ways:

- **Lightning Strikes:** Lightning is a common occurrence during severe weather and poses a substantial risk to electrical infrastructure. Lightning strikes can damage power lines, transformers, substations, and other critical components, leading to power outages.
- **Wind Damage:** High winds associated with severe weather can cause trees, branches, and other debris to fall onto power lines. This can result in downed power lines, structural damage to utility poles, and disruptions in electrical service.
- **Hailstorms:** Severe weather may produce hail, which can damage power lines, transformers, and other equipment. Hailstones can also lead to short circuits and insulation damage on electrical components.
- **Power Surges:** Lightning strikes, strong winds, and other storm-related events can lead to power surges in the electrical grid. These surges can damage electronic devices, appliances, and utility equipment connected to the power supply.

Severe weather can have significant impacts on electrical utilities, leading to disruptions in power supply and potential damage to infrastructure. Severe weather can affect electrical utilities in the following ways:

- **Lightning Strikes:** Lightning is a common occurrence during severe weather and poses a substantial risk to electrical infrastructure. Lightning strikes can damage power lines, transformers, substations, and other critical components, leading to power outages.
- **Wind Damage:** High winds associated with severe weather can cause trees, branches, and other debris to fall onto power lines. This can result in downed power lines, structural damage to utility poles, and disruptions in electrical service.
- **Hailstorms:** Severe weather may produce hail, which can damage power lines, transformers, and other equipment. Hailstones can also lead to short circuits and insulation damage on electrical components.

- **Power Surges:** Lightning strikes, strong winds, and other storm-related events can lead to power surges in the electrical grid. These surges can damage electronic devices, appliances, and utility equipment connected to the power supply.

Mapping concerning electrical infrastructure may be found in Section 3.9: Critical Infrastructure. Information concerning the costs to repair or reconstruct transportation and electrical infrastructure may be found in Section 5.9.6.

Water and Wastewater Utilities
In general, severe weather components do not have a large impact on water and wastewater infrastructure and operations. However, the cascading impacts from an event such as power loss disrupting pumping and treatment capabilities, localized flooding from heavy overwhelming drainage systems, or frozen pipes in water distribution systems may cause system disruptions.

Medical and Response Facilities
Severe weather can significantly impact emergency response infrastructure, creating challenges for first responders and organizations involved in managing and mitigating the effects of severe weather events. Severe weather can impact emergency response through:

- **Transportation Disruptions:** Debris accumulation on roads can hinder the ability of emergency vehicles to navigate and reach affected areas promptly. Hazardous road conditions may result in delays in response times.
- **Communication Disruptions:** Severe weather can disrupt communication networks, affecting the ability of emergency responders to coordinate and communicate effectively. Downed power lines and damage to communication infrastructure contribute to these disruptions.
- **Power Outages:** Severe weather can lead to power outages. Emergency response facilities, such as command centers and fire stations, may lose power, affecting their operational capabilities.
- **Exposure:** Emergency responders face increased health and safety risks in severe weather conditions. Exposure to hail and high winds can impact the well-being of responders and affect their ability to provide effective assistance.
- **Resource Allocation Challenges:** Severe weather often requires the allocation of additional resources, including personnel, equipment, and supplies, to address immediate needs. This can strain emergency response organizations and impact their ability to respond to other concurrent incidents.
- **Increased Demand for Services:** Severe weather can result in an increased demand for emergency services, including medical assistance, search and rescue operations, and responses to accidents. Emergency response organizations may need to manage a higher volume of incidents simultaneously. Setting up and managing these shelters can strain resources.

Educational Facilities
Depending on the educational facility capability and location, severe weather may necessitate the closure of the facility for the duration of the event due to damages or lack of access. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

- **School Closures:** Severe weather can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems
All communication systems within Kansas Region D and all participating jurisdictions are at risk to severe weather. Severe weather can disrupt vital communications system, affecting reliability and functionality. Some of the key vulnerabilities include:

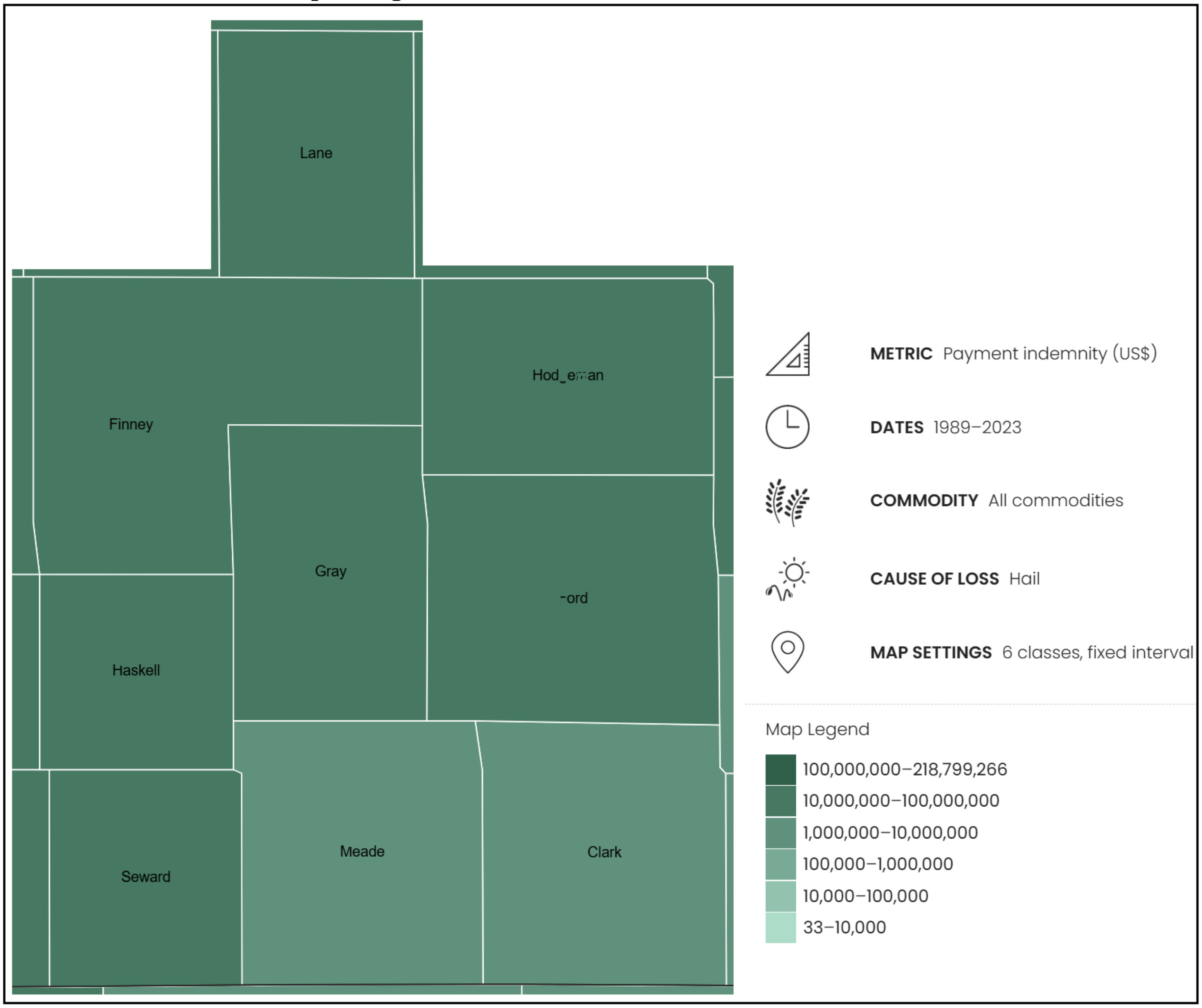
- **Physical Infrastructure Damage:** High winds, heavy rainfall, and other severe weather conditions can cause physical damage to communication infrastructure such as cell towers, antennas, cables, and data centers. This damage can result in network outages and disruptions.
- **Power Outages:** Severe storms often lead to power outages, which can affect the operation of communication networks. Without a stable power supply, cell towers, data centers, and other critical components may become non-functional, leading to service interruptions.
- **Lightning Strikes:** Lightning poses a threat to communication infrastructure. Direct strikes or induced surges can damage electronic equipment, leading to the need for repairs or replacements and causing downtime.
- **Signal Interference:** Severe storms can create electromagnetic interference that disrupts radio signals used in wireless communication. This interference can lead to poor signal quality, dropped calls, and slower data speeds.
- **Loss of Backhaul Connectivity:** Severe weather events can damage the backhaul infrastructure that connects various communication nodes. This backbone infrastructure is crucial for transmitting data between local and regional networks, and any disruption can impact overall network performance.
- **Communication Tower Instability:** High winds and extreme weather conditions can compromise the stability of communication towers. If towers are not designed to withstand severe weather, they may collapse, leading to network outages.
- **Network Congestion:** In the event of a disaster, communication networks may experience a surge in usage as people attempt to contact emergency services, friends, and family. This increased demand can lead to network congestion, making it difficult for users to connect.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. Estimated repair cost from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency may be found in Section 5.11.6.

Environmental and Agricultural Impacts

Hail events can cause significant agricultural impacts. The following map from the United States Department of Agriculture details total county-wide agricultural losses, by county, due to hail events from 1989 - 2023:

Map 62: Agricultural Losses Due to Hail Events, 1989 - 2023



Source: USDA

Severe weather can pose various risks to the environment. These risks can have both short-term and long-term impacts on natural ecosystems. Severe weather can produce heavy rainfall over a short period of time, leading to flash floods and riverine flooding. This can result in soil erosion, damage to aquatic habitats, and the displacement of aquatic organisms. Large hailstones can damage crops, vegetation, and natural habitats. Hail can strip leaves from trees and plants, reducing their ability to photosynthesize and grow. It can also damage wildlife habitats. Severe weather often produces strong straight-line winds. These winds can uproot trees, damage forests, and disrupt animal habitats. They can also scatter debris and cause structural damage to buildings, which can lead to further environmental issues if hazardous materials are released. Lightning is a common occurrence during severe weather and can spark wildfires. These wildfires can have significant ecological impacts, including habitat destruction, loss of wildlife, and changes in the local ecosystem.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** With 10.5% of citizens living in poverty, severe weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Finney County:** With 12.8% of citizens living in poverty, severe weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (12.3%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Ford County:** With 11.8% of citizens living in poverty, severe weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (9.6%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Gray County:** With 4.6% of citizens living in poverty, severe weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (8.3%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Haskell County:** With 11.3% of citizens living in poverty, severe weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (19.7%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Hodgeman County:** With 11.3% of citizens living in poverty, severe weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Lane County:** With 12.4% of citizens living in poverty, severe weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention.

Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.

- **Meade County:** With 8.7% of citizens living in poverty, severe weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (10.4%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Seward County:** With 14.0% of citizens living in poverty, severe weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (10.8%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with severe weather may include:

- Direct physical damage to buildings and structures:
- Transportation infrastructure disruption
- Power outages and electrical grid disruption
- Communication system disruption
- Transportation and supply chain disruptions
- Environmental and ecological damage
- Economic impacts and business closures
- Emergency services overload

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 132: Severe Weather Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Severe weather can cause extensive property damage, loss of utility service, and injury to the public. Those most at-risk are low-income and homeless individuals without proper shelter.
Impact on Responders	First responders may be unable to access roadways due to flooding, trees, or debris. Exposure to lightning, flooding, and high winds may cause injuries to first responders. Vehicles and resources may be damaged, leading to impaired response activities. In addition, road conditions may become hazardous as a result of the by-products

Table 132: Severe Weather Consequence Analysis

Subject	Potential Impacts
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. Severe Weather may impact an agency's ability to maintain continuity of operations due to power outages, flooding, and wind damage. If the activation of alternate facilities was required, travel may be difficult as well as computer/network access due to long-term power outages caused by severe weather.
Delivery of Services	Delivery of services may be impaired by flooding, obstruction, and damage to roadways and resources. The ability to deliver goods and services will be impacted locally, regionally, or statewide depending on the magnitude of the event. Goods, equipment, and vehicles may become damaged during transport.
Property, Facilities, and Infrastructure	Power lines and power generators are most at risk from severe weather and impacts could result in isolated power outages or full-scale blackouts. Building and vehicle damage can occur from hail and other debris created by severe weather. Properties and critical facilities also may face foundational and physical damage due to flooding, lightning strike, or excessive winds, delaying response and recovery operations.
Impact on Environment	Waste and debris from damaged treatment infrastructure or hazardous materials facilities could contaminate sources of water and food. Debris can impact and contaminate wildlife and natural areas. Lightning strikes may also ignite fires, leading to destruction of agricultural crops, critical ecosystems, and natural habitats.
Economic Conditions	Flooding, high winds, lightning, and hail can stress local resources. Even if some of the costs can be recouped through federal reimbursements (federal disaster declaration), there is a fiscal impact on the local government.
Public Confidence in Governance	Ineffective response can decrease the public's confidence in the ability to respond and govern. Governmental response across local, state, regional, and federal levels require direct actions that must be immediate and effective to maintain public confidence.

5.13.7 Future Development

Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Kansas Region D and the majority of participating jurisdictions have generally seen static to decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also initially slow and then decrease. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, is expected to increase the housing stock. However, adherence to building codes will provide any new construction a degree of hazard resiliency.

Any continued growth in modular or mobile homes would potentially increase future vulnerability. However, all participating jurisdictions have seen a decrease in the number of mobile homes from 2000 through 2020 (with the exception of Englewood, Meade County, City of Meade, and plains, which have seen minor increases).

5.13.8 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the extreme heat hazard.

Table 133: Example Severe Weather Mitigation Actions

Category	Example Action
Planning and Regulation	Review building codes and structural policies to ensure they are adequate to protect older structures from wind damage.
	Require tie-downs with anchors and ground anchors appropriate for the soil type for manufactured homes.
	Incorporate passive ventilation in the site design. Passive ventilation systems use a series of vents in exterior walls or at exterior windows to allow outdoor air to enter the home in a controlled way.
	Establish standards for all utilities regarding tree pruning around lines.
	Inspect utility poles to ensure they meet specifications and are wind resistant.
	Ensure the development and enforcement of building codes for roof snow loads.
Infrastructure	Install lightning protection devices and methods, such as lightning rods and grounding, on communications infrastructure and other critical facilities.
	Install and maintain surge protection on critical electronic equipment.
	Retrofit buildings with load-path connectors to strengthen the structural frames.
	Avoid placing flag poles or antennas near buildings.
	Protect traffic lights and other traffic controls from high winds.
	Add building insulation to walls and attics.
Natural Systems	Properly maintain stream and river channels to ensure flow.
	Use living snow fences (e.g., rows of trees or other vegetation) to limit blowing and drifting of snow over critical roadway segments.
Education	Develop a lightning brochure for distribution by recreation equipment retailers or outfitters in mountainous areas.
	Educate design professionals to include wind mitigation during building design.
	Instruct property owners on how to properly install temporary window coverings before a storm.
	Produce and distribute family and traveler emergency preparedness information about severe winter weather hazards.
	Organize outreach to vulnerable populations, including establishing and promoting accessible heating centers in the community.

5.14 Severe Winter Weather

5.14.1 Hazard Description

Severe winter weather encompasses multiple effects caused by winter storms and conditions. Included are strong winds, ice storms, heavy or prolonged snow, sleet, and extreme temperatures. Winter storms can be increasingly hazardous in areas and regions that only see winter storms intermittently.

This plan defines severe winter weather as a combination of the following effects as defined by NOAA and the NWS.

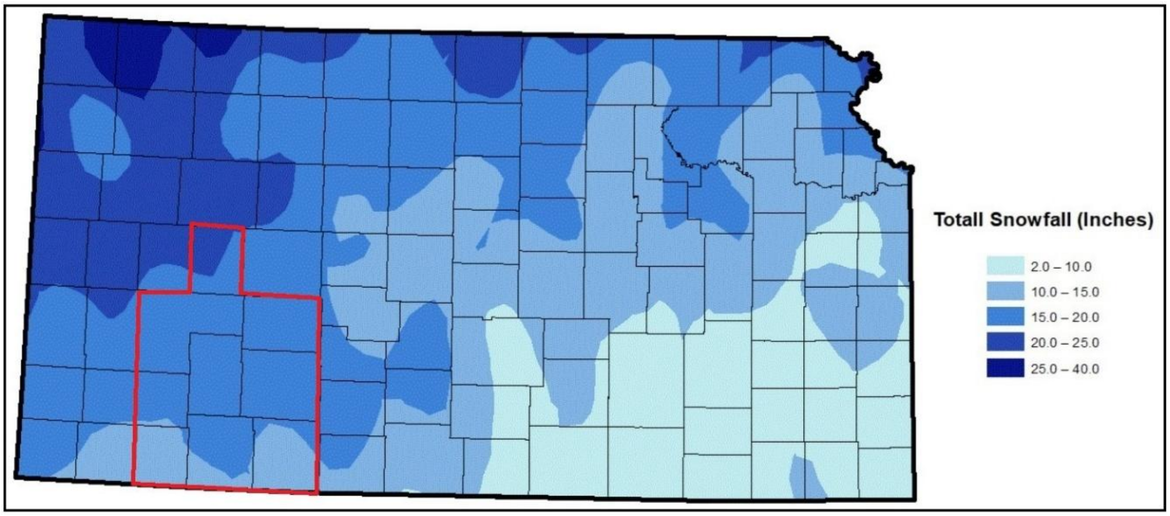
- **Ice Storm:** An ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication and can make travel extremely dangerous. Significant ice accumulations are usually accumulations of ¼" or greater.
- **Heavy Snow:** This generally means snowfall accumulating to 4" or more in depth in 12 hours or less; or snowfall accumulating to 6" or more in depth in 24 hours or less.
- **Winter Storm:** Hazardous winter weather in the form of heavy snow, freezing rain, or heavy sleet. It may also include extremely low temperatures and increased wind.
- **Cold Wave/Extreme Cold:** As described by NWS, a cold wave is a rapid fall in temperature within a 24-hour period requiring substantially increased protection to agriculture, industry, commerce, and social activities. As evidenced by past incidents across the U.S., extreme cold can cause impact to human life and property.

5.14.2 – Location and Extent

All of Kansas Region D is vulnerable to winter and ice storms. Based on the non-geographic specific aspect of this hazard, i.e., no one area is at a greater risk, all of the planning area’s structural inventory and population is vulnerable. Severe winter weather occurs regularly throughout Kansas Region D. These events occur on a large geographic scale, often affecting multiple counties, regions, and states. Winter storms typically form with some warning and are often anticipated. Like other large storm fronts, the severity of a storm is not as easily predicted due to myriad factors that can influence its impact. Although meteorologists estimate the amount of snowfall a winter storm will drop, it is not known exactly how much snow will fall, whether or not it will form an ice storm, or how powerful the winds will be until the storm is already affecting a community.

The following map from Kansas State University indicates the average annual snowfall for Kansas Region D:

Map 63: Kansas Region D Normal Annual Snowfall



Source: NOAA

The Northeast Snowfall Impact Scale is a scale used to assess and rank the impact of snowfall events in the northeastern United States, but allows for an idea of intensity for Kansas Region D. It was developed by NOAA to provide a standardized way of measuring the societal and economic impacts of snowstorms. The scale takes into account factors such as snowfall amount, population density, and the area affected by the storm to determine its impact. The scale has five categories, each with its own associated impacts:

Table 134: Snowfall Impact Scale

Category	Description	Impacts
1	Notable	Light to moderate snowfall. Limited impacts on transportation and daily life. Typically localized to small areas.
2	Significant	Moderate to heavy snowfall. Widespread impacts on transportation, including delays and disruptions. Some school and business closures. Widespread power outages are rare.
3	Major	Heavy snowfall, often exceeding one foot or more. Significant transportation disruptions, including major highway closures. Widespread school and business closures. Power outages may occur, especially in areas with wet, heavy snow.
4	Crippling	Extreme snowfall, often exceeding two feet or more. Severe and prolonged transportation disruptions, including highway closures. Widespread school and business closures for an extended period. Widespread and prolonged power outages, especially in areas with ice accumulation.
5	Extreme	Exceptional snowfall, often exceeding three feet or more. Complete paralysis of transportation systems, including major highways and airports. Extended school and business closures. Widespread and prolonged power outages with significant damage to the electrical infrastructure.

Source: NOAA

The scale provides information for emergency management, public safety agencies, and the public to understand the potential impacts of a snowstorm and to prepare accordingly. It helps to quantify and communicate the severity of winter weather events, especially where snowfall can have a major impact on daily life and the economy.

Ice storms are characterized by the accumulation of freezing rain or freezing drizzle, which coats surfaces with a layer of ice. These storms can have significant impacts on transportation, infrastructure, and the environment. Ice storms occur when there's a layer of warm air above a layer of cold air near the surface. Precipitation falls as rain in the warm layer and then freezes upon contact with surfaces at or below freezing temperatures in the cold layer. The most common type of precipitation during an ice storm is freezing rain. This is rain that falls as a liquid but freezes upon contact with cold surfaces, forming a layer of ice.

The Sperry–Piltz Ice Accumulation Index is an ice accumulation and ice damage prediction index that, when combined with NWS data, predicts the projected footprint, total ice accumulation, and resulting potential damage from approaching ice storms.

Figure 9: Sperry–Piltz Ice Accumulation Index

ICE DAMAGE INDEX	DAMAGE AND IMPACT DESCRIPTIONS
0	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
4	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

Source: Sperry–Piltz Ice Accumulation Index

The MPC views severe winter weather as a local, county-wide, and regional hazard. Discussions with the MPC and a review of all available data indicated severe winter weather is a community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Clark County** Severe weather identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable. However, continuing climate change may result in a decrease in their intensity, potentially lowering community concern.

- **Finney County:** Severe weather identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable. However, continuing climate change may result in a decrease in their intensity, potentially lowering community concern.
- **Ford County:** Severe weather identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable. Continuing climate change may result in an increase in their intensity, raising community concern.
- **Gray County:** Severe weather identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable. However, continuing climate change may result in a decrease in their intensity, potentially lowering community concern.
- **Haskell County:** Severe weather identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable. However, continuing climate change may result in a decrease in their intensity, potentially lowering community concern.
- **Hodgeman County:** Severe weather identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable. However, continuing climate change may result in a decrease in their intensity, potentially lowering community concern.
- **Lane County:** Severe weather identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable. However, continuing climate change may result in a decrease in their intensity, potentially lowering community concern.
- **Meade County:** Severe weather identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable. However, continuing climate change may result in a decrease in their intensity, potentially lowering community concern.
- **Seward County** Severe weather identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable. However, continuing climate change may result in a decrease in their intensity, potentially lowering community concern.

5.14.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Kansas Region D has experienced two Presidential Disaster Declaration related to severe winter weather events, reflected in the following table:

Table 135: Kansas Region D Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Counties	Individual and Public Assistance	Mitigation Grants
DR-4774-KS	4/28/2024	**Winter Storm**	Ford, Gray, Hodgeman		DR-4774-KS
DR-4319-KS	6/16/2017	**Severe Winter Storm, Snowstorm**, Straight-Line Winds, and Flooding	Finney, Haskell, Lane, Seward	$40,146,036	DR-4319-KS
DR-4304-KS	2/24/2017	**Severe Winter Storm**	Clark, Ford, Hodgeman, Meade, Seward	$12,516,658	DR-4304-KS
DR-4112	4/26/2013	**Snowstorm**	Hodgeman	$1,320,793	DR-4112
DR-1741-KS	2/1/2008	**Severe Winter Storms**	Clark, Ford, Hodgeman	$227,086,533	DR-1741-KS
DR-1626-KS	1/26/2006	**Severe Winter Storm**	Hodgeman	$36,376,189	DR-1626-KS
DR-1579-KS	2/8/2005	**Severe Winter Storm**, Heavy Rains, and Flooding	Clark	$82,381,461	DR-1579-KS

Source: FEMA
-: Not reported

The Governor of the State of Kansas has declared one Kansas Disaster Declarations during the past five years for Region D for severe winter weather:

- **January 18, 2019:** A declaration was issued for a major winter storm system.

Additionally, the following table presents NCEI identifies severe winter weather events and the resulting damage totals in Kansas Region D from 1950 to 2024:

Table 136: Kansas Region D NCEI Severe Winter Weather Events. 1950 - 2024

Region	Event Type	Number of Days with Events	Property Damage	Deaths and Injuries
Kansas Region D	Blizzard	15	$0	0
	Ice Storm	9	$0	0
	Winter Storm	35	$0	0

Source: NCEI

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or NWS office. When reporting an event, the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Additionally, deaths and injuries may be underreported as they may be a result of a concurrent event, such as a person driving unsafely during heavy rain and passing away.

5.14.4 Probability of Future Events

Predicting the probability of severe weather occurrences is tremendously changing due to the large number of factors involved and the random nature of formation. Data and mapping from NOAA indicate that Kansas Region D can expect 10" – 25" of snow per year.

Based on historical occurrences, Kansas Region D will continue to experience severe winter storm events on an annual basis. The following table, using data from the NCEI, indicates the yearly probability of a severe winter storm event, the number of deaths or injuries, and estimated property damage for each county in Kansas Region D:

Table 137: Kansas Region D NCEI Severe Winter Storm Event Probability Summary

Event Type	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Blizzard	15	<1	0	0	$0	$0
Ice Storm	9	<1	0	0	$0	$0
Winter Storm	35	<1	0	0	$0	$0

Source: NCEI

5.14.5 Projected Changes in Location, Intensity, Frequency, and Duration

Climate change can lead to greater variability in precipitation patterns. In Kansas Region D, this may result in more erratic winter storms with periods of heavy snowfall followed by rain or freezing rain. These mixed precipitation events can make winter storms more changing to predict and can lead to a greater risk of ice accumulation. Additionally, Kansas Region D may experience milder winters as average temperatures rise due to climate change. While this could lead to a decrease in the frequency of traditional snowstorms, it may also increase the likelihood of winter storms that produce mixed precipitation, including freezing rain and sleet. Warmer temperatures can lead to a higher snowfall threshold, meaning that storms that would have produced snow in the past may now bring more rain or a mix of precipitation types. This can affect the accumulation of snow in the state. Changes in atmospheric circulation patterns associated with climate change can influence the tracks of winter storms. This could lead to a shift in the amounts of heavy snowfall, ice, and other winter weather hazards in Kansas Region D.

5.14.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Kansas Region D and all participating jurisdictions from severe winter weather. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Kansas Region D and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 138: Participating Jurisdiction Ice Storm Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Clark County	**All**	**Relatively Low**	**51.9**	**0.5**
Ashland, Englewood, and Minneola	967100	Relatively High	96.6	0.5
Finney County	**All**	**Relatively Low**	**46.8**	**0.5**
Holcomb	960100	Relatively Low	68.3	0.5
Garden City	960200	Relatively Moderate	74.4	0.4
Garden City	960300	Relatively Low	63.4	0.4
Garden City	960401	Relatively Low	38.0	0.4
Garden City	960403	Relatively Low	51.9	0.4
Garden City	960404	Relatively Low	66.0	0.4
Garden City	960501	Relatively Low	60.2	0.4
Garden City	960503	Relatively Low	32.8	0.5
Garden City	960505	Relatively Low	46.7	0.4
Garden City	960507	Relatively Low	62.5	0.4
Garden City	960508	Relatively Low	57.6	0.4
Garden City	960600	Relatively Moderate	75.9	0.5
Ford County	**All**	**Relatively Low**	**47.1**	**0.6**
Spearville	961600	Relatively Low	46.0	0.6
Bucklin and City of Ford	961700	Relatively Low	50.9	0.5
Dodge City	961801	Relatively Low	68.0	0.5
Dodge City	961802	Relatively Moderate	74.4	0.6
Dodge City	961901	Relatively Low	66.4	0.5
Dodge City	961902	Relatively Low	63.6	0.5
Dodge City	962000	Relatively Moderate	74.3	0.5
Dodge City	962101	Relatively Moderate	78.9	0.5
Dodge City	962102	Relatively Low	67.0	0.5
Gray County	**All**	**Relatively Low**	**34.5**	**0.5**
Cimarron and Ingalls	962600	Relatively Moderate	81.4	0.5
Copeland, Ensign, and Montezuma	962700	Relatively Moderate	82.9	0.5
Haskell County	**All**	**Relatively Low**	**30.7**	**0.5**
Satanta and Sublette	463100	Relatively Moderate	87.7	0.5
Hodgeman County	**All**	**Relatively Low**	**42.6**	**0.6**
Hanston and Jetmore	461100	Relatively High	93.6	0.6
Lane County	**All**	**Relatively Low**	**37.1**	**0.4**
Dighton	956600	Relatively High	91.3	0.4
Meade County	**All**	**Relatively Low**	**31.4**	**0.5**

Table 138: Participating Jurisdiction Ice Storm Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Fowler and Plains	966600	Relatively Moderate	84.5	0.5
City of Meade	966700	Relatively Moderate	70.0	0.5
Seward County	**All**	**Relatively Low**	**39.4**	**0.5**
Kismet	965600	Relatively Moderate	69.8	0.5
Liberal	965700	Relatively Moderate	80.9	0.4
Liberal	965800	Relatively Low	67.5	0.3
Liberal	965900	Relatively Moderate	69.6	0.3
Liberal	966000	Relatively Low	68.2	0.3

Source: FEMA NRI

Table 139: Participating Jurisdiction Ice Storm Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Clark County	**All**	**Relatively Low**	**53.0**	**$66K**
Ashland, Englewood, and Minneola	967100	Relatively High	96.6	$66K
Finney County	**All**	**Relatively Low**	**42.1**	**$37K**
Holcomb	960100	Relatively Low	66.9	$5.1K
Garden City	960200	Relatively Low	69.3	$5.8K
Garden City	960300	Relatively Low	56.3	$3.1K
Garden City	960401	Relatively Low	41.5	$1.7K
Garden City	960403	Relatively Low	49.7	$2.3K
Garden City	960404	Relatively Low	59.9	$3.6K
Garden City	960501	Relatively Low	52.5	$2.7K
Garden City	960503	Very Low	32.9	$1.2K
Garden City	960505	Relatively Low	41.1	$1.6K
Garden City	960507	Relatively Low	51.1	$2.5K
Garden City	960508	Relatively Low	49.5	$2.3K
Garden City	960600	Relatively Low	67.1	$5.1K
Ford County	**All**	**Relatively Low**	**43.2**	**$39K**
Spearville	961600	Relatively Low	53.7	$2.8K
Bucklin and City of Ford	961700	Relatively Low	55.2	$3K
Dodge City	961801	Relatively Low	64.9	$4.6K
Dodge City	961802	Relatively Low	67.1	$5.1K
Dodge City	961901	Relatively Low	62.0	$4K
Dodge City	961902	Relatively Low	63.4	$4.3K
Dodge City	962000	Relatively Low	65.9	$4.8K
Dodge City	962101	Relatively Moderate	71.3	$6.4K
Dodge City	962102	Relatively Low	59.9	$3.7K
Gray County	**All**	**Relatively Low**	**35.4**	**$25K**
Cimarron and Ingalls	962600	Relatively Moderate	81.3	$12K
Copeland, Ensign, and Montezuma	962700	Relatively Moderate	81.8	$13K
Haskell County	**All**	**Relatively Low**	**28.8**	**$18K**
Satanta and Sublette	463100	Relatively Moderate	85.7	$18K
Hodgeman County	**All**	**Relatively Low**	**44.8**	**$42K**
Hanston and Jetmore	461100	Relatively High	93.6	$42K
Lane County	**All**	**Relatively Low**	**39.1**	**$32K**
Dighton	956600	Relatively High	91.4	$32K
Meade County	**All**	**Relatively Low**	**31.8**	**$21K**
Fowler and Plains	966600	Relatively Moderate	82.6	$14K

Table 139: Participating Jurisdiction Ice Storm Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
City of Meade	966700	Relatively Moderate	72.9	$7.1K
Seward County	**All**	**Relatively Low**	**34.7**	**$25K**
Kismet	965600	Relatively Low	66.5	$5K
Liberal	965700	Relatively Low	74.6	$7.9K
Liberal	965800	Relatively Low	63.4	$4.3K
Liberal	965900	Relatively Low	61.9	$4K
Liberal	966000	Relatively Low	58.3	$3.4K

Source: FEMA

Table 140: Participating Jurisdiction Winnter Weather Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Clark County	**All**	**Very Low**	**6.5**	**2.1**
Ashland, Englewood, and Minneola	967100	Relatively Moderate	70.1	2.1
Finney County	**All**	**Relatively Low**	**53.4**	**2.3**
Holcomb	960100	Relatively Moderate	83.0	2.3
Garden City	960200	Relatively High	87.8	2.3
Garden City	960300	Relatively Moderate	74.8	2.3
Garden City	960401	Relatively Low	58.3	2.3
Garden City	960403	Relatively Moderate	68.4	2.3
Garden City	960404	Relatively Moderate	80.7	2.3
Garden City	960501	Relatively Moderate	72.0	2.3
Garden City	960503	Relatively Low	51.2	2.3
Garden City	960505	Relatively Moderate	61.4	2.3
Garden City	960507	Relatively Moderate	69.1	2.3
Garden City	960508	Relatively Moderate	76.7	2.3
Garden City	960600	Relatively High	87.0	2.3
Ford County	**All**	**Relatively Low**	**49.5**	**2.3**
Spearville	961600	Relatively Low	57.0	2.3
Bucklin and City of Ford	961700	Relatively Moderate	62.2	2.3
Dodge City	961801	Relatively Moderate	79.5	2.3
Dodge City	961802	Relatively Moderate	84.8	2.3
Dodge City	961901	Relatively Moderate	80.6	2.3
Dodge City	961902	Relatively Moderate	74.4	2.3
Dodge City	962000	Relatively Moderate	85.8	2.3
Dodge City	962101	Relatively Moderate	85.3	2.3
Dodge City	962102	Relatively Moderate	77.1	2.3
Gray County	**All**	**Very Low**	**15.2**	**2.2**
Cimarron and Ingalls	962600	Relatively Moderate	72.8	2.2
Copeland, Ensign, and Montezuma	962700	Relatively Moderate	78.9	2.2
Haskell County	**All**	**Very Low**	**13.2**	**2.3**
Satanta and Sublette	463100	Relatively Moderate	84.7	2.3
Hodgeman County	**All**	**Very Low**	**20.0**	**2.2**
Hanston and Jetmore	461100	Relatively High	91.0	2.2
Lane County	**All**	**Very Low**	**19.1**	**2.4**
Dighton	956600	Relatively High	90.4	2.4
Meade County	**All**	**Very Low**	**10.7**	**2.4**
Fowler and Plains	966600	Relatively Moderate	74.6	2.4

Table 140: Participating Jurisdiction Winnter Weather Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
City of Meade	966700	Relatively Low	56.5	2.4
Seward County	**All**	**Relatively Low**	**41.5**	**2.3**
Kismet	965600	Relatively Moderate	71.5	2.3
Liberal	965700	Relatively Moderate	85.0	2.3
Liberal	965800	Relatively Moderate	80.5	2.3
Liberal	965900	Relatively High	88.1	2.3
Liberal	966000	Relatively Moderate	83.9	2.3

Source: FEMA NRI

Table 141: Participating Jurisdiction Winnter Weather Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Clark County	**All**	**Very Low**	**9.7**	**$3.7K**
Ashland, Englewood, and Minneola	967100	Relatively High	70.2	$3.7K
Finney County	**All**	**Relatively Low**	**50.1**	**$47K**
Holcomb	960100	Relatively Moderate	82.3	$7.1K
Garden City	960200	Relatively Moderate	84.3	$8K
Garden City	960300	Relatively Moderate	69.3	$3.5K
Garden City	960401	Relatively Moderate	61.1	$2.3K
Garden City	960403	Relatively Moderate	66.8	$3.1K
Garden City	960404	Relatively Moderate	75.9	$4.9K
Garden City	960501	Relatively Moderate	66.1	$3K
Garden City	960503	Relatively Low	51.2	$1.4K
Garden City	960505	Relatively Low	56.8	$1.9K
Garden City	960507	Relatively Moderate	59.4	$2.1K
Garden City	960508	Relatively Moderate	70.6	$3.7K
Garden City	960600	Relatively Moderate	79.8	$6.1K
Ford County	**All**	**Relatively Low**	**47.2**	**$42K**
Spearville	961600	Relatively Moderate	64.1	$2.7K
Bucklin and City of Ford	961700	Relatively Moderate	66.3	$3K
Dodge City	961801	Relatively Moderate	77.1	$5.3K
Dodge City	961802	Relatively Moderate	78.6	$5.7K
Dodge City	961901	Relatively Moderate	77.2	$5.3K
Dodge City	961902	Relatively Moderate	74.6	$4.6K
Dodge City	962000	Relatively Moderate	79.0	$5.8K
Dodge City	962101	Relatively Moderate	77.8	$5.5K
Dodge City	962102	Relatively Moderate	71.0	$3.8K
Gray County	**All**	**Relatively Low**	**18.4**	**$9.7K**
Cimarron and Ingalls	962600	Relatively Moderate	72.8	$4.2K
Copeland, Ensign, and Montezuma	962700	Relatively Moderate	77.8	$5.5K
Haskell County	**All**	**Very Low**	**15.1**	**$7.3K**
Satanta and Sublette	463100	Relatively Moderate	82.7	$7.3K
Hodgeman County	**All**	**Relatively Low**	**24.5**	**$15K**
Hanston and Jetmore	461100	Relatively High	91.7	$15K
Lane County	**All**	**Relatively Low**	**23.8**	**$14K**
Dighton	956600	Relatively High	91.3	$14K
Meade County	**All**	**Very Low**	**13.6**	**$6.3K**
Fowler and Plains	966600	Relatively Moderate	72.0	$4K
City of Meade	966700	Relatively Moderate	60.3	$2.2K

Table 141: Participating Jurisdiction Winnter Weather Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Seward County	**All**	**Relatively Low**	**37.1**	**$27K**
Kismet	965600	Relatively Moderate	68.2	$3.3K
Liberal	965700	Relatively Moderate	78.7	$5.7K
Liberal	965800	Relatively Moderate	77.2	$5.3K
Liberal	965900	Relatively Moderate	83.5	$7.6K
Liberal	966000	Relatively Moderate	76.5	$5.1K

Source: FEMA

Population

Severe winter weather, and the extremely cold temperatures that often accompany it, is a threat to anyone exposed to them. Extreme cold can cause frostbite and hypothermia. Bitterly cold temperatures can also burst water and create an excessive demand on providers to deliver energy for household heating. There are also fire dangers associated with home heating. Heavy snow and/or ice can paralyze communities. Roads can become hazardous which may cause accidents, disrupted flow of supplies, and challenges in the delivery of emergency and medical services. Additional impacts on people and the community may include:

- **Injuries and Fatalities:** Slippery sidewalks, roads, and driveways can lead to slip and fall accidents, vehicle crashes, and pedestrian injuries. Exposure to extreme cold temperatures can cause frostbite, hypothermia, and cold-related illnesses, which can be life-threatening.
- **Power Outages:** Heavy snow, ice, and freezing rain can bring down power lines and disrupt electricity supply. Power outages can lead to heating and lighting challenges, particularly in extreme cold conditions.
- **Transportation Disruptions:** Winter storms can make roads and highways treacherous, leading to travel delays, accidents, and stranded motorists. Public transportation services may be disrupted, affecting commuters and essential travel.
- **Stranded or Isolated Communities:** Severe winter weather can leave communities isolated and cut off from emergency services and supplies. Residents may need to shelter in place or rely on local resources until conditions improve.
- **Health Risks:** Exposure to extreme cold can lead to a range of health risks, including frostbite, hypothermia, and cold-related illnesses. Individuals with pre-existing health conditions may face exacerbated risks.
- **Increased Heating Costs:** Cold weather can result in higher heating costs, which can be a financial burden for many households. Low-income individuals and families may struggle to afford adequate heating.
- **Disruption of Essential Services:** Severe winter weather can disrupt essential services such as healthcare, emergency response, and utilities. Hospitals may face increased patient volumes due to weather-related injuries and illnesses.

When extremely cold temperatures are accompanied by strong winds the result can be potentially lethal wind chills. Wind chill is the temperature your body feels when the air temperature is combined with the wind speed and is based on the rate of heat loss from exposed skin caused by the effects of wind and cold. As the speed of the wind increases, it can carry heat away from your body much more quickly, causing skin temperature to drop.

All Kansas Region D and participating jurisdiction populations are vulnerable to the impacts of severe weather. Please see Section 3.3: Population Data and Section 3.4: Socially Vulnerable and At-Risk Populations for data concerning jurisdictional populations.

Buildings and Structures

All buildings and structures within Kansas Region D and participating jurisdictions can be impacted by severe winter weather. However, the location and construction of the facility will have a significant impact on the vulnerability. In general, older structures would be at higher risk of negative impacts. Some of the potential impacts include:

- **Electrical Infrastructure Damage:** Severe winter weather can damage electrical infrastructure, including power lines, transformers, and substations. This can result in widespread power outages, affecting homes, businesses, hospitals, and other critical facilities.
- **Communication Disruptions:** Severe winter weather can disrupt telecommunications infrastructure, including cell towers, data centers, and communication networks. This can impact emergency communication and coordination efforts.
- **Safety Risks:** Damage to infrastructure can pose safety risks to workers and the public. Fallen power lines, damaged buildings, and debris can be hazardous.
- **Building Damage:** Heavy snow or ice loads can cause damage to the building.

Governmental Operations

Severe winter weather can pose various risks to government operations. These risks can have significant economic and operational consequences, and can include:

- **Power Outages:** Severe winter weather can lead to power outages by damaging electrical infrastructure such as power lines and substations. Government buildings may lose power, affecting critical operations and services.
- **Flooding:** Heavy snow, or rapid melting of snow during severe winter weather can lead to flooding, which can damage government buildings and disrupt operations. Flood damage may require extensive repairs and cleanup.
- **Communication Disruptions:** Severe winter weather can damage communication equipment, including telephone lines and computer systems. This can hinder communication between government agencies and the public.
- **Transportation Disruptions:** Severe winter weather can make roads impassable due to snow or ice. This can impact the ability of government employees to commute to work.
- **Budgetary Impact:** The costs associated with repairing and restoring government buildings and infrastructure after severe winter weather can strain budgets.

Transportation and Electrical Infrastructure

Severe winter weather can have significant impacts on road infrastructure, creating changing conditions for transportation and necessitating proactive measures for maintenance and safety. Winter storms can impact road infrastructure through:

- **Snow Accumulation:** Snowfall can accumulate on road surfaces, creating slippery and hazardous conditions for drivers. Accumulated snow can reduce road visibility and make travel difficult.
- **Ice Formation:** Freezing temperatures can lead to the formation of ice on roadways, increasing the risk of accidents and making roads slippery. Black ice, which is nearly invisible, poses a particular hazard.
- **Snowdrifts:** Strong winds during winter storms can lead to the formation of snowdrifts on roads, especially in open areas. These drifts can obstruct visibility and impede traffic flow.
- **Road Surface Damage:** The freeze-thaw cycle, where melted snow refreezes, can lead to the formation of ice patches and potholes on road surfaces. This cycle can contribute to the deterioration of road infrastructure over time.
- **Freeze-Thaw Cycling:** Alternating freezing and thawing can cause the expansion and contraction of water within pavement cracks, leading to the formation and enlargement of potholes.

- **Snowplow and Deicing Operations:** Snowplows and deicing operations are necessary to clear roads and improve driving conditions. However, the use of salt and chemicals for deicing can contribute to corrosion and deterioration of road surfaces and infrastructure.
- **Infrastructure Stress:** Bridges and overpasses are particularly susceptible to ice formation due to the lack of ground contact. Winter storms can stress these structures, potentially leading to structural issues over time.

Significant cost can be incurred for snow removal from transportation routes. In smaller jurisdictions with fewer resources and equipment, the cost may be on the lower end of the spectrum, ranging from a few thousand dollars to around $10,000 per snow event. In larger counties or urban areas with extensive road networks and higher population densities, the cost can be much higher, potentially ranging from $10,000 to $50,000 or more per snow event.

In general, the priority for snow removal is based on traffic volume, speed limits and road surface types. Preference is generally given in the following order:

- State trunklines
- Primary roads
- Major local roads
- Residential / subdivision streets

Severe winter weather can impact electrical utilities in various ways, potentially leading to disruptions in service. These impacts include:

- **Power Outages:** Low temperatures can strain electrical systems, leading to increased demand for heating systems. This heightened demand can overload power grids, resulting in power outages.
- **Equipment Failure:** Electrical equipment, such as cables and switches, may experience higher stress during extremely cold weather, increasing the likelihood of equipment failures.
- **Icing on Power Lines:** Ice accumulation on power lines can lead to increased weight, potentially causing lines to sag or break. This can result in power outages and safety hazards.

Water and Wastewater Utilities

In general, severe winter weather components do not have a large impact on water and wastewater infrastructure and operations. However, the cascading impacts from an event such as power loss disrupting pumping and treatment capabilities, localized flooding from heavy overwhelming drainage systems, or frozen pipes in water distribution systems, can cause system disruptions.

Medical and Response Facilities

Severe winter weather can significantly impact emergency response infrastructure, creating challenges for first responders and organizations involved in managing and mitigating the effects of severe winter weather events. Winter storms can impact emergency response through:

- **Transportation Disruptions:** Snow and ice accumulation on roads can hinder the ability of emergency vehicles to navigate and reach affected areas promptly. Hazardous road conditions may result in delays in response times.
- **Communication Disruptions:** Severe winter weather can disrupt communication networks, affecting the ability of emergency responders to coordinate and communicate effectively. Downed power lines and damage to communication infrastructure contribute to these disruptions.
- **Power Outages:** Severe winter weather can lead to power outages. Emergency response facilities, such as command centers and fire stations, may lose power, affecting their operational capabilities.

- **Exposure:** Emergency responders face increased health and safety risks in severe winter weather conditions. Exposure to hail, high winds, extreme cold, snow, and ice can impact the well-being of responders and affect their ability to provide effective assistance.
- **Resource Allocation Challenges:** Severe winter weather often requires the allocation of additional resources, including personnel, equipment, and supplies, to address immediate needs. This can strain emergency response organizations and impact their ability to respond to other concurrent incidents.
- **Increased Demand for Services:** Severe winter weather can result in an increased demand for emergency services, including medical assistance, search and rescue operations, and responses to accidents. Emergency response organizations may need to manage a higher volume of incidents simultaneously. Severe winter weather can increase the demand for emergency shelters, particularly in cases of widespread power outages. Setting up and managing these shelters can strain resources.

Educational Facilities

Severe winter weather can significantly impact school operations. Impacts may include:

- **Transportation Disruptions:** Snow and ice accumulation on roads can hinder the ability of school vehicles to navigate and reach both students and facilities. Hazardous road conditions may result in delays or closures.
- **School Closures:** Severe winter weather can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems

All communication systems within Kansas Region D and all participating jurisdictions are at risk to severe winter weather. Severe winter weather can disrupt vital communications system, affecting reliability and functionality. Some of the key vulnerabilities include:

- **Physical Infrastructure Damage:** Heavy snow or ice conditions can cause physical damage to communication infrastructure such as cell towers, antennas, cables, and data centers. This damage can result in network outages and disruptions.
- **Power Outages:** Severe winter storms often lead to power outages, which can affect the operation of communication networks. Without a stable power supply, cell towers, data centers, and other critical components may become non-functional, leading to service interruptions.
- **Signal Interference:** Severe winter storms can create electromagnetic interference that disrupts radio signals used in wireless communication. This interference can lead to poor signal quality, dropped calls, and slower data speeds.
- **Loss of Backhaul Connectivity:** Severe winter weather events can damage the backhaul infrastructure that connects various communication nodes. This backbone infrastructure is crucial for transmitting data between local and regional networks, and any disruption can impact overall network performance.
- **Communication Tower Instability:** Heany snow and ice loads can compromise the stability of communication towers. If towers are not designed to withstand severe weather, they may collapse, leading to network outages.
- **Network Congestion:** In the event of a disaster, communication networks may experience a surge in usage as people attempt to contact emergency services, friends, and family. This increased demand can lead to network congestion, making it difficult for users to connect.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. Estimated repair cost from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency may be found in Section 5.11.6.

Environmental and Agricultural Impacts
Severe winter weather conditions can cause significant agricultural impacts. Mapping from United States Department of Agriculture details total county-wide agricultural losses, by county, due to freeze events from 1989 – 2023 may be found in Section 5.11.6.

Severe winter weather can have various impacts on the environment, particularly in regions prone to cold and snowy winters. These impacts can affect ecosystems, wildlife, and natural resources and can include habitat disruption, reduction of food sources, changes in migration patterns, and damage to foliage (especially if a spring storm). Additionally, the use of salt and de-icing chemicals on roads and sidewalks can have negative environmental impacts. These chemicals can find their way into nearby water bodies, leading to water pollution and harm to aquatic ecosystems. Snowmelt can also introduce pollutants from roadways and urban areas into rivers and streams, leading to reduced water quality. Elevated sediment levels and changes in water temperature can also affect aquatic life.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** With 10.5% of citizens living in poverty, severe winter weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Finney County:** With 12.8% of citizens living in poverty, severe winter weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (12.3%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Ford County:** With 11.8% of citizens living in poverty, severe winter weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (9.6%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Gray County:** With 4.6% of citizens living in poverty, severe winter weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (8.3%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.

- **Haskell County:** With 11.3% of citizens living in poverty, severe winter weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (19.7%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Hodgeman County:** With 11.3% of citizens living in poverty, severe winter weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Lane County:** With 12.4% of citizens living in poverty, severe winter weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Meade County:** With 8.7% of citizens living in poverty, severe winter weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (10.4%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Seward County:** With 14.0% of citizens living in poverty, severe winter weather is a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (10.8%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with severe weather may include:

- Direct physical damage to buildings and structures:
- Transportation infrastructure disruption
- Power outages and electrical grid disruption
- Communication system disruption
- Transportation and supply chain disruptions
- Environmental and ecological damage
- Economic impacts and business closures
- Emergency services overload

Consequence Analysis
This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 142: Severe Winter Weather Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Freezing temperatures coupled with heavy snow accumulation can cause dangerous travel conditions, leading to accidents and road closures. Downed power lines can lead to a loss of electricity and heat, with the young and the elderly especially vulnerable. Extremely cold temperatures may lead to hypothermia and death.
Impact on Responders	Dangerous road conditions create transportation challenges for first responders. First responders will need to control their own exposure to the elements for prolonged periods of time and will need to continuously seek heat and shelter to stay warm. Equipment may also be damaged or destroyed due to cold temperatures, heavy wind, ice, and heavy snowfall, which may lead to a decrease in response capabilities.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary. Severe winter weather may impact an agency's ability to maintain operations due to power outages and transportation difficulties. If the activation of alternate facilities was required, travel may be difficult. Additionally, computer/network and other communication access may be impacted due to power outages.
Delivery of Services	The ability to deliver services can be impacted locally, regionally, or statewide depending on the severity of the severe winter weather event. Dangerous road conditions may lead to roadway and bridge closures, as well as transit service disruptions. Businesses and places of commerce may completely shut down, which leads to the disruption of goods and services.
Property, Facilities, and Infrastructure	Transportation, governmental operations, and communications may be heavily disrupted. Roads and bridges may be heavily impacted by severe winter weather, and may be completely obstructed by downed trees, powerlines, and snow accumulation. Snow and ice can impact access to homes and critical facilities such as hospitals, schools, and supermarkets. Power loss can lead to disruption of critical infrastructure and technology.
Impact on Environment	Heavy snow and ice accumulation can weigh down and damage vegetation, tree limbs, and power lines. Flooding may also occur after the rapid melting of a heavy snowfall, causing bodies of water to flood, damaging the surrounding areas. Exposure to extreme winter weather may result in animal death. Chemicals used to treat roadways may contaminate natural environments and water reservoirs if used in large quantities.
Economic Conditions	Severe winter weather poses a fiscal impact on the governments, even if some of those costs can be recouped through federal grant reimbursements. Local, county, and state resources may be drained by a severe winter weather event.
Public Confidence in Governance	The public's confidence in governance is affected by immediate local and state response through direct and effective actions. Efficiency in response and recovery operations is critical in keeping public confidence high.

5.14.7 Future Development
Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to

continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Kansas Region D and the majority of participating jurisdictions have generally seen static to decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also initially slow and then decrease. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, is expected to increase the housing stock. However, adherence to building codes will provide any new construction a degree of hazard resiliency.

Any continued growth in modular or mobile homes would potentially increase future vulnerability. However, all participating jurisdictions have seen a decrease in the number of mobile homes from 2000 through 2020 (with the exception of Englewood, Meade County, City of Meade, and plains, which have seen minor increases).

5.14.8 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the extreme heat hazard.

Table 143: Example Severe Winter Weather Mitigation Actions

Category	Example Action
Planning and Regulation	Review building codes and structural policies to ensure they are adequate to protect older structures from snow loads.
	Require tie-downs with anchors and ground anchors appropriate for the soil type for manufactured homes.
	Incorporate passive ventilation in the site design to allow outdoor air to enter the home in a controlled way.
	Establish standards for all utilities regarding tree pruning around lines.
	Inspect utility poles to ensure they meet specifications and are ice resistant.
	Ensure the development and enforcement of building codes for roof snow loads.
Infrastructure	Protect traffic lights and other traffic controls from ice.
	Add building insulation to walls and attics.
Natural Systems	Property maintain stream and river channels to ensure flow.
	Use snow fences or “living snow fences” (e.g., rows of trees or other vegetation) to limit blowing and drifting of snow over critical roadway segments.
Education	Develop a winter weather brochure for distribution by recreation equipment retailers or outfitters in mountainous areas.
	Educate design professionals to include snow mitigation during building design.
	Instruct property owners on how to properly install temporary window coverings before a storm.
	Produce and distribute family and traveler emergency preparedness information about severe winter weather hazards.
	Organize outreach to vulnerable populations, including establishing and promoting accessible heating centers in the community.

5.15 Tornadoes

5.15.1 Hazard Description

A tornado is a violent, dangerous, rotating column of air that is in contact with both the surface of the earth and a cumulonimbus Barton or, in rare cases, the base of a cumulus Barton. Tornadoes 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 Barton of debris and dust.

Tornadoes can cause several kinds of damage to buildings. Tornadoes have been known to lift and move objects weighing more than three tons, toss homes more than 300 feet from their foundations, and siphon millions of tons of water. However, less spectacular damage is much more common. Houses and other obstructions in the path of the wind cause the wind to change direction. This change in wind direction increases pressure on parts of the building. The combination of increased pressures and fluctuating wind speeds creates stress on the building that frequently causes connections between building components, roofing, siding, and windows to fail. Tornadoes can also generate a tremendous amount of flying debris. If wind speeds are high enough, airborne debris can be thrown at buildings with enough force to penetrate windows, roofs, and walls.

5.15.2 – Location and Extent

All of Kansas Region D is vulnerable to tornadoes. Based on the non-geographic specific aspect of this hazard, i.e., no one area is at a greater risk, all of the planning area's structural inventory and population is vulnerable. Tornadoes can strike anywhere in Kansas Region D. A tornado may arrive with a squall line or cold front and touch down quickly. Smaller tornadoes 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 (EF) Scale to categorize tornadoes. The scale correlates wind speed values per F level and provides a rubric for estimating damage.

Table 144: Enhanced Fujita Scale

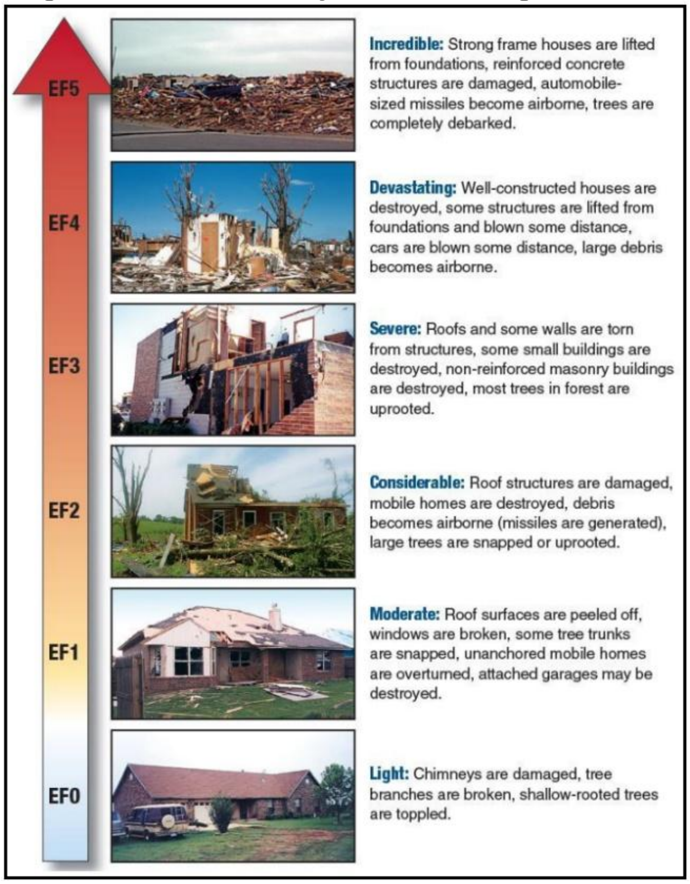
Scale	Wind Speed (mph)	Relative Frequency	Potential Damage
EF0	65-85	53.5%	Light. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always 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

Table 144: Enhanced Fujita Scale

Scale	Wind Speed (mph)	Relative Frequency	Potential Damage
			reinforced concrete structure badly damaged; high rise buildings have significant structural deformation; incredible phenomena will occur.

Source: NOAA Storm Prediction Center

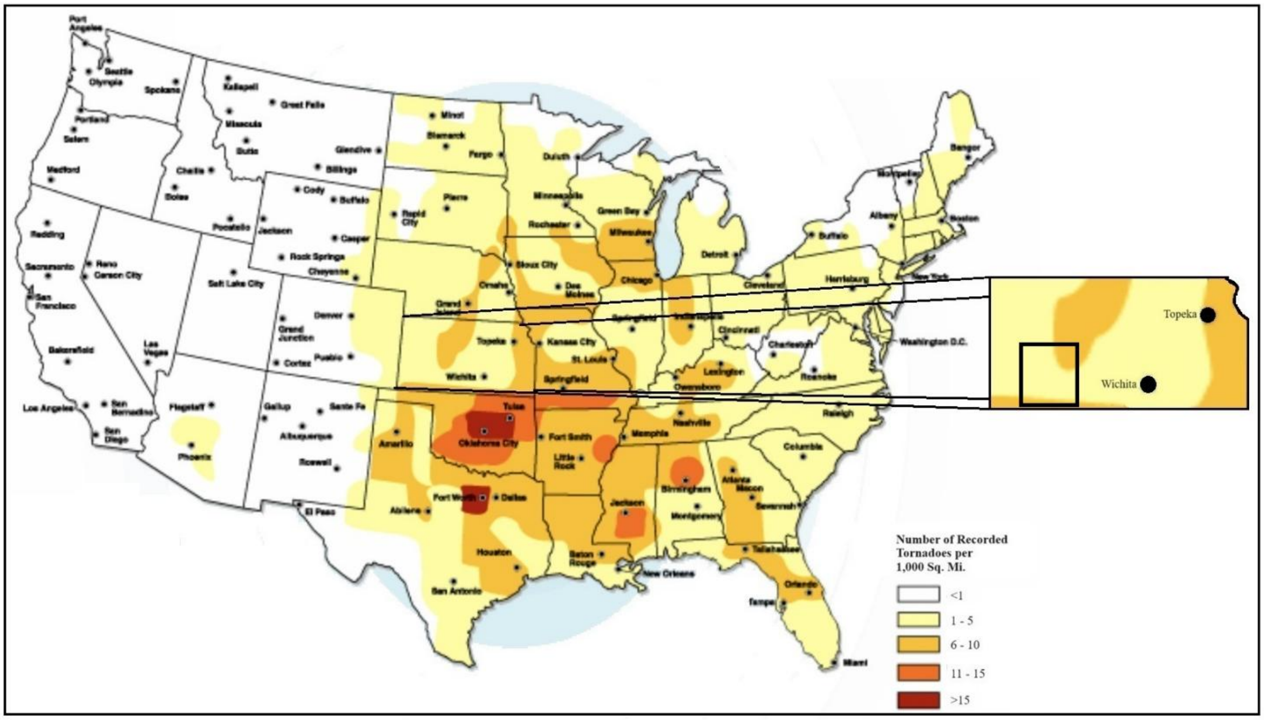
Figure 10: Enhanced Fujita Scale Damage Estimates



Source: FEMA

The following map, from FEMA, indicates tornado activity per 1,000 square miles for Kansas Region D

Map 64: Tornado Activity per 1,000 Square Miles



Source: FEMA

The MPC views tornadoes as a local, county-wide, and regional hazard. Discussions with the MPC and a review of all available data indicated tornadoes are a community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Clark County** Tornadoes identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable.
- **Finney County:** Tornadoes identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable.
- **Ford County:** Tornadoes identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable.
- **Gray County:** Tornadoes identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable.
- **Haskell County:** Tornadoes identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable.
- **Hodgeman County:** Tornadoes identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable.
- **Lane County:** Tornadoes identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable.
- **Meade County:** Tornadoes identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable.
- **Seward County** Tornadoes identified as a community concern for all participating jurisdictions as citizens, structures, and infrastructure are vulnerable.

5.15.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Kansas Region D has experienced 11 Presidential Disaster Declaration related to tornado events, reflected in the following table:

Table 145: Kansas Region D Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Counties	Individual and Public Assistance	Mitigation Grants
DR-4824-KS	9/24/2024	Severe Storms, Straight-Line Winds, **Tornadoes**, and Flooding	Clark, Finney, Gray, Meade		DR-4824-KS
DR-4811-KS	8/20/2024	Severe Storm, Straight-Line Winds, **Tornadoes**, and Flooding	Hodgeman	-	DR-4811-KS
DR-4747-KS	10/26/2023	Severe Storms, Straight-Line Winds, **Tornadoes**, and Flooding	Clark, Finney, Ford		DR-4747-KS
DR-4449-KS	8/14/2019	Severe Storms, Straight-Line Winds, Flooding, **Tornadoes**, Landslides, and Mudslides	Clark, Hodgeman, Meade	$51,157,548	DR-4449-KS
DR-4230-KS	7/20/2015	Severe Storms, **Tornadoes**, Straight-Line Winds and Flooding	Gray, Haskell, Hodgeman, Meade	$11,018,053	DR-4230-KS
DR-4150-KS	10/22/2013	Severe Storms, Straight-Line Winds, **Tornadoes**	Clark, Hodgeman, Lane, Meade	$10,135,201	DR-4150-KS
DR-4063-KS	5/24/2012	Severe Storms, **Tornadoes**, Straight-Line Winds and Flooding	Hodgeman	$4,883,034	DR-4063-KS
DR-1849-KS	6/25/2009	Severe Storms, Flooding, Straight-Line Winds, and **Tornadoes**	Finney	$11,534,818	DR-1849-KS
DR-1776-KS	7/9/2008	Severe Storms, Flooding, and **Tornadoes**	Clark, Haskell, Hodgeman, Lane, Seward	$55,300,511	DR-1776-KS
DR-1254-KS	10/14/1998	Severe Storms, Flooding and **Tornadoes**	Seward	$6,640,272	DR-1254-KS
DR-229-KS	7/18/1967	**Tornadoes**, Severe Storms, Flooding	Finney	-	DR-229-KS

Source: FEMA
-: Not reported

The following table presents NCEI identified tornado events and the resulting damage totals in Kansas Region D from 1950 to 2023.

Table 146: Kansas Region D Tornado Events

County	Number of Events	Property Damage	Deaths or Injuries	Highest Rated Tornados	Number of EF2 or Greater Tornadoes
Clark	22	$75,030	0	EF3	4
Finney	56	$31,511,000	42	F3	14
Ford	55	$3,373,000	2	F4	19
Gray	36	$4,790,000	3	F3	
Haskell	28	$9,726,000	7	F2	5
Hodgeman	34	$1,081,000	4	F4	10
Lane	27	$157,750	2	F3	2
Meade	28	$6,645,000	0	F	6
Seward	32	$16,112,000	12	EF3	9

Source: NCEI

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or NWS office. When reporting an event oftentimes the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Additionally, deaths and injuries may be underreported as they may be a result of a concurrent event, such as a person driving unsafely during heavy rain and passing away.

Recent notable events include:

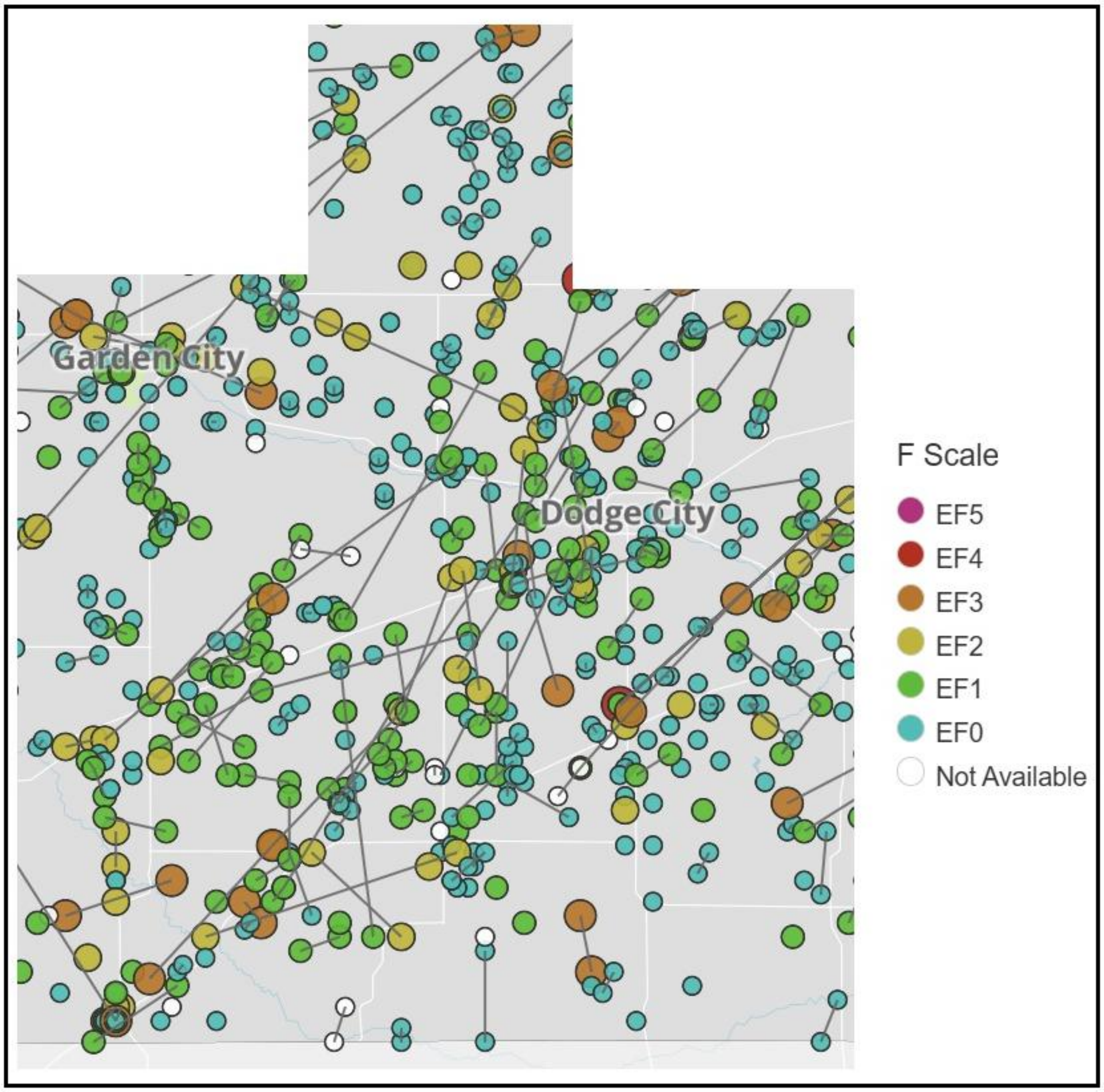
- **July 1, 2020 Seward County, Kismet:** A detailed storm survey was done on this tall and very visible tornado. Pivot irrigation sprinklers, power poles and crops were impacted. Property damage was recorded at $200,000.
- **May 26, 2019: Gray County, Cimarron:** A tornado heavily damaged a pivot irrigation sprinkler. It was dislodged from the pivot and drug 10 yards. Property damage was recorded at $60,000.
- **May 5, 2019 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 27, 2015 Haskell County, Sublette:** 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 $2,850,000.
- **May 24, 2015 Meade County, Plains:** 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 Seward County, Kismet**: 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.
- **April 22, 2010 Gray County:** This tornado was a mile wide at its maximum size as witnessed by storm chasers and storm spotters. It did minimal damage to pivot sprinklers and barns as this was a very sparsely populated area. Damages were reported at $180,000.
- **April 22, 2010 Hodgeman County:** This wedge tornado was witnessed by storm chasers and spotters and damaged several barns, sheds and 2 pivot irrigation sprinklers. Damages were reported at $210,000.
- **May 15, 2003 Seward County, Liberal:** The tornado entered Meade County from Seward County at 1545 CST 4 SW of Plains and moved ENE at 35 miles an hour striking the southern part of the town of Meade at around 1600 CST. It ended one mile SE of Meade after doing extensive damage to Meade High School, power lines, and several agri-based businesses in southern Meade Township. Damage estimates were around $14,000,000.
- **June 4, 1999 Meade County:** An F1 tornado caused damages reported at $750,000.
- **May 26, 1996 Gray County:** The thunderstorm that produced the F2 tornado in Seward and Haskell counties spun up an even bigger tornado further into Haskell and Gray counties. The tornado took a few trees in Haskell county. In Gray County, 34 irrigation sprinklers systems were damaged or destroyed, power poles were snapped, 2 houses were damaged, a barn was destroyed, a truck overturned, flood irrigation pipe was tossed like match sticks. In fact one witness reported the 30 foot pipes were 4 or 5 hundred feet in the air. In addition, 3-inch-high corn plants were completely removed leaving the field bare. Several people videotaping the tornado were chased by the tornado only to take shelter under a bridge. The tornado passed about 1/2 mile east of them while they watched 5-inch diameter hail pound the ground. Property damage was recorded at $2,850,000.

- **April 9, 1994 Meade County, Plains:** The tornado entered Meade County from Seward County at 1545 CST 4 SW of Plains and moved ENE at 35 miles an hour striking the southern part of the town of Meade at around 1600 CST. It ended one mile SE of Meade after doing extensive damage to Meade High School, power lines, and several agri-based businesses in southern Meade Township. Damage estimates were around $5,000,000.
- **May 5, 1993 Meade County:** A 1/2 mile wide F4 tornado developed six miles southeast of Hugoton. A farmstead 4 1/2 miles southwest of Moscow was completely destroyed. At least 30 irrigation systems were also destroyed. A female teenager in bare feet received a cut on the foot when she stepped on broken glass at the farmstead. Damages were reported at $5,000,000.
- **June 19, 1990 Clark County:** An F2 tornado caused damages reported at $2,500,000.

NOAA has been tracking tornadoes in Kansas for decades. This following map, which contains data from 1950 to 2023, pinpoints tornado tracts:

Map 65: Kansas Region D Tornado Paths, 1950 -2024



Source: NOAA

5.15.4 Probability of Future Events

Predicting the probability of tornado occurrences is tremendously changing due to the large number of factors involved and the random nature of formation. Based on historical occurrences, Kansas Region D will continue to experience tornado events on an annual basis. The following tables, using data from the NCEI, indicate the yearly probability of a tornado event, the number of deaths or injuries, and estimated property damage for each county in Kansas Region D:

Table 147: Kansas Region D NCEI Tornado Event Probability Summary

County	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Clark	22	<1	0	0	$75,030	$1,000
Finney	56	1	42	1	$31,511,000	$420,147
Ford	55	1	2	<1	$3,373,000	$44,973
Gray	36	<1	3	<1	$4,790,000	$63,867
Haskell	28	<1	7	<1	$9,726,000	$129,680

Table 147: Kansas Region D NCEI Tornado Event Probability Summary

County	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Hodgeman	34	<1	4	<1	$1,081,000	$14,413
Lane	27	<1	2	<1	$157,750	$2,103
Meade	28	<1	0	<1	$6,645,000	$88,600
Seward	32	<1	12	<1	$16,112,000	$214,827

Source: NCEI

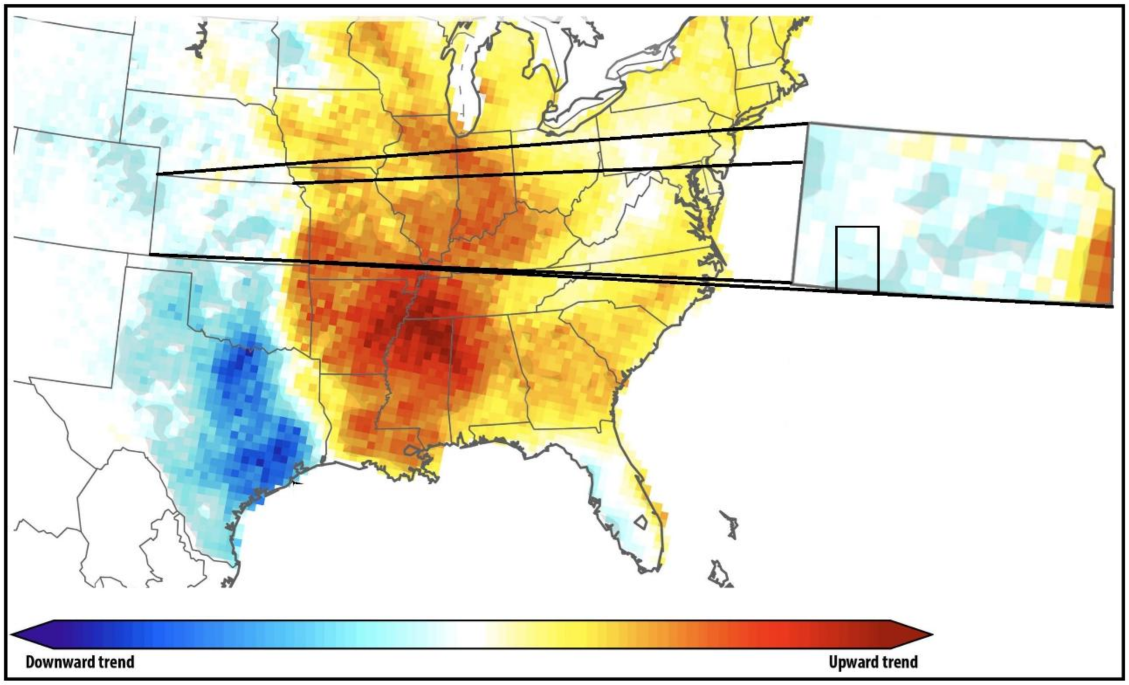
5.15.5 Projected Changes in Location, Intensity, Frequency, and Duration

The relationship between climate change and tornadoes is complex, and while there is ongoing research in this area, it is not fully understood. Tornadoes are small-scale, short-lived weather phenomena that can be influenced by a variety of atmospheric factors, including temperature, humidity, wind patterns, and atmospheric instability. Climate change can influence some of these factors, which may, in turn, affect tornado activity. Tornadoes typically form when warm, moist air near the surface clashes with cooler, drier air aloft, creating atmospheric instability. Climate change can alter temperature and humidity patterns, potentially affecting the conditions necessary for tornado formation. Additionally, climate change can lead to more extreme and variable weather patterns. While this may not necessarily increase the overall number of tornadoes, it could lead to more unpredictable and severe tornado events when they do occur. Some research suggests that climate change could lead to longer tornado seasons, with tornadoes occurring outside of their typical timeframes.

It's important to emphasize that while there may be some links between climate change and tornado activity, these links are not fully understood, and it is difficult to attribute specific tornado events to climate change. Tornadoes are influenced by a complex interplay of factors, and any changes in tornado patterns may vary by region.

Research conducted by the National Severe Storms Lab looked at Significant Tornado Parameters to help determine future tornado probability. Significant Tornado Parameters are 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 Significant Tornado Parameter data, indicates that Kansas Region D and all participating jurisdictions may see an increase in the number of tornados:

Map 66: Tornado Frequency Trends



Source: Northern Illinois University

5.15.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Kansas Region D and all participating jurisdictions from severe winter weather. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Kansas Region D and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 148: Participating Jurisdiction Tornado Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Clark County	**All**	**Relatively Low**	**28.4**	**0.9**
Ashland, Englewood, and Minneola	967100	Very High	93.6	0.9
Finney County	**All**	**Relatively Moderate**	**82.7**	**1.8**
Holcomb	960100	Very High	95.7	1.7
Garden City	960200	Very High	98.0	0
Garden City	960300	Relatively High	91.1	0
Garden City	960401	Relatively Moderate	65.3	0
Garden City	960403	Relatively High	78.9	0
Garden City	960404	Relatively High	92.9	0
Garden City	960501	Relatively High	88.0	0
Garden City	960503	Relatively Moderate	61.5	0
Garden City	960505	Relatively Moderate	74.2	0
Garden City	960507	Relatively High	90.9	0
Garden City	960508	Relatively High	83.8	0
Garden City	960600	Very High	98.6	0
Ford County	**All**	**Relatively Moderate**	**79.8**	**1.3**

Table 148: Participating Jurisdiction Tornado Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Spearville	961600	Relatively Moderate	70.2	0.6
Bucklin and City of Ford	961700	Relatively High	78.5	0.7
Dodge City	961801	Relatively High	90.5	0
Dodge City	961802	Very High	96.4	0
Dodge City	961901	Relatively High	84.5	0
Dodge City	961902	Relatively High	87.2	0
Dodge City	962000	Very High	95.4	0
Dodge City	962101	Very High	99.3	0
Dodge City	962102	Relatively High	90.8	0
Gray County	**All**	**Relatively Low**	**47.3**	**1**
Cimarron and Ingalls	962600	Relatively High	95.5	0.4
Copeland, Ensign, and Montezuma	962700	Very High	96.5	0.6
Haskell County	**All**	**Relatively Low**	**30.9**	**0.6**
Satanta and Sublette	463100	Very High	95.8	0.6
Hodgeman County	**All**	**Relatively Low**	**30.1**	**1.1**
Hanston and Jetmore	461100	Very High	95.3	1.1
Lane County	**All**	**Very Low**	**26.3**	**0.9**
Dighton	956600	Relatively High	90.7	0.9
Meade County	**All**	**Relatively Low**	**39.8**	**1.2**
Fowler and Plains	966600	Very High	96.4	1.2
City of Meade	966700	Relatively High	81.7	0
Seward County	**All**	**Relatively Moderate**	**74.7**	**0.6**
Kismet	965600	Very High	89.2	0.6
Liberal	965700	Very High	98.6	0
Liberal	965800	Relatively Low	95.5	0
Liberal	965900	Very High	98.4	0
Liberal	966000	Very High	97.1	0

Source: FEMA NRI

Table 149: Participating Jurisdiction Tornado Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Clark County	**All**	**Very Low**	**31.6**	**$405K**
Ashland, Englewood, and Minneola	967100	Relatively High	94.7	$405K
Finney County	**All**	**Relatively Moderate**	**79.2**	**$3M**
Holcomb	960100	Very High	95.7	$440K
Garden City	960200	Very High	96.2	$459K
Garden City	960300	Relatively High	85.4	$257K
Garden City	960401	Relatively Moderate	68.3	$133K
Garden City	960403	Relatively High	77.0	$188K
Garden City	960404	Relatively High	88.5	$291K
Garden City	960501	Relatively High	81.2	$220K
Garden City	960503	Relatively Moderate	61.3	$95K
Garden City	960505	Relatively Moderate	68.6	$135K
Garden City	960507	Relatively High	80.1	$212K
Garden City	960508	Relatively High	75.7	$179K
Garden City	960600	Very High	95.1	$418K
Ford County	**All**	**Relatively Moderate**	**76.6**	**$2.6M**
Spearville	961600	Relatively High	78.6	$201K

Table 149: Participating Jurisdiction Tornado Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Bucklin and City of Ford	961700	Relatively High	84.1	$245K
Dodge City	961801	Relatively High	88.4	$290K
Dodge City	961802	Relatively High	91.3	$333K
Dodge City	961901	Relatively High	79.8	$209K
Dodge City	961902	Relatively High	88.2	$288K
Dodge City	962000	Relatively High	88.2	$288K
Dodge City	962101	Very High	97.4	$519K
Dodge City	962102	Relatively High	84.2	$246K
Gray County	**All**	**Relatively Low**	**49.2**	**$929K**
Cimarron and Ingalls	962600	Very High	96.2	$459K
Copeland, Ensign, and Montezuma	962700	Very High	96.5	$470K
Haskell County	**All**	**Relatively Low**	**31.7**	**$405K**
Satanta and Sublette	463100	Very High	94.7	$405K
Hodgeman County	**All**	**Relatively Low**	**34.0**	**$468K**
Hanston and Jetmore	461100	Very High	96.4	$468K
Lane County	**All**	**Relatively Low**	**29.7**	**$357K**
Dighton	956600	Relatively High	92.7	$357K
Meade County	**All**	**Relatively Low**	**42.2**	**$708K**
Fowler and Plains	966600	Very High	95.6	$437K
City of Meade	966700	Relatively High	86.8	$272K
Seward County	**All**	**Relatively Moderate**	**69.1**	**$1.9M**
Kismet	965600	Relatively High	86.3	$266K
Liberal	965700	Relatively Moderate	96.2	$459K
Liberal	965800	Relatively Moderate	93.7	$380K
Liberal	965900	Relatively Moderate	96.0	$451K
Liberal	966000	Relatively Moderate	92.0	$345K

Source: FEMA

Population

Tornadoes can have a wide range of effects on people, often posing significant risks to life, property, and general well-being. In the absence of proper shelter, tornadoes can cause serious injury. In general, if potentially exposed persons take shelter in a solid, well-constructed structure protection from would be provided. However, old or poorly constructed facilities may be more prone to damage, potentially increasing the impact on economically disadvantaged populations. Some of the potential effects of tornadoes on people may include:

- **Death and Injury:** Tornadoes can produce wind driven debris, causing injuries or fatalities.
- **Power Outages:** Strong tornadic winds can lead to power outages, disrupting daily life, and potentially affecting essential services, such as medical equipment and refrigeration.
- **Mental Health Impact:** Tornadoes can be frightening and stressful, leading to anxiety and post-traumatic stress disorder in some individuals. The emotional toll of property damage and loss can also be significant.
- **Displacement:** People may need to evacuate their homes or be temporarily displaced due to storm damage, requiring emergency shelter and support.
- **Economic Costs:** Tornadoes often result in high economic costs, including repair and recovery expenses, insurance claims, and potential loss of income due to property damage or work disruptions.
- **Public Safety Response:** Tornadoes can strain public safety resources, including emergency services, law enforcement, and medical facilities.

All Kansas Region D and participating jurisdiction populations are vulnerable to the impacts of tornadoes. Please see Section 3.3: Population Data. At greater risk may be the vulnerable populations, including those with disabilities and the elderly due to evacuation concerns, and those below the poverty level due to underinsurance and relocation concerns. Vulnerable population information may be found in Section 3.4: Socially Vulnerable and At-Risk Populations.

Buildings and Structures
All buildings and structures within Kansas Region D and participating jurisdictions can be impacted by tornadoes. However, the location and construction of the facility will have a significant impact on the vulnerability. In general, older structures would be at higher risk of negative impacts. Some of the potential impacts include:

- **Electrical Infrastructure Damage:** Tornadoes can damage electrical infrastructure, including power lines, transformers, and substations. This can result in widespread power outages, affecting homes, businesses, hospitals, and other critical facilities.
- **Communication Disruptions:** Tornadoes can disrupt telecommunications infrastructure, including cell towers, data centers, and communication networks. This can impact emergency communication and coordination efforts.
- **Safety Risks:** Damage to infrastructure can pose safety risks to workers and the public. Fallen power lines, damaged buildings, and debris can be hazardous.
- **Building Damage:** Very high winds and blown debris can cause damage to the building.

Governmental Operations
Tornadoes can pose various risks to government operations. These risks can have significant economic and operational consequences, and can include:

- **Power Outages:** Tornadoes can lead to power outages by damaging electrical infrastructure such as power lines and substations. Government buildings may lose power, affecting critical operations and services.
- **Flooding:** Heavy rainfall during tornadoes can lead to flooding, which can damage government buildings and disrupt operations. Flood damage may require extensive repairs and cleanup.
- **Communication Disruptions:** Tornadoes can damage communication equipment, including telephone lines and computer systems. This can hinder communication between government agencies and the public.
- **Transportation Disruptions:** Tornadoes can make roads impassable due to flooding or debris. This can impact the ability of government employees to commute to work.
- **Budgetary Impact:** The costs associated with repairing and restoring government buildings and infrastructure after tornadoes can strain budgets.

Transportation and Electrical Infrastructure
In general, tornadoes do not have a large impact on transportation infrastructure, with the exception of power loss disrupting signaling and poor conditions and debris impacting driving conditions.

Tornadoes can have significant impacts on electrical utilities, leading to disruptions in power supply and potential damage to infrastructure. Tornadoes can affect electrical utilities in the following ways:

- **Lightning Strikes:** Lightning is a common occurrence during tornado events and poses a substantial risk to electrical infrastructure. Lightning strikes can damage power lines, transformers, substations, and other critical components, leading to power outages.
- **Wind Damage:** High winds associated with tornadoes can cause trees, branches, and other debris to fall onto power lines. This can result in downed power lines, structural damage to utility poles, and disruptions in electrical service.

- **Hailstorms:** Tornadoes may produce hail, which can damage power lines, transformers, and other equipment. Hailstones can also lead to short circuits and insulation damage on electrical components.
- **Power Surges:** Lightning strikes, strong winds, and other tornado-related events can lead to power surges in the electrical grid. These surges can damage electronic devices, appliances, and utility equipment connected to the power supply.

Water and Wastewater Utilities

In general, tornadoes do not have a large impact on water and wastewater infrastructure and operations unless directly struck. However, the cascading impacts from an event such as power loss disrupting pumping and treatment capabilities or localized flooding from heavy overwhelming drainage systems may cause disruptions to operations.

Medical and Response Facilities

Tornadoes can significantly impact emergency response infrastructure, creating challenges for first responders and organizations involved in managing and mitigating the effects of tornado events. Tornadoes can impact emergency response through:

- **Transportation Disruptions:** Debris accumulation on roads can hinder the ability of emergency vehicles to navigate and reach affected areas promptly. Hazardous road conditions may result in delays in response times.
- **Communication Disruptions:** Tornadoes can disrupt communication networks, affecting the ability of emergency responders to coordinate and communicate effectively. Downed power lines and damage to communication infrastructure contribute to these disruptions.
- **Power Outages:** Tornadoes can lead to power outages. Emergency response facilities, such as command centers and fire stations, may lose power, affecting their operational capabilities.
- **Exposure:** Emergency responders face increased health and safety risks in tornadoes conditions. Exposure to hail and high winds can impact the well-being of responders and affect their ability to provide effective assistance.
- **Resource Allocation Challenges:** Tornadoes often requires the allocation of additional resources, including personnel, equipment, and supplies, to address immediate needs. This can strain emergency response organizations and impact their ability to respond to other concurrent incidents.
- **Increased Demand for Services:** Tornadoes can result in an increased demand for emergency services, including medical assistance, search and rescue operations, and responses to accidents. Emergency response organizations may need to manage a higher volume of incidents simultaneously. Setting up and managing these shelters can strain resources.

Educational Facilities

Depending on the educational facility capability and location, tornadoes may necessitate the closure of the facility for the duration of the event due to damages or lack of access. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

- **School Closures:** Tornadoes can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems

All communication systems within Kansas Region D are at risk to tornadoes, which can disrupt vital communications system affecting reliability and functionality. Some of the key vulnerabilities include:

- **Physical Infrastructure Damage:** High winds and tornadoes conditions can cause physical damage to communication infrastructure such as cell towers, antennas, cables, and data centers. This damage can result in network outages and disruptions.
- **Power Outages:** Tornadoes often lead to power outages, which can affect the operation of communication networks. Without a stable power supply, cell towers, data centers, and other critical components may become non-functional, leading to service interruptions.
- **Signal Interference:** Tornadoes can create electromagnetic interference that disrupts radio signals used in wireless communication. This interference can lead to poor signal quality, dropped calls, and slower data speeds.
- **Loss of Backhaul Connectivity:** Tornadoes can damage the backhaul infrastructure that connects various communication nodes. This backbone infrastructure is crucial for transmitting data between local and regional networks, and any disruption can impact overall network performance.
- **Communication Tower Instability:** High winds and extreme weather conditions can compromise the stability of communication towers. If towers are not designed to withstand tornadoes, they may collapse, leading to network outages.
- **Network Congestion:** In the event of a disaster, communication networks may experience a surge in usage as people attempt to contact emergency services, friends, and family. This increased demand can lead to network congestion, making it difficult for users to connect.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. Estimated repair cost from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency may be found in Section 5.11.6.

Environmental and Agricultural Impacts

Mapping from the United States Department of Agriculture details total county-wide agricultural losses due to tornado events from 1989 – 2023 indicates only minor impacts on regional agriculture.

Tornadoes can pose various risks to the environment. These risks can have both short-term and long-term impacts on natural ecosystems. Tornadic weather can produce heavy rainfall over a short period of time, leading to flash floods and riverine flooding. This can result in soil erosion, damage to aquatic habitats, and the displacement of aquatic organisms. Large hailstones often associated with tornadoes can damage crops, vegetation, and natural habitats. Hail can strip leaves from trees and plants, reducing their ability to photosynthesize and grow. It can also damage wildlife habitats. Strong winds associated with tornadoes can uproot trees, damage forests, and disrupt animal habitats. They can also scatter debris and cause structural damage to buildings, which can lead to further environmental issues if hazardous materials are released. Downed power lines are a common occurrence during tornadoes and can spark wildfires. These wildfires can have significant ecological impacts, including habitat destruction, loss of wildlife, and changes in the local ecosystem.

Jurisdictional Concerns:

As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** With 10.5% of citizens living in poverty, tornadoes are a a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.

- **Finney County:** With 12.8% of citizens living in poverty, tornadoes are a a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (12.3%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Ford County:** With 11.8% of citizens living in poverty, tornadoes are a a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (9.6%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Gray County:** With 4.6% of citizens living in poverty, tornadoes are a a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (8.3%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Haskell County:** With 11.3% of citizens living in poverty, tornadoes are a a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (19.7%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Hodgeman County:** With 11.3% of citizens living in poverty, tornadoes are a a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Lane County:** With 12.4% of citizens living in poverty, tornadoes are a a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.
- **Meade County:** With 8.7% of citizens living in poverty, tornadoes are a a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical

facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (10.4%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.

- **Seward County:** With 14.0% of citizens living in poverty, tornadoes are a a concern as many citizens may not have adequate insurance coverage to rebuild or repair damaged structures or to seek needed medical attention. Additionally, with a high percentage of the population being elderly and/or identified as having a disability, evacuation and after-event care challenges are a concern. Limited emergency response capabilities and medical facilities are also a major jurisdictional concern. Additionally, a high percentage of mobiles homes as part of the county housing stock (10.8%) increases potential community vulnerability. Due to the large agricultural base of all participating jurisdictions, crop hail damage is a very large community concern.

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with severe weather may include:

- Direct physical damage to buildings and structures:
- Transportation infrastructure disruption
- Power outages and electrical grid disruption
- Communication system disruption
- Transportation and supply chain disruptions
- Environmental and ecological damage
- Economic impacts and business closures
- Emergency services overload

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 150: Tornado Consequence Analysis

Subject	Potential Impacts
Impact on the Public	High wind speeds can cause automobiles to become airborne, destroy homes, and turn debris into projectiles, which may cause injury or death. An increased demand for medical treatment for traumatic injuries caused by the tornado would be anticipated. Significant portions of the population may be displaced by the destruction and those individuals may not have access to personal documents or medical records.
Impact on Responders	First responders may be injured as the tornado passes, resulting in employee absenteeism that impacts the overall capacity to respond to the event. The deposit of debris on major roadways, the location of the event, and/or damage to equipment or facilities may increase the response times. Exposed wires or hazardous materials may cause injury to first responders during search and rescue operations.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. Tornadoes may impact an agency’s ability to maintain continuity of operations due to power or communications infrastructure impacts. If the activation of alternate facilities was required, travel may be difficult due to reduced transportation options, power outages, or damage to facilities.
Delivery of Services	Delivery of services may be impacted by dangerous conditions or disruption to transportation systems, causing food, water, and resource systems to be delayed or

Table 150: Tornado Consequence Analysis

Subject	Potential Impacts
	halted. Waterway infrastructure may be damaged or malfunction, stopping barge and ship traffic. Goods may be damaged, destroyed, or carried off by high winds.
Property, Facilities, and Infrastructure	Damages from lower intensity tornadoes can range from chimney damage to uprooted shallow trees. A significant tornado (EF-2) would cause damage to roofs on frame houses, complete destruction of mobile homes and large trees and utility lines snapping. A devastating tornado (EF-4) would result in well-constructed houses being leveled, weak foundations blown away, and cars thrown away. Communications or power infrastructure may be damaged or destroyed.
Impact on Environment	Tornadoes may cause significant damage to the environment by exposing hazardous materials, causing contamination of water or food sources, or uprooting vegetation. Animals may be injured by flying debris or being lifted by the tornado. Agricultural crops may be lost due to contamination or being uprooted.
Economic Conditions	Tornadoes pose a fiscal impact on the local governments, even if some of those costs can be recouped through federal grant reimbursements. Fiscal resources may be drained by the occurrence of a tornado.
Public Confidence in Governance	The public's confidence in governance is affected by immediate local and state response through direct and effective actions. Efficiency in response and recovery operations is critical in keeping public confidence high.

5.15.7 Future Development

Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Kansas Region D and the majority of participating jurisdictions have generally seen static to decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also initially slow and then decrease. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, is expected to increase the housing stock. However, adherence to building codes will provide any new construction a degree of hazard resiliency.

Any continued growth in modular or mobile homes would potentially increase future vulnerability. However, all participating jurisdictions have seen a decrease in the number of mobile homes from 2000 through 2020 (with the exception of Englewood, Meade County, City of Meade, and plains, which have seen minor increases).

5.15.8 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the extreme heat hazard.

Table 151: Example Tornado Mitigation Actions

Category	Example Action
Planning and Regulation	Requiring construction of safe rooms in new schools, daycares, and nursing homes.
	Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shopping malls, or other vulnerable public structures.
	Developing a local grant program to assist homeowners who wish to construct a new safe room.
	Require or encourage wind engineering measures and construction techniques.
Infrastructure	Retrofit buildings with load-path connectors to strengthen the structural frames.
	Tie-down all modular homes and facilities.
	Retrofit all exterior windows with shatter resistant film
	Build safe rooms in jurisdictional facilities, including schools and government buildings.
Natural Systems	Properly maintain trees near facilities and power lines.
Education	Conduct tornado drills in schools and public buildings.
	Distribute tornado shelter location information.
	Promote use of National Oceanic and Atmospheric Administration weather radios.
	Educate citizens through media outlets.
	Organize outreach to vulnerable populations, including establishing and promoting accessible shelters in the community.

5.17 Wildfire

5.16.1 Hazard Description

The National Weather Service 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 and through human action. Population de-concentration in the U.S. has resulted in rapid development in the outlying fringe of urban 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.

According to the National Park Service there are three classifications of wildfires:

- **Surface Fire:** Burning which may spread rapidly and ignite leaf litter, fallen branches and other fuels located at ground level.
- **Ground Fire:** Burning of organic matter in the soil beneath the surface.
- **Crown Fire:** Burning through the top layer (canopy) of trees and shrubs. Crown fires, which can be very intense and difficult to contain, require strong winds, steep slopes, and large amounts of fuel to burn.

Wildfires are strongly influenced by multiple factors, including:

- **Weather:** Factors such as relative humidity, wind speed, ambient temperature and precipitation all influence the formation and growth of wildfires.
- **Topography:** Natural features, such as canyons or ridges, can increase the spread rate of a fire by funneling or drawing heated air and fire.
- **Fuel Type, Distribution and Moisture:** Available fuels, the spacing and density of available fuels, and fuel moisture content can determine spread rates and intensity of wildfires.
- **Drought Conditions:** Drought tends to increase both the likelihood and severity of wildfires.

Fire science distinguishes between wildland fires and wildland urban interface (WUI) fires**.** The primary difference between a wildland fire and a WUI fire lies in their location and the type of areas they impact:

- **Wildland Fire:**
  - Definition: A wildland fire occurs in undeveloped, natural areas such as forests, grasslands, and shrublands. It is driven by natural fuels like trees, grass, brush, and dead vegetation.
  - Characteristics: These fires are often started by natural causes (lightning) or human activity (campfires, equipment use). They can spread rapidly depending on fuel, weather conditions (wind and temperature), and topography.
  - Impact Area: Wildland fires primarily affect forests and other natural ecosystems, causing habitat loss, ecosystem changes, and environmental damage, though they can also impact air quality over a large region.
- **WUI Fire:**
  - Definition: A WUI fire occurs where wildland areas meet or intermingle with human development. It involves not only natural vegetation but also structures (homes, businesses, infrastructure).
  - Characteristics: These fires are especially dangerous because they can ignite homes, buildings, and other man-made structures, often in suburban or rural areas where homes are built near forests or brush.

- Impact Area: WUI fires are particularly destructive to property and can result in large-scale evacuations and property loss. They are challenging for firefighters because of the dual threat to both natural landscapes and human communities.

5.16.2 – Location and Extent

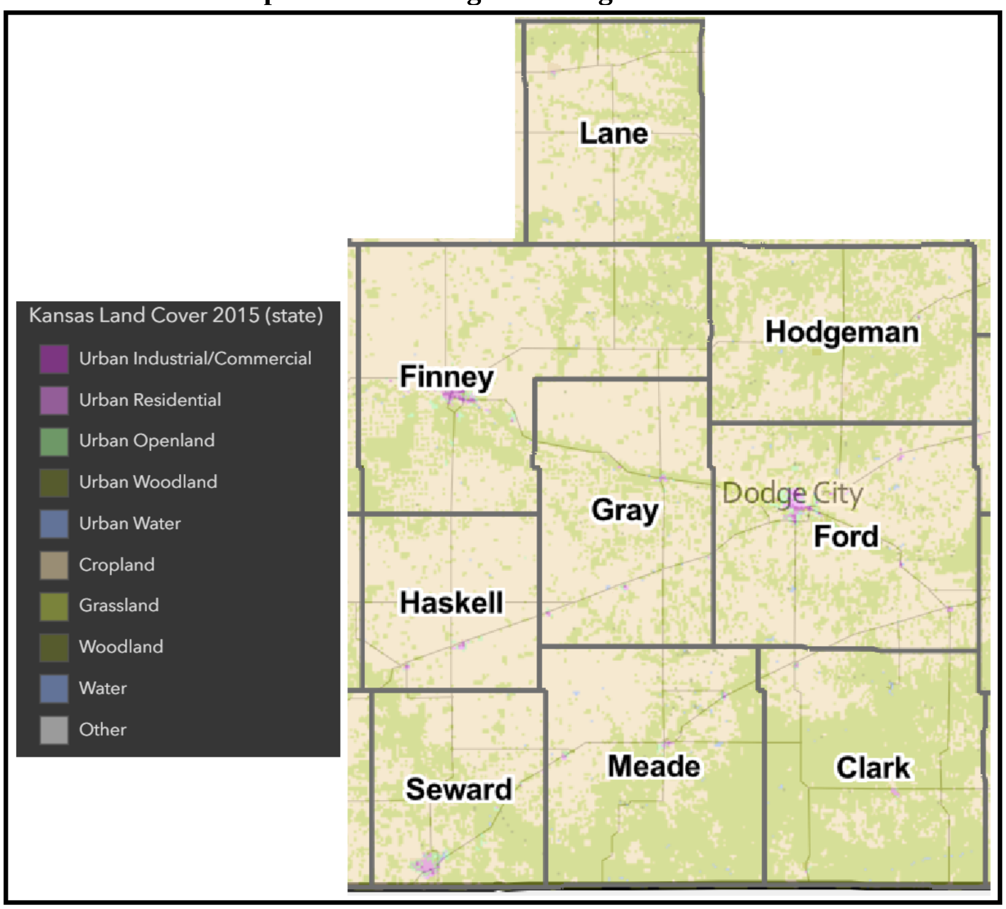
All of Kansas Region D is vulnerable to wildfires. Based on the non-geographic specific aspect of this hazard, i.e., no one area is at a greater risk, all of the planning area's structural inventory and population is vulnerable.

According to the Office of the State Fire Marshal, in 2021 Kansas fire departments responded to close to 5,000, vegetation-related fires that burned over 185,000 acres. Over 900 of these fires required counties to seek mutual-aid assistance to bring them under control.

According to fire officials, nearly ninety-five percent of all wildfires result from the activity of people and, subsequently, a significant number could be prevented through taking proper actions towards fire safety.

The following map, from the University of Kansas, indicates vegetation types within Kansas Region D, with areas of grasses and crops more likely to experience a wild or brush fire:

Map 67: Kansas Region D Vegetation Cover

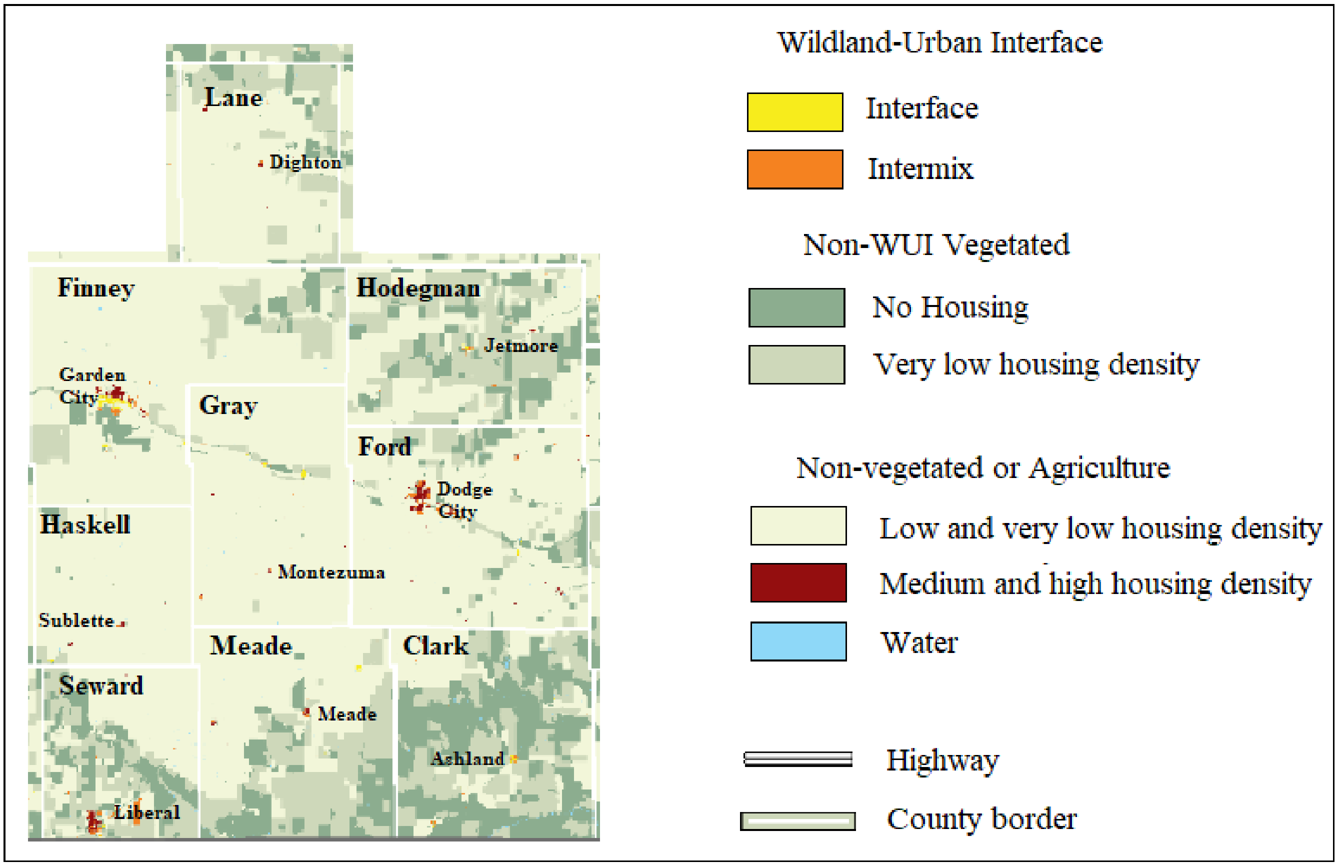


Source: University of Kansas

The wildland/urban interface (WUI) is the area where human improvements such as homes, ranches and farms come in contact with the wildlands. The WUI creates an environment in which fire can move readily between structure and vegetation fuels, often resulting in massive fires, or conflagrations, that may lead to widespread evacuations. The expansion of the WUI in recent decades has significant implications for wildfire management and its impact. There are two types of WUI, intermixed and interface. Intermix WUI are areas where housing and vegetation intermingle, and interface WUI are areas with housing in the vicinity of dense, contiguous wildland vegetation.

The following map, from the University of Wisconsin SILVIS Labs, illustrates WUI areas throughout the Kansas Region D:

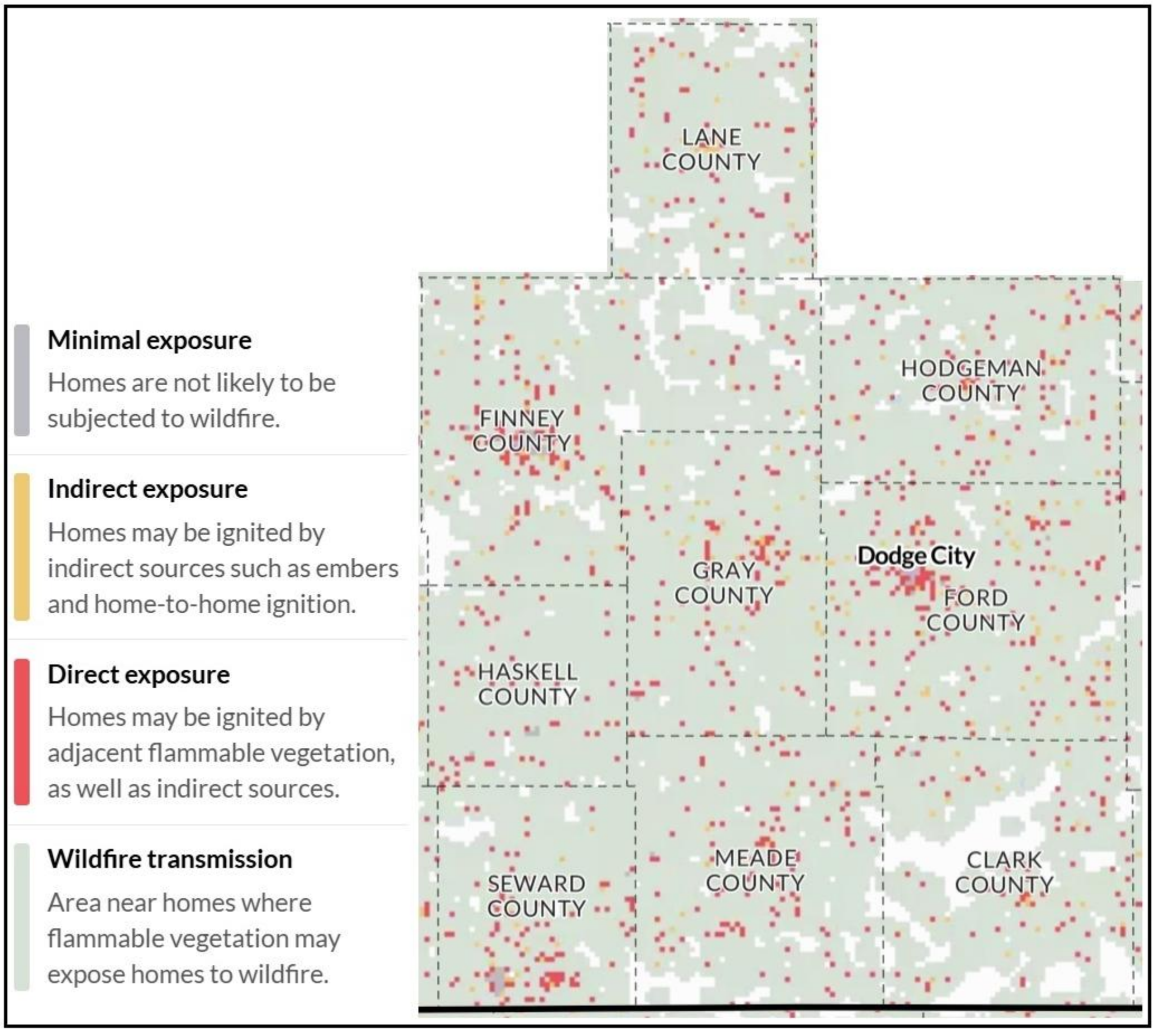
Map 68: Kansas Region D WUI Areas



Source: University of Wisconsin SILVIS Labs

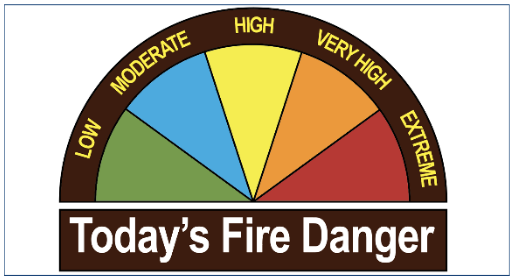
Exposure is the intersection of wildfire likelihood and intensity with communities. Communities can be directly exposed to wildfire from adjacent wildland vegetation, or indirectly exposed to wildfire from embers and home-to-home ignition. Communities that are not exposed are not likely to be subjected to wildfire from either direct or indirect sources. Wildfire exposure is calculated based on wildfire likelihood and proximity to large areas of flammable wildland vegetation. Any community that is located where there is a chance wildfire could occur (in other words, where wildfire likelihood is greater than zero) is exposed to wildfire. Directly exposed homes are located in an area considered to be covered by flammable wildland vegetation. Indirectly exposed homes are located within one mile of a large area considered to be covered by flammable wildland vegetation. Non-exposed homes are located more than one mile from a large area considered to be covered by flammable wildland vegetation. The following map, from NOAA's Wildfire Risk to Communities, indicates the wildfire exposure for Kansas Region D:

Map 69: Kansas Region Wildfire Exposure



Source: NOAA’s Wildfire Risk to Communities

The duration of a wildfire depends on the weather conditions, how dry it is, the availability of fuel to spread, and the ability of responders to contain and extinguish the fire. Historically, some wildfires have lasted only hours, while other fires have continued to spread and grow for an entire season. They spread quickly and often begin unnoticed until they have grown large enough to signal by dense smoke. If fuel is available, and high wind speeds hit, a wildfire can spread over a large area in a very short amount of time. These factors make the difference between small upstart fires easily controlled by local fire services to fires destroying thousands of acres requiring multiple state and federal assets for containment and suppression.



The National Fire Danger Rating System allows fire managers to estimate today's or tomorrow's fire danger for a given area. It combines the effects of existing and expected states of selected fire danger factors into one or more qualitative or numeric indices that reflect an area's fire protection needs. It links an organization's readiness level (or pre-planned fire suppression actions) to the potential fire problems of the day. The following is a brief explanation of the different fire danger levels based on criteria established by the National Fire Danger Rating System.

Table 152: National Fire Danger Rating System

Rating	Description
Low	Fuels do not ignite easily from small embers, but a more intense heat source, such as lightning, may start fires in duff or dry rotten wood. Fires in open, dry grasslands may burn easily a few hours after a rain, but most wood fires will spread slowly, creeping or smoldering. Control of fires is generally easy.
Moderate	Fires can start from most accidental causes, but the number of fire starts is usually pretty low. If a fire does start in an open, dry grassland, it will burn and spread quickly on windy days. Most wood fires will spread slowly to moderately. Average fire intensity will be moderate except in heavy concentrations of fuel, which may burn hot. Fires are still not likely to become serious and are often easy to control.
High	Fires can start easily from most causes and small fuels (such as grasses and needles) will ignite readily. Unattended campfires and brush fires are likely to escape. Fires will spread easily, with some areas of high intensity burning on slopes or concentrated fuels. Fires can become serious and difficult to control unless they are put out while they are still small.
Very High	Fires will start easily from most causes. The fires will spread rapidly and have a quick increase in intensity, right after ignition. Small fires can quickly become large fires and exhibit extreme fire intensity, such as long-distance spotting and fire whirls. These fires can be difficult to control and will often become much larger and longer-lasting fires.
Extreme	Fires of all types start quickly and burn intensely. All fires are potentially serious and can spread very quickly with intense burning. Small fires become big fires much faster than at the "very high" level. Spot fires are probable, with long-distance spotting likely. These fires are very difficult to fight and may become very dangerous and often last for several days.

Source: Wildfire Fire Assessment System

The severity of wildfire depends on several quickly changing environmental factors. It is impossible to strategically estimate the severity of a wildfire as these factors, including drought conditions and wind speed, have such a great influence on the wildfire conditions. The Characteristic Fire Intensity Scale within identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist based on a weighted average of four percentile weather categories. The following table details the range of wildfire intensity:

Table 153: Characteristic Fire Intensity Scale

Class	Description
Class 1- Very Low	Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
Class 2- Low	Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

Table 153: Characteristic Fire Intensity Scale

Class	Description
Class 3-Moderate	Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
Class 4 - High	Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers are generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property
Class 5-Very High	Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

Source: Southern Wildfire Risk Assessment Summary Report

A Red Flag Warning is an alert issued by the National Weather Service to indicate that critical fire weather conditions are either occurring or expected shortly. A Red Flag Warning is typically issued when the following conditions are met:

- **Low relative humidity (often below 15%):** Dry air makes vegetation more likely to ignite and sustain fire.
- **High winds (usually sustained winds above 25 mph):** Winds can quickly spread embers and flames, helping fires move faster and become more intense.
- **Dry vegetation:** Vegetation such as grass, shrubs, and trees become highly flammable when moisture levels are low, creating ideal conditions for fires to ignite and spread.
- **High temperatures:** Hot weather exacerbates dryness and lowers fuel moisture, increasing fire potential.

When a Red Flag Warning is issued, it means that the potential for wildfire ignition and rapid spread is extremely high. The warning often leads to heightened preparedness among firefighting agencies and advisories for the public to avoid activities that could spark fires, such as outdoor burning or using machinery that could create sparks.

The MPC views wildfire as a local, county-wide, and regional hazard. Discussions with the MPC and a review of all available data indicated wildfire is a community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Clark County:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continuing climate change resulting in higher temperatures and increased occurrence of drought conditions is likely to exacerbate this concern.
- **Finney County:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continuing climate change resulting in higher temperatures and increased occurrence of drought conditions is likely to exacerbate this concern.
- **Ford County:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continuing climate change resulting in higher temperatures and increased occurrence of drought conditions is likely to exacerbate this concern.
- **Gray County:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continuing climate change resulting in higher temperatures and increased occurrence of drought conditions is likely to exacerbate this concern.
- **Haskell County:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continuing climate change resulting in higher temperatures and increased occurrence of drought conditions is likely to exacerbate this concern.
- **Hodgeman County:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continuing climate change resulting in higher temperatures and increased occurrence of drought conditions is likely to exacerbate this concern.

- **Lane County:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continuing climate change resulting in higher temperatures and increased occurrence of drought conditions is likely to exacerbate this concern.
- **Meade County:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continuing climate change resulting in higher temperatures and increased occurrence of drought conditions is likely to exacerbate this concern.
- **Seward County:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continuing climate change resulting in higher temperatures and increased occurrence of drought conditions is likely to exacerbate this concern.

5.16.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Kansas Region D has experienced no Presidential Disaster Declarations related to wildfire events.

The Governor, or the Governor's Authorized Representative, may submit a request for a fire management assistance declaration as required. FEMA will approve declarations for fire management assistance when it is determined that a fire or fire complex on public or private forest land or grassland threatens such destruction as would constitute a major disaster. Research indicates that there have been three fire management declarations for Kansas Region D since 1953:

Table 154: Kansas Region D Fire Management Declarations

Designation	County(ies)	Declaration Date	Incident Name	Public Assistance	Emergency Work
FM-5171-KS	Clark	3/6/2017	Kansas Clark County Fire	$1,082,212	FM-5171-KS
FM-5173-KS	Ford	3/6/2017	Kansas Ford County Fire Complex	$75,847	FM-5173-KS
FM-2878-KS	Haskell and Meade	4/3/2011	Kansas Haskell County Fire	$0	FM-2878-KS

Source: FEMA

Wildfires are a frequent occurrence in both Kansas and Kansas Region D with over 35,000 incidents reported from 2018 to 2023. The majority of these are generally small and quickly contained with recent fire occurrences burning a smaller acreage due to quicker response times, better spotting practices, and stronger management policies. The following table details recent Kansas Region D wildfires that burned over 500 acres, caused damages greater than $100,000, and/or caused injuries or fatalities:

Table 155: Kansas Region D Wildfires 2018- 2023

County	Date	Jurisdiction	Buildings Burned	Total Dollar Loss	Injuries and Fatalities	Acres Burned
Finney	04/10/2022	Arapahoe	0	$1,500,000	0	Not reported
Finney	10/23/2022	Garden City	0	$130,000	2	Not reported
Finney	10/18/2019	Pierceville	0	$0	0	640
Haskell	01/10/2018	Satanta	0	$10,000	0	700
Hodgeman	03/29/2022	Hanston	0	$0	0	850
Seard	04/05/2022	Turpin (Oklahoma)	0	$0	0	23,000

Source: KDEM

5.16.4 Probability of Future Events

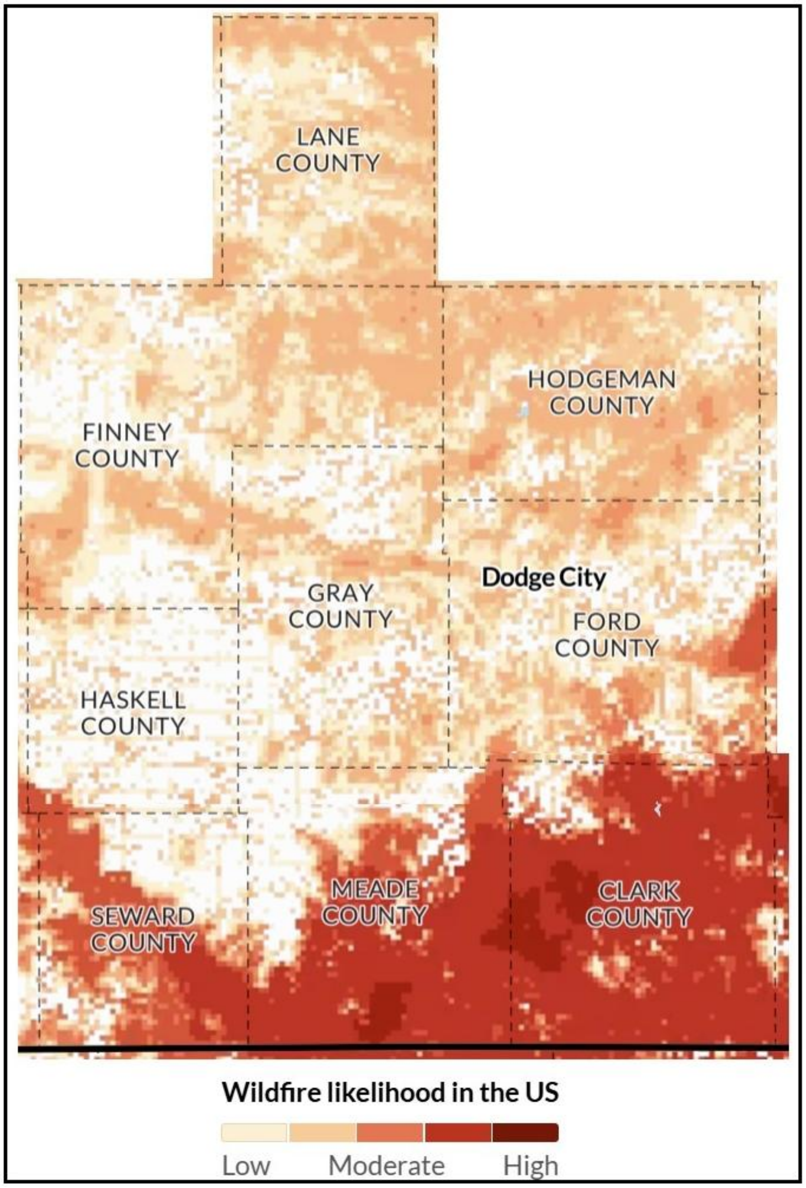
Predicting the probability of wildfire occurrences is tremendously changing due to the large number of factors involved and the random nature of formation. Available data from KDEM indicates that Kansas Region D has had four wildfire events over 500 acres, burning 4,430 acres and no buildings during the six year period of 2018 to 2023. This equates to an average of one wildfire, over 500 acres, per year burning 738 acres per year.

NOAA's Wildfire Risk to Communities mapping, which uses the best available science to identify risk, was used to help determine the probability of future wildfires within Kansas Region D. Wildfire likelihood is the probability of a wildfire occurring based on fire behavior modeling across thousands of simulations of possible fire seasons. In each simulation, factors contributing to the probability of a fire occurring, including weather, topography, and ignitions, are varied based on patterns derived from observations in recent decades. Wildfire likelihood is not predictive and does not reflect any currently forecasted weather or fire danger conditions. For communities, tribal areas, and counties, Wildfire Likelihood is summarized and ranked for the risk calculation area. This includes a 2.4 km buffer around populated areas to incorporate the risk of embers. Wildfire likelihood classification is based on the following national percentile rank:

- **Low:** <40th percentile
- **Medium:** >40th and <70th percentile
- **High:** >70th and <90th percentile
- **Very High:** >90th percentile

According to NOAA's Wildfire Risk to Communities Kansas Region D has, on average, greater wildfire likelihood than 97% of counties in the US. The following map indicates the likelihood of a wildfire within Kansas Region D:

Map 70: Kansas Region D Wildfire Likelihood



Source: NOAA's Wildfire Risk to Communities

5.16.5 Projected Changes in Location, Intensity, Frequency, and Duration

Climate change can result in a significant increase in the likelihood and severity of wildfires. The occurrence of more frequent and longer lasting droughts due to climate change can increase the availability of fuels for wildfires through the drying of vegetation. Additionally, both the increased occurrence and continued decline of native species due to lack of precipitation can cause the proliferation of invasive species which can provide quick-burning fuels that contribute to the start and spread of fire.

Climate change may impact the frequency and magnitude of wildfire in the following ways:

- **Increased Frequency:** Warmer temperatures and prolonged periods of drought associated with climate change create conditions that favor more frequent wildfires. Extended fire seasons are becoming the new norm in many regions.
- **Greater Intensity:** Higher temperatures and drier conditions can lead to more intense wildfires. These fires burn hotter and spread more rapidly, making them more challenging to control and extinguish.

- **Longer Fire Seasons:** Climate change is extending the length of fire seasons, leading to earlier starts and later endings. This puts additional stress on firefighting resources and increases the risk of wildfires overlapping with other disasters.
- **Altered Precipitation Patterns:** Changes in precipitation patterns, including more intense rainfall events followed by extended dry periods, can promote the growth of vegetation, which can then become fuel for wildfires during subsequent dry periods.
- **Drought Conditions:** Prolonged droughts associated with climate change reduce soil moisture levels and the availability of water sources. Dry conditions increase the susceptibility of vegetation to ignition.
- **Vegetation Changes:** Climate change can alter the distribution and composition of vegetation, such as the expansion of drought-tolerant species. This can change fuel availability and make ecosystems more fire prone.
- **Insect Infestations:** Warmer temperatures can lead to increased insect infestations in forests. Infested and dead trees provide additional fuel for wildfires.
- **Wildfire Behavior**: Climate change can lead to changes in wildfire behavior, including the development of fire whirls, more extreme fire behavior events, and increased spotting (the spread of embers ahead of the main fire).

While both population and housing levels have remained static, or slightly decreased, in Kansas Region D any continued expansion into WUI areas significantly increases the risk and potential damage from wildfires for several reasons, including:

- **Proximity to Natural Fuels:** As development spreads into previously undeveloped wildland areas, homes and infrastructure are built in close proximity to natural fuels which can ignite during a wildfire. Natural landscapes in WUI zones are often dense with vegetation, providing a continuous fuel source that allows fires to spread quickly from wildland areas to residential zones. This increases the likelihood of structure ignition, as homes are surrounded by flammable vegetation.
- **Increased Human Activity:** Human activities, such as outdoor recreation, construction, and the use of equipment, are more common in WUI areas, and these activities can inadvertently start fires
- **Difficulty in Fire Suppression:** WUI fires are harder to control because firefighting efforts must focus on both the natural landscape and protecting homes and infrastructure. Firefighters face the dual challenge of containing the wildfire and defending structures, which can divert resources and increase the complexity of suppression efforts. Narrow or inaccessible roads in WUI areas can make it difficult for firefighting equipment and personnel to reach homes at risk, delaying response times.

5.16.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Kansas Region D and all participating jurisdictions from wildfire. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Kansas Region D and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 156: Participating Jurisdiction Wildfire Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Clark County	**All**	**Relatively Low**	**71.0**	**0.214%**
Ashland, Englewood, and Minneola	967100	Relatively High	96.1	0.214%
Finney County	**All**	**Very Low**	**22.1**	**0.004%**
Holcomb	960100	Relatively Low	77.2	0.004%
Garden City	960200	Relatively Low	61.2	0.001%

Table 156: Participating Jurisdiction Wildfire Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Frequency (per year)
Garden City	960300	Relatively Low	48.9	Less than 0.001%
Garden City	960401	Very Low	39.5	Less than 0.001%
Garden City	960403	Very Low	47.2	Less than 0.001%
Garden City	960404	Relatively Low	52.3	Less than 0.001%
Garden City	960501	Relatively Low	68.5	Less than 0.001%
Garden City	960503	Very Low	41.8	0.001%
Garden City	960505	Very Low	33.6	Less than 0.001%
Garden City	960507	Very Low	44.9	Less than 0.001%
Garden City	960508	Relatively Low	52.9	Less than 0.001%
Garden City	960600	Relatively Low	68.2	Less than 0.001%
Ford County	**All**	**Relatively Low**	**64.5**	**0.055%**
Spearville	961600	Relatively Low	83.9	0.039%
Bucklin and City of Ford	961700	Relatively Moderate	89.0	0.068%
Dodge City	961801	Relatively Low	70.9	0.004%
Dodge City	961802	Relatively Moderate	86.6	0.034%
Dodge City	961901	No Rating	0.0	0%
Dodge City	961902	Relatively Low	75.6	0.022%
Dodge City	962000	Relatively Low	77.4	0.013%
Dodge City	962101	Relatively Moderate	89.2	0.029%
Dodge City	962102	Relatively Moderate	85.6	0.020%
Gray County	**All**	**Very Low**	**14.9**	**0.014%**
Cimarron and Ingalls	962600	Relatively Low	61.6	0.001%
Copeland, Ensign, and Montezuma	962700	Relatively Low	79.9	0.021%
Haskell County	**All**	**Very Low**	**2.5**	**0.002%**
Satanta and Sublette	463100	Relatively Low	69.1	0.002%
Hodgeman County	**All**	**Very Low**	**45.1**	**0.026%**
Hanston and Jetmore	461100	Relatively Moderate	89.1	0.026%
Lane County	**All**	**Very Low**	**21.3**	**0.015%**
Dighton	956600	Relatively Low	82.7	0.015%
Meade County	**All**	**Relatively Low**	**65.9**	**0.115%**
Fowler and Plains	966600	Relatively Moderate	94.1	0.115%
City of Meade	966700	Relatively Moderate	87.8	0.098%
Seward County	**All**	**Relatively Low**	**74.6**	**0.041%**
Kismet	965600	Relatively Moderate	93.7	0.038%
Liberal	965700	Relatively Moderate	94.3	0.097%
Liberal	965800	Relatively Low	83.5	0.045%
Liberal	965900	Relatively Low	82.2	0.064%
Liberal	966000	Relatively Moderate	92.2	0.091%

Source: FEMA NRI

Table 157: Participating Jurisdiction Wildfire Expected Annual Loss

Jurisdiction	Census Tract	EAL Rating	National Percentile	EAL
Clark County	**All**	**Very Low**	**71.3**	**$184K**
Ashland, Englewood, and Minneola	967100	Relatively High	96.0	$184K
Finney County	**All**	**Very Low**	**18.7**	**$5.9K**
Holcomb	960100	Relatively Low	76.2	$2.4K
Garden City	960200	Relatively Low	56.4	$517
Garden City	960300	Very Low	45.1	$211
Garden City	960401	Very Low	40.9	$145
Garden City	960403	Very Low	46.1	$230
Garden City	960404	Very Low	48.5	$281
Garden City	960501	Relatively Low	63.5	$852
Garden City	960503	Very Low	41.7	$156
Garden City	960505	Very Low	32.1	$53
Garden City	960507	Very Low	39.7	$129
Garden City	960508	Very Low	48.5	$280
Garden City	960600	Relatively Low	60.2	$679
Ford County	**All**	**Relatively Low**	**62.7**	**$88K**
Spearville	961600	Relatively Moderate	85.4	$13K
Bucklin and City of Ford	961700	Relatively Moderate	89.8	$33K
Dodge City	961801	Relatively Low	68.1	$1.2K
Dodge City	961802	Relatively Low	84.7	$11K
Dodge City	961901	No Expected Annual Losses	0	0
Dodge City	961902	Relatively Low	75.1	$2.1K
Dodge City	962000	Relatively Low	72.3	$1.6K
Dodge City	962101	Relatively Moderate	87.0	$18K
Dodge City	962102	Relatively Low	84.0	$9.3K
Gray County	**All**	**Very Low**	**14.3**	**$4.4K**
Cimarron and Ingalls	962600	Relatively Low	60.9	$711
Copeland, Ensign, and Montezuma	962700	Relatively Low	79.3	$3.7K
Haskell County	**All**	**Very Low**	**2.2**	**$1K**
Satanta and Sublette	463100	Relatively Low	66.0	$1K
Hodgeman County	**All**	**Very Low**	**45.4**	**$29K**
Hanston and Jetmore	461100	Relatively Moderate	89.2	$29K
Lane County	**All**	**Very Low**	**22.2**	**$7.4K**
Dighton	956600	Relatively Low	82.9	$7.4K
Meade County	**All**	**Relatively Low**	**65.3**	**$109K**
Fowler and Plains	966600	Relatively High	93.6	$84K
City of Meade	966700	Relatively Low	88.6	$25K
Seward County	**All**	**Relatively Low**	**71.7**	**$190K**
Kismet	965600	Relatively Moderate	93.1	$73K
Liberal	965700	Relatively Moderate	92.8	$69K
Liberal	965800	Relatively Moderate	82.5	$6.8K
Liberal	965900	Relatively Moderate	80.3	$4.4K
Liberal	966000	Relatively Moderate	90.4	$37K

Source: FEMA

Population

Wildfires have profound and far-reaching impacts on all jurisdictional citizens, affecting physical health, mental well-being, and socio-economic conditions. These impacts can vary depending on the severity, location, and preparedness of the communities affected. Key wildfire impacts include:

- **Health Impacts**
  - Smoke inhalation: Wildfire smoke contains fine particulate matter that can penetrate deep into the lungs and exacerbate respiratory and cardiovascular problems. It is especially dangerous for people with pre-existing conditions like asthma, COPD, or heart disease. Exposure to smoke can cause short-term issues like coughing, throat irritation, and difficulty breathing, as well as long-term health effects from prolonged exposure.
  - Burn injuries: Direct exposure to flames or heat during evacuations or firefighting efforts can result in serious burn injuries.
  - Mental health: Survivors of wildfires often experience stress, anxiety, depression, and post-traumatic stress disorder, especially those who have lost homes, loved ones, or livelihoods.
- **Economic and Financial Impacts**
  - Property damage: Wildfires can destroy homes, businesses, and infrastructure, leading to significant financial losses. Insurance premiums in wildfire-prone areas often increase, and many homeowners struggle to rebuild after losing their property.
  - Loss of livelihoods: Wildfires can disrupt local economies, particularly in recreation and tourism, agricultural, and forestry-based communities. Employment in affected areas may decline, and businesses may close either temporarily or permanently.
  - Cost of relocation: In cases of long-term displacement, families must bear the costs of relocation, housing, and rebuilding, which can be a financial burden, especially for low-income households.
- **Evacuations and Displacement**
  - Evacuations: Wildfires often force mass evacuations, leaving people displaced from their homes for extended periods. Evacuations can be stressful, especially if there is little warning, leading to rushed departures where families leave behind essential belongings or pets. Additionally, their can be challenge sin reaching remote communities with information concerning evacuations.
  - Long-term displacement: In severe cases, entire communities may be permanently displaced if homes are destroyed or if areas are deemed too hazardous to return to, leading to loss of community and social networks.
- **Social and Community Disruption**
  - Community dislocation: Wildfires can cause permanent damage to communities, forcing people to relocate and resulting in the breakdown of social networks and support systems.
  - Loss of heritage: In some cases, wildfires destroy culturally significant sites, landmarks, and natural heritage, such as forests and ecosystems that communities may depend on or cherish.

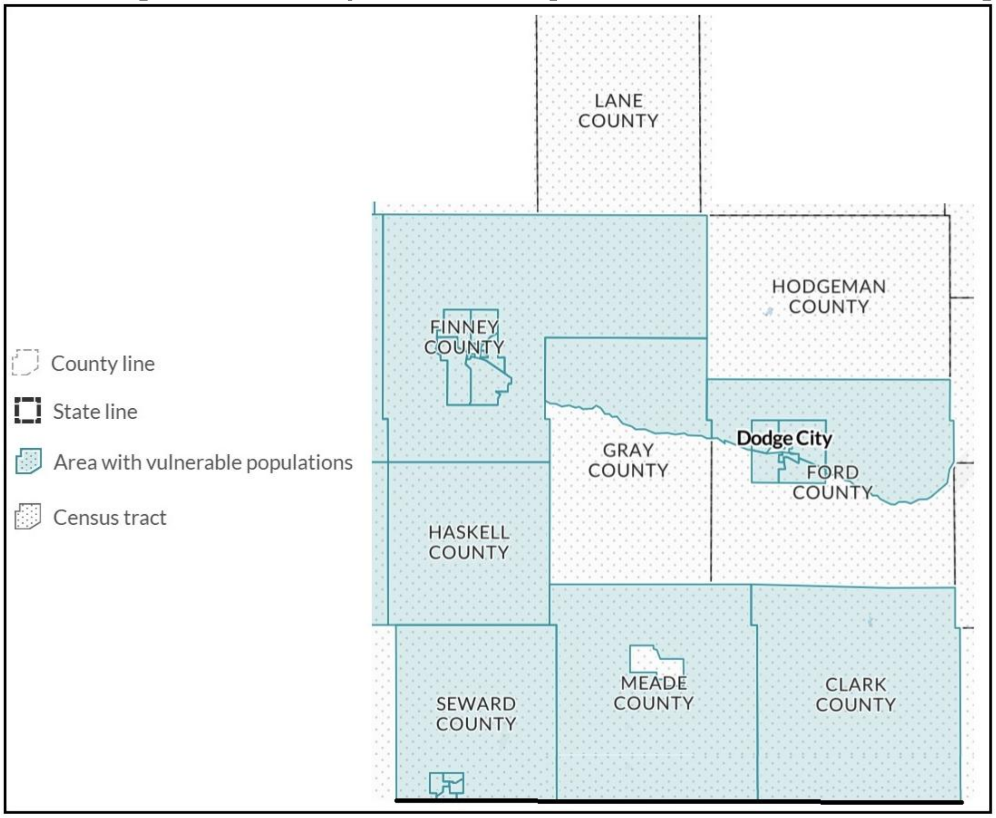
Wildfires can disproportionately affect vulnerable populations due to their limited resources, reduced mobility, and pre-existing health or socio-economic challenges. These groups often include the elderly, disabled individuals, low-income households, children, and those with chronic health conditions. Ways that wildfires may have a greater impact on these populations include:

- **Health Vulnerabilities**
  - Respiratory and cardiovascular risks: Vulnerable populations, such as the elderly, children, and those with pre-existing respiratory or heart conditions, are more susceptible to the harmful effects of wildfire

  - smoke. The fine particulate matter from the smoke can exacerbate asthma, bronchitis, and heart disease, leading to increased hospitalizations and, in severe cases, mortality.
  - Limited healthcare access: Vulnerable groups often have less access to healthcare services, which can delay critical treatment during or after wildfire exposure. Health facilities may be overwhelmed during wildfire events, and transportation to care facilities may be hindered by road closures or evacuations.
- **Challenges with Evacuation**
  - Mobility issues: Elderly individuals, people with disabilities, and those without access to vehicles may struggle to evacuate quickly. They may depend on public transportation, community aid, or emergency services, which can be delayed or overburdened during a wildfire emergency.
  - Language barriers: Immigrant communities or non-English speakers may not fully understand emergency alerts or evacuation instructions, making it harder for them to react swiftly. This can increase the risk of delayed evacuation, which is particularly dangerous in fast-moving wildfires.
  - Poverty and housing instability: Low-income families are less likely to have the means to evacuate, such as access to a car or money for temporary shelter. They may also live in less resilient housing, which is more vulnerable to wildfire damage.
- **Economic Disparities**
  - Loss of homes and belongings: Vulnerable populations are often more likely to live in fire-prone or poorly constructed homes that are less resistant to wildfires. They may lack adequate insurance coverage to rebuild or replace what is lost, which can lead to long-term displacement and financial hardship.
  - Job loss and economic disruption: After a wildfire, vulnerable populations are more likely to experience prolonged economic disruption. Many people in low-wage jobs or agriculture may face unemployment if the local economy is disrupted, or if their place of work is destroyed. Recovery can take months or years, leaving them with few financial safety nets.
- **Increased Long-Term Vulnerability**
  - Difficulty in recovery: Vulnerable populations often face more significant challenges during the recovery phase of wildfires. They may lack insurance, savings, or government support to rebuild homes, replace belongings, or relocate. This can lead to prolonged displacement or homelessness, further exacerbating their vulnerabilities.
  - Disruption of social networks: Vulnerable groups rely heavily on community networks for support during and after disasters. Wildfires may displace communities, breaking apart these networks and leaving people isolated during their recovery process.
- **Disparities in Resource Allocation**
  - Limited access to relief aid: Vulnerable populations may struggle to access emergency relief services due to logistical, language, or bureaucratic barriers. They may not be prioritized for resource distribution, further exacerbating their difficulties in recovering from wildfire impacts.

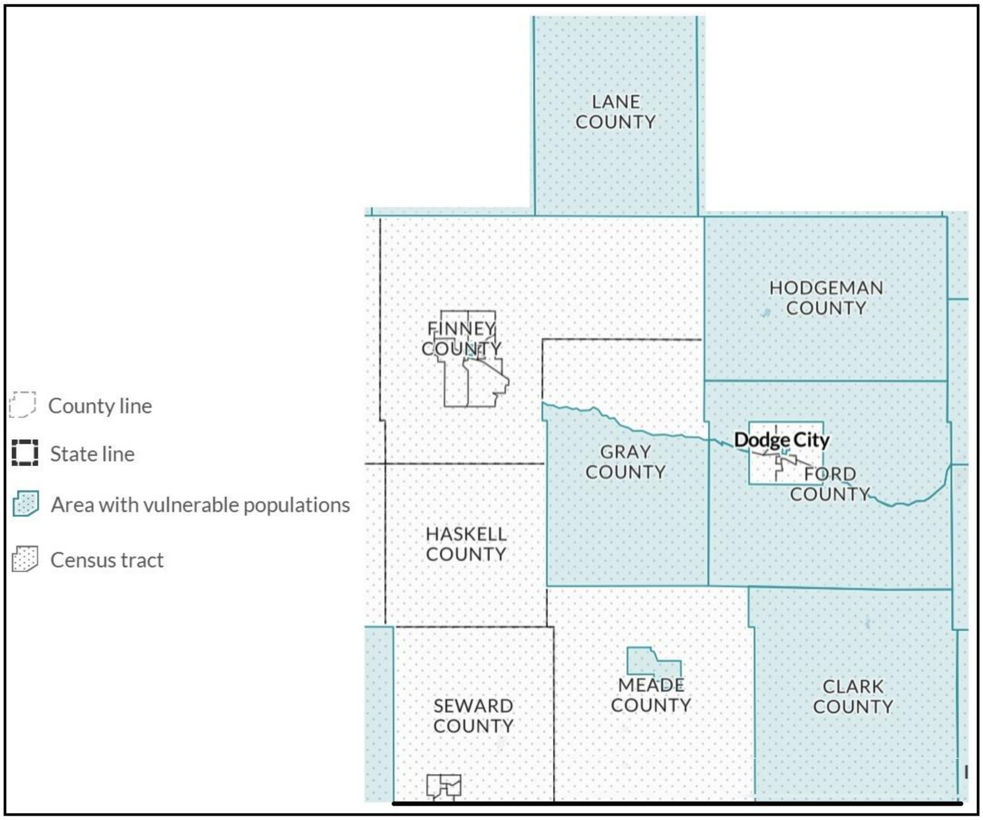
The following maps show the location of vulnerable populations compared to wildfire risk. Census tracts are highlighted that have values equal to or greater than the community median:

Map 71: Kansas Region D Potentially Vulnerable Populations to Wildfire, Under the Age of Five



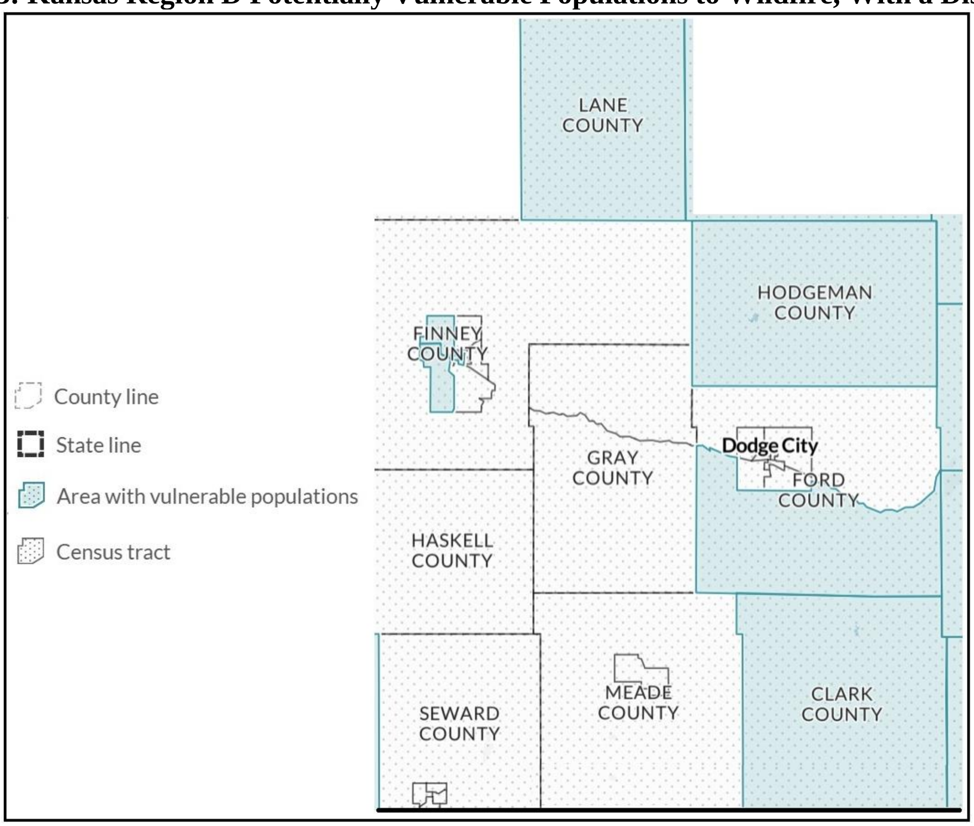
Source: NOAA's Wildfire Risk to Communities

Map 72: Kansas Region D Potentially Vulnerable Populations to Wildfire, Over the Age of 65



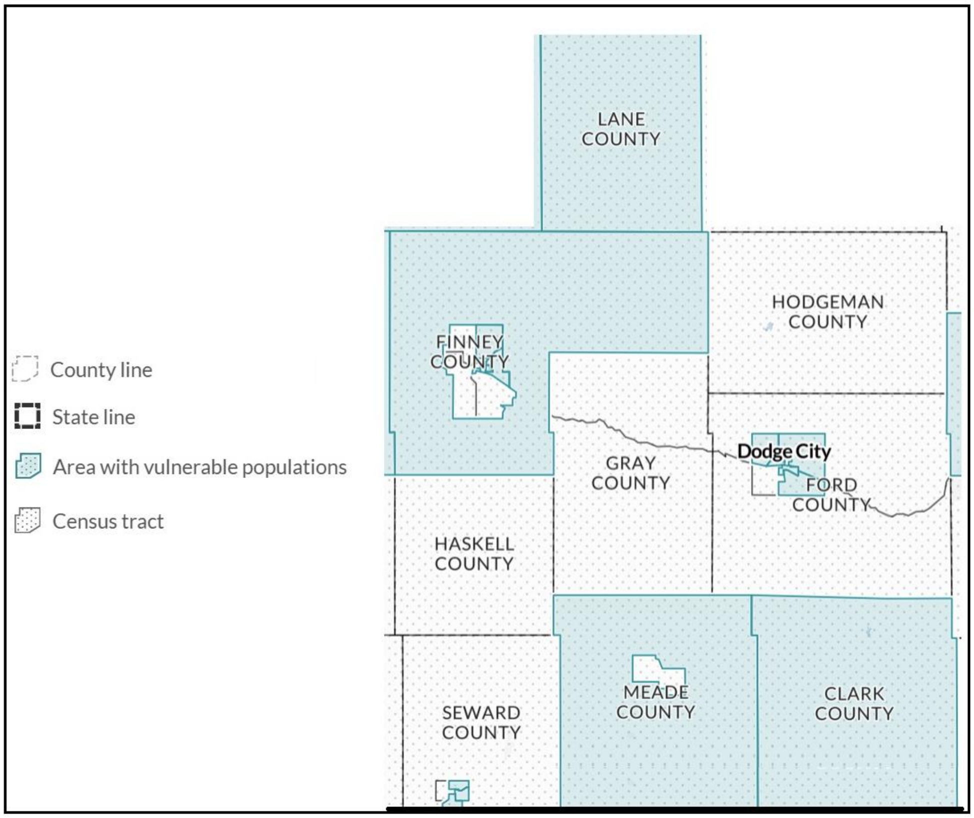
Source: NOAA's Wildfire Risk to Communities

Map 73: Kansas Region D Potentially Vulnerable Populations to Wildfire, With a Disability



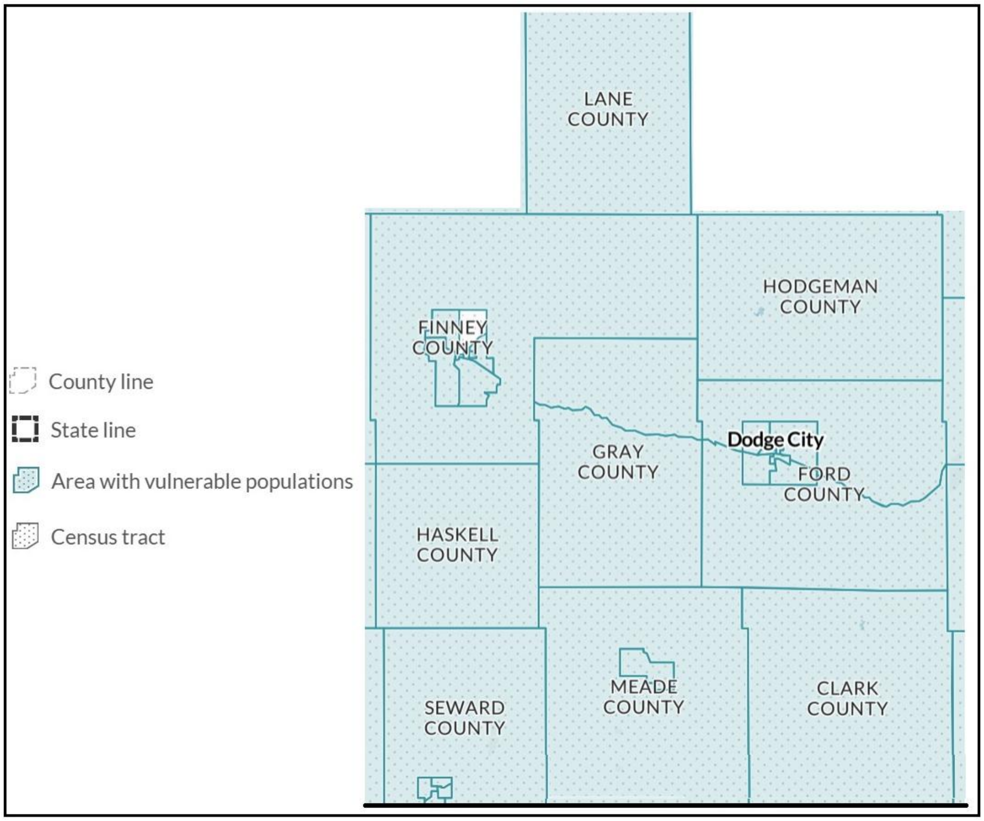
Source: NOAA's Wildfire Risk to Communities

Map 74: Kansas Region D Potentially Vulnerable Populations to Wildfire, Poverty



Source: NOAA's Wildfire Risk to Communities

Map 75: Kansas Region D Potentially Vulnerable Populations to Wildfire, Mobile Homes



Source: NOAA's Wildfire Risk to Communities

All Kansas Region D and participating jurisdiction populations are vulnerable to the impacts of wildfires. Please see Section 3.3: Population Data and Section 3.4: Socially Vulnerable and At-Risk Populations for data concerning jurisdictional populations.

Buildings and Structures

All jurisdictional buildings and structures are vulnerable to wildfires due to their location, materials, and surrounding environment. These factors determine how easily a structure may ignite, sustain damage, or be destroyed by fire. Here's how these vulnerabilities manifest:

- **Proximity to Vegetation:** Homes located in the WUI are particularly vulnerable as they are closer to dense vegetation that serves as fuel for wildfires. If the vegetation (trees, shrubs, dry grasses) is not properly managed around the property, fire can easily spread to homes.
- **Flammable roofing materials:** Roofs made from materials like wood shingles are highly flammable and can easily ignite from embers. Non-flammable materials like metal, tile, or asphalt are more resistant to fire.
- **Siding and exterior walls:** Homes with wood siding or other combustible materials are more vulnerable to fire than homes built with fire-resistant materials like stucco, brick, or concrete.
- **Windows:** Single-pane windows are more likely to break during a wildfire due to heat exposure, allowing embers and flames to enter the building. Double-pane or tempered glass windows offer more protection.
- **Eaves and vents:** Eaves and vents can allow embers to enter the attic or other vulnerable spaces in the home. If they are not properly screened or fireproofed, they become entry points for embers to ignite the structure.
- **Decks and porches:** Wooden decks and porches are highly susceptible to wildfire if they are not made from fire-resistant materials or if they have combustible items stored underneath them.

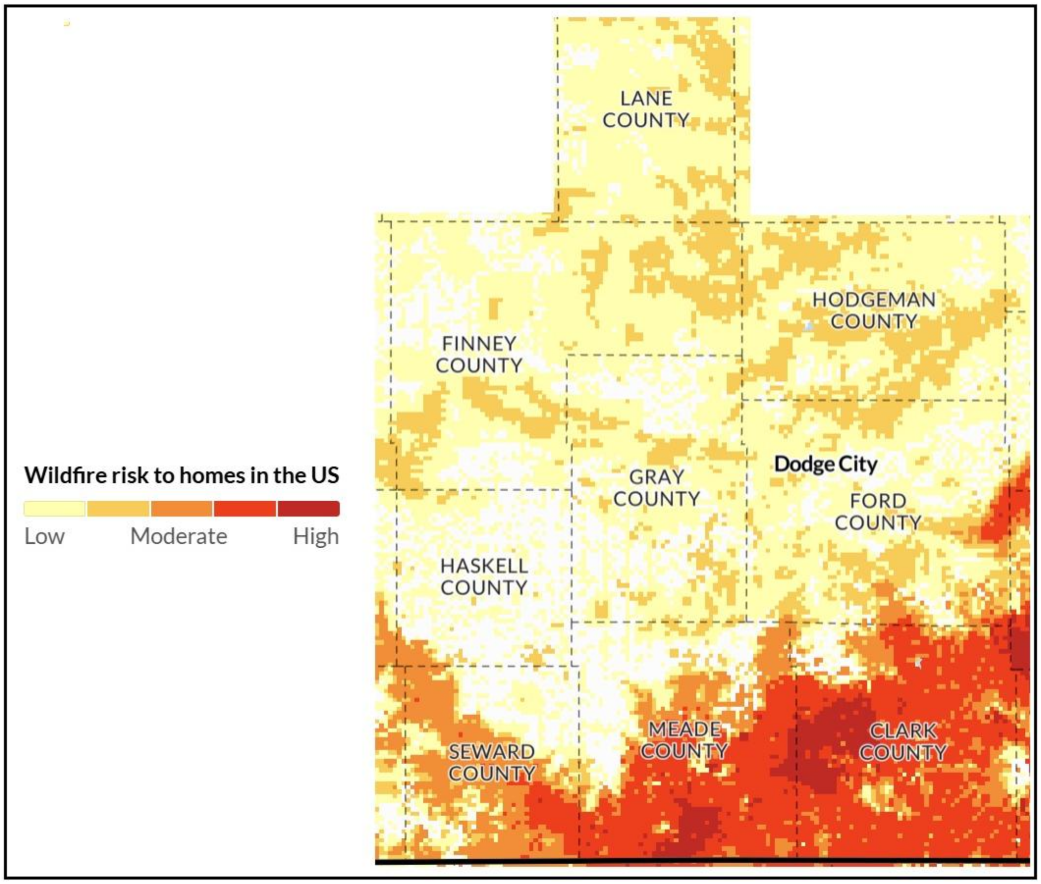
- **Lack of defensible space:** Defensible space is the buffer zone between a building and surrounding vegetation. If this space is not cleared of flammable materials (like dry leaves, dead trees, or fire-prone plants), a wildfire can spread rapidly to a home. Homes without sufficient defensible space are much more likely to ignite during a fire.
- **Combustible materials near the home:** Storing firewood, propane tanks, or other flammable items near the structure increases vulnerability, as these materials can easily catch fire and ignite the building.
- **Distance from fire services:** Homes located far from fire stations or without adequate road access may experience delayed emergency response times, leaving them more vulnerable to destruction.
- **Neglected maintenance**: Homes that are not well-maintained, such as those with clogged gutters full of leaves or overgrown vegetation, are more likely to catch fire. Regular maintenance, such as clearing gutters and removing dead vegetation, is essential to reducing wildfire vulnerability.

When homes and buildings ignite in a wildfire, the damage can be severe. Wildfire impacts on structures typically include:

- **Complete destruction:** Buildings can be completely consumed by flames, leaving nothing but the foundation.
- Partial damage: Fire can damage parts of the building, such as roofs, walls, or outdoor structures, necessitating costly repairs.
- **Smoke damage:** Even if a structure does not burn down, smoke can infiltrate the building, causing significant damage to the interior, furniture, and electronics.
- **Water damage:** In the process of firefighting, water can cause additional damage to structures, particularly if fire suppression efforts are extensive.

According to NOAA's Wildfire Risk to Communities 99% of Kansas Region D's buildings are exposed to wildfires:

Map 76: Kansas Region D Wildfire Risk to Homes



Source: NOAA's Wildfire Risk to Communities

Governmental Operations

Wildfires can pose various risks to government operations. These risks can have significant economic and operational consequences, and can include:

- **Power Outages:** Wildfires can lead to power outages by damaging electrical infrastructure such as power lines and substations. Government buildings may lose power, affecting critical operations and services.
- **Flooding:** Heavy rainfall after a wildfire can lead to flooding, which can damage government buildings and disrupt operations. Flood damage may require extensive repairs and cleanup.
- **Communication Disruptions:** Wildfires can damage communication equipment, including telephone lines and computer systems. This can hinder communication between government agencies and the public.
- **Transportation Disruptions:** Wildfires can make roads impassable due to debris, smoke, heat, and potentially after event flooding or landslides. This can impact the ability of government employees to commute to work.
- **Budgetary Impact:** The costs associated with repairing and restoring government buildings and infrastructure after a wildfire can strain budgets.

Transportation and Electrical Infrastructure

In general, wildfires do not have a large impact on transportation infrastructure, with the exception of power loss disrupting signaling, road closures due to events, and poor conditions impacting driving conditions.

Wildfires can have severe and widespread impacts on electric infrastructure, disrupting power distribution and causing long-term damage. Here are some key ways wildfires affect electric infrastructure:

- **Damage to Transmission Lines and Power Poles**

- Direct fire damage: Wildfires can burn through wooden power poles and even damage steel or aluminum transmission towers due to extreme heat. Transmission lines are especially vulnerable in heavily forested or remote areas where wildfires tend to occur.
    - Melting of cables and equipment: High temperatures can cause transmission lines and electrical equipment to melt or warp, leading to failures or shutdowns.
    - Power outages: Wildfires can lead to widespread power outages by directly damaging transmission lines or transformers. In some cases, utilities may also proactively shut off power (public safety power shutoffs, or PSPS) to prevent the ignition of fires by downed or sparking power lines.
- **Smoke and Soot Contamination**
    - Conductivity of smoke: Smoke and ash from wildfires can increase the conductivity of the air, leading to short circuits or arcing in power lines, especially in high-voltage systems.
    - Soot buildup: Wildfire soot can accumulate on insulators and electrical equipment, reducing efficiency and causing potential equipment failures if not cleaned.
- **Substation and Equipment Vulnerability**
    - Heat and embers: Substations, transformers, and electrical panels can be damaged by heat or flying embers. Damage to substations can have a particularly large impact since they are key distribution points for electricity.
    - Component failures: Equipment such as switches, transformers, and circuit breakers may suffer from thermal stress or fire-related damage, leading to breakdowns and costly repairs.
- **Challenges for Utility Workers**
    - Delayed repairs: Repair crews face significant challenges during and after wildfires. Access to damaged areas can be restricted due to ongoing fires, road closures, or unsafe conditions, delaying repairs.
    - Safety hazards: Workers may be exposed to unsafe conditions, including the risk of encountering smoldering areas or downed power lines.
- **Disruptions to Power Generation Facilities**
    - Hydroelectric plants: Wildfires in watersheds that supply hydroelectric plants can disrupt water flow, reducing power generation capacity.
    - Thermal power plants: Plants using coal, natural gas, or other fuel sources may also face interruptions if transportation of fuel is hindered due to wildfires or if nearby infrastructure is damaged.

Water and Wastewater Utilities
In general, wildfires and severe winter weather components do not have a large impact on water and wastewater infrastructure and operations. However, the cascading impacts from an event such as power loss disrupting pumping and treatment capabilities, localized flooding from heavy overwhelming drainage systems, or frozen pipes in water distribution systems, causing water outages and expensive repairs when pipes burst.

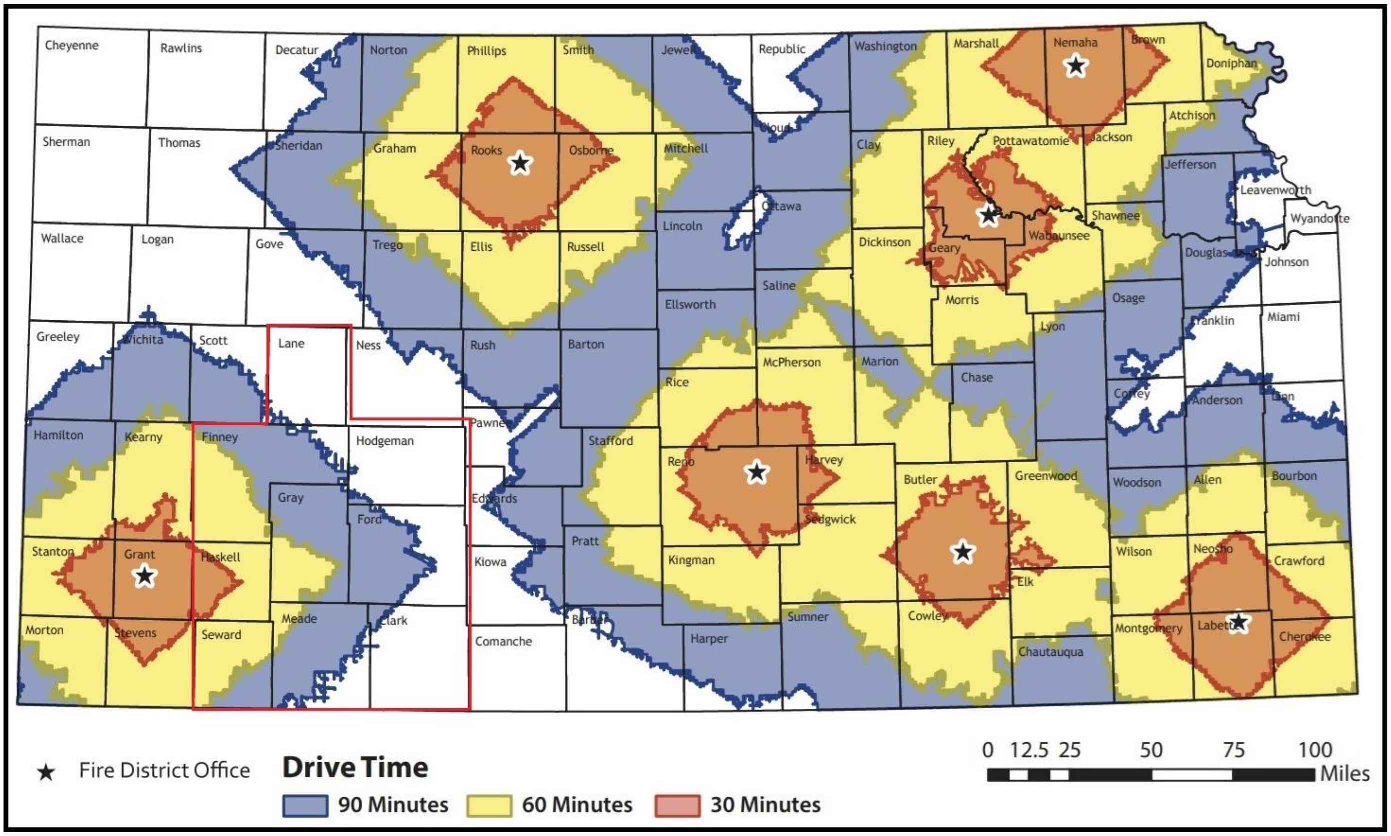
Medical and Response Facilities
Wildfires can significantly impact emergency response infrastructure, creating challenges for first responders and organizations involved in managing and mitigating the effects of wildfires events. Wildfires can impact emergency response through:

- **Transportation Disruptions:** Debris on roads and road closures can hinder the ability of emergency vehicles to navigate and reach affected areas promptly. Hazardous road conditions may result in delays in response times.
- **Communication Disruptions:** Wildfires can disrupt communication networks, affecting the ability of emergency responders to coordinate and communicate effectively. Downed power lines and damage to communication infrastructure contribute to these disruptions.

- **Power Outages:** Wildfires can lead to power outages. Emergency response facilities, such as command centers and fire stations, may lose power, affecting their operational capabilities.
- **Exposure:** Emergency responders face increased health and safety risks during wildfire events. Exposure to fire, ash, particulate matter, and high temperatures can impact the well-being of responders and affect their ability to provide effective assistance.
- **Resource Allocation Challenges:** Wildfires often requires the allocation of additional resources, including personnel, equipment, and supplies, to address immediate needs. This can strain emergency response organizations and impact their ability to respond to other concurrent incidents.
- **Increased Demand for Services:** Wildfires can result in an increased demand for emergency services, including medical assistance, and search and rescue operations. Emergency response organizations may need to manage a higher volume of incidents simultaneously. Wildfires can also increase the demand for emergency shelters, particularly in cases of widespread evacuations.

The Kansas Forest Service operates seven full-time district offices with fire staff to serve firefighters and communities in wildland fire efforts. The following map illustrates the anticipated response time for these staff to reach Kansas Region D communities when requested by local resources:

Map 77: Kansas Forest Service Response Time



Source: Kansas Forest Service

Educational Facilities

Depending on the educational facility capability and location, wildfires may necessitate the closure of the facility for the duration of the event due to damages or lack of access. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

- **School Closures:** Wildfires can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems

All communication systems within Kansas Region D are at risk to wildfire events. Wildfires can disrupt vital communications system affecting reliability and functionality. Some of the key vulnerabilities include:

- **Physical Infrastructure Damage:** Wildfires can cause physical damage to communication infrastructure such as cell towers, antennas, cables, mountain top antennas, and data centers. This damage can result in network outages and disruptions.
- **Power Outages:** Wildfires often lead to power outages, which can affect the operation of communication networks. Without a stable power supply, cell towers, data centers, and other critical components may become non-functional, leading to service interruptions.
- **Communication Tower Instability:** Wildfires can compromise the stability of communication towers. If towers are not designed to withstand wildfires, they may collapse, leading to network outages.
- **Network Congestion:** In the event of a disaster, communication networks may experience a surge in usage as people attempt to contact emergency services, friends, and family. This increased demand can lead to network congestion, making it difficult for users to connect.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. Estimated repair cost from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency may be found in Section 5.11.6.

Environmental and Agricultural Impacts

Wildfire events can cause significant agricultural impacts The following map from the United States Department of Agriculture details total county-wide agricultural losses, by county, due to wildfire events from 1989 - 2023:

Map 78: Kansas Region D Agricultural Losses Due to Wildfire Events, 1989 - 2023

Source: USDA

Wildfires have significant and often devastating effects on the environment. These impacts can be both immediate and long-lasting, affecting air quality, ecosystems, water resources, soil stability, and wildlife. Wildfires release large quantities of smoke, which contains fine particulate matter, carbon monoxide, and other harmful pollutants. These particles can travel long distances, reducing air quality far from the fire itself, and can cause respiratory issues, especially for vulnerable populations. Wildfires contribute to climate change by releasing significant amounts of carbon dioxide (CO_2), methane (CH_4), and other greenhouse gases stored in vegetation and trees, intensifying global warming.

Fires can decimate forests, grasslands, and other plant ecosystems. The loss of vegetation can result in habitat destruction for countless species, reducing biodiversity and altering the structure of the ecosystem. Recovery can take decades, depending on the severity of the fire and the resilience of the vegetation. Wildfires can degrade soil by burning away organic matter, making it less fertile. Intense heat can also cause soil to become hydrophobic (water-repellent), increasing the risk of erosion and reducing water infiltration, which impacts plant regrowth.

After a wildfire, ash, debris, and eroded soil can be washed into rivers and streams during rainstorms, contaminating water supplies. This can affect both aquatic ecosystems and human water sources, requiring extensive treatment. The destruction of vegetation disrupts the local hydrological cycle by reducing transpiration (the release of water vapor from plants). This can result in lower humidity levels, reduced rainfall, and potentially, longer drought periods.

Animals are often killed directly by fire, especially those that are less mobile (like reptiles, amphibians, and small mammals) or those caught in fast-moving fires. Wildfires destroy habitats, which can lead to displacement, loss of food sources, and increased competition for remaining resources. This can cause population declines in already vulnerable species. Wildfires can disrupt key ecosystem services such as pollination, seed dispersal, and predator-prey relationships, affecting the balance of the ecosystem.

With the loss of vegetation, the soil becomes more susceptible to erosion. Without plants to stabilize the soil, rain and wind can easily carry away topsoil, which is crucial for plant regrowth and nutrient cycling. In steep areas, the loss of vegetation can lead to landslides during subsequent rain events. These slides can cause further destruction to the landscape, waterways, and infrastructure.

Wildfires can create opportunities for invasive species to take hold. Invasive plants, often better adapted to disturbed environments, may outcompete native species in the post-fire landscape, leading to long-term changes in ecosystem composition and reducing biodiversity. Some ecosystems, like certain forests and grasslands, are adapted to periodic fire and even rely on it for regeneration. However, the increasing intensity and frequency of wildfires, driven by climate change, can overwhelm these ecosystems, preventing recovery and pushing them beyond their adaptive capacity.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an identified fire difficult.
- **Finney County:** All populations would be at risk to a wildfire event. Due to smaller capacity road systems, an evacuation of citizens would be problematic, especially if the fire blocked main arterials including the interstate. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an identified fire difficult.
- **Ford County:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities and jurisdictional remoteness, would make the timely attack of an identified fire difficult.
- **Gray County:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities and jurisdictional remoteness, would make the timely attack of an identified fire difficult.

- **Haskell County:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities and jurisdictional remoteness, would make the timely attack of an identified fire difficult.
- **Hodgeman County:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an identified fire difficult.
- **Lane County:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an identified fire difficult.
- **Meade County:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an identified fire difficult.
- **Seward County:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an identified fire difficult.

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with wildfires may include:

- Direct physical damage to buildings and structures:
- Transportation infrastructure disruption
- Power outages and electrical grid disruption
- Communication system disruption
- Transportation and supply chain disruptions
- Environmental and ecological damage
- Economic impacts and business closures
- Emergency services overload

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 158: Wildfire Consequence Analysis

Subject	Potential Impacts
Impact on the Public	People located in the immediate area of the fire face the risk injury or death if not evacuated in time. Once evacuated, they may face a lengthy period of relocation. Fires can release toxic components which can cause adverse health effects including respiratory and cardiovascular system impacts. Psychological and psychiatric concerns may arise due to exposure to the traumatic event. Young children and the elderly are especially vulnerable to health issues stemming from fire and smoke exposure.
Impact on Responders	Fire, police, and emergency responders may be called to evacuate people from the fire area, close roads, create fire breaks, attend to the injured, and direct traffic. Firefighters are at a higher risk of smoke inhalation, burns, and health problems due to working in close proximity to fires and the subsequent smoke.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. Wildfires may impact an agency's ability to maintain continuity of operations due to impacts on critical infrastructure.
Delivery of Services	Fires can cause disruption of services, including the ability to deliver goods and services. Impacts on operations could lead to a reduction or cessation of services. Goods and facilities may be damaged or destroyed by fire, smoke, or extremely high temperatures.
Property, Facilities, and Infrastructure	Fire can damage or completely destroy property and critical facilities, as well as lead to interruption of the power supply system. A fire of significant strength can cause major damage to buildings or farmland. Large fires may also interrupt transportation systems such as train and bus lines, creating a challenge for public transit and evacuation.
Impact on Environment	Fires can have significant impact to the environment by spreading pollution, damaging agricultural crops, and disturbing the wildlife and natural areas. Water and soil pollution caused by fire can cause longer term threats to ecosystem health. Fire damage may also affect soil formation, nutrient cycling, and carbon sequestration and storage.
Economic Conditions	Fires can cause a fiscal impact on the local government, even if costs can be recouped by federal grants. Agriculture is a major component of the local, county and local economy, and major fires could cause significant impact. Costs may be associated with loss of income, damage to property, and firefighting can be significant.
Public Confidence in Governance	Governmental response, on all levels, state and local, would require direct action that must be immediate and effective to maintain public confidence.

5.16.7 Future Development

Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Kansas Region D and the majority of participating jurisdictions have generally seen static to decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also initially slow and then decrease. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, is expected to increase the housing stock. However, adherence to building codes will provide any new construction a degree of hazard resiliency.

Any continued growth in modular or mobile homes would potentially increase future vulnerability. However, all participating jurisdictions have seen a decrease in the number of mobile homes from 2000 through 2020 (with the exception of Englewood, Meade County, City of Meade, and plains, which have seen minor increases).

5.16.8 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the wildfire hazard.

Table 159: Example Wildfire Mitigation Actions

Category	Example Action
Planning and Regulation	Use GIS mapping of wildfire hazard areas to facilitate analysis and planning decisions through comparison with zoning, development, infrastructure, etc.
	Use zoning and/or a special wildfire overlay district to designate high-risk areas and specify the conditions for the use and development of specific areas.
	Promote conservation of open space or wildland-urban boundary zones to separate developed areas from high-hazard areas.
	Set guidelines for annexation and service extensions in high-risk areas
	Address fire mitigation through access, signage, fire hydrants, water availability, vegetation management, and special building construction standards.
	Establish wildfire mitigation planning requirements for large scale developments or planned unit developments.
	Enclose the foundations of homes and other buildings in wildfire-prone areas, rather than leaving them open and potentially exposing undersides to blown embers or other materials.
	Encourage the use of functional shutters on windows
	Use fire resistant roofing and building materials in remodels, upgrades, and new construction.
Infrastructure	Install roof coverings, sheathing, flashing, skylights, roof and attic vents, eaves, and gutters that conform to ignition-resistant construction standards.
	Protect propane tanks or other external fuel sources.
	Create buffers around residential and non-residential structures through the removal or reduction of flammable vegetation, including vertical clearance of tree branches.
	Perform arson prevention cleanup activities in areas of abandoned or collapsed structures, accumulated trash or debris, and with a history of storing flammable materials where spills or dumping may have occurred.
	Prevent or alleviate wildfires by proper maintenance and separation of power lines as well as efficient response to fallen power lines.
	Require and maintain safe access for fire apparatus to wildland-urban interface neighborhoods and properties.
Natural Systems	Perform maintenance including fuel management techniques such as pruning and clearing dead vegetation, selective logging, cutting high grass, planting fire-resistant vegetation, and creating fuel/fire breaks (i.e., areas where the spread of wildfires will be slowed or stopped by the removal of fuels).
	Use prescribed burning to reduce fuel loads that threaten public safety and property.
	Cut firebreaks into public wooded areas in the wildland-urban interface.
	Develop a vegetation management plan
Education	Join the “Firewise Communities/USA” recognition program sponsored by the National Wildlife Coordinating Group
	Offer GIS hazard mapping online for residents and design professionals.
	Sponsor awareness workshops for local officials, developers, civic groups, and neighborhood/homeowners’ associations.

Table 159: Example Wildfire Mitigation Actions

Category	Example Action
	Organize a local fire department tour to show local elected officials the most vulnerable areas of the community's wildland-urban interface and increase their understanding of risks.
	Work with insurance companies, utility providers, and others to include wildfire safety information in materials provided to area residents.
	Develop partnerships with neighborhood groups, homeowners' associations, and others to conduct outreach activities.
	Create a defensible space or buffer zone cleared of combustible materials around property.
	Remove dead or dry leaves, needles, twigs, and combustibles from roofs, decks, eaves, porches, and yards.

5.17 Cybersecurity Event

5.17.1 Hazard Description

Cybersecurity attack refers to a deliberate and malicious attempt to compromise the security of computer systems, networks, devices, or data. The primary objectives of cyberattacks can vary widely and may include gaining unauthorized access, stealing sensitive information, disrupting operations, or extorting payment. Cybersecurity threat actors can be classified as:

- **Hacktivists:** Loosely organized groups known for conducting distributed denial-of-service attacks and defacing websites to promote political or social causes.
- **Ransomware Operators:** Criminal groups use ransomware to encrypt victims' data and demand ransoms for decryption keys.
- **Malware Developers:** Individuals or groups create and distribute malicious software (malware) for profit.
- **Organized Crime:** Criminal organizations may engage in various forms of cybercrime, such as identity theft, credit card fraud, and hacking for profit.
- **Advanced Persistent Threat Groups:** Nation-state-sponsored groups are among the most sophisticated threat actors. They conduct long-term, highly targeted cyber espionage campaigns.

5.17.2 – Location and Extent

The entire region and all participating jurisdictions are vulnerable to cybersecurity incidents. As most day-to-day activities rely on the internet in one aspect or another, any person or infrastructure is susceptible to cybersecurity threats. Cyber-attacks can take various forms, each with its own tactics and techniques, and include:

- **Malware Attacks:** Malicious software, such as viruses, worms, Trojans, ransomware, and spyware, is used to infect and compromise a computer or network. Malware can cause damage, steal information, or provide unauthorized access.
- **Phishing Attacks:** Phishing attacks involve tricking individuals into revealing sensitive information, such as passwords or financial details, by posing as a legitimate entity. Phishing emails, websites, and messages are common tools for attackers.
- **Denial-of-Service Attack:** An attack that overwhelms a target system or network with traffic, rendering it inaccessible.
- **Distributed Denial-of-Service Attack:** An attack that involves multiple compromised devices (a botnet) flooding a target with traffic, making it impossible to function effectively.
- **Man-in-the-Middle Attacks:** In these attacks, an attacker intercepts and possibly alters communications between two parties without their knowledge. This can lead to data interception, eavesdropping, or impersonation.
- **SQL Injection Attacks:** Attackers inject malicious SQL code into input fields of a web application to manipulate a database, potentially gaining unauthorized access or extracting data.
- **Zero-Day Vulnerabilities:** Attackers leverage security vulnerabilities in software or hardware that are not yet known to the vendor or public. These vulnerabilities are known as "zero-days."
- **Brute Force:** Attackers attempt to gain access to an account or system by trying all possible password combinations until the correct one is found.
- **Dictionary Attacks:** Attackers use precompiled lists of common passwords to guess login credentials.
- **Social Engineering Attacks:** This involves manipulating individuals into divulging confidential information or performing actions that compromise security. It often relies on psychological manipulation.

- **Ransomware Attacks:** Attackers encrypt a victim's data and demand a ransom in exchange for the decryption key. Payment does not guarantee data recovery, and it encourages further attacks.
- **Insider Attacks:** Malicious or negligent actions by individuals within an organization can pose significant cybersecurity risks, as they may have access to sensitive information and systems.
- **Supply Chain Attacks:** Attackers target suppliers, vendors, or partners to compromise the security of products or services, which can affect downstream organizations and consumers.
- **Internet of Things Attacks:** Devices connected to the internet, such as smart appliances and sensors, can be targeted to gain unauthorized access or control.

The MPC views cyberattack as a local concern. Discussions with the MPC and a review of all available data indicated cyberattack a community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Clark County:** Cyberattack identified as a concern for all participating jurisdictions as all systems are vulnerable. Additionally, continuing reliance on the internet is likely to exacerbate this concern.
- **Finney County:** Cyberattack identified as a concern for all participating jurisdictions as all systems are vulnerable. Additionally, continuing reliance on the internet is likely to exacerbate this concern.
- **Ford County:** Cyberattack identified as a concern for all participating jurisdictions as all systems are vulnerable. Additionally, continuing reliance on the internet is likely to exacerbate this concern.
- **Gray County:** Cyberattack identified as a concern for all participating jurisdictions as all systems are vulnerable. Additionally, continuing reliance on the internet is likely to exacerbate this concern.
- **Haskell County:** Cyberattack identified as a concern for all participating jurisdictions as all systems are vulnerable. Additionally, continuing reliance on the internet is likely to exacerbate this concern.
- **Hodgeman County:** Cyberattack identified as a concern for all participating jurisdictions as all systems are vulnerable. Additionally, continuing reliance on the internet is likely to exacerbate this concern.
- **Lane County:** Cyberattack identified as a concern for all participating jurisdictions as all systems are vulnerable. Additionally, continuing reliance on the internet is likely to exacerbate this concern.
- **Meade County:** Cyberattack identified as a concern for all participating jurisdictions as all systems are vulnerable. Additionally, continuing reliance on the internet is likely to exacerbate this concern.
- **Seward County:** Cyberattack identified as a concern for all participating jurisdictions as all systems are vulnerable. Additionally, continuing reliance on the internet is likely to exacerbate this concern.

5.17.3 Previous Occurrences

Kansas Region D has experienced numerous cyber-attacks over the past few years. In general, jurisdictions impacted by cyber-attacks have elected not to publicize these events as part of this HMP.

5.17.4 Probability of Future Events

The continued evolution of cyber criminals and nation sponsored groups indicates that the probability of future events is significant. Although the Kansas Region D has not experienced a large-scale cybersecurity incident, large-scale attacks occur worldwide on a regular basis. The number of attacks is projected to increase, especially on critical infrastructure. Additionally, due to the widespread use of computers, email, and the internet, and the reliance on technology to support daily functions, the risks of cybersecurity incidents will continue to grow.

5.17.5 Projected Changes in Location, Intensity, Frequency, and Duration

Predicting the exact future changes in the frequency and intensity of cyber-attacks is changing due to the rapidly evolving nature of threats, the expanding diversity of attack vectors, and the dynamic landscape of technology. Cyber criminals are likely to continue evolving their tactics, techniques, and procedures to become more sophisticated. This includes the use of advanced malware, ransomware, and targeted attacks that exploit vulnerabilities in both technology and human behavior.

Future geopolitical landscape conditions can influence the location and targeting of cyber-attacks. Nation-state actors may shift their focus based on political tensions, economic interests, or strategic objectives. Critical infrastructure, government entities, and corporations may be primary targets.

5.17.6 Vulnerability and Impact

FEMA NRI

The FEMA NRI does not provide a rating for the cybersecurity hazard.

Population

Cybersecurity attacks can have a range of potential impacts on individuals, both direct and indirect, often affecting their finances and privacy. Some of the potential impacts of a cybersecurity attack may include:

- **Theft of Funds:** Attackers may steal money from victims' bank accounts or cryptocurrency wallets.
- **Credit Card Fraud:** Stolen credit card information can be used for unauthorized purchases.
- **Identity Theft:** Attackers may steal personal data, such as Social Security numbers, addresses, and dates of birth, to commit identity theft.
- **Opening Fraudulent Accounts:** Cybercriminals can use stolen information to open credit cards, loans, or other financial accounts in the victim's name.
- **Data Exposure:** Personal or sensitive information may be exposed, leading to loss of privacy and potential embarrassment or harm.
- **Blackmail or Extortion:** Attackers may use compromising information to blackmail or extort victims.

The impact of a cybersecurity attack on people can be far-reaching, affecting various aspects of their lives. Timely detection, response, and preventive measures, such as strong passwords, cybersecurity awareness, and software updates, are essential to mitigate these risks.

Buildings and Structures

Cybersecurity attacks can have wide-ranging impacts on facilities, including critical infrastructure, industrial facilities, government buildings, and data centers. The extent of these impacts depends on the type and sophistication of the attack, the facility's level of cybersecurity preparedness, and the criticality of the systems and operations involved. Potential impacts may include:

- **Disruption of Operations:** Cyberattacks can lead to the disruption of facility operations, causing downtime that can be costly and disruptive.
- **Production Delays:** Manufacturing and industrial facilities may experience delays in production processes, affecting supply chains and delivery schedules.
- **Revenue Loss:** Downtime and operational disruptions can result in financial losses due to lost sales, contracts, or customer trust.
- **Remediation Costs:** Facilities must invest in cybersecurity measures and incident response efforts, incurring additional costs.
- **Data Breach:** Facilities that store sensitive data, such as customer information or proprietary research, may suffer data breaches, leading to data loss or theft.
- **Regulatory Penalties:** Compliance violations and regulatory fines may be imposed for failing to protect sensitive data.
- **Physical Safety Risks:** Attacks on critical infrastructure facilities, such as power plants or water treatment plants, can pose physical safety risks to the public and the environment.

- **Industrial Accidents:** Industrial control systems attacks can lead to accidents or malfunctions with serious safety implications.
- **Loss of Control:** Cyberattacks targeting operational technology systems can lead to a loss of control over critical processes, affecting safety and efficiency.

Attacks on facilities with environmental controls can lead to environmental damage, such as chemical spills or pollution which can affect the surrounding ecosystem and wildlife.

Governmental Operations

Cyberattacks on government operations can have wide-ranging impacts on the services provided to citizens. The effects of these attacks can vary depending on factors like the type of attack, the target's level of cybersecurity readiness, and the criticality of the systems involved, and may include:

- **Disruption of Government Services:** Cyberattacks can disrupt government services, leading to delays in processing applications, issuing licenses, or providing essential public services.
- **Website Downtime:** Government websites may become inaccessible, hindering access to information and online services.
- **Financial Costs:** Jurisdictions may incur significant expenses related to incident response, system recovery, and cybersecurity improvements.
- **Loss of Revenue:** Disrupted services can lead to revenue losses, impacting budgets and financial stability.
- **Confidential Data Exposure:** Cyberattacks can result in the exposure of sensitive citizen and employee data, including Social Security numbers, health records, and financial information.
- **Regulatory Penalties:** Non-compliance with data protection regulations can lead to penalties and legal consequences.
- **Election Integrity:** Attacks on election systems can compromise the integrity of elections, eroding trust in the democratic process.
- **Emergency Response:** Cyberattacks on public safety and emergency response systems can hinder responses to disasters or crises.
- **Reputation Damage:** Publicized cyberattacks can damage citizens' trust in government agencies and institutions.
- **Legal and Regulatory Consequences:** Jurisdictions may face legal liability for cybersecurity incidents, leading to lawsuits, fines, and settlements.

Transportation and Electrical Infrastructure

In general, cyberattacks do not have a large impact on transportation infrastructure, with the exception of power loss disrupting signaling and poor conditions.

Cyberattacks can have significant impacts on electrical utilities, leading to disruptions in power supply and potential damage to infrastructure.

Water and Wastewater Utilities

In general, cyberattacks do not have a large impact on water and wastewater infrastructure and operations unless directly struck. However, the cascading impacts from an event such as power loss disrupting pumping and treatment capabilities may cause disruptions to operations.

Medical and Response Facilities

Cyberattacks can significantly impact emergency response infrastructure, creating challenges for first responders and organizations. Cyberattacks can impact emergency response through:

- **Communication Disruptions:** Cyberattacks can disrupt communication networks, affecting the ability of emergency responders to coordinate and communicate effectively.
- **Power Outages:** Cyberattacks can lead to power outages. Emergency response facilities, such as command centers and fire stations, may lose power, affecting their operational capabilities.

Educational Facilities
Depending on the educational facility capability and location, cyberattacks may necessitate the closure of the facility for the duration of the event. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

- **School Closures:** Cyberattacks can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems
All communication systems within Kansas Region D are at risk to cyberattacks, which can disrupt vital communications system affecting reliability and functionality. Some of the key vulnerabilities include:

- **Power and System Outages:** Cyberattacks often lead to power and system outages, which can affect the operation of communication networks. Without a stable power supply, cell towers, data centers, and other critical components may become non-functional, leading to service interruptions.
- **Network Congestion:** In the event of a cyberattack, communication networks may experience a surge in usage as people attempt to contact emergency services, friends, and family. This increased demand can lead to network congestion, making it difficult for users to connect.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. Estimated repair cost from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency may be found in Section 5.11.6.

Environmental and Agricultural Impacts
No impacts are expected.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** Due to the high usage of the internet, online software and applications, and electronic systems by all participating jurisdictions, cyberattack is a large concern.
- **Finney County:** Due to the high usage of the internet, online software and applications, and electronic systems by all participating jurisdictions, cyberattack is a large concern.
- **Ford County:** Due to the high usage of the internet, online software and applications, and electronic systems by all participating jurisdictions, cyberattack is a large concern.
- **Gray County:** Due to the high usage of the internet, online software and applications, and electronic systems by all participating jurisdictions, cyberattack is a large concern.
- **Haskell County:** Due to the high usage of the internet, online software and applications, and electronic systems by all participating jurisdictions, cyberattack is a large concern.

- **Hodgeman County:** Due to the high usage of the internet, online software and applications, and electronic systems by all participating jurisdictions, cyberattack is a large concern.
- **Lane County:** Due to the high usage of the internet, online software and applications, and electronic systems by all participating jurisdictions, cyberattack is a large concern.
- **Meade County:** Due to the high usage of the internet, online software and applications, and electronic systems by all participating jurisdictions, cyberattack is a large concern.
- **Seward County:** Due to the high usage of the internet, online software and applications, and electronic systems by all participating jurisdictions, cyberattack is a large concern.

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with severe weather may include:

- Transportation infrastructure disruption
- Power outages and electrical grid disruption
- Communication system disruption
- Transportation and supply chain disruptions
- Economic impacts and business closures

This consequence analysis lists the potential impacts of a hazard on various elements of community and jurisdictional infrastructure. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 160: Cybersecurity Incident Consequence Analysis

Subject	Potential Impacts
Impact on the Public	The public is heavily reliant on technology. Any disruption caused by a cyber incident could impair activities such as communications and mobile banking. Although mostly indirect, public health impacts may include loss of access of important medical information and services, personal information, and unwanted sharing of information.
Impact on Responders	If a cybersecurity incident were to directly impact the communications infrastructure relied upon by first responders, it would create severe disruptions in the ability to provide response services. If a cybersecurity event were to affect the 911 operations, response capabilities would be impacted significantly increasing critical response times.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. A cybersecurity event may impact an agency’s ability to maintain continuity of operations based on the hazard’s potential to impact power or communications infrastructure. Specifically, agencies that rely on electronic backup of critical files are vulnerable to cyber incidents. A cyber incident that disrupts access to technology at both the primary and alternative facilities would be catastrophic.
Delivery of Services	The delivery of goods and services is heavily reliant on technology for the facilitation of transactions. A cyber incident could significantly disrupt the delivery of goods and services for businesses that rely on technology for the delivery of their materials.
Property, Facilities, and Infrastructure	Property and facilities may become unusable as a result of a cyber incident, particularly if their infrastructure is reliant on technology for sustainability. In addition, a significant majority of critical infrastructure systems are tied to technology through virtual operations and supervisory control and data acquisition systems. A cyber incident could disable the majority of systems which control critical infrastructure, as well as traffic control, dispatch, utility, and response systems.

Table 160: Cybersecurity Incident Consequence Analysis

Subject	Potential Impacts
Impact on Environment	Targeted cyber incidents can impact water or wastewater treatment facilities. The disruption of the systems tied to this infrastructure could cause water pollution or contamination. In addition, a cyber incident could impact the environment if a release of a hazardous material was triggered as a cascading effect of the incident.
Economic Conditions	A significant cyber incident could have ramifications on the economy. Society is heavily reliant on electronic-based commerce through mobile banking, automated teller machines, and electronic trading. Any disruption to daily activities by a cyber incident could effectively halt the ability to conduct transactions electronically.
Public Confidence in Governance	In the case of a cyber incident in which significant amounts of data is stolen, the government’s inability to protect confidential personal data would impact confidence. Such an incident would also subsequently cause pause regarding the security of using electronic systems for government services.

5.17.7 Future Development

A continued and growing reliance on the internet, online software and applications, and electronic systems by all participating jurisdictions will see this hazard be a continuing, and potentially growing concern.

5.17.8 Hazard Planning Significance

Utilizing the above detailed formula for calculating the hazard planning significance for human caused and technological hazards, the following table details the rating of each criterion along with a composite rating:

Table 161: Cyber Security Incident Planning Significance

County	Probability	Magnitude	Warning Time	Duration	Score	Planning Significance
Clark County	4	3	3	3	3.5	High
Finney County	4	3	3	3	3.5	High
Ford County	4	3	3	3	3.5	High
Gray County	4	3	3	3	3.5	High
Haskell County	4	3	3	3	3.5	High
Hodgeman County	4	3	3	3	3.5	High
Lane County	4	3	3	3	3.5	High
Meade County	4	3	3	3	3.5	High
Seward County	4	3	3	3	3.5	High

5.18 Hazardous Material Incident

5.18.1 Hazard Description

Hazardous materials 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.

5.18.2 – Location and Extent

All of Kansas Region D is vulnerable to hazardous materials incidents. Hazardous materials incidents are generally classified as:

- **Fixed Facility Incidents:** Commercial Facilities and Superfund Sites
- **Transportation Incidents:** Highway, Railway, Pipeline, Air, and Water

Tier II facilities, also known as Tier II Reporting facilities, refer to certain types of industrial or commercial establishments that are required to report information about the hazardous chemicals they store or use. This reporting is mandated under the Emergency Planning and Community Right-to-Know Act under Section 312. Key factors in Tier II reporting include:

- **Hazardous Chemicals:** Tier II facilities are those that store or use hazardous chemicals in quantities that meet or exceed specific thresholds established by EPCRA. Hazardous chemicals can include substances such as flammable liquids, toxic gases, and corrosive materials.
- **Reporting Thresholds:** Facilities must report if they have a quantity of any hazardous chemical at the facility that equals or exceeds established thresholds. These thresholds can vary depending on the specific chemical and are typically set in terms of pounds (or a lower threshold for Extremely Hazardous Substances).
- **Reporting Frequency:** Tier II reports must be submitted annually to the State Emergency Response Commission, the Local Emergency Planning Committee, and local fire department.
- **Information Required:** Tier II reports must include detailed information about the hazardous chemicals stored or used at the facility, including the chemical name, location on the site, quantities, and specific health and physical hazards.
- **Community Right-to-Know:** In addition to assisting emergency responders, Tier II reporting also serves the "Community Right-to-Know" aspect of EPCRA, allowing the public to access information about hazardous chemicals in their communities. This information is typically made available through public databases.
- **Enforcement:** Non-compliance with Tier II reporting requirements can result in penalties and fines. Facilities are responsible for ensuring accurate and timely reporting.

Transportation-related hazardous materials incidents can encompass a wide range of scenarios involving the transportation of hazardous materials, including chemicals, flammable substances, radioactive materials, and other dangerous goods. These incidents can occur during the movement of these materials by road, rail, or air. These transportation-related hazardous materials incidents can include:

- **Chemical Spills on Highways:** Accidents involving trucks carrying hazardous chemicals can result in spills on highways. This can lead to the release of toxic, flammable, or corrosive substances, posing risks to people, the environment, and emergency responders.
- **Train Derailments:** Train derailments can result in the release of hazardous materials from tanker cars. These incidents can occur on both freight and passenger rail lines and may involve chemicals, fuels, or other hazardous substances.
- **Aircraft Hazmat Incidents:** Cargo planes and commercial aircraft can carry hazardous materials as cargo. Incidents may involve leaks, fires, or other issues related to hazardous materials on board.
- **Pipeline Leaks:** Pipelines transport hazardous liquids and gases over long distances. Leaks or ruptures in pipelines can result in the release of hazardous materials into the environment.
- **Radiological Transport Incidents:** The transport of radioactive materials, including medical isotopes and nuclear fuel, carries the risk of accidents that can result in the release of radioactive substances. These incidents can have serious health and environmental consequences.
- **Chemical Fires in Transit:** Fires in transit vehicles carrying hazardous chemicals can be particularly changing to control. The fire may cause chemical reactions, leading to toxic smoke or explosions.
- **Cargo Container Incidents:** Shipping containers transported by truck or rail can contain hazardous materials. Incidents involving these containers may include leaks, fires, or chemical reactions.
- **Intermodal Transport Incidents:** When goods are transferred between different modes of transportation (e.g., ship to truck), there is the potential for mishandling or spills during these transfers.

Counties with multiple chemical facilities experience a greater risk of a chemical incident than other locations. However, almost every community in Kansas Region D has at least one fixed facility that stores, produces, or utilizes hazardous material. Hazardous materials shipments move through Kansas Region D annually. These shipments can occur at any time, day or night, and by means of road, rail, or air, and often through areas with urbanized, high volume traffic routes.

Discussions with the MPC and a review of all available data indicated a hazardous materials event is a community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Clark County:** As hazardous materials are utilized for a wide variety of activities throughout all jurisdictions, an accidental release is a concern for all jurisdictions.
- **Finney County:** As hazardous materials are utilized for a wide variety of activities throughout all jurisdictions, an accidental release is a concern for all jurisdictions.
- **Ford County:** As hazardous materials are utilized for a wide variety of activities throughout all jurisdictions, an accidental release is a concern for all jurisdictions.
- **Gray County:** As hazardous materials are utilized for a wide variety of activities throughout all jurisdictions, an accidental release is a concern for all jurisdictions.
- **Haskell County:** As hazardous materials are utilized for a wide variety of activities throughout all jurisdictions, an accidental release is a concern for all jurisdictions.
- **Hodgeman County:** As hazardous materials are utilized for a wide variety of activities throughout all jurisdictions, an accidental release is a concern for all jurisdictions.
- **Lane County:** As hazardous materials are utilized for a wide variety of activities throughout all jurisdictions, an accidental release is a concern for all jurisdictions.

- **Meade County:** As hazardous materials are utilized for a wide variety of activities throughout all jurisdictions, an accidental release is a concern for all jurisdictions.
- **Seward County:** As hazardous materials are utilized for a wide variety of activities throughout all jurisdictions, an accidental release is a concern for all jurisdictions.

5.18.3 Previous Occurrences

The United States Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) is a federal agency responsible for regulating the safe and secure transportation of hazardous materials by all modes of transportation, including pipelines, trucks, trains, and aircraft. PHMSA's primary mission is to protect people and the environment from the risks associated with the transportation of hazardous materials. PHMSA plays a crucial role in safeguarding public safety, protecting the environment, and ensuring the integrity of the nation's hazmat transportation infrastructure. Its work encompasses a wide range of hazardous materials, including chemicals, radioactive materials, explosives, and more. The agency collaborates with industry stakeholders, state and local governments, and other federal agencies to achieve its safety and security objectives.

For the five-year period from 2018 to 2023, PHMSA has reported over 2,300 hazardous materials incidents in Kansas. Of these incidents, no events in Kansas Region D resulted in a serious evacuation, a major artery closure, fatalities, or injuries.

5.18.4 Probability of Future Events

Data from PHSMA indicates that the probability of a hazardous material incident during any given year is 100%. However, data indicates that the large majority of these incidents will be small in scale and cause no evacuation, injuries, or deaths,

5.18.5 Projected Changes in Location, Intensity, Frequency, and Duration

Projecting specific changes in the location, intensity, and frequency of hazardous materials events involves numerous variables, including future industrial activities, changes in transportation systems, and more stringent regulatory measures. The location of hazardous materials events is often influenced by urbanization and industrialization. The vulnerability of communities to hazardous materials incidents may change based on demographic shifts, land-use changes, and socioeconomic factors. Population density and proximity to industrial sites influence the potential impact of such incidents.

The continued transportation of hazardous materials by road, rail, and air poses inherent risks. Changes in transportation patterns, such as increased volumes or altered routes, can impact the potential for accidents and spills. However, the adoption of new technological solutions, such as sensor technologies, remote monitoring, and safety measures, can contribute to the mitigation of hazardous materials risks.

Changes in climate patterns, such as extreme weather events, floods, or wildfires, can influence the frequency and intensity of hazardous materials incidents. Events like floods or wildfires may impact facilities handling hazardous materials.

As previously noted, Kansas Region D facilities have seen no major changes in the past five years, with only modest repairs and upgrades being conducted and no major rehabilitation or construction projects completed. As such, the risk to jurisdictional facilities has remained static since the completion of the 2019 HMP.

5.17.6 Vulnerability and Impact

FEMA NRI

The FEMA NRI does not provide a rating for the hazardous materials hazard.

Population

Kansas Region D's first line of defense in protecting public health, safety, and welfare in a hazardous materials event are trained local responders and the Office of the State Fire Marshal. The Office of the State Fire Marshal Hazardous Materials Division was developed in 1999 to enhance the safety of Kansans by making trained, equipped hazardous materials teams available throughout the state. These teams support local first responders in hazardous materials incidents, accidents, weapons of mass destruction and acts of terrorism.

Hazardous materials teams exist through contracts between individual local fire departments and the Office of the State Fire Marshal. The fire departments agree to provide team members and regional response outside their local jurisdiction and the Office of the State Fire Marshal provides training and supplements equipment at no cost to the department. The ten regional response teams, consisting of nationally accredited hazardous materials technicians, are fully equipped to enter the area immediately surrounding the hazardous material in order to monitor the environment and mitigate the incident. The regional response teams comprise a network and are able to support each other with personnel and or equipment when needed.

These teams can respond to most areas in Kansas within an hour or less in order to address hazardous materials incidents. The regional response teams are located in the following areas:

- Coffeyville
- Colby
- Emporia
- Ford County
- Manhattan
- Overland Park
- Salina
- Sedgwick County
- Topeka

A hazardous materials release can have serious and immediate impacts on human health and safety, as well as long-term effects depending on the nature of the hazardous materials involved, the release's magnitude, and the proximity of individuals to the incident. Acute health effects from a hazardous materials release can include:

- **Chemical Exposure:** Depending on the type of hazardous material, exposure can lead to symptoms such as respiratory distress, skin burns, eye irritation, nausea, vomiting, and headaches.
- **Toxicity:** Exposure to highly toxic substances can cause severe poisoning, organ damage, and even death.
- **Asphyxiation:** Some hazardous materials, like certain gases, can displace oxygen and lead to asphyxiation when inhaled in high concentrations.
- **Physical Injuries:** Explosive releases or fires involving hazardous materials can cause physical injuries such as burns, cuts, and blunt force trauma.
- **Psychological Trauma:** Witnessing or being affected by a hazardous materials incident can lead to psychological trauma, including post-traumatic stress disorder (PTSD) and anxiety.

Long-term health effects from a hazardous materials release can include:

- **Chronic Illnesses:** Exposure to hazardous materials may lead to chronic health conditions, including cancer, respiratory diseases, neurological disorders, and reproductive problems.
- **Delayed Effects:** Some hazardous substances have delayed health effects, with symptoms appearing days, months, or even years after exposure.

Additionally, a hazardous material release can result in impacted populations requiring:

- **Evacuation:** To protect public safety, authorities may order evacuations of affected areas, displacing residents from their homes.
- **Temporary Shelter:** Evacuated individuals may require temporary shelter, food, and medical care.

Buildings and Structures

The direct risk or vulnerability to property and facilities from a hazardous materials incident is generally limited. Impacts include restricting access to a facility or potential damage to the facility from corrosive agents. Direct risk and vulnerability to actual structures is limited due to the characteristics of a hazardous materials incident.

Critical facilities and infrastructure may suffer secondary impacts from a hazardous materials incident. Access may be restricted due to closures, causing employee absenteeism which could indirectly impact the ability for a critical facility to operate. Without necessary operators, critical infrastructure may be susceptible to indirect failure.

Governmental Operations

A hazardous materials incident can have wide-ranging impacts on local operations. These impacts can disrupt government operations, strain resources, and pose challenges to maintaining public order. Some of the impacts of a hazardous materials release on operations may include:

- **Emergency Response and Healthcare:** Local agencies must rapidly mobilize emergency response teams, medical personnel, and healthcare facilities to address a release. The surge in demand for medical resources can strain healthcare systems, including hospitals, clinics, and emergency services.
- **Resource Allocation:** Local agencies may need to allocate resources to respond to the incident. This includes personnel, equipment, and facilities.
- **Transportation and Supply Chain Disruption:** Transportation infrastructure closures can affect the movement of essential goods and services, including medical supplies, food, and fuel.
- **Economic Impact:** The economic consequences of a hazardous materials incident can be severe. Business closures, reduced consumer confidence, and trade disruptions can lead to financial losses, unemployment, and economic instability.
- **Public Services:** Essential public services, such as law enforcement, fire services, and sanitation, may be stretched thin due to the demands of responding to an incident.
- **Agency Coordination:** Coordination and communication among various agencies and with federal authorities will be tested during a hazardous materials incident. Local emergency management agencies will activate emergency response plans and incident command structures.

Transportation and Electrical Infrastructure

Hazardous material events can result in the temporary, or long-term, closure of both transportation and electrical systems.

Water and Wastewater Utilities

In general, hazardous materials events do not have a large impact on water and wastewater infrastructure and operations unless the release occurs directly at the facility, or the release enters the facility lines or systems.

Medical and Response Facilities

A hazardous materials release, depending on the size and scope, could overwhelm healthcare systems. Additionally, the nature of the response could overwhelm response agencies.

Educational Facilities

Depending on the educational facility capability and location, a hazardous materials release may necessitate the closure of the facility for the duration of the event. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

- **School Closures:** Hazardous materials events can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems
Inn general, communications systems would not be vulnerable to a hazardous materials event unless it required the shutdown of a communication node at the release location.

Environmental and Agricultural Impacts
A hazardous materials release can have significant and lasting impacts on the environment, depending on the type and quantity of hazardous materials involved, the location of the release, and the effectiveness of response and cleanup efforts. Environmental impacts can range from immediate and localized effects to long-term ecological damage and may include:

- **Soil Contamination:** Hazardous materials can seep into the soil, contaminating it with toxic substances. This can affect soil quality and fertility.
- **Agricultural Damage:** Contaminated soil may harm crops, leading to reduced agricultural yields or the need to abandon affected fields.
- **Surface Water Contamination:** Hazardous materials can enter rivers, lakes, and streams, leading to water pollution. This can harm aquatic ecosystems, fish, and wildlife.
- **Groundwater Contamination:** Contaminants can infiltrate underground aquifers, potentially affecting drinking water supplies and requiring costly remediation efforts.
- **Habitat Destruction:** Contamination can harm natural habitats, disrupt ecosystems, and threaten the survival of plant and animal species.
- **Bioaccumulation:** Toxic substances can accumulate in the food chain, leading to health issues for wildlife and potentially impacting humans who consume contaminated organisms.

Some hazardous materials are persistent and can remain in the environment for extended periods, causing ongoing harm. Environmental recovery from hazardous materials releases can be slow and changing, requiring extensive remediation efforts.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Finney County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Ford County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
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- **Lane County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Meade County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Seward County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with severe weather may include:

- Transportation infrastructure disruption
- Power outages and electrical grid disruption
- Transportation and supply chain disruptions
- Economic impacts and business closures

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of community and jurisdictional infrastructure. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 162: Hazardous Materials Incident Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Cities within Kansas Region D with dense populations, particularly along major travel routes, are the most vulnerable (with an emphasis on any particularly vulnerable groups, such as infants and young children in day-care centers, children in schools, the elderly in residential facilities, hospital patients, etc.). Varying materials will have different effects on the population as well as environmental effects which will dilute or increase potency. Protective measures will need to be taken particularly for those of the most vulnerable communities.
Impact on Responders	Hazardous material incidents can create a dangerous environment and significant challenges for first responders. First responders may have to manage the evacuation of people from the area impacted by an incident, as well as direct traffic, close roads, operate shelters, and take care of the injured and sick. First responders must control their own exposure to the incident and ensure the correct PPE is utilized. Equipment may also be damaged or destroyed due to the impact of the incident, which may lead to a decrease in response capabilities.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. A hazardous materials incident may impact an agency's ability to maintain continuity of operations based on the incidents potential to cause workforce absenteeism, contamination, or destruction of public facilities.
Delivery of Services	The ability to deliver services can be impacted locally, regionally, or statewide depending on the characteristics of the incident. To reduce the public's potential exposure to dangerous materials, roadway and bridge closures may be required, as well

Table 162: Hazardous Materials Incident Consequence Analysis

Subject	Potential Impacts
	as transit service disruptions. Businesses and places of commerce may completely shut down due to chemical incidents, which leads to the disruption of goods and services.
Property, Facilities, and Infrastructure	Transportation, governmental operations, and infrastructure facilities may be disrupted during a significant incident. Roads and bridges can be completely obstructed and require cleanup. Incidents can impact access to homes and critical entities such as hospitals, schools, and supermarkets, as well as other critical facilities. Safe access to homes, vehicles, structures, and resources may adversely affect response activities. Power loss can lead to disruption of critical infrastructure and technology.
Impact on Environment	Agriculture crops and livestock are extremely susceptible to the adverse effects of biological incidents that may cause contamination of a large area of land livestock. biological incidents may impact the environment long-term by disturbing or killing wildlife and adversely affecting nature preserves.
Economic Conditions	Hazardous materials incidents pose a fiscal impact on the local governments. Local, county, and state resources may be required during a large incident therefore reducing their availability for future events. Additionally, private businesses may not be able to maintain operations during or after an incident if they are impacted, which would impact the economy.
Public Confidence in Governance	The public's confidence in governance is affected by immediate local and state response through direct and effective actions. Efficiency in response and recovery operations is critical in keeping public confidence high.

5.18.7 Future Development

Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Kansas Region D and the majority of participating jurisdictions have generally seen static to decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also initially slow and then decrease. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, is expected to increase the housing stock. However, adherence to building codes will provide any new construction a degree of hazard resiliency.

5.18.8 Hazard Planning Significance

Utilizing the above detailed formula for calculating the hazard planning significance for human caused and technological hazards, the following table details the rating of each criterion along with a composite rating:

Table 163: Hazardous Materials Incident Planning Significance

County	Probability	Magnitude	Warning Time	Duration	Score	Planning Significance
Clark County	1.5	1.5	4.0	1.0	1.9	Low
Finney County	1.5	1.5	4.0	1.0	1.9	Low
Ford County	1.5	1.5	4.0	1.0	1.9	Low

Table 163: Hazardous Materials Incident Planning Significance

County	Probability	Magnitude	Warning Time	Duration	Score	Planning Significance
Gray County	1.5	1.5	4.0	1.0	1.9	Low
Haskell County	1.5	1.5	4.0	1.0	1.9	Low
Hodgeman County	1.5	1.5	4.0	1.0	1.9	Low
Lane County	1.5	1.5	4.0	1.0	1.9	Low
Meade County	1.5	1.5	4.0	1.0	1.9	Low
Seward County	1.5	1.5	4.0	1.0	1.9	Low

5.19 Infrastructure Failure

5.19.1 Hazard Description

Infrastructure failure refers to the malfunction, breakdown, or collapse of critical infrastructure systems or components that are essential for the functioning of the region. These failures can disrupt essential services, impact public safety, and lead to economic losses. There are many potential causes of infrastructure failure, including:

- **Aging Infrastructure:** Many infrastructure systems, such as bridges, roads, and water pipelines, have exceeded their designed lifespan. Over time, the materials degrade, and the risk of failure increases.
- **Earthquakes:** Seismic events can damage or destroy buildings, bridges, dams, and utility systems.
- **Floods:** Flooding can damage electrical systems, disrupt transportation, and contaminate water supplies.
- **Severe Weather:** High winds and heavy rainfall can damage infrastructure.
- **Extreme Heat:** Prolonged periods of extreme heat can cause roads to buckle, power lines to sag, and strain electrical grids.
- **Freezing Temperatures:** Cold weather can lead to frozen water pipes, which can burst and disrupt the water supply.
- **Design Flaws and Poor Maintenance:** Inadequate design, construction, or maintenance practices can result in structural weaknesses or deteriorating infrastructure.
- **Corrosion and Erosion:** Infrastructure components, particularly those involving metals, can deteriorate due to corrosion over time. Erosion of natural landscapes can damage infrastructure.
- **Material Failures:** Inadequate materials or the use of substandard materials during construction can lead to premature infrastructure failure.
- **Overloading and Overuse:** Bridges, roads, and other structures can fail if they are subjected to loads beyond their designed capacity. Water and wastewater systems can fail if they are overwhelmed by excessive demand.
- **Cyberattacks:** Critical infrastructure systems, such as power grids, water treatment plants, and transportation systems, can be vulnerable to cyberattacks, which can disrupt operations and compromise safety.
- **Terrorism and Sabotage:** Deliberate acts of terrorism or sabotage can target critical infrastructure, leading to failures and disruptions.
- **Environmental Changes:** Long-term environmental changes due to climate change can threaten infrastructure.

Infrastructure failures can have significant consequences, including economic losses, public safety risks, and disruptions to daily life. Preventing such failures and ensuring the resilience of critical infrastructure often require proactive measures such as regular maintenance, improvements in design and construction practices, disaster preparedness, and investments in modernization and upgrades.

5.19.2 – Location and Extent

Details concerning Kansas Region D’s infrastructure were sourced from the 2020 Report Card for Kansas’s Infrastructure from the American Society of Civil Engineers (ASCE). The report provides information on infrastructure components and provides a letter grade to indicate condition. Grades are issued based on the following scale:

Table 164: ASCE Infrastructure Grade System

Grade	Description
A: Exceptional	The infrastructure in the system or network is generally in excellent condition, typically new or recently rehabilitated, and meets capacity needs

Table 164: ASCE Infrastructure Grade System

Grade	Description
	for the future. A few elements show signs of general deterioration that require attention. Facilities meet modern standards for functionality and are resilient to withstand most disasters and severe weather events.
B: Adequate for Now	The infrastructure in the system or network is in good to excellent condition; some elements show signs of general deterioration that require attention. A few elements exhibit significant deficiencies. Safe and reliable with minimal capacity issues and minimal risk.
C: Mediocre, Requires Attention	The infrastructure in the system or network is in fair to good condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies in conditions and functionality, with increasing vulnerability to risk.
D: Poor, At Risk	The infrastructure is in poor to fair condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration. Condition and capacity are of significant concern with strong risk of failure.
F: Failing/Critical, Unfit for Purpose	The infrastructure in the system is in unacceptable condition with widespread advanced signs of deterioration. Many of the components of the system exhibit signs of imminent failure.

Source: ASCE

The following table indicates the grades by the State of Kansas received for infrastructure components:

Table 165: ASCE Kansas Infrastructure Grades

Infrastructure Component	Grade
Aviation	C-
Bridges	C
Dams	C-
Drinking Water	C
Energy	C
Levees	C
Rail	C
Roads	C-
Stormwater	C-
Overall Grade	**C**

Source: ASCE

The Aviation Division of the Kansas Department of Transportation supports airfield pavement management programs and calculates pavement condition for all airports within its system apart from Dwight D. Eisenhower National airport in Seward, which is required to perform the program as a small hub airport. The most recent state-wide pavement management report indicated pavement on 79 of 80 airports examined as having a condition of fair or less than fair on 51% of the pavement area, and a condition of satisfactory or good on the remaining 49% of the pavement. Runway pavement condition, of critical importance to operations, is reported as 50% of the runways available fall below a fair condition.

Kansas ranks fifth in the nation for total number of bridges with approximately 5,000 state-owned, 19,500 locally owned, and 400 Kansas Turnpike Authority owned structures, making up the 25,001 Kansas bridge inventory. The majority of local bridges are owned by counties. The average age of a Kansas bridge is 48 years, with over 20% of the bridges exceeding the modern 75-year design life

Railroads in Kansas consist of 4,700 miles of track which transport approximately 340,000,000 tons of freight per year. While the 2,800 miles of track owned by the major rail companies is typically well maintained, short line tracks that carry lower traffic volumes may not have adequate funding in place for necessary maintenance and upgrades.

Kansas has over 140,000 miles of public roadways. The two agencies responsible for the major highways and interstates are the Kansas Department of Transportation and the Kansas Turnpike Authority, who maintain 10,300 miles (7.4%) and 236 miles (less than 0.2%) of the state's total public road miles, The remainder of road network is maintained by cities and counties.

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 online.

Discussions with the MPC and a review of all available data indicated a utility failure is a community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Clark County:** Utility failure identified as a community concern or all participating jurisdictions.
- **Finney County:** Utility failure identified as a community concern or all participating jurisdictions.
- **Ford County:** Utility failure identified as a community concern or all participating jurisdictions.
- **Gray County:** Utility failure identified as a community concern or all participating jurisdictions.
- **Haskell County:** Utility failure identified as a community concern or all participating jurisdictions.
- **Hodgeman County:** Utility failure identified as a community concern or all participating jurisdictions.
- **Lane County:** Utility failure identified as a community concern or all participating jurisdictions.
- **Meade County:** Utility failure identified as a community concern or all participating jurisdictions.
- **Seward County:** Utility failure identified as a community concern or all participating jurisdictions.

5.19.3 Previous Occurrences
Small scale infrastructure failures occur as a secondary impact from a natural disaster, such as a temporary power outage due to a thunderstorm or a communications outage from downed lines following a severe storm. Kansas Region D experiences these minor disruptions routinely and manages them through coordination across agencies and with the private sector. Specifically, when utility and/or infrastructure failure does occur, utility providers generally respond quickly to restore service. However, depending on the cause of the utility disruption, events of prolonged outages do occur.

5.19.4 Probability of Future Events
The probability of a utility failure can vary depending on a range of factors, including the type of utility, the condition of the infrastructure, weather conditions, and maintenance practices. Utility providers typically have systems and protocols in place to minimize the risk of utility failures, and they work to respond quickly to any outages or disruptions. The probability of a failure may also vary seasonally or during extreme weather events.

5.19.5 Projected Changes in Location, Intensity, Frequency, and Duration
Climate change can influence the frequency, intensity, and patterns of extreme weather events. An increase in these events can cause a commensurate increase in infrastructure failures. It is expected that climate change will impact infrastructure in the following ways:

- **Increased Frequency of Extreme Weather Events:** Climate change is associated with an increased frequency and intensity of extreme weather events, such as heatwaves, heavy rainfall, and wildfires. These events can damage utility infrastructure, leading to outages.
- **Heatwaves and Electrical Grids:** Rising temperatures can lead to more frequent and prolonged heatwaves. High temperatures can strain electrical grids, leading to increased demand for electricity for cooling and potentially causing power outages.
- **Increased Storm Intensity and Utility Damage:** Weather may become more intense due to warming oceans. Stronger storms can damage power lines, transformers, and other electrical infrastructure, resulting in widespread electricity outages.
- **Flooding and Water Utilities:** More frequent and severe flooding events can impact water supply and wastewater treatment facilities, causing contamination and disruptions in water services.
- **Wildfires and Power Lines:** Climate change can contribute to more extensive and intense wildfires. In regions prone to wildfires, power lines and electrical equipment are at risk of igniting fires, leading to power outages and infrastructure damage.
- **Extreme Weather and Gas Pipelines:** Extreme weather events, including extreme cold or heat, can impact natural gas pipelines. Cold temperatures can freeze pipelines, while heatwaves can affect gas compressors and transmission systems.

As previously noted, Kansas Region D facilities have seen no major changes in the past five years, with only modest repairs and upgrades being conducted and no major rehabilitation or construction projects completed. As such, the risk to jurisdictional facilities has remained static since the completion of the 2020 HMP.

5.19.6 Vulnerability and Impact

FEMA NRI

The FEMA NRI does not provide a rating for the utility failure hazard.

Population

Infrastructure failure can have significant and immediate impacts on people. The specific impacts can vary depending on the type of utility that fails (electricity, water, gas) and the duration of the outage, and may include:

- **Disruption of Daily Life:** Utility failures can disrupt daily routines, including cooking, bathing, heating or cooling homes, and using electronic devices. Lack of electricity can also disrupt businesses, schools, and healthcare facilities.
- **Safety Concerns:** Utility failures, particularly in electrical and gas systems, can pose safety risks such as fires, electrical hazards, and gas leaks. Lack of electricity can result in the loss of lighting, increasing the risk of accidents and falls.
- **Health Implications:** Medical equipment that relies on electricity can become non-functional, posing risks to individuals with medical conditions. Lack of access to clean water can impact hygiene and health. Utility failures in healthcare facilities can impact the ability to provide medical care and support for patients. Prolonged utility failures, especially during extreme weather events, can lead to stress, anxiety, and discomfort. Vulnerable populations, such as the elderly, children, and those with special needs, may be particularly affected.

Buildings and Structures

Utility failures can have significant impacts on critical infrastructure and facilities. The specific impacts can vary depending on the type of utility affected, the duration of the outage, and the criticality of the infrastructure, and may include:

- **Disruption of Operations:** Utility failures can disrupt the normal operations of critical facilities, including hospitals, emergency response centers, data centers, and transportation hubs.
- **Compromised Safety and Security:** Loss of electricity can impact security systems, including surveillance cameras and alarm systems. Critical facilities may rely on backup power sources to maintain safety and security.
- **Loss of Communication:** Utility failures can disrupt communication systems, affecting the ability of critical facilities to coordinate responses and communicate with staff and the public.
- **Healthcare Impacts:** Hospitals and healthcare facilities may experience disruptions in patient care due to power outages, affecting the health and safety of patients. Medical equipment may require backup power to continue functioning.
- **Water and Sanitation Services:** Water utility failures can disrupt water supply to critical facilities, impacting sanitation services, firefighting capabilities, and patient care. Wastewater treatment plants may be affected, posing environmental and health risks.
- **Transportation Disruptions:** Transportation infrastructure, including airports, train stations, and traffic management systems, may be impacted by utility failures, leading to travel disruptions.
- **Safety Hazards:** Gas utility failures can result in gas leaks, posing fire and explosion hazards to critical infrastructure and nearby areas. Electrical failures may lead to equipment malfunctions, increasing the risk of accidents and safety incidents.

Governmental Operations

Infrastructure failure can have significant impacts on governmental operations, affecting the ability to provide essential services, respond to emergencies, and maintain critical infrastructure. The specific impacts can vary depending on the type of utility affected and the duration of the outage, and may include:

- **Disruption of Emergency Services:** Failures can disrupt the operations of emergency response agencies, including police, fire departments, and medical services. This can impede their ability to respond to accidents, fires, and medical emergencies.
- **Communication Challenges:** Failures, particularly in telecommunications and internet infrastructure, can hinder communication between government agencies, first responders, and the public. This can impact coordination during emergencies.
- **Data Loss and Information Technology Disruptions:** Electrical outages and information technology infrastructure failures can result in data loss and disrupt government operations that rely on digital records and systems.
- **Transportation Disruptions:** Transportation infrastructure, such as traffic management systems and public transit, may be impacted by utility failures, leading to travel disruptions and challenges in managing traffic flow.
- **Public Health Services:** Healthcare facilities and public health agencies may experience disruptions in patient care, vaccination programs, and disease surveillance during utility failures.
- **Safety Risks:** Failures can pose safety risks to government employees and the public, particularly when they result in electrical hazards, gas leaks, or water contamination.
- **Economic Consequences:** The economic impact of infrastructure failures can extend to governmental operations, affecting budgets and resources available for public programs and services.
- **Disaster Response and Recovery:** Failures may occur during natural disasters, adding complexity to response and recovery efforts. Coordination among agencies becomes crucial.

Transportation and Electrical Infrastructure

Utility failures can have significant impacts on transportation and electrical infrastructure and facilities. The specific impacts can vary depending on the type of utility affected, the duration of the outage, and the criticality of the infrastructure, and may include:

- **Disruption of Operations:** Utility failures can disrupt the normal operations of critical facilities, including hospitals, emergency response centers, data centers, and transportation hubs.
- **Compromised Safety and Security:** Loss of electricity can impact security systems, including surveillance cameras and alarm systems. Critical facilities may rely on backup power sources to maintain safety and security.
- **Loss of Communication:** Utility failures can disrupt communication systems, affecting the ability of critical facilities to coordinate responses and communicate with staff and the public.
- **Transportation Disruptions:** Transportation infrastructure, including airports, train stations, and traffic management systems, may be impacted by utility failures, leading to travel disruptions.
- **Safety Hazards:** Gas utility failures can result in gas leaks, posing fire and explosion hazards to critical infrastructure and nearby areas. Electrical failures may lead to equipment malfunctions, increasing the risk of accidents and safety incidents.

Water and Wastewater Utilities
Utility failures can have significant impacts on water and wastewater systems. The specific impacts can vary depending on the type of utility affected, the duration of the outage, and the criticality of the infrastructure, and may include:

- **Disruption of Operations:** Utility failures can disrupt the normal operations of critical facilities, including hospitals, emergency response centers, data centers, and transportation hubs.
- **Compromised Safety and Security:** Loss of electricity can impact security systems, including surveillance cameras and alarm systems. Critical facilities may rely on backup power sources to maintain safety and security.
- **Water and Sanitation Services:** Water utility failures can disrupt water supply to critical facilities, impacting sanitation services, firefighting capabilities, and patient care. Wastewater treatment plants may be affected, posing environmental and health risks.
- **Safety Hazards:** Gas utility failures can result in gas leaks, posing fire and explosion hazards to critical infrastructure and nearby areas. Electrical failures may lead to equipment malfunctions, increasing the risk of accidents and safety incidents.

Medical and Response Facilities
Utility failures can have significant impacts on medical and response facilities. The specific impacts can vary depending on the type of utility affected, the duration of the outage, and the criticality of the infrastructure, and may include:

- **Disruption of Operations:** Utility failures can disrupt the normal operations of critical facilities, including hospitals, emergency response centers, data centers, and transportation hubs.
- **Compromised Safety and Security:** Loss of electricity can impact security systems, including surveillance cameras and alarm systems. Critical facilities may rely on backup power sources to maintain safety and security.
- **Loss of Communication:** Utility failures can disrupt communication systems, affecting the ability of critical facilities to coordinate responses and communicate with staff and the public.
- **Healthcare Impacts:** Hospitals and healthcare facilities may experience disruptions in patient care due to power outages, affecting the health and safety of patients. Medical equipment may require backup power to continue functioning.
- **Safety Hazards:** Gas utility failures can result in gas leaks, posing fire and explosion hazards to critical infrastructure and nearby areas. Electrical failures may lead to equipment malfunctions, increasing the risk of accidents and safety incidents.

Educational Facilities

Depending on the educational facility capability and location, a utility failure may necessitate the closure of the facility for the duration of the event. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

- **School Closures:** Utility failure events can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems

Utility failures can have significant impacts on communication systems. The specific impacts can vary depending on the type of utility affected, the duration of the outage, and the criticality of the infrastructure, and may include:

- **Loss of Communication:** Utility failures can disrupt communication systems, affecting the ability of critical facilities to coordinate responses and communicate with staff and the public.

Environmental and Agricultural Impacts

In general, a utility failure would have little effect on the environment. However, specific circumstances of the failure, such as a chemical leak, a downed power line in a fire prone area, or loss of wastewater containment could pose a concern. The impacts from those type of events can range from relatively minor and localized effects to more significant and widespread environmental consequences, and may include:

- **Wildfires:** Electrical utility failures, such as downed power lines or equipment malfunctions, can trigger wildfires. Wildfires can have devastating effects on natural landscapes and ecosystems.
- **Water Pollution:** Water utility failures, such as sewage system overflows or treatment plant malfunctions, can lead to the release of untreated wastewater into rivers, lakes, or oceans. This can result in water pollution, harm aquatic ecosystems, and affect drinking water quality downstream.
- **Chemical Spills:** Utility failures, particularly in industrial settings, can result in chemical spills and releases. These spills can harm the environment, contaminate soil and water, and endanger wildlife.

Jurisdictional Concerns:

As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Finney County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Ford County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Gray County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Haskell County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Hodgeman County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Lane County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.

- **Meade County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Seward County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.

Cascading Impacts

Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with severe weather may include:

- Transportation infrastructure disruption
- Power outages and electrical grid disruption
- Transportation and supply chain disruptions
- Economic impacts and business closures

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of community and jurisdictional infrastructure. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 166: Infrastructure Failure Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Critical infrastructure failures can lead to heavy flooding, power loss, property damage, injury, and even death. Roadways may be obstructed or inaccessible to the public, changing transport and resource acquirement activities. A failure of critical infrastructure would have a direct impact on public health. Power outages, transit failures, access to clean water would create severe and immediate public health impacts.
Impact on Responders	Infrastructure failure would have a direct and immediate impact on first responder's ability to respond effectively. Critical infrastructure failure may cause inaccessibility of roadways. Communications system failure would impact the responders' ability to communicate their status or response capability.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. An infrastructure failure may impact an agency's ability to maintain operations based on the incidents impact, including access to facility by transportation systems, and the availability of utilities, communications, energy, and water and wastewater systems.
Delivery of Services	Delivery of services will be disrupted due to critical infrastructure failure. Transit systems may face closures due to public safety concerns. The ability to deliver food, drinking-water, and services will be impacted due to problems with accessibility and transport abilities. Communications, transportation, and governmental services operations would be impacted due to power failure and accessibility challenges.
Property, Facilities, and Infrastructure	Roads and bridges may be impacted, water and sewer systems may be damaged, leading to the issue of sanitation and waste collection. Property of homes and businesses may be completely destroyed if situated close to the failure point.
Impact on Environment	The impacts on the environment of critical infrastructure would vary based on the event. Failure of wastewater plants would result in spreading pollution and hazardous materials throughout the environment including large bodies of water. Ecosystems and natural habitats may be destroyed, causing migration or death of wildlife.

Table 166: Infrastructure Failure Consequence Analysis

Subject	Potential Impacts
Economic Conditions	Critical infrastructure failure would have a direct and considerable fiscal impact on the local government, however through federal disaster may be offset. Additionally, infrastructure failure in every sector has the potential to impact the ability of businesses to operate. If the private sector was not able to maintain operability, there would be continued revenue loss until operability was restored.
Public Confidence in Governance	Critical infrastructure failure would have a direct and immediate impact on the ability to provide governance, maintain order, and ensure the continuity of public services. Given a prolonged failure, the public would become increasingly distrustful of the government's abilities. Direct, immediate, and effective actions must be taken in order to maintain public confidence.

5.19.7 Future Development

Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Kansas Region D and the majority of participating jurisdictions have generally seen static to decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also initially slow and then decrease. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, is expected to increase the housing stock. However, adherence to building codes will provide any new construction a degree of hazard resiliency.

5.19.8 Hazard Planning Significance

Utilizing the above detailed formula for calculating the hazard planning significance for human caused and technological hazards, the following table details the rating of each criterion along with a composite rating:

Table 167: Infrastructure Failure Planning Significance

County	Probability	Magnitude	Warning Time	Duration	Score	Planning Significance
Clark County	2.5	2.0	4.0	2.5	2.6	Moderate
Finney County	2.5	2.0	4.0	2.5	2.6	Moderate
Ford County	2.5	2.0	4.0	2.5	2.6	Moderate
Gray County	2.5	2.0	4.0	2.5	2.6	Moderate
Haskell County	2.5	2.0	4.0	2.5	2.6	Moderate
Hodgeman County	2.5	2.0	4.0	2.5	2.6	Moderate
Lane County	2.5	2.0	4.0	2.5	2.6	Moderate
Meade County	2.5	2.0	4.0	2.5	2.6	Moderate
Seward County	2.5	2.0	4.0	2.5	2.6	Moderate

5.20 Terrorism

5.20.1 Hazard Description

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."

Terrorism is characterized by the use of violence, intimidation, or the threat of violence to instill fear, achieve political, religious, ideological, or social objectives, and disrupt the normal functioning of a society. It often involves acts of violence deliberately targeting civilians. Key elements and characteristics of terrorism include:

- **Political or Ideological Motivation:** Terrorism is often driven by political, religious, ideological, or social goals. Perpetrators seek to advance a particular agenda or bring about change in accordance with their beliefs.
- **Use of Violence:** Terrorism involves the use of violence, which can range from bombings, shootings, and kidnappings to cyberattacks and biological threats. The intent is to cause harm and instill fear.
- **Targeting Civilians:** Terrorist acts typically target civilians or non-combatants, rather than military or government personnel. This is done to maximize the psychological impact and create a sense of vulnerability within society.
- **Psychological Impact:** The primary objective of terrorism is to create fear and anxiety within the population. The fear generated by terrorist acts can have profound psychological and societal effects.
- **Non-State Actors:** Terrorism is often associated with non-state actors, such as terrorist organizations, extremist groups, or individuals acting independently. However, some state entities have also been accused of engaging in acts that meet the criteria of terrorism.
- **Symbolism:** Terrorist acts are often symbolic in nature, targeting specific locations, landmarks, or institutions that hold significance to the perpetrators or their cause.

Terrorism in the United States can take various forms, and the nature of terrorist threats has evolved over time. Common forms of terrorism in the United States include:

- **Domestic Terrorism:** Domestic terrorism involves acts of violence or intimidation committed by individuals or groups within the United States. These acts are typically driven by extremist ideologies, such as far-right extremism, far-left extremism, or other radical beliefs. Recent examples of domestic terrorism include attacks on religious institutions, acts of violence against minority communities, and violent protests.
- **Far-Right Extremism:** Far-right extremism refers to ideologies and movements characterized by extreme nationalism, racism, and opposition to government authority. Some far-right extremists have engaged in acts of violence targeting minority communities, government officials, or perceived enemies.
- **Far-Left Extremism:** Far-left extremism encompasses a range of radical ideologies, including anarchist and socialist beliefs. While not as prevalent as far-right extremism, far-left extremists have been involved in protests, clashes with law enforcement, and acts of violence.
- **Religiously Motivated Terrorism:** Religious extremism can lead to acts of terrorism. In the United States, this has included attacks by individuals or groups inspired by extremist interpretations of Islam, Christianity, or other religions.

- **Single-Actor Terrorism:** Lone-wolf terrorism involves individuals who carry out acts of violence without direct affiliation with established terrorist organizations. These individuals are often self-radicalized and may be inspired by online propaganda. Examples include the 1995 Oklahoma City bombing and the 2013 Boston Marathon bombing.
- **Eco-Terrorism:** Eco-terrorism refers to acts of violence or sabotage carried out in the name of environmental activism. These acts target industries or organizations perceived as harmful to the environment.
- **Cyberterrorism:** Cyberterrorism involves using computer technology to disrupt or damage critical infrastructure, institutions, or networks. While not as common as other forms of terrorism, cyberattacks pose significant risks. Cyberattacks by state-sponsored actors or independent hackers can target government agencies, corporations, and infrastructure.

The U.S. government, law enforcement agencies, and intelligence services actively monitor and address various forms of terrorism. Counterterrorism efforts include preventive measures, intelligence gathering, community engagement, and law enforcement actions. Public awareness, community outreach, and reporting suspicious activities also play a role in countering terrorism in the United States.

Whether mass shooting events (especially school shootings) are considered acts of terrorism can be a subject of debate and can vary depending on the specific circumstances and legal definitions in different jurisdictions. There is no standardized definition of a mass shooting. The United States Investigative Assistance for Violent Crimes Act defines a mass killing as three or more killings in a single incident while the Federal Bureau of Investigation defines a mass shooting as any incident in which at least four people were shot and killed. Mass shootings involve acts of violence carried out in public places, often by individuals who may have personal grievances, mental health issues, or other motivations not necessarily connected to a political or ideological agenda. While mass shootings are undoubtedly acts of violence that result in tragedy and loss of life, they may not always fit the traditional definition of terrorism, as the primary motivation is often not to advance a political or ideological cause. If the shooter's primary aim is to instill fear, advance a political agenda, or promote a particular ideology, it may be more likely to be classified as terrorism. However, if the shooter's motivation is primarily personal, such as a desire for revenge or mental health issues, the act may not be considered terrorism under many legal definitions.

5.20.2 – Location and Extent

All of Kansas Region D is vulnerable to terrorism, particularly in densely populated urban areas or crowded venues. However, it is nearly impossible to pinpoint the exact location of the next terrorist attack. Through information and intelligence sharing, public safety personnel at the local, state, and federal level help identify potential targets for terrorist activity. Although it is impossible to predict for certain where the next terrorist attack will take place, terrorists generally target large, crowded places, such as malls, parks, and other large public or social gatherings, in order to maximize damage. In addition, some acts of terror are conducted against critical infrastructure in an effort to weaken or cripple services such as transportation, communications, and electricity.

The extent of terrorism can vary significantly depending on a range of factors including the tactics, capabilities, and the effectiveness of counterterrorism efforts. Tactics employed may include bombings, firearm attacks, kidnappings, assassinations, cyberattacks, or a combination. The choice of targets, such as civilians, government institutions, religious sites, or critical infrastructure can also affect the extent of the terrorist threat. The extent of terrorism may also be influenced by public support or sympathy for extremist ideologies, as well as the recruitment and radicalization of individuals into terrorist organizations. Socio-economic factors, such as poverty, unemployment, and inequality, can contribute to the conditions conducive to terrorism.

The effectiveness of counterterrorism efforts by governments and international organizations can influence the extent of terrorism. Robust counterterrorism measures can disrupt terrorist networks and reduce the frequency and impact of attacks. Efforts to address terrorism typically involve a combination of security measures, intelligence sharing, diplomacy, counter-radicalization programs, and community engagement. Reducing the extent of terrorism often requires a multifaceted approach that addresses both the root causes and the immediate security threats associated with terrorism.

Discussions with the MPC and a review of all available data indicated a terrorism is a minor community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Clark County:** The small size and rural nature of all participating jurisdictions makes them unlikely target for a terrorism event. However, the ever-shifting nature or terrorism may change this analysis if operations and goals change.
- **Finney County:** The small size and rural nature of all participating jurisdictions makes them unlikely target for a terrorism event. However, the ever-shifting nature or terrorism may change this analysis if operations and goals change.
- **Ford County:** The small size and rural nature of all participating jurisdictions makes them unlikely target for a terrorism event. However, the ever-shifting nature or terrorism may change this analysis if operations and goals change.
- **Gray County:** The small size and rural nature of all participating jurisdictions makes them unlikely target for a terrorism event. However, the ever-shifting nature or terrorism may change this analysis if operations and goals change.
- **Haskell County:** The small size and rural nature of all participating jurisdictions makes them unlikely target for a terrorism event. However, the ever-shifting nature or terrorism may change this analysis if operations and goals change.
- **Hodgeman County:** The small size and rural nature of all participating jurisdictions makes them unlikely target for a terrorism event. However, the ever-shifting nature or terrorism may change this analysis if operations and goals change.
- **Lane County:** The small size and rural nature of all participating jurisdictions makes them unlikely target for a terrorism event. However, the ever-shifting nature or terrorism may change this analysis if operations and goals change.
- **Meade County:** The small size and rural nature of all participating jurisdictions makes them unlikely target for a terrorism event. However, the ever-shifting nature or terrorism may change this analysis if operations and goals change.
- **Seward County:** The small size and rural nature of all participating jurisdictions makes them unlikely target for a terrorism event. However, the ever-shifting nature or terrorism may change this analysis if operations and goals change.

5.20.3 Previous Occurrences

Although there has not been a terrorist attack in Kansas Region D, this does not reduce the significance of the threat. There have been numerous examples of terrorism that have occurred in the United States, and specifically terrorist events that have occurred in the region. Of note:

- Alfred P. Murrah Federal Building, Oklahoma City (1995), 168 killed.

5.20.4 Probability of Future Events

Assessing the probability of a terrorist attack in Kansas Region D involves complex analysis conducted by intelligence and law enforcement agencies such as the U.S. Department of Homeland Security, the Federal Bureau of Investigation, and the Kansas State Police. These agencies regularly provide threat assessments and security information to the public based on local, international, and geopolitical intelligence.

5.20.5 Projected Changes in Location, Intensity, Frequency, and Duration

Predicting the specific changes in the location, intensity, and frequency of terrorist events is highly changing due to the complex and dynamic nature of terrorism. Terrorism is influenced by a multitude of factors, including political, social, economic, and ideological considerations. Additionally, responses by governments, international cooperation, and evolving global dynamics contribute to the uncertainty surrounding future projections.

The increasing reliance on technology provides terrorists with new tools and methods for conducting attacks. Cyberterrorism can be used to disrupt critical infrastructure or compromise information systems may become more prevalent. Additionally, the use of online platforms for radicalization and recruitment purposes is a growing concern. Changes in the online landscape, social media platforms, and encryption methods can influence the reach and effectiveness of extremist propaganda.

Climate change can indirectly influence terrorism by exacerbating certain conditions that may contribute to the emergence and persistence of terrorist threats. While climate change itself does not directly cause terrorism, it can interact with other factors to create a more conducive environment for terrorist activities. Climate change can lead to resource scarcity, such as water and arable land shortages, which may intensify poverty. This scarcity can create conditions that extremist groups exploit. Additionally, climate-induced displacement and migration can result from events like sea-level rise, extreme weather events, and droughts. Displaced populations can become vulnerable to recruitment by extremist groups, as they may lack basic necessities and economic opportunities.

As previously noted, Kansas Region D facilities have seen no major changes in the past five years, with only modest repairs and upgrades being conducted and no major rehabilitation or construction projects completed. As such, the risk to jurisdictional facilities has remained static since the completion of the last LHMP.

5.20.6 Vulnerability and Impact

FEMA NRI

The FEMA NRI does not provide a rating for the terrorism hazard.

Scenario Based Assessment

In general, 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. The following hypothetical scenario, using the Electronic Mass Casualty Assessment and Planning Scenarios developed by Johns Hopkins University, provides an estimated impact of a potential terrorism event.

> **Scenario: Improvised Explosive Device**
>
> **Event:** A van transported improvised explosive device utilizing an ammonium nitrate/fuel oil mixture is detonated in the parking area of a stadium as people are entering. 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 one 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, and the falling glass hazard distance is estimated at 600 feet according to the Bureau of Alcohol, Tobacco, Firearms and Explosives Standards. In this event, damage would occur to vehicles, and depending on the proximity of other structures, damage 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 168: 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

Population

Terrorism can have profound and far-reaching impacts on individuals and communities. These effects can be physical, psychological, social, and economic, and may include:

- **Loss of Life and Injury:** Terrorism often results in the loss of innocent lives and injuries to survivors. Victims may suffer physical trauma, disabilities, and long-term health issues.
- **Psychological Trauma:** Many survivors of terrorist attacks and witnesses may experience Post-Traumatic Stress Disorder, characterized by flashbacks, nightmares, anxiety, and emotional distress. Children and young people may be particularly vulnerable to the psychological effects of terrorism, which can impact their emotional and cognitive development.
- **Anxiety and Depression:** Terrorism can lead to increased anxiety and depression in affected individuals and communities.
- **Grief and Loss:** Those who lose loved ones in terrorist attacks may experience profound grief and loss, which can be long-lasting.

Terrorism can disrupt social structures and community cohesion, leading to feelings of insecurity and mistrust. Fear of future attacks may limit social activities and interactions, impacting the quality of life. Some terrorist attacks, such as bombings, can result in displacement and homelessness for those affected, leading to housing instability and further psychological stress. People may alter their daily routines, travel plans, or social activities due to fear of further attacks. This can impact personal freedom and quality of life.

Buildings and Structures

Critical infrastructure is often high-value and high-impact, making it an attractive target for terrorists looking to cause disruption, economic damage, and fear. Many critical infrastructure sectors are interconnected, so an attack on one sector can have cascading effects on others. For example, an attack on the power grid can impact telecommunications and transportation. Compounding the issue, certain critical infrastructure facilities are accessible to the public or located in urban areas, making them vulnerable to physical attacks, such as bombings or shootings. Specific impacts on critical infrastructure may include:

- **Disruption of Operations:** Attacks can disrupt the normal operations of critical facilities, including hospitals, emergency response centers, data centers, and transportation hubs.
- **Economic Disruption:** Attacks can lead to significant economic disruption, including damage to facilities, loss of productivity, and increased operational costs.
- **Public Safety:** Attacks on certain critical infrastructure, such as transportation hubs or healthcare facilities, can pose immediate risks to public safety, leading to injuries and loss of life.

- **Disruption of Services:** Infrastructure attacks can result in service disruptions, including power outages, water supply interruptions, and communication breakdowns.
- **Healthcare Impact:** Attacks on healthcare infrastructure, like hospitals, can limit access to medical care during emergencies, potentially leading to higher casualties.

Governmental Operations

Terrorism can have significant impacts on governmental operations. These impacts can vary depending on the nature and scale of terrorist attacks, the level of preparedness and response, and the specific vulnerabilities, and may include:

- **Security and Law Enforcement:** An attack would lead to an increased demand on law enforcement agencies to prevent, investigate, and respond to terrorist threats and incidents. Allocation of significant resources to counterterrorism efforts would stretch resources.
- **Emergency Response:** Local emergency management agencies, in conjunction with state and federal agencies, would need to activate emergency response and management systems to coordinate response. A long-term activation could strain resources and personnel. Additionally, responders may be vulnerable to secondary devices or attacks.
- **Public Services:** An attack could lead to the disruption of public services, such as transportation, utilities, and public spaces, due to security concerns.
- **Economic Impact:** Negative economic consequences, including damage to businesses, loss of investor confidence, and reduced tourism and foreign investment can occur.
- **Surveillance and Privacy Concerns:** Expansion of surveillance capabilities may result in concerns about potential violations of privacy rights.
- **Impact on Government Operations:** An attack would likely cause the disruption of government functions, including closures of government offices and facilities.
- **Psychological Impact on Government Officials:** Psychological stress and burnout among government officials and first responders involved in counterterrorism efforts.
- **Public Opinion and Confidence:** Fluctuations in public opinion and confidence in the government's ability to provide security and protect citizens would occur.

Transportation and Electrical Infrastructure

Depending on the nature of the event, terrorism would be expected to have minimal impacts on transportation and electric systems with the exception of possible short or long-term system disruption.

Water and Wastewater Utilities

Depending on the nature of the event, terrorism would be expected to have minimal impacts on water and wastewater systems.

Medical and Response Facilities

Terrorism can have significant impacts on medical and response facilities and operations. These impacts can vary depending on the nature and scale of terrorist attacks, the level of preparedness and response, and the specific vulnerabilities, and may include:

- **Medical System Overload:** Depending on the nature of the event, an attack could quickly overwhelm response and medical operations and facilities.
- **Security and Law Enforcement:** An attack would lead to an increased demand on law enforcement agencies to prevent, investigate, and respond to terrorist threats and incidents. Allocation of significant resources to counterterrorism efforts would stretch resources.

- **Emergency Response:** Local emergency management agencies, in conjunction with state and federal agencies, would need to activate emergency response and management systems to coordinate response. A long-term activation could strain resources and personnel. Additionally, responders may be vulnerable to secondary devices or attacks.

Educational Facilities
Depending on the educational facility capability and location, a terrorism event may necessitate the closure of the facility for the duration of the event. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

- **School Closures:** Terrorism events can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems
Depending on the nature of the event, terrorism can have significant impacts on communication systems. The specific impacts can vary depending on the type of utility affected, the duration of the outage, and the criticality of the infrastructure, and may include:

- **Loss of Communication:** A terrorism event can overload or disrupt communication systems, affecting the ability of critical facilities to coordinate responses and communicate with staff and the public.

Environmental and Agricultural Impacts
Depending on the nature of the event, a terrorist attack would have little effect on the environment.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Finney County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Ford County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Gray County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Haskell County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Hodgeman County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Lane County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Meade County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.
- **Seward County:** Due to limited local and regional response capabilities, and the potentially long time required to receive outside aid, this hazard remains a concern for all participating jurisdictions.

Cascading Impacts
Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with severe weather may include:

- School closures
- Daily life disruptions
- Transportation infrastructure disruption
- Power outages and electrical grid disruption
- Transportation and supply chain disruptions
- Economic impacts and business closures

Consequence Analysis
This consequence analysis lists the potential impacts of a hazard on various elements of community and jurisdictional infrastructure. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 169: Terrorism Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Terrorist activities including bombings, kidnappings, shootings, and hijackings could cause considerable injury and death. An attack could kill and injure hundreds to thousands of people, which could overwhelm hospitals.
Impact on Responders	Attacks can create a dangerous environment and significant challenges for first responders, who may have to manage the evacuation of people, close areas, operate shelters, and take care of the injured. First responders may be a direct target of terrorism themselves from a secondary attack during response activities. Equipment may also be damaged or destroyed, which may lead to a decrease in response capabilities.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. A terrorist event may impact an agency's ability to maintain operations due to the potential to cause a significant injury to staff or impede travel.
Delivery of Services	The ability to deliver services can be impacted depending on the characteristics of the attack. Roadway and bridge closures may be required, as well as transit service disruptions. Businesses and places of commerce may completely shut down, which leads to the disruption of goods and services.
Property, Facilities, and Infrastructure	Transportation, governmental operations, and infrastructure facilities may be disrupted both directly and indirectly. Roads and bridges may be impacted if explosive devices are utilized in the attack. Access to homes and critical facilities such as hospitals, schools, and supermarkets may be impossible. If power loss occurs following an attack, it may lead to disruption of critical infrastructure and technology.
Impact on Environment	Terrorist attacks involving bombings and arson pose considerable negative impacts to the environment in the form of smoke and destruction of vegetation. A terrorist attack utilizing chemical, nuclear, and biological weapons pose a significantly higher risk to the environment by causing pollution, damaging sewer and wastewater treatment plants; or disturbing or killing wildlife, and adversely affecting nature preserves.
Economic Conditions	Local, county, and state resources may be severely depleted during a terrorist attack response. Private businesses may not be able to maintain operations during or after an incident if they are impacted, which would impact the economy.

Table 169: Terrorism Consequence Analysis

Subject	Potential Impacts
Public Confidence in Governance	If government employees or facilities are targeted directly by terrorism, it will have a significant impact on the ability to govern. The public's confidence in governance is affected by immediate response through direct and effective actions. Efficiency in response and recovery operations is critical in keeping public confidence.

5.20.7 Future Development

Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Kansas Region D and the majority of participating jurisdictions have generally seen static to decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also initially slow and then decrease. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast, is expected to increase the housing stock. However, adherence to building codes will provide any new construction a degree of hazard resiliency.

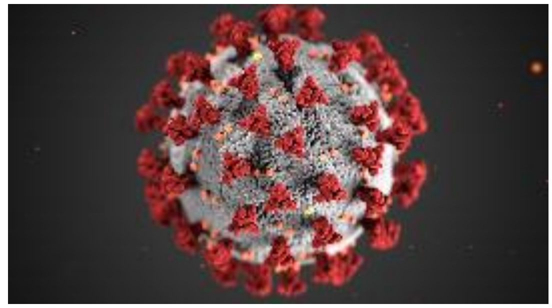
5.20.8 Hazard Planning Significance

Utilizing the above detailed formula for calculating the hazard planning significance for human caused and technological hazards, the following table details the rating of each criterion along with a composite rating:

Table 170: Terrorism Planning Significance

County	Probability	Magnitude	Warning Time	Duration	Score	Planning Significance
Clark County	1.0	2.0	4.0	1.0	1.8	Low
Finney County	1.0	2.0	4.0	1.0	1.8	Low
Ford County	1.0	2.0	4.0	1.0	1.8	Low
Gray County	1.0	2.0	4.0	1.0	1.8	Low
Haskell County	1.0	2.0	4.0	1.0	1.8	Low
Hodgeman County	1.0	2.0	4.0	1.0	1.8	Low
Lane County	1.0	2.0	4.0	1.0	1.8	Low
Meade County	1.0	2.0	4.0	1.0	1.8	Low
Seward County	1.0	2.0	4.0	1.0	1.8	Low

5.21 Transmissible Disease



5.21.1 Hazard Description

A transmissible disease, also known as a communicable or infectious disease, is a type of illness caused by pathogens (such as bacteria, viruses, fungi, or parasites) that can be transmitted from one person or organism to another, directly or indirectly. These diseases can spread through various means, including person-to-person contact, respiratory droplets, contaminated food or water, vectors like mosquitoes, or contact with infected animals.

Transmissible diseases are characterized by their ability to pass from an infected individual to a susceptible host, leading to new cases of the disease. The transmission can occur through various routes, depending on the specific pathogen and the mode of transmission it utilizes. Examples of transmissible diseases include:

- **Influenza:** The flu is caused by influenza viruses and can spread through respiratory droplets when an infected person coughs or sneezes.
- **West Nile Virus:** A mosquito-borne virus that can cause a range of illnesses in humans, from mild febrile symptoms to severe neurological disease. It is primarily transmitted to humans through the bite of infected mosquitoes.
- **Malaria:** Malaria is caused by Plasmodium parasites and is transmitted through the bite of infected female Anopheles mosquitoes.
- **Salmonella Infection:** This bacterial infection is often contracted through the consumption of contaminated food or water and can lead to gastrointestinal symptoms.
- **Tuberculosis:** Tuberculosis is caused by Mycobacterium tuberculosis and can be transmitted through the inhalation of respiratory droplets from an infected person with an active disease.
- **Measles:** Measles is caused by the measles virus and spreads through respiratory droplets, making it highly contagious.

Of particular concern are novel transmissible diseases. This is a disease that is caused by a pathogen (such as a virus, bacterium, or other microorganism) that is newly recognized in a human population or is increasing in incidence or geographic range. These diseases are termed novel because they have not been previously identified or have not been known to affect humans in the past. Several factors can contribute to the emergence of novel transmissible diseases, including changes in human behavior, urbanization, deforestation, climate change, global travel, and the encroachment of humans into natural habitats. Defining characteristics of novel transmissible diseases: include

- **New Pathogen or Strain:** Novel transmissible diseases often involve a pathogen or strain of a pathogen that is new to humans. This may result from genetic mutations, cross-species transmission (zoonotic diseases), or the introduction of a pathogen to a new geographic area.
- **Human Transmission:** These diseases have the potential to spread from person to person, either through direct contact, respiratory droplets, contaminated surfaces, or other modes of transmission.
- **Challenges in Control:** Because these diseases are new and may have limited prior immunity in the population, they can pose challenges for public health authorities in terms of surveillance, diagnosis, treatment, and containment.

Novel transmissible diseases can have pandemic potential, meaning they can spread globally and affect a large portion of the world's population. Dealing with novel transmissible diseases requires a multi-pronged approach, including surveillance, early detection, containment measures, public health interventions, and research to understand the pathogen and develop effective countermeasures. It also underscores the importance of preparedness and global cooperation in responding to emerging infectious diseases.

5.21.2 – Location and Extent

Kansas Region D's geographic and demographic characteristics make it vulnerable to the spread of transmissible diseases. The extent of a transmissible disease can vary widely depending on several factors, including:

- **Pathogen Characteristics:** The biological properties of the infectious agent, such as its mode of transmission, incubation period, and virulence, play a significant role. Pathogens that are highly contagious and have a short incubation period are more likely to spread rapidly.
- **Human Behavior:** Human behavior and practices, such as hygiene, travel, and social interactions, can influence the extent of disease spread. For example, frequent travel and close interpersonal contact can facilitate the rapid transmission of infectious diseases.
- **Public Health Measures:** The effectiveness of public health measures, such as quarantine, isolation, contact tracing, and vaccination, can limit the extent of disease spread. Prompt and coordinated public health responses can be crucial.
- **Geographic Factors:** The geographic spread of a disease can be influenced by factors like population density, climate, and geographic barriers. Dense urban areas may experience more rapid transmission, while isolated or remote regions may be less affected.
- **Healthcare Infrastructure:** The capacity of healthcare systems to detect, treat, and isolate cases can impact the extent of an outbreak. Overwhelmed healthcare systems can lead to a larger extent of disease.
- **Pre-Existing Immunity:** If a portion of the population has pre-existing immunity to the disease, either due to prior exposure or vaccination, this can limit the extent of disease transmission.
- **Global Travel:** In an era of global travel, novel infectious diseases can quickly cross international borders, affecting multiple countries and regions.
- **Vaccination:** The availability and coverage of vaccines against the disease can significantly reduce the extent of an outbreak. High vaccination rates create herd immunity, protecting even those who are not vaccinated.
- **Mutation and Variants:** Some infectious agents may undergo mutations that affect their transmissibility or virulence. New variants can lead to changes in the extent and severity of the disease.
- **Public Awareness and Compliance:** Public awareness of the disease, willingness to follow public health guidance, and compliance with preventive measures can affect disease transmission rates.
- **Timeliness of Response:** The speed with which authorities and healthcare systems respond to an outbreak can have a substantial impact. Rapid detection and containment efforts can limit the extent of spread.

The extent of a transmissible disease can range from localized outbreaks that are quickly contained to global pandemics that affect large populations across multiple countries. The management of such diseases requires a combination of robust surveillance, effective public health interventions, research, and international collaboration to minimize their impact on human health and society.

Discussions with the MPC and a review of all available data indicated a transmissible disease is a community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

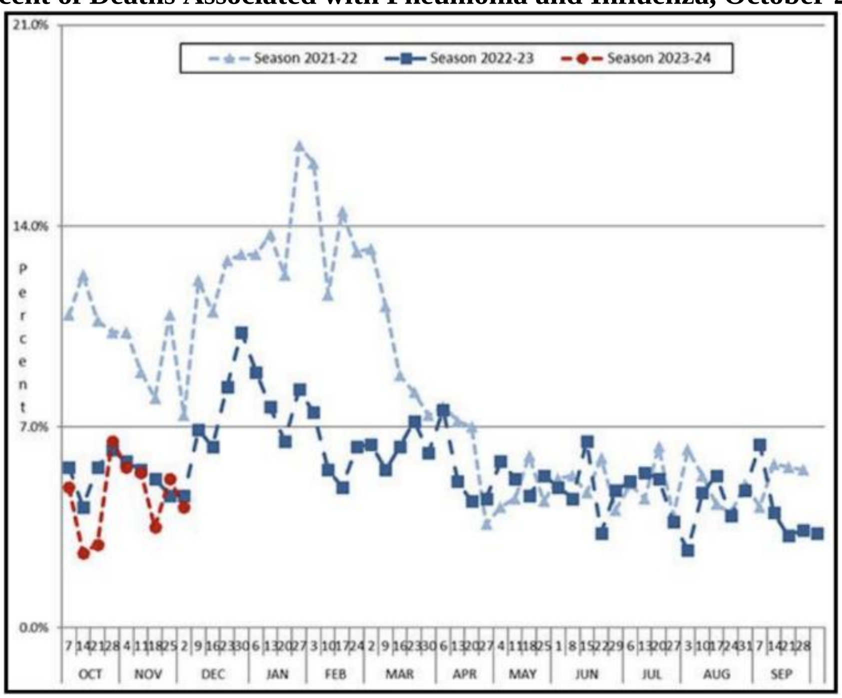
- **Clark County:** The small population and rural nature of all participating jurisdictions make the rapid spread of a transmissible disease less likely. However, limited medical facilities increase concern.
- **Finney County:** The small population and rural nature of all participating jurisdictions make the rapid spread of a transmissible disease less likely. However, limited medical facilities increase concern.
- **Ford County:** The small population and rural nature of all participating jurisdictions make the rapid spread of a transmissible disease less likely. However, limited medical facilities increase concern.

- **Gray County:** The small population and rural nature of all participating jurisdictions make the rapid spread of a transmissible disease less likely. However, limited medical facilities increase concern.
- **Haskell County:** The small population and rural nature of all participating jurisdictions make the rapid spread of a transmissible disease less likely. However, limited medical facilities increase concern.
- **Hodgeman County:** The small population and rural nature of all participating jurisdictions make the rapid spread of a transmissible disease less likely. However, limited medical facilities increase concern.
- **Lane County:** The small population and rural nature of all participating jurisdictions make the rapid spread of a transmissible disease less likely. However, limited medical facilities increase concern.
- **Meade County:** The small population and rural nature of all participating jurisdictions make the rapid spread of a transmissible disease less likely. However, limited medical facilities increase concern.
- **Seward County:** The small population and rural nature of all participating jurisdictions make the rapid spread of a transmissible disease less likely. However, limited medical facilities increase concern.

5.21.3 Previous Occurrences

One of the most common transmissible diseases within the Kansas Region D is Influenza. Influenza, commonly known as the flu, is a contagious respiratory illness caused by influenza viruses. It can affect humans, birds, and other animals. Influenza viruses are classified into types A, B, C, and D, with types A and B being the most common in humans and responsible for seasonal flu outbreaks. The following graph details deaths for the state from 2021 through 2023:

Graph 27: Percent of Deaths Associated with Pneumonia and Influenza, October 2020 to Present



Source: Kansas Department of Health and Environment

The most notable recent novel infectious disease to strike Kansas Region D is COVID-19, also known as Coronavirus Disease 2019. Covid-19 is an infectious respiratory illness caused by a novel coronavirus known as SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2). It was first identified in December 2019 in the city of Wuhan, China, and spread globally leading to a pandemic. COVID-19 primarily spreads from person to person through respiratory droplets when an infected person coughs, sneezes, talks, or breathes. It can also spread by touching surfaces contaminated with the virus and then touching the face. Symptoms can range from mild to severe and may include fever, cough, shortness of breath, fatigue, muscle aches, loss of taste or smell, sore throat, congestion, and gastrointestinal symptoms like diarrhea. Some individuals may remain asymptomatic, meaning they carry the virus without displaying symptoms. While many people with COVID-19 experience mild to moderate symptoms and recover without hospitalization, the disease can be severe, especially among older adults and individuals with underlying health conditions. Severe cases can lead to pneumonia, acute respiratory distress syndrome, organ failure, and death. Available data from the Kansas Department of Health and Environment indicates the following for COVID-19 for Kansas:

- 946,56 cases
- 10,229 deaths

COVID-19 has had a profound impact on public health, economy, and daily life across Kansas Region D. Some of the key measures taken in Kansas Region D in response to the COVID-19 pandemic include:

- **Public Health Measures:** Kansas implemented various public health measures to slow the spread of the virus. These included stay-at-home orders, mask mandates, social distancing guidelines, and limits on gathering sizes.
- **Testing and Contact Tracing:** Kansas established testing sites and conducted contact tracing to identify and isolate individuals who had been exposed to the virus. Testing was widely available to the public.
- **Vaccination Efforts:** Kansas launched vaccination campaigns to administer COVID-19 vaccines to eligible residents. Mass vaccination sites, healthcare providers, and pharmacies played a role in the distribution of vaccines.
- **School Closures and Remote Learning:** Like many other states, Kansas Region D temporarily closed schools and shifted to remote learning to minimize the risk of virus transmission among students and staff.
- **Travel and Quarantine Measures:** Kansas issued travel advisories and quarantine requirements for travelers coming into the state, especially from areas with high infection rates.
- **Mask Mandates and Social Distancing:** Face mask mandates and social distancing measures were enforced in indoor public spaces and in situations where social distancing was not possible.

Additionally, COVID-19 had numerous, and oftentimes severe impacts on Kansas Region D, including:

- **Economic Repercussion:** Job losses, business closures, and economic strain on individuals and families were common within the Kansas Region D. Kansas, like other states, implemented economic relief measures.
- **Healthcare System Overload:** Hospitals and healthcare facilities in Kansas Region D worked to increase capacity to treat COVID-19 patients. There were efforts to secure additional medical supplies and equipment.
- **Protection of Vulnerable Populations:** Efforts were made to protect vulnerable populations, including the elderly and those with underlying health conditions, who were at higher risk of severe illness from COVID-19.
- **Educational Impact:** The pandemic disrupted education, with students and teachers adapting to remote learning. Schools implemented safety measures upon reopening.

The response to COVID-19 evolved as more information became available, and measures were adjusted based on the changing circumstances of the pandemic. Kansas Region D worked to balance public health concerns with the economic and social well-being of its residents. The state and region's response were guided by recommendations from health experts from the Centers for Disease Control.

5.21.4 Probability of Future Events

While it is impossible to predict with certainty when or if a transmissible disease outbreak will occur, the probability of occurrence can be estimated based on historical patterns and current global conditions. Factors to consider include:

- **Globalization:** Increased global travel and trade can facilitate the rapid spread of infectious diseases. The interconnectedness of the world means that a disease can quickly cross borders, increasing the risk of a pandemic.

- **Vaccine Coverage:** The level of vaccination coverage against preventable diseases can impact the likelihood of pandemics. Low vaccine coverage can lead to outbreaks that have pandemic potential.
- **Public Health Preparedness:** The readiness of healthcare systems, public health agencies, and governments to respond to outbreaks is crucial. Adequate preparedness can help contain outbreaks before they become pandemics.
- **Surveillance and Early Detection:** Improved surveillance systems and early detection mechanisms can help identify and contain outbreaks before they escalate to pandemics.
- **Scientific Advancements:** Advances in science and technology, such as the rapid development of vaccines and treatments, can influence our ability to respond to emerging infectious diseases.
- **Behavioral Factors:** Human behavior, including adherence to preventive measures like handwashing, mask-wearing, and vaccination, plays a role in disease transmission. Public health campaigns can influence behavior.
- **Climate Change:** Environmental changes driven by climate change can alter the geographic distribution of diseases and the behavior of vectors (like mosquitoes). This can affect disease transmission patterns and increase the risk of outbreaks.
- **Agriculture and Farming Practices:** The way animals are raised and farmed can impact the risk of zoonotic diseases, which are diseases transmitted from animals to humans. The probability of another pandemic is influenced by the frequency of spillover events (when a pathogen jumps from animals to humans). Factors like deforestation, urbanization, and increased contact with wildlife can contribute to these events.

Transmissible disease outbreaks can vary in their impact, and public health measures can mitigate their effects. Governments, international organizations, and scientists continuously monitor and assess the risk of transmissible diseases and work to improve preparedness and response capabilities.
In order to prevent the rapid spreads of transmissible diseases, the Kansas Department of Health and Environment tracks occurrences of the following diseases and conditions:

- Acute flaccid myelitis
- Anthrax
- Anaplasmosis
- Arboviral disease, neuroinvasive and nonneuroinvasive (including chikungunya virus, dengue virus, La Crosse, West Nile virus, and Zika virus)
- Babesiosis
- Botulism
- Brucellosis
- Campylobacteriosis
- Candida auris
- Carbapenem-resistant bacterial infection or colonization
- Chancroid
- Chickenpox (varicella)
- Chlamydia trachomatis infection
- Cholera
- Coccidioidomycosis
- Cryptosporidiosis
- Cyclosporiasis
- Diphtheria
- Ehrlichiosis
- Giardiasis

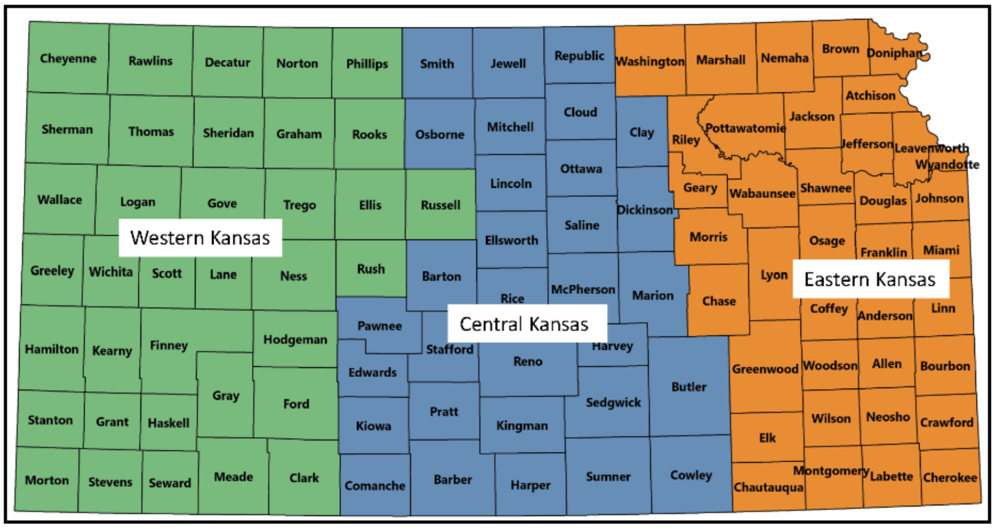
- Gonorrhea (include antibiotic susceptibility results, if performed)
- Haemophilus influenzae, invasive disease
- Hansen’s disease (leprosy)
- Hantavirus
- Hemolytic uremic syndrome, post-diarrheal
- Hepatitis, viral (A, B, C, D, and E, acute and chronic)
- Histoplasmosis
- Human Immunodeficiency Virus (HIV) (
- Leptospirosis
- Influenza, novel A virus infection
- Legionellosis
- Listeriosis
- Lyme disease
- Malaria
- Measles (rubeola)
- Meningococcal disease
- Mumps
- Pertussis (whooping cough)
- Plague (Yersinia pestis)
- Poliovirus
- Psittacosis
- Q Fever (Coxiella burnetii, acute and chronic)
- Rabies
- Rubella
- Salmonellosis, including typhoid fever
- Severe Acute Respiratory Syndrome-associated coronavirus (SARS-CoV)
- Shiga toxin-producing Escherichia coli
- Shigellosis
- Smallpox
- Spotted fever rickettsiosis
- Streptococcus pneumoniae, invasive disease
- Syphilis, all stages, including congenital syphilis
- Tetanus
- Toxic shock syndrome, streptococcal and other
- Transmissible spongioform encephalopathy or prion disease
- Trichinellosis or trichinosis
- Tuberculosis
- Tularemia, including laboratory exposures
- Vancomycin-intermediate and resistant Staphylococcus aureus
- Vibriosis (all cholerae and non-cholerae Vibrio species)
- Viral hemorrhagic fevers
- Yellow fever

Kansas Region D Health Departments report all nationally notifiable conditions to the Centers for Disease Control using the National Electronic Disease Surveillance System to allow for rapid and appropriate response.

The Kansas Department of Health and Environment Field Epidemiology Services Program provides trained field epidemiologists to support epidemiological activities of local health departments. Field epidemiologists are the boots on the ground regionally for the state health department and serve as a liaison between the local health departments and the Kansas Department of Health and Environment. The four primary areas of support include:

- Investigation of complex or unusual infectious disease cases and large or complicated outbreaks
- Reporting and surveillance for reportable diseases
- Data analysis and reporting
- Public health training and education

Map 79: Kansas Department of Health and Environment Field Epidemiology Services Program Regions



Source: Kansas Department of Health and Environment

5.21.5 Projected Changes in Location, Intensity, Frequency, and Duration

A continued increase in international travel, both to and from Kansas, may increase the spread of infectious disease. The movement of people across diverse geographical regions brings together individuals with different immunological profiles. This mingling creates opportunities for the emergence of novel pathogens or the introduction of diseases into populations with limited immunity.

Climate change can have several impacts on the emergence and spread of transmissible diseases. While the relationship between climate change and transmissible diseases is complex, there are several ways in which climate change can influence disease dynamics including:

- **Altered Disease Transmission Patterns in Vector-Borne Diseases:** Climate change can affect the distribution and behavior of disease vectors (mosquitoes and ticks) by influencing temperature and precipitation patterns. This can lead to the expansion of diseases like malaria, dengue fever, and Lyme disease into new geographic areas.
- **Extended Transmission Seasons:** Rising temperatures can lengthen the transmission seasons for certain diseases, allowing them to be active for a more extended period each year.
- Changes in Pathogen Survival: Some pathogens can survive longer in warmer and wetter conditions. This can affect the persistence of infectious agents in the environment.

- **Increased Risk of Zoonotic Diseases:** Climate change can disrupt ecosystems and alter the habitats and migration patterns of wildlife. This can lead to increased interactions between humans, domestic animals, and wildlife, potentially facilitating the transmission of zoonotic diseases (diseases that originate in animals) to humans.
- **Weakened Immune Response:** Climate-related stressors, such as extreme heat events, can weaken the immune systems of vulnerable populations, making them more susceptible to infectious diseases.

To mitigate the impacts of climate change, public health measures, adaptation strategies, and international cooperation are essential, and may include:

- Strengthening disease surveillance systems to monitor changing disease patterns.
- Implementing vector control measures in areas at risk of vector-borne diseases.
- Enhancing healthcare infrastructure resilience to climate-related disasters.
- Promoting climate-resilient agricultural practices to ensure food security.
- Supporting research on the links between climate change and infectious diseases.
- Raising awareness and educating communities about the risks and preventive measures.

5.21.6 Vulnerability and Impact

FEMA NRI

The FEMA NRI does not provide a rating for the terrorism hazard.

Population

People can be vulnerable to transmissible diseases due to various factors that influence their susceptibility to infection and the potential severity of illness. These vulnerabilities can be influenced by individual, societal, and environmental factors, and may include:

- **Lack of Immunity:** Many transmissible diseases are ones that people have little to no immunity to.
- **Vaccination Status:** Vaccination can provide immunity against certain diseases. People who are not vaccinated or have not received booster shots may be more vulnerable.
- **Age:** Infants, young children, and the elderly often have weaker immune systems, making them more susceptible to infections and complications.
- **Underlying Health Conditions:** Individuals with underlying health conditions, such as immunodeficiency disorders, chronic diseases, or respiratory conditions, may be more vulnerable to severe illness.
- **Medication and Treatment Availability:** The availability of medications or treatments specific to the disease can impact vulnerability. Rapid access to appropriate treatments can be lifesaving.
- **Population Density:** Highly populated areas can facilitate the rapid spread of diseases, making people in densely populated regions more vulnerable.
- **Sanitation and Hygiene:** Poor sanitation and hygiene practices can increase the risk of disease transmission. Access to clean water and sanitation facilities is crucial for reducing vulnerability.
- **Access to Healthcare:** The availability and accessibility of healthcare services, including diagnostic testing and medical treatment, can significantly impact the outcome of a novel transmissible disease.
- **Public Awareness:** People who are unaware of the risks associated with a novel transmissible disease or who do not know how to protect themselves may be more vulnerable.
- **Behavioral Factors:** People's behavior, such as adherence to public health guidelines (e.g., handwashing, wearing masks), can influence vulnerability.
- **Fear and Panic:** Fear and panic can hinder effective responses, potentially increasing vulnerability.

- **Access to Information:** Timely and accurate information can empower individuals to take protective measures. Lack of information or misinformation can increase vulnerability.

The spread of a transmissible disease can have severe and far-reaching impacts on human health and society, and can include:

- **Illness and Death:** The most immediate impact is the potential for widespread illness and death. Depending on the disease, the severity of illness can range from mild to life-threatening.
- **Healthcare Overload:** A rapidly spreading disease can quickly overwhelm healthcare systems, leading to shortages of medical supplies, hospital beds, and healthcare personnel. The ability to provide timely medical care may be compromised.
- **Social Disruption:** Social disruption can occur due to isolation and quarantine measures, as well as the need for social distancing. Schools, businesses, and public gatherings may be canceled or limited, affecting daily life and routines.
- **Psychological Trauma:** Survivors of a transmissible disease may experience long-lasting psychological trauma due to the fear of infection, the loss of loved ones, and the overall trauma of the event.
- **Long-Term Health Effects:** Some diseases can cause long-term health effects in survivors, including chronic illnesses and disabilities.

It is important to note that public health agencies and emergency responders work to minimize vulnerabilities by implementing preventive measures, conducting public awareness campaigns, and having response plans in place. Preparedness efforts, including vaccination programs, stockpiling of medical supplies, and coordination among healthcare providers, are critical for reducing vulnerabilities.

The direct risk or vulnerability to property and critical facilities from a transmissible disease is generally limited. While unlikely, transmissible diseases could possibly be moved through a facility's ventilation system. An incident like this would not pose a direct risk to the structure's integrity; however, considerable contamination of the facility may occur, requiring decontamination and potential loss of access to the building for a considerable length of time. Critical facilities and infrastructure generally will not suffer direct impacts from a novel transmissible disease event. Employee absenteeism could indirectly impact the ability for a critical facility to operate. Without necessary operators, critical infrastructure may be susceptible to indirect failure.

Zoonotic diseases are infections that can be transmitted between animals and humans. These diseases can have significant impacts on both human and animal populations, as well as broader environmental consequences. Some diseases have caused significant declines and extinctions in affected species and can infect domesticated animals, leading to economic losses in the agricultural sector. Diseases like avian influenza and foot-and-mouth disease can result in culling of livestock to prevent disease spread. Zoonotic diseases can also influence the health and dynamics of ecosystems. Changes in wildlife populations due to disease can have cascading effects on biodiversity and ecosystem function.

The rapid spread of a transmissible disease can have wide-ranging impacts on governmental operations, affecting functions and public safety. These impacts can disrupt government operations, strain resources, and pose challenges to maintaining public order, and can include:

- **Emergency Response and Healthcare:** Kansas Region D would need to rapidly mobilize emergency response teams, medical personnel, and healthcare facilities. The surge in demand for medical resources can strain healthcare systems, including hospitals, clinics, and emergency services.

- **Public Health Services:** County health departments would play a critical role in disease surveillance, contact tracing, and public health messaging. A transmissible disease could require additional personnel and resources to manage the outbreak.
- **Resource Allocation:** County health departments may need to help allocate resources for medical supplies, pharmaceuticals, personal protective equipment, and vaccine distribution. Competition for limited resources can lead to shortages and increased costs.
- **Transportation and Supply Chain Disruption:** Quarantine measures, travel restrictions, and supply chain disruptions can affect the movement of essential goods and services, including medical supplies, food, and fuel.
- **Economic Impact:** The economic consequences of a transmissible disease can be severe. Business closures, reduced consumer confidence, and trade disruptions can lead to financial losses, unemployment, and economic instability.
- **Education Disruption:** School closures and disruptions to education can affect students' learning and parental work arrangements, leading to social and economic consequences.
- **Public Services:** Essential public services, such as law enforcement, fire services, and sanitation, may be stretched thin due to the demands of responding to the outbreak.
- **Social Distancing and Isolation Measures:** Government directives for social distancing, isolation, and quarantine can impact daily life, social interactions, and public gatherings. The enforcement of such measures can be challenging.
- **Psychological and Societal Impact:** Fear and anxiety can spread rapidly during disease transmission, affecting public morale and mental health. Disinformation and rumors can compound these psychological impacts.

Buildings and Structures
Impacts would be expected to be minor, with potential facility closure or limited access.
Governmental Operations
Impacts would be expected to be minor, with closure or limited and remote operations impacting community needs. A potential loss of revenue due to decreased spending.

Transportation and Electrical Infrastructure
Depending on the nature of the event, a transmissible disease event would be expected to have minimal impacts on transportation and electric systems.

Water and Wastewater Utilities
Depending on the nature of the event, a transmissible disease event would be expected to have minimal impacts on water and wastewater systems.

Medical and Response Facilities
A transmissible disease can have significant impacts on medical and response facilities and operations. These impacts can vary depending on the nature of the event, the level of preparedness and response, and the specific vulnerabilities, and may include:

- **Medical System Overload:** Depending on the nature of the event, a transmissible could quickly overwhelm response and medical operations and facilities.
- **Medical Response:** Depending on the nature of the event, a transmissible could quickly cause the cessation of medical response due to infection concerns.
- **Mortuary System Overload:** Depending on the nature of the event, a transmissible could quickly cause the overload and cessation of all mortuary services due to infection concerns and supply chain concerns.
- **Supply Chain Disruptions:** Depending on the nature of the event, a transmissible disease could quickly cause the exhaustion of disposal medical materials (personal protective equipment) and the exhaustion of medications

and supplies for both medical and medical response operations A potentially restricted supply chain would compound these issues.

Educational Facilities
Depending on the educational facility capability and location, a transmissible disease event may necessitate the closure of the facility for the duration of the event. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

- **School Closures:** Transmissible disease events can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems
Depending on the nature of the event, a transmissible disease event would be expected to have minimal impacts on communications systems.

Environmental and Agricultural Impacts
Depending on the nature of the event, a transmissible disease event would have little effect on the environment.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Clark County:** Due to limited local and regional medical and medical response capabilities, and potentially limited outside aid, this hazard remains a concern for all participating jurisdictions.
- **Finney County:** Due to limited local and regional medical and medical response capabilities, and potentially limited outside aid, this hazard remains a concern for all participating jurisdictions.
- **Ford County:** Due to limited local and regional medical and medical response capabilities, and potentially limited outside aid, this hazard remains a concern for all participating jurisdictions.
- **Gray County:** Due to limited local and regional medical and medical response capabilities, and potentially limited outside aid, this hazard remains a concern for all participating jurisdictions.
- **Haskell County:** Due to limited local and regional medical and medical response capabilities, and potentially limited outside aid, this hazard remains a concern for all participating jurisdictions.
- **Hodgeman County:** Due to limited local and regional medical and medical response capabilities, and potentially limited outside aid, this hazard remains a concern for all participating jurisdictions.
- **Lane County:** Due to limited local and regional medical and medical response capabilities, and potentially limited outside aid, this hazard remains a concern for all participating jurisdictions.
- **Meade County:** Due to limited local and regional medical and medical response capabilities, and potentially limited outside aid, this hazard remains a concern for all participating jurisdictions.
- **Seward County:** Due to limited local and regional medical and medical response capabilities, and potentially limited outside aid, this hazard remains a concern for all participating jurisdictions.

Cascading Impacts
Cascading impacts often result when one a hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with severe weather may include:

- School closures
- Daily life disruptions

- Supply chain disruption
- Economic impacts and business closures

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of community and jurisdictional infrastructure. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Kansas Region D residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 171: Transmissible Disease Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Depending on the scale of outbreak and type of disease, residents may be at risk of illness or death. Population density may play a role in the spread of disease, with urban areas being more likely to be impacted than rural areas. Specific impacts to residents will be dependent upon the type of disease and how it is transmitted.
Impact on Responders	Epidemics pose a unique risk to first responders because they are more likely to be exposed to a transmissible disease before it has been identified. If the novel transmissible disease infects first responders and healthcare practitioners, the provision of public safety and public health services may be significantly impacted.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. A transmissible disease may impact an agency's ability to maintain continuity of operations based on the potential to create high levels of employee absenteeism. Employee absenteeism could also hinder the ability to fulfill critical operations as well as implementation and maintenance of the plan itself.
Delivery of Services	Epidemics may cause disruption of services in the event of employee absenteeism.
Property, Facilities, and Infrastructure	It is unlikely that an epidemic would have direct effects on critical infrastructure or other facilities or structures. However, under cases of absenteeism, it is possible that regular maintenance or repairs would not be performed, resulting in disrepair.
Impact on Environment	In some cases, disease outbreaks are caused by infections spreading from animals to humans. Under these circumstances, infections may be spread as the result of normal care (proximity) to sick animals or consumption of byproducts of infected animals. Infected animals may die as a result of the disease. Timely removal of infected animal carcasses may help to reduce the spread of the disease among animals.
Economic Conditions	Depending on the scale of outbreak and type of disease, a localized infectious disease outbreak could impact Kansas Region D significantly. In the event residents and workers became infected from an epidemic, employee absenteeism would increase and the length of time necessary to recover could be significant.
Public Confidence in Governance	Governmental response requires direct actions that must be immediate and effective to maintain public confidence. If government functionality is reduced by absenteeism, the public's confidence in governance may be reduced. The ability to perform critical functions will directly impact the community's perception of government. Maintenance of these operations will be critical to response and recovery operations.

5.21.7 Future Development

Kansas Region D and the majority of all participating jurisdictions are experiencing consistent population decline or a static population as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast publication, this decreasing or static population trend is expected to continue in these Kansas Region D jurisdictions through 2064. The exception to this trend is noted in Ford County. An increasing population, as predicted by the Wichita State University Center for Economic Development and Business Research Kansas Population Forecast may increase the vulnerability to hazards detailed in this plan.

5.21.8 Hazard Planning Significance

Utilizing the above detailed formula for calculating the hazard planning significance for human caused and technological hazards, the following table details the rating of each criterion along with a composite rating:

Table 172: Transmissible Disease Planning Significance

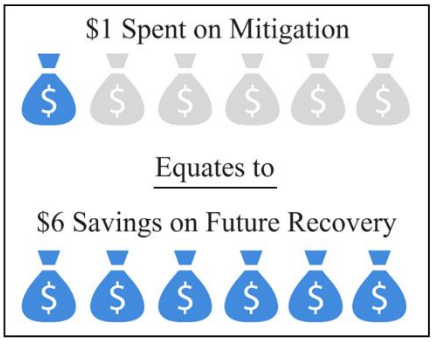
County	Probability	Magnitude	Warning Time	Duration	Score	Planning Significance
Clark County	3.0	3.0	1.0	4.0	2.8	Moderate
Finney County	3.0	3.0	1.0	4.0	2.8	Moderate
Ford County	3.0	3.0	1.0	4.0	2.8	Moderate
Gray County	3.0	3.0	1.0	4.0	2.8	Moderate
Haskell County	3.0	3.0	1.0	4.0	2.8	Moderate
Hodgeman County	3.0	3.0	1.0	4.0	2.8	Moderate
Lane County	3.0	3.0	1.0	4.0	2.8	Moderate
Meade County	3.0	3.0	1.0	4.0	2.8	Moderate
Seward County	3.0	3.0	1.0	4.0	2.8	Moderate

Section 6 – Mitigation Strategy

6.1 Introduction

As part of this planning effort, Kansas Region D worked to minimize the risk of future impacts from identified hazards to all citizens of the region. In an attempt to shape future regulations, ordinances and policy decisions the MPC reviewed, revised, and developed a comprehensive hazard mitigation strategy. This comprehensive strategy includes:

- Goals to guide the selection of activities to mitigate and reduce potential loss.
- A discussion of funding capabilities for hazard mitigation projects.
- Identification, evaluation, and prioritization of mitigation actions along with potential funding sources.



Kansas Region D's mitigation strategy promotes long-term hazard resilience that will have a positive impact on quality-of-life issues. By minimizing both the exposure to, and potential impacts from, identified hazards jurisdictions can expect to minimize injuries and loss of life, reduce property damage, and minimize the day to day social and economic disruptions that follow hazard events.

According to an analysis by the National Institute of Building Sciences, natural hazard mitigation saves $6 on average for every $1 spent on federal mitigation grants.

6.2 Mitigation Goals

During this process, and after a thorough review and discussion with all stakeholders, it was determined that the priorities of the Kansas Region D in relation to hazard mitigation planning have not changed during the five years of the previous planning cycle. Additionally, and based on discussion with all stakeholders, it was determined that the goals identified in the previous LHMP remained viable and valid. The following represent the identified goals for the 2025 LHMP:

- **Goal 1:** Reduce the risk to the people and property from the identified hazards in this plan.
- **Goal 2:** Work to protect all vulnerable populations, structures, and critical facilities 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 the understanding identified hazards and hazard mitigation opportunities.
- **Goal 4:** Enhance communication and coordination among all agencies and between agencies and the public.

The Kansas Region D MPC will continuously evaluate these identified goals against current capabilities and conditions. As part of this process, the Kansas Region D MPC will utilize a monitoring and evaluation system to systematically track, assess, and measure the progress of activities and outcomes related to the goals outlined in this HMP. Key components to the monitoring and evaluation system include:

- Establishment of baseline data to quantify the starting point upon the approval of this plan. This will provide a reference against which progress can be measured.
- Enactment of a monitoring plan which outlines the specific activities, tasks, and responsibilities for regularly collecting, analyzing, and reporting data on the performance indicators.
- Identification and specification of the methods for collecting data, whether through surveys, interviews, focus groups, or observations.
- Definition of the criteria and methods for analyzing collected data. This includes determining how quantitative and qualitative data will be processed and interpreted to assess progress.

- Involvement of stakeholders to ensure that all perspectives are considered, and that feedback on the progress of achieving the delineated goals is taken into account.

Providing specific goals for each hazard type in Appendix D, the jurisdictions tailored their mitigation efforts to address the unique challenges posed by different types of hazards while still working towards the overarching goals established for the entire region.

6.3 Review and Creation of Hazard Mitigation Actions

Hazard mitigation actions are proactive measures taken to reduce or eliminate the long-term risk and impact of natural and human-made hazards. These actions are designed to minimize the damage caused by disasters and contribute to the overall resilience of communities and infrastructure.

For this plan update members of the MPC were provided with a complete list of previously identified mitigation actions and asked to review them to determine their status. Previously identified mitigation status was reported using the following definitions:

- **Completed:** The action has been fully completed.
- **Not Completed:** The action was not started or has been started and is not completed.
- **Revised:** Action has been revised to reflect current planning environment or identified changes.
- **Cancelled:** The action has been removed from consideration due to either a lack of resources or changing mitigation priorities.
- **Ongoing:** The action is completed and has become an ongoing activity or capability.
- **Continuous:** Actions that are on-going or repetitive in nature.

Additionally, MPC members and stakeholders were provided with opportunities to identify and incorporate newly identified actions based on the changing hazard environment or previously unidentified needs. When considering new mitigation actions, participating jurisdictions were guided to the January 2013 FEMA publication Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards. This document offers a comprehensive collection of strategies and best practices for reducing risks associated with natural hazards. It covers various types of natural hazards, and provides practical ideas for communities, local governments, and individuals to implement.

In preparing a mitigation strategy all reasonable and obtainable mitigation actions were considered to help achieve the general goals. Priorities were developed based on past damage, existing exposure to risk, and weaknesses identified by local capability assessments. In identifying mitigation actions, the following activities 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.

In general, all identified mitigation actions were classified under one of the following broad categories:

- **Local plans and regulations:** Actions that create or update plans to reflect situational changes and/or actions that aid in the creation, revision, or adoption of regulations related to hazard mitigation and management.
- **Infrastructure:** Actions that the modification of existing buildings or structures or involve the construction of structures to reduce the impact of hazard.
- **Natural system protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.
- **Public education and awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

6.4 Prioritization of Mitigation Actions

The MPC and subject matter experts worked together to prioritize both previously identified and newly identified hazard mitigation actions. The methodology used to determine mitigation action priorities was based upon the following:

- Review of the updated risk assessments.
- Review of revised goals and objectives.
- Review of capabilities.

A multi-pronged and flexible analysis method was used for determining and prioritizing mitigation actions. An initial review of previously identified but not completed actions was conducted to ensure that, based on current condition and capabilities, the actions were still viable. Actions that were considered viable were retained in this plan update, with minor revisions completed as necessary.

For identified actions that were retained, and for newly identified actions, the FEMA recommended Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) criteria were used to assist with prioritization. The following table details the STAPLEE criteria:

Table 173: STAPLEE Review Criteria

Criteria	Discussion	Example Considerations
Social	There should be community acceptance and support for the mitigation action?	Does the action have community acceptance? Will the proposed action adversely affect one segment of the population?
Technical	The proposed mitigation action should be technically feasible and should provide a long-term reduction in losses.	How effective is the action in avoiding or reducing future losses? Does it solve a problem or only a symptom? Does the action create additional problems?
Administrative	Personnel and administrative capabilities should be available to administer all phases of the project.	Are the staffing and administrative capabilities to implement the action in place? Is there someone to coordinate and lead the effort?
Political	Political support for the mitigation action needs to be present.	Is the action politically acceptable? Have political leaders been involved in the planning process? Is there a political champion to help see the project to completion?
Legal	The legal authority to implement the actions need to be in place or possible with the passing of laws or regulations.	Does the legal authority to implement the proposed action exist? Are there potential legal repercussions?
Economic	The current budget (and/or general obligation bonds or other instruments) need to be in place to fully fund the mitigation action.	Do the potential benefits of this action exceed the potential costs?

Table 173: STAPLEE Review Criteria

Criteria	Discussion	Example Considerations
		Has funding been secured for the proposed action? What are the potential funding sources (public, non-profit, and private)? How will this action affect the fiscal capability of the community(s)? Does the action contribute to other community goals, such as capital improvements or economic development?
Environmental	Actions should interface with the need for sustainable and environmentally healthy communities. Also, statutory considerations, such as the National Environmental Policy Act need to considered for federal funds.	How will the action affect the environment? Will the action need environmental regulatory approvals? Will it meet federal, state, and local state regulatory requirements? Are endangered or threatened species likely to be affected?

Based on the prioritization review, the MPC assigned each action the following prioritized ranking:

- **High Priority:** Actions that provide substantial progress towards improving resiliency and are determined as potentially urgent in nature by the MPC. This would include actions that strongly support the reduction of high hazard risks and meet mitigation goals. Additionally, actions in this ranking may have imminent funding availability or strong community support.
- **Medium Priority:** Actions that provide reasonable progress towards improving resiliency and are determined as moderately urgent in nature by the MPC. This would include actions that would lessen impact hazard events, but not eliminate the impact completely.
- **Low Priority:** Actions that provide incremental progress towards improving resiliency and are determined as slightly urgent in nature by the MPC. This would include actions that are generally the responsibility of the local community, actions outside the normal authority of the jurisdiction, or actions whose cost/benefit analysis returns a low yield.

6.5 Mitigation Action Funding Sources

It is generally recognized that mitigation actions help realize long term savings by preventing future losses due to hazard events. However, many mitigation actions are beyond the budgetary capabilities of a single jurisdiction. This section provides a general description of some of the avenues available to defray the cost of implementing mitigation actions.

FEMA provides financial assistance to state, local, tribal, and territorial governments, as well as certain private non-profit organizations, to implement projects that help reduce the risk and impact of future disasters. These grant programs are designed to support initiatives aimed at mitigating hazards and improving resilience. The main grant program offered by FEMA for hazard mitigation is the Hazard Mitigation Assistance (HMA) program. The HMA program includes four subprograms, the Hazard Mitigation Grant Program (HMGP), the HMGP Post-Fire, Building Resilient Infrastructure and Communities (BRIC), and the Flood Mitigation Assistance (FMA) grant program. Applicants to these grant programs are required to submit project proposals that demonstrate the effectiveness of their proposed mitigation projects. The eligibility criteria, application process, and specific requirements for each program are outlined by FEMA in their guidelines and announcements, which are typically published on FEMA’s website.

The following provides a general overview of major grant funding streams:

- **HMGP and HMGP Fire:** HMGP grants assist in implementing long-term hazard mitigation measures following Presidential disaster declarations, including fire declarations. Funding is available to implement projects in accordance with State, Tribal, and local priorities.
- **BRIC:** BRIC supports states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency. Working in coordination with BRIC, the National Mitigation Investment Strategy is intended to provide a national, whole-community approach to investments in mitigation activities and risk management.
- **FMA Grant Program:** FMA is a competitive grant program that provides funding to states, local communities, federally recognized tribes and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the NFIP. FEMA chooses recipients based on the applicant's ranking of the project and the eligibility and cost-effectiveness of the project. FEMA requires state, local, tribal and territorial governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation assistance projects.

The following chart summarizes HMA grant programs:

Chart 5: HMA Grant Program Summary

HMA Program Comparison	HMGP	HMGP Post Fire	BRIC	FMA
Program Type	Post-disaster	Post-disaster	Pre-disaster	Pre-disaster
Funding Availability	Presidentially declared disaster	FMAG-declared disaster	6% set aside from federal post-disaster grant funding	Annual appropriations
Competitive?	No	No	Yes	Yes
Eligible Applicants	States, federally recognized tribes, territories and the District of Columbia (DC)	States, federally recognized tribes, territories and DC	States, federally recognized tribes, territories and DC	States, federally recognized tribes, territories and DC
Eligible Subapplicants	State agencies, local governments, tribes and private nonprofit organizations	State agencies, local governments, tribes and private nonprofit organizations	State agencies, local governments and tribes	State agencies, local governments and tribes
Hazard Mitigation Plan Requirement	Yes	Yes	Yes	Yes
NFIP Participation	Communities with projects in Special Flood Hazard Areas (SFHAs)	Communities with projects in SFHAs	Communities with projects in SFHAs	Subapplicants and properties

Additionally, the following provide available grant funding avenues for hazard mitigation projects:

- **Rehabilitation Of High Hazard Potential Dam (HHPD) Grant Program:** HHPD awards provide technical, planning, design and construction assistance in the form of grants for rehabilitation of eligible high hazard potential dams. A state or territory with an enacted dam safety program, the State Administrative Agency, or an equivalent state agency, is eligible for the grant.
- **Emergency Management Performance Grant:** Program provides state, local, tribal and territorial emergency management agencies with the resources required for implementation of the National Preparedness System and works toward the National Preparedness Goal of a secure and resilient nation. Allowable costs support efforts to build and sustain core capabilities across the prevention, protection, mitigation, response and recovery mission areas.
- **State Homeland Security Program:** Program includes a suite of risk-based grants to assist state, local, tribal and territorial efforts in preventing, protecting against, mitigating, responding to and recovering from acts of terrorism and other threats. This grant provides the resources required for implementation of the National Preparedness System and working toward the National Preparedness Goal of a secure and resilient nation.

- **Nonprofit Security Grant Program:** Program is one of three grant programs that support DHS/FEMA's focus on enhancing the ability of state, local, tribal, and territorial governments, as well as nonprofits, to prevent, protect against, prepare for, and respond to terrorist or other extremist attacks. These grant programs are part of a comprehensive set of measures authorized by Congress and implemented by DHS to help strengthen the nation's communities against potential terrorist or other extremist attacks. Among the five basic homeland security missions noted in the DHS Strategic Plan for Fiscal Years 2020-2024
- **Public Assistance Program:** The mission of FEMA's Public Assistance program is to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President. Through the Public Assistance program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain private non-profit organizations. The Public Assistance Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process. The Federal share of assistance is not less than 75% of the eligible cost for emergency measures and permanent restoration. The grantee determines how the non-Federal share (up to 25%) is split with the eligible applicants.
- **Individual Assistance Program:** After a disaster, the federal government determines if any county in the state meets the criteria for individual disaster assistance. The decision is based on damage related to the severity and magnitude of the event. When a county receives an Individual Assistance declaration from the President of the United States, anyone who lives in that county can apply for assistance.
- **Small Business Administration Disaster Loans:** The Small Business Administration provides low-interest disaster loans to homeowners, renters, businesses of all sizes, and most private nonprofit organizations. Small Business Administration disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets.
- **The Housing and Urban Development Agency**: Provides flexible grants to help cities, counties, and States recover from Presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations.
- **Community Development Block Grant Program**: This is a flexible program that provides communities with resources to address a wide range of unique community development needs. The program provides annual grants on a formula basis to general units of local government and States.
- **Individual and Households, Other Needs Assistance Program:** This 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 provides grants for necessary expenses and serious needs that cannot be provided for by insurance, another federal program, or other source of assistance. The current maximum allowable amount for any one disaster to individuals or families is $25,000. 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.
- **WUI Grants:** The 10-Year Comprehensive Strategy focuses on assisting people and communities in the WUI to moderate the threat of catastrophic fire through the four broad goals of improving prevention and suppression, reducing hazardous fuels, restoring fire-adapted ecosystems, and promoting community assistance. The WUI grant may be used to apply for financial assistance towards hazardous fuels and educational projects within the four goals of: improved prevention, re duction of hazardous fuels, restoration of fire-adapted ecosystems and promotion of community assistance.

Additionally, many of these programs also emphasize the protection of culturally significant sites and resources from the impacts of natural hazards.

Small and impoverished communities that receive grants may receive a federal cost share of up to 90% of the total amount approved under the grant award. As defined in 44 CFR 201.2, a small and impoverished community is:

- A community of 3,000 or fewer individuals that is identified by the State as a rural community
- Is not a remote area within the corporate boundaries of a larger city
- Is economically disadvantaged, by having an average per capita annual income of residents not exceeding 80% of national, per capita income
- The local unemployment rate exceeds by one percentage point or more, the most recently reported, average yearly national unemployment rate
- Any other factors identified in the State Plan in which the community is located

6.6 Previously Identified Jurisdictional Mitigation Actions

Previously identified hazard mitigation actions were revied by the relevant jurisdiction to determine ethe statis of each action. The status of these previously identified hazard mitigation actions indicates if the action has been completed, is carried over to this version of the plan, has been revised, or is no longer being considered. Additionally, each action was assigned a new number to conform with the numbering system in this LHMP. These actions may be found under the relevant jurisdiction in Appendix D. Please note that the action description may have been updated for clarity

6.7 Completed Mitigation Actions

Kansas Region D and all participating jurisdictions remain committed to investigating and obtaining all available grant funding for the completion of hazard mitigation projects. Any competed action is noted under the relevant jurisdictions in Appendix D.

6.8 Jurisdictional Mitigation Actions

__Public Comment:__ Strengthen infrastructure and public education.

To support the mitigation goals identified in this LHMP, all participating jurisdictions identified a comprehensive range mitigation projects and activities. The selected set of hazard mitigation actions carefully takes a holistic approach to mitigation while simultaneously addressing each of the plan's profiled hazards. The list of mitigation actions is based upon the potential to reduce risk to life and property with an emphasis on ease of implementation, community and agency support, consistency with local jurisdictions' plans and capabilities, available funding, and jurisdictional vulnerability. It is important to note that since the previous LHMP, requirements for plan approval have changed. In the previous plan, many participating jurisdictions identified only a few mitigation actions, with none that are specific to an identified hazard. As such, numerous additional actions have been identified to ensure there is at least one action per identified hazard.

To ensure that all hazard that could potentially impact a participating jurisdiction have been assigned a mitigation action, the following table provides a cross check of action and identified hazards. Please see Appendix D: Jurisdictional Mitigation Actions for a full list of jurisdictional mitigation actions.

Table 174: Jurisdictional Mitigation Action Cross Check

Jurisdiction	All Hazards	Agricultural Infestation	Dam or Levee Failure	Drought	Extreme Temperatures	Flood	Severe Weather	Severe Winter Weather	Tornado	Wildfire
Clark County	**1-4**	**5**	**6**	**7**	**8**	**9,10,11**	**12,13**	**8**	**12,13**	**14,15,16**
City of Ashland	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	11, 12
City of Englewood	1	-	-	2	3	4, 5, 6	7, 8	3, 9	7, 8	10, 11
City of Minneola		-	-	1	2	3, 4, 5	6, 7	2, 8	6, 7	9, 10
USD #219 - Minneola	1	-	-	2	3	4	5, 6	3	5, 6	6
USD #220 - Ashland	2	-	-	3	1, 4	5	1, 6	1, 4	1, 6	1
Ashland Health Center	1	-	-		1	1	1	1	1	1
Minneola District Hospital	1, 2	-	-	1, 2	1, 2	1, 2	1, 2, 3	1, 2	1, 2, 3	1, 2
CMS Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Southern Pioneer Electric COOP	1, 2, 3	-	-	-	-	-	-	-	-	-
Finney County	**1, 2, 3**	**4**	**-**	**5**	**6**	**7, 8, 9**	**10, 11**	**12**	**10, 11**	**13, 14, 15**
City of Garden City	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
City of Holcomb	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
Garden City Community College	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #363 – Holcomb	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #457 – Garden City	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
Lane-Scott Electric Cooperative	1, 2	-	-	-	-	-	-	-	-	-
Midwest Energy	1, 2	-	-	-	-	-	-	-	-	-
Pioneer Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Sunflower Electric Power Corporation	1, 2, 3	-	-	-	-	-	-	-	-	-
Victory Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Wheatland Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Pawnee Watershed Joint District #81		-	1-5	1-5	-	-	-	-	-	-
Ford County	**1, 2, 3**	**4**	**5**	**6**	**7**	**8-14**	**15, 16**	**7, 17**	**15, 16**	**18, 19, 20**
City of Bucklin	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
City of Dodge City	1-4	-	5	6-9	10	11,12,13	14	10	14	15,16
City of Ford	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
City of Spearville	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
Dodge City Community College	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #381 - Spearville	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
UDS #443 – Dodge City	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #459 - Bucklin	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
Bucklin Hospital District	1, 2	-	-	-	-	-	-	-	-	-
Sunflower Electric Power Corporation	1, 2, 3	-	-	-	-	-	-	-	-	-
Victory Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Pawnee Watershed Joint District #81	-	-	1-5	1-5	-	-	-	-	-	-
Gray County	**1, 2, 3**	**4**	**5**	**6**	**7**	**8, 9, 10**	**11, 12**	**13**	**11, 12**	**14, 15, 16**
City of Cimarron	1	-	2	3	4	5, 6, 7	8, 9, 10	4	8, 9, 10	8, 12, 13
City of Copeland	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
City of Ensign	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
City of Ingalls	-	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
City of Montezuma	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
USD #102 - Cimarron	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #371 - Montezuma	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #476 – Copeland / South Gray	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #477 - Ingalls	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
CMS Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Pioneer Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Midwest Energy	1, 2	-	-	-	-	-	-	-	-	-

Table 174: Jurisdictional Mitigation Action Cross Check

Jurisdiction	All Hazards	Agricultural Infestation	Dam or Levee Failure	Drought	Extreme Temperatures	Flood	Severe Weather	Severe Winter Weather	Tornado	Wildfire
Sunflower Electric Power Corporation	1, 2, 3	-	-	-	-	-	-	-	-	-
Victory Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Wheatland Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Pawnee Watershed Joint District #81		-	1-5	1-5	-	-	-	-	-	-
Haskell County	**1, 2, 3**	**4**	**-**	**5**	**6**	**7, 8, 9**	**10, 11**	**12**	**10, 11**	**13, 14, 15**
City of Satanta	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
City of Sublette	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
USD #374 - Sublette	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #507 - Satanta	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
Satanta District Hospital	1, 2	-	-	-	-	-	-	-	-	-
Pioneer Electric COOP	1, 2, 3	-	-	-	-	-	-	-	-	-
Midwest Energy	1, 2	-	-	-	-	-	-	-	-	-
Southern Pioneer Electric Company	1, 2, 3	-	-	-	-	-	-	-	-	-
Sunflower Electric Power Corporation	1, 2, 3	-	-	-	-	-	-	-	-	-
Victory Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Hodgeman County	**1, 2, 3**	**4**	**5**	**6**	**7**	**8, 9, 10**	**11, 12**	**13**	**11, 12**	**14, 15, 16**
City of Hanston	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
City of Jetmore	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
Marena Township	1	-	-	-	2	4, 5	6	3	6	6, 7
USD #227 – Hodgeman County	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
Hodgeman County Health Center	1, 2	-	-	-	-	-	-	-	-	-
Horse Thief Reservoir District	1, 2	-	-	-	-	-	-	-	-	-
Lane-Scott Electric Cooperative	1, 2	-	-	-	-	-	-	-	-	-
Midwest Energy	1, 2	-	-	-	-	-	-	-	-	-
Sunflower Electric Power Corporation	1, 2, 3	-	-	-	-	-	-	-	-	-
Victory Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Pawnee Watershed Joint District #81			1-5	1-5						
Lane County	**1, 2, 3**	**4**	**-**	**5**	**6**	**7, 8, 9**	**10, 11**	**12**	**10, 11**	**13, 14, 15**
City of Dighton	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
USD #468 – Healy Public Schools	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #482- Dighton	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
Lane County Hospital	1, 2, 3	-	-	-	-	-	-	-	-	-
Lane-Scott Electric Cooperative	1, 2	-	-	-	-	-	-	-	-	-
Midwest Energy	1, 2	-	-	-	-	-	-	-	-	-
Sunflower Electric Power Corporation	1, 2, 3	-	-	-	-	-	-	-	-	-
Pawnee Watershed Joint District #81			1-5	1-5						
S&T Telecom	1, 2	-	-	-	-	-	-	-	-	-
Meade County	**1-4**	**5**	**-**	**6**	**7**	**8, 9**	**10, 11**	**12**	**10, 11**	**13, 14, 15**
City of Fowler	1	-	-	2	3	4, 5	6, 7, 8	3, 9	6, 7, 8	10, 11
City of Meade	1	-	-	2	3	4, 5	6, 7, 8	3, 9	6, 7, 8	10, 11
City of Plains	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
USD #225 - Fowler	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #226 - Meade	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #483 – Kismet / Plains	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
Artesian Valley Health System	1, 2	-	-	-	-	-	-	-	-	-
CMS Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Southern Pioneer Electric Company	1, 2, 3	-	-	-	-	-	-	-	-	-
Sunflower Electric Power Corporation	1, 2, 3	-	-	-	-	-	-	-	-	-
Seward County	**1, 2, 3**	**4**	**-**	**5**	**6**	**7, 8, 9**	**10, 11**	**12**	**10, 11**	**13, 14, 15**

Table 174: Jurisdictional Mitigation Action Cross Check

Jurisdiction	All Hazards	Agricultural Infestation	Dam or Levee Failure	Drought	Extreme Temperatures	Flood	Severe Weather	Severe Winter Weather	Tornado	Wildfire
City of Kismet	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
City of Liberal	1	-	-	2	3	4, 5, 6	7, 8, 9	3, 10	7, 8, 9	7, 11, 12
Seward County Community College	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #480 - Liberal	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
USD #483 – Kismet / Plains	1, 2	-	-	3	4	5	6, 7	4	6, 7	7
CMS Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Midwest Energy	1, 2	-	-	-	-	-	-	-	-	-
Pioneer Electric Cooperative	1, 2, 3	-	-	-	-	-	-	-	-	-
Southern Pioneer Electric Company	1, 2, 3	-	-	-	-	-	-	-	-	-
Sunflower Electric Power Corporation	1, 2, 3	-	-	-	-	-	-	-	-	-

Note: -: Jurisdiction did not consider hazard to be either a major risk to the community, provided an action for the hazard classified as all hazards, and/or the hazard to be managed by another entity.

Prior to the implementation of any action further feasibility analysis will be performed. Additionally, a Benefit-Cost Analysis that determines the future risk reduction benefits of a hazard mitigation project and compares those benefits to its costs will be conducted as required. Applicants and sub-applicants will use FEMA approved methodologies and tools, such as the Benefit-Cost Analysis Toolkit, to demonstrate the cost-effectiveness of their projects. The result of the analysis is a Benefit-Cost Ratio, and a project is considered cost-effective when the Benefit-Cost Ratio is 1.0 or greater. Depending on the project, either a full Benefit-Cost Analysis will be completed by entering documented values into the FEMA Benefit-Cost Analysis Toolkit, which calculates a benefit-cost ratio or, if the project meets specified criteria, a streamlined Benefit-Cost Analysis may be completed (FEMA's cost-effectiveness requirement is never waived).

All participating jurisdictions acknowledge that the adoption and approval of this plan does not obligate the completion of each identified action. Rather, the MPC understands that progress should be shown in mitigation efforts which may include the completion of mitigation actions or other actions or progress in achieving the goals of the LHMP.

6.8 Mitigation Action Implementation and Monitoring

Each participating jurisdiction is responsible for implementing and managing identified mitigation actions. To foster accountability and increase the likelihood that actions will be implemented, every proposed action is assigned to a specific department or position as a champion. In general:

- The identified champion will be responsible for tracking and reporting on action status.
- The identified champion should provide input on whether the action as implemented is successful in reducing vulnerability, if applicable.
- 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 determine if the action is being implemented according to plan.

In general, the Kansas Region D MPC is responsible for monitoring the progress of mitigation activities and projects throughout the county in conjunction with participating jurisdictions. To facilitate the tracking of any awarded hazard mitigation grants, the Kansas Region D MPC, in conjunction with participating jurisdictions, will compile a list of projects funded throughout the calendar year, if any, and add it to an electronic database administered by KDEM.

Additionally, the Kansas Region D MPC will monitor information on any other mitigation projects that were not funded through hazard mitigation grants.

To track mitigation projects from initiation to closeout, participating jurisdictions will use a project tracking spreadsheet that includes, at a minimum, the following information:

- Applicant/Subrecipient
- Grant Identifier
- Contractor
- Total Cost Estimate
- Federal/Local share
- Award Date
- Period of Performance
- Quarterly Reports
- Subrecipient Risk
- Reimbursements

Upon completion of a project, a member of the awarded jurisdiction, a member of the Kansas Region D MPC, and a State of Kansas representative will conduct a closeout site visit to:

- Review all files and documents
- Review all procurement files and contracts to third parties
- Take photos of the completed project

Project closeout packages will generally be submitted 90 days after a project has been completed, and will include the following:

- Summary of documentation
- Pictures of completed project
- Materials, labor, and equipment forms, if required
- Close-out certification

Additionally, the State of Kansas is currently working with FEMA to apply the FEMA GO system to all FEMA grants. The FEMA GO system allows users to apply, track, and manage all disaster and non-disaster grants and helps improve oversight and monitoring.

Section 7 – Plan Maintenance

7.1 Introduction

The LHMP is a living document that will be updated and submitted to FEMA for approval every five years as required by 44 CRF 201.4. 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. All participating jurisdictions will utilize the MPC to provide plan updates, revisions, and data collection for future LHMP planning purposes.

7.2 Plan Maintenance Responsibilities

KDEM serves as the lead coordinating agency for plan maintenance. Additional assistance in the plan maintenance process is provided by members of the MPC, subject matter experts, and representatives of local jurisdictions.

KDEM and the MPC will facilitate the review and revision of the HMP every five years. The review and revision will be an ongoing process. This process will incorporate all of the revisions made during the life of the plan, especially new data obtained from participating jurisdictions.

7.3 Plan Review Meetings

As part the Local Emergency Planning Committee (LEPC), a Mitigation Sub-Committee will be formed from members of the MPC. The LEPC Mitigation Sub-Committee will meet annually for the first two years after plan approval. Kansas Region D LEPC Mitigation Sub-Committee members will determine the meeting dates and locations and will ensure that the meetings are open to all participating jurisdictions and the public. The elected LEPC Mitigation Sub-Committee Chair will be the main point of contact for these meetings and will maintain attendance and meeting minutes.

The purpose of these meetings is to discuss agency capability changes, the status of proposed projects, and any new studies or mapping that may inform the LHMP. Should a specific plan element or section require revision or amendment due to a state or federal legislation or policy change, the LEPC Mitigation Sub-Committee will work with the KDEM SHMO to complete a plan addendum and submit it to FEMA as quickly as is practicable.

During these meetings, and in order to monitor LHMP progress, the following information will be tracked by the LEPC Mitigation Sub-Committee:

- 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 is technical assistance being received

Additionally, the LEPC Mitigation Sub-Committee will monitor the following elements to ensure the HMP is current and correct:

- 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

After each meeting, the LEPC Mitigation Sub-Committee will compile a meeting report for usage in future plan revisions:

In addition to these meetings, MPC members and local jurisdictional representatives will monitor and evaluate the progress of mitigation projects via quarterly reports, site visits, correspondence, and reimbursements. Completed projects will be evaluated for loss avoidance and alignment with local development plans.

KDEM may request a non-scheduled report on the monitoring, evaluation, or updating of any portion of the HMP plan due to irregular progress on mitigation actions and or projects, in the aftermath of a hazard event, or for any reason deemed appropriate.

7.4 Plan Monitoring and Situational Change

Plan monitoring can be defined as the ongoing process by which stakeholders obtain regular feedback on the progress being made towards achieving their goals and objectives. In the more limited approach, monitoring may focus on tracking projects and the use of the agency's resources. In the broader approach, monitoring also involves tracking strategies and actions being taken by partners and non-partners, and figuring out what new strategies and actions need to be taken to ensure progress towards the most important results.

The full MPC or the LEPC Mitigation Sub-Committee will track and record all substantial situational changes and will address, as appropriate, the following questions:

- Is the mitigation project under, over, or on budget?
- Is the mitigation project behind, ahead of, or on schedule?
- Are there any changes in jurisdictional capabilities which impact the plan?
- Are there any changes in jurisdictional hazard risk?
- Has the mitigation action been initiated, or its initiation planned?
- Is the current process of prioritizing mitigation actions and projects appropriate and accurate?
- Has the current method of incorporating mitigation actions and projects yielded a comprehensive action and project strategy to address seen and unforeseen hazards?
- If applicable, has participation in a mitigation action's collaboration been regular?
- Was a negative result caused directly or indirectly by insufficient levels of public outreach?
- If any, what plan updates occurred, why they occurred, and what is their impact?

7.5 Post-Disaster Review

After each Presidential disaster declaration, and in coordination with FEMA and the KDEM, the MPC will convene to document impacts on Kansas Region D and to determine if any mitigation actions should be considered to reduce future risk. This will allow for the development of hazard mitigation recommendations to FEMA during the disaster operation as well as to update the mitigation strategy as needed. The post-disaster review may coincide with established meetings or may be convened as separate events.

7.6 Plan Evaluation

A plan evaluation, conducted by the MPC, is a rigorous and independent assessment of either completed or ongoing activities to determine the extent to which they are achieving stated goals and contributing to decision making.

A plan evaluation report will be completed when the situation dictates. The following situations are typical examples of when an evaluation will be necessary.

- Post hazard event
- Post training exercise
- Post tabletop or drill exercise
- Significant change or completion of a mitigation project

- Significant change or completion of a mitigation action

An evaluation report will ask the following questions in response to the previously listed events.

- Do the mitigation objectives and goals continue to address the current hazards?
- Are there new or previously unforeseen hazards?
- Does a change in hazard vulnerability demand a change of or addition of mitigation actions or projects?
- Does a change in the mitigation strategy demand a change of or addition of mitigation actions or projects?
- Are current resources appropriate for implementing a mitigation project?
- Was the outcome of a mitigation action/project expected?
- Are there implementation problems?
- Was the public engaged to the point where they were satisfied with current engagement strategies?
- Did the public participate in a number that produced a positive yield on the plan, action, or project?
- Are there coordination problems?

7.7 Plan Updates

Typically, the updating of a HMP is initiated upon the completion of a plan evaluation when the evaluation determines an update is appropriate. A plan update also occurs every five years per FEMA guidelines or at any time it is deemed necessary by MPC members or KDEM.

According to FEMA DMA 2000 guidelines for mitigation planning g, Kansas Region D will begin the update process three years from this plan’s adoption under the direction of the LEPC Mitigation Sub-Committee. An increase in meeting tempo to twice yearly will allow the LEPC Mitigation Sub-Committee to gather relevant information needed for the next plan update. The following meeting schedule indicates the tasks to be performed during this plan update period:

- **2027 Fall Meeting:** The LEPC Mitigation Sub-Committee will begin updating the risk assessment portion of the plan. Hazards will be analyzed to determine if they are still relevant, if location should be updated, and if new hazards should be added. Previous occurrences will be reviewed to help determine the probability of future events.
- **2028 Spring Meeting:** The LEPC Mitigation Sub-Committee will begin updating the vulnerability assessment. The MPC will update the vulnerability assessment portion of the plan. Data will need to be gathered for assets, critical facilities, building stock values, jurisdictional damages, etc.
- **2028 Fall Meeting:** The LEPC Mitigation Sub-Committee will review information received and determine if the goals and objectives are still relevant and if new ones should be added. Actions will be reviewed to determine if they should remain in the plan, have been completed, or are no longer relevant. The LEPC Mitigation Sub-Committee will review the potential funding sources for each action.
- **2029 Spring Meeting:** As appropriate, a new MPC for Kansas Region D will be formed, and all participating jurisdictions will be convened, to take over the planning process. The new MPC and all participating jurisdictions will evaluate the policies, programs, capabilities, and funding sources from the previous plan to determine if they are still accurate and if any new items should be added.
- **2029 Fall Meeting:** The new MPC and all participating jurisdictions will review the draft copy of the mitigation plan and make comments and updates if necessary. Formal submittal to FEMA for re-approval will follow.

In general, the following steps will be taken to complete the next HMP revision:

Table 175: Kansas Region D HMP Update Task List

Task	Action
1	Evaluate and update the planning process.

Table 175: Kansas Region D HMP Update Task List

Task	Action
2	Review the stakeholder contact list and identify new stakeholders.
3	Initiate plan outreach and discussion, including a stakeholder meeting.
4	Consider the addition, removal, or modification of hazards identified in the plan.
5	Update and revise membership of the MPC.
6	Evaluate risk assessment methodologies and data sources.
7	Evaluate and update critical facility inventory information.
8	Evaluate and update the hazard profiles.
9	Evaluate and update the risk assessment summary.
10	Evaluate and update the mitigation strategy, including proposed mitigation actions.
11	Evaluate and update the mitigation implementation system.
12	Integrate new and updated local plans.
13	Evaluate and update other plans sections.
14	Identify and add any additional sections or information needed.
15	Review updated plan in its entirety.
16	Conduct updated plan outreach, including public information, comment period, and meetings.
17	Integrate additional comments received.
18	Finalize plan document.
19	Complete crosswalk and submit final plan to FEMA for review and approval.
20	Make additional modifications as required.
21	Obtain jurisdictional adoption resolutions.

7.8 Continued Public Involvement

Kansas Region D and all participating jurisdictions are dedicated to involving the public in the continual shaping of the HMP and in the development of its mitigation projects and activities.

The Kansas Region D MPC, the LEPC Mitigation Sub-Committee, and all participating jurisdictions will continue to keep the public informed about hazard mitigation projects and activities through jurisdictional websites, and as appropriate, public announcements. The public will also be invited to participate in all meetings to review and discuss the mitigation-related events. Additionally, participating jurisdictions will present to public officials in a public forum concerning the progress of mitigation actions identified in this plan as progress is made.

Copies of the Kansas Region D LHMP will be distributed to all the participating jurisdictions and made available to the public. Methods of public availability may include electronically posted on a website or a hard copy kept at a jurisdictional office.

7.9 Plan Amendment

Amending the approved and adopted Kansas Region D LHMP does not necessarily result in the need to reevaluate the entire plan against all requirements. As the Kansas Region D MPC will consistently review this LHMP, FEMA Region VII expects modifications to the risk assessment or adding/removing mitigation actions, especially in preparation for submitting applications to FEMA for assistance and ensuring the project conforms with the mitigation plan. Kansas Region D and all participating jurisdictions are encouraged to keep the State of Kansas and FEMA Region VII informed, but these amendments do not need to be reviewed by either. If these changes identify new mitigation actions that might be eligible for FEMA assistance programs, then Kansas Region D and/or the participating jurisdiction will advise FEMA Region VII and the State of Kansas. FEMA will acknowledge and note the receipt of the added action(s), where appropriate, but will not need to formally review or approve the action(s).

7.10 Amendment to Include New Jurisdiction

Jurisdictions may be added to this existing and approved LHMP only if the following conditions below met:

- The jurisdiction asking to be included is within the boundaries of Kansas Region D.
- Kansas Region D agrees with adding the requesting jurisdiction(s) to the mitigation plan.
- An analysis of the natural hazards that have the potential to affect the additional jurisdiction must be completed and integrated into any current analysis within the LHMP.
- The new jurisdiction must meet all requirements of 44 CFR § 201.6, including:
    - Review the multi-jurisdictional hazard analysis and determine if any additional hazards that have not been addressed threaten the jurisdiction(s).
    - Document their agreement with the stated mitigation goals
    - Develop a list of proposed mitigation actions
    - Document the involvement of both the general public and the local government in the planning process
    - Submit the annex or appendix, along with the multi-jurisdictional mitigation plan and correspondence of concurrence from Kansas Region D for formal review.
    - Adopt the LHMP.

7.11 Late LHMP Adoption

Any participating jurisdiction that did not adopt the plan within six months of the Approved Pending Adoption date must either:

- Validate that the information in the plan remains current with respect to both the risk assessment and mitigation strategy.

Or

- Make the necessary updates before submitting the adoption resolution to State of Kansas and FEMA Region VII.

This late adoption does not affect the plan expiration date, with the adopted LHMP expiring five years from the date the first adoption was received.

Appendix A – Kansas Region C Adoption Documentation and FEMA Region VII Approval Documentation

Appendix B – Community Feedback

Kickoff Survey

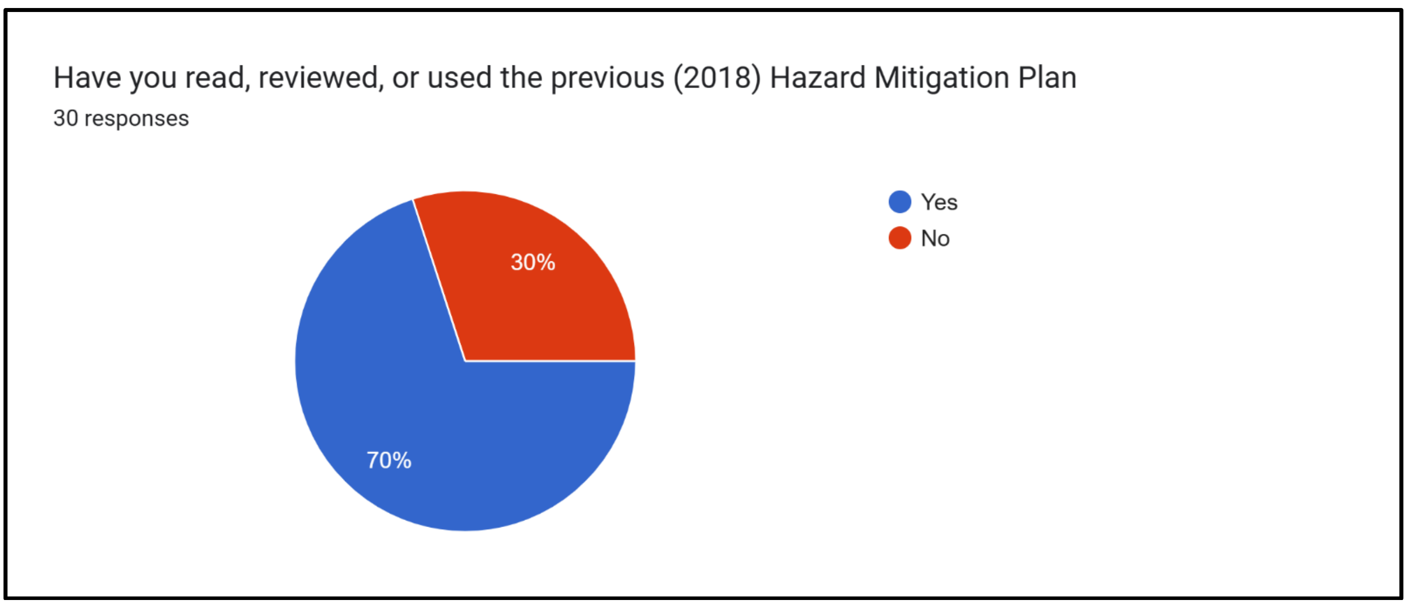
What County and City do you live in (or nearest city)?

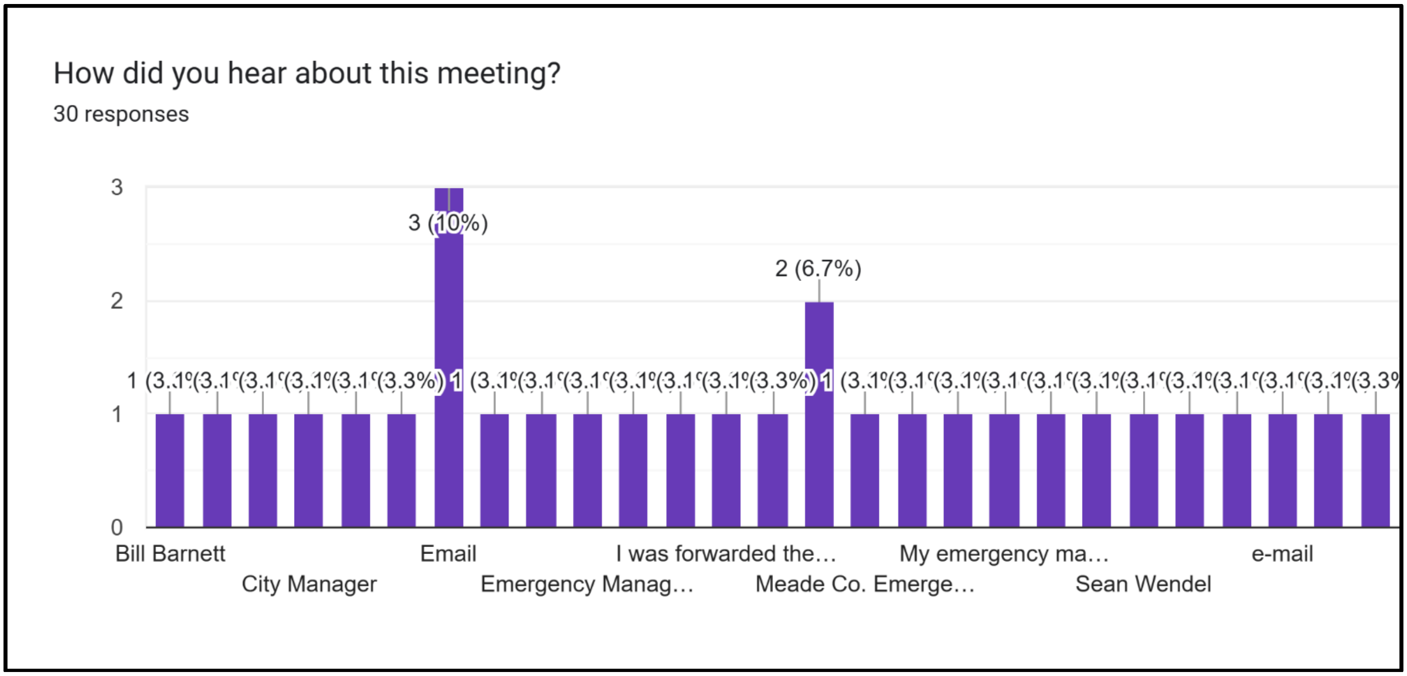
- Meade
- Haskell Co., Sublette
- Haskell County, Sublette
- Gray county city of Ingalls
- Seward, Liberal
- Ford dodge city
- Satanta, Haskell County
- Gray and Ingalls
- Pawnee
- Hodgeman Co. Jetmore
- Midwest Energy’s corporate office is in Hays, Ks. (Ellis County) we will participate in most of Region D plan either by Electric or Gas services.
- Spearville, Ford County
- Spearville
- Gray/city of Montezuma
- Gray County, Montezuma
- Meade County and City of Meade
- Dighton
- Ford
- Dighton lane county
- Seward County City of Kismet
- Gray County, City of Cimarron
- Ford County
- Dodge City Ford CO
- Haskell Co. and live in Satanta
- Seward County, Kismet
- Lane County Dighton Kansas
- Haskell County
- Dodge City Kansas
- Ford County, Dodge City

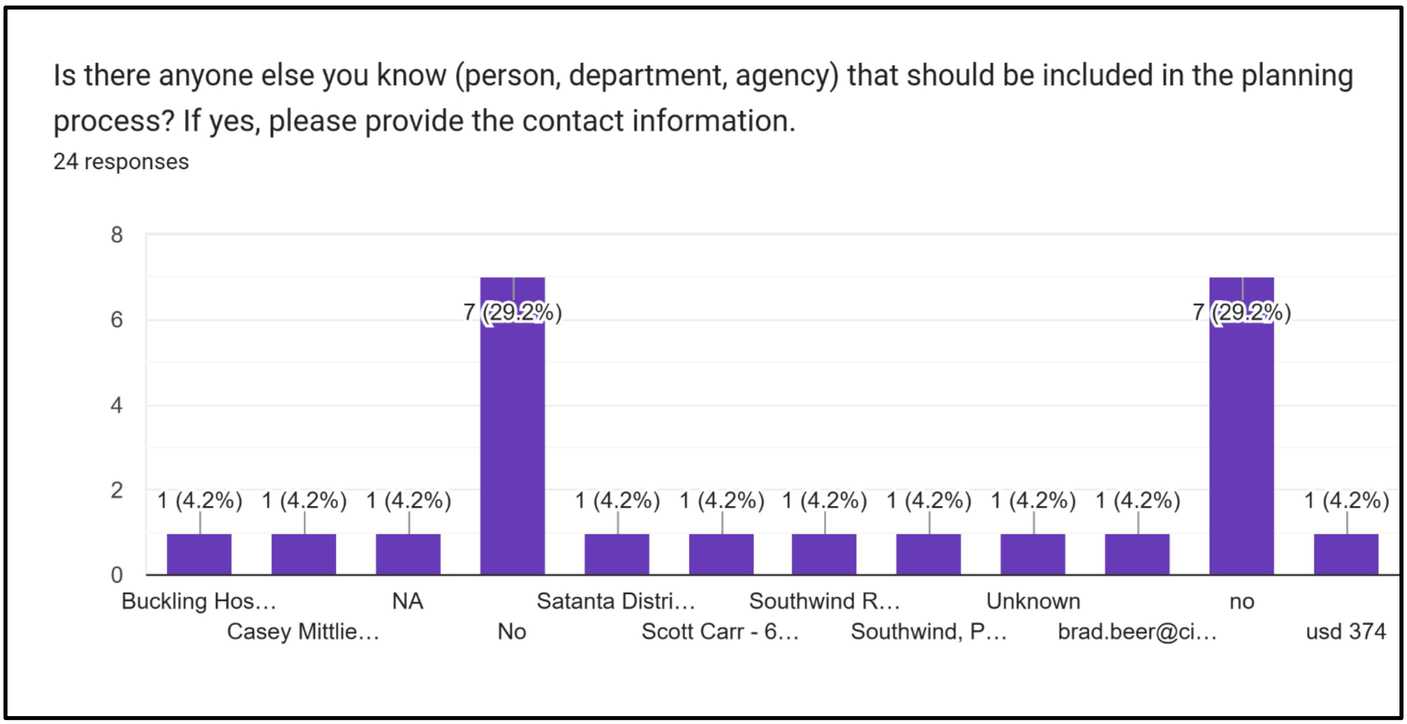
Who are you here representing?

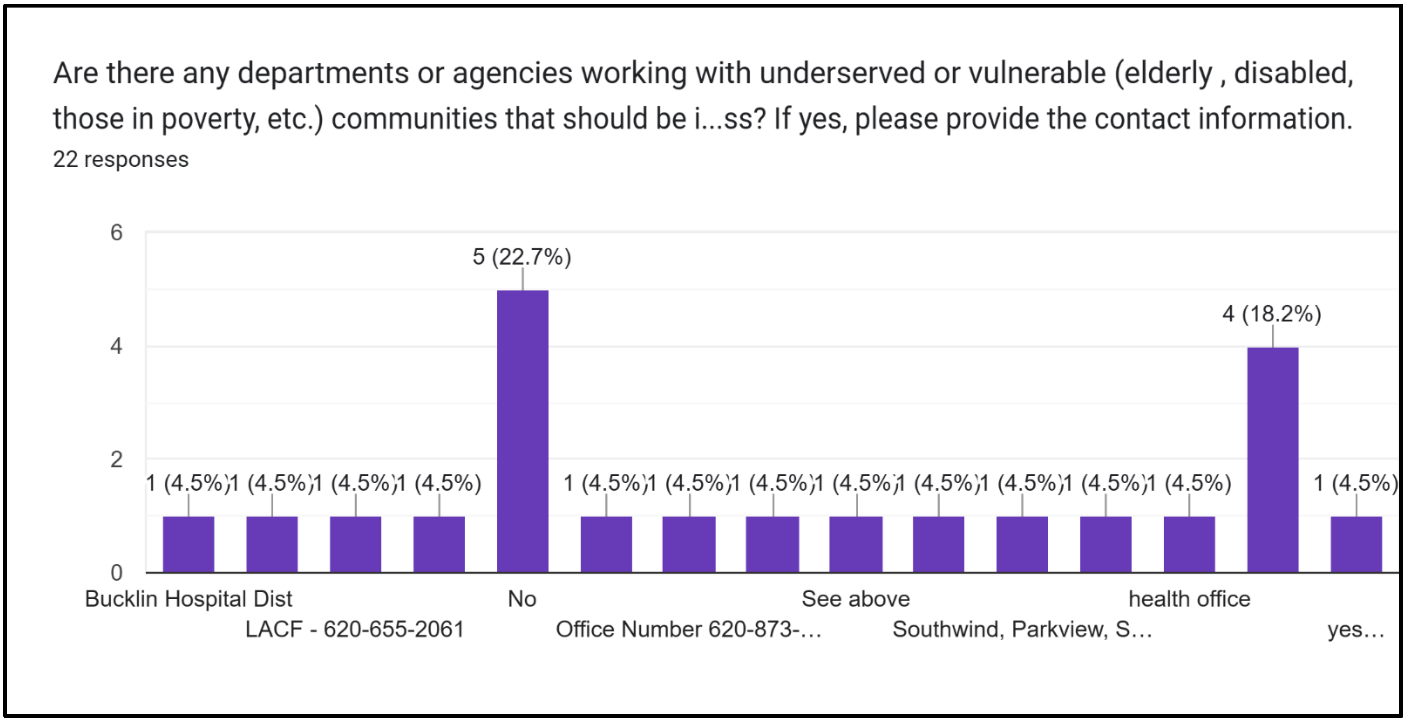
- County and EMA
- Ford County
- CMS Electric Cooperative
- CIty of Dodge City
- Satanta District Hospital, EP
- Dodge City Fire
- County of Seward County KS
- City of Ingalls
- Meade County Emergency Management
- Pawnee Watershed District

- Montezuma
- Spearville USD 381 School District
- USD 482 Dighton
- Hodgeman Co.
- USD 507
- City of Liberal
- City of Dighton
- Spearville
- Artesian Valley Health Systems Meade District Hospital
- Gray County
- DCFD
- Cimarron
- The City of Sublette
- USD 443, Dodge City Schools
- City of Montezuma
- Haskell County
- Midwest Energy
- Haskell County Emergency Management
- Meade County Commission
- Victory Electric




How did you hear about this meeting?
30 responses
3 (10%)
2 (6.7%)
Bill Barnett
City Manager
Email
Emergency Manag…
I was forwarded the…
Meade Co. Emerge…
My emergency ma…
Sean Wendel
e-mail


Is there anyone else you know (person, department, agency) that should be included in the planning process? If yes, please provide the contact information.
24 responses
7 (29.2%)
1 (4.2%)
Buckling Hos…
Casey Mittlie…
NA
No
Satanta Distri…
Scott Carr - 6…
Southwind R…
Southwind, P…
Unknown
brad.beer@ci…
no
usd 374



Do you have any specific concerns about any hazard that could impact southwest Kansas?

- no
- No
- Lack of generators in public buildings and need for sheltering staff and facility. Need for Tornado sirens new locations.
- NA
- wildfire, convective storms
- Tornado
- Weather Events
- Not at this moment
- Livestock Disease, Cyber
- Cybersecurity attacks, power outages, phone outages
- no yet
- Water availability
- not at this time
- Not at this time
- Wild Fires and severe storms

Is there anything else concerning hazard mitigation that you would like us to know?

- No
- no
- Not at this time
- not at this time
- No now
- NA

- Every hazard will have to be dealt with individually
- My first time here

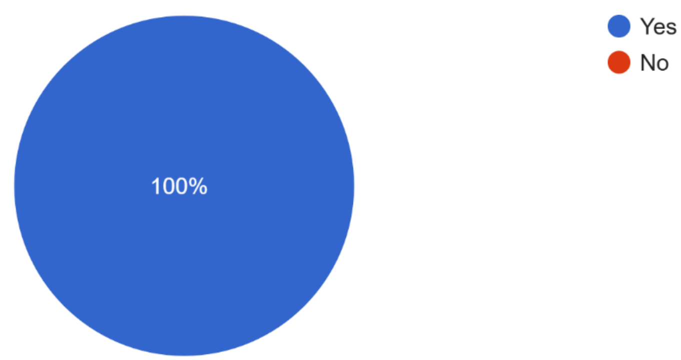
Mid-Term Survey

What jurisdiction are you representing?

- Haskell County
- Lane County
- Lane County Public Works
- Fowler USD 225
- Southern Pioneer Electric
- USD 374 Sublette
- City of Copeland
- City of Ashland, Ashland Kansas, Jeremy Smith
- The Lane-Scott Electric Cooperative, Inc.
- Pawnee Watershed Joint District No.81
- Bucklin Hospital District (Hill Top House)
- Victory Electric
- Sunflower Electric Power Corporation
- Ford County
- Montezuma USD #371 & Copeland USD #476
- City of Plains
- Hodgeman County USD 227
- Horsethief Reservoir
- City of Bucklin
- Lane County Emergency Management
- City of Meade, Kansas
- Artesian Valley Health System (Meade County)
- Gray
- CMS Electric Cooperative
- City of Dighton
- Meade Schools
- USD 507
- Fowler
- City of Ford
- Hodgeman County Health Center
- Meade County
- Clark County
- Lane County USD 482
- Hodgeman County -City of Hanston
- Southern Pioneer Electric Company
- Haskell County, Satanta

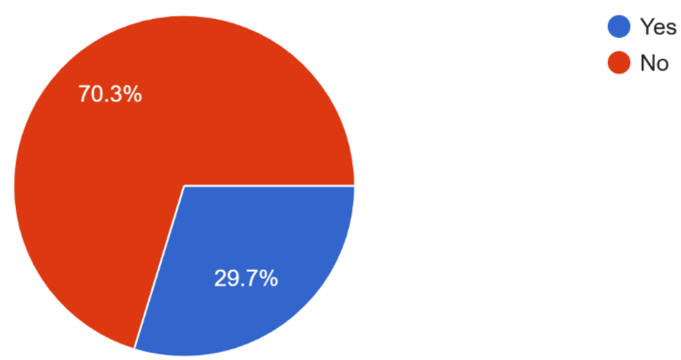
Have your reviewed your jurisdiction's capability assessment from the 2020 Kansas Region D Hazard Mitigation Plan?

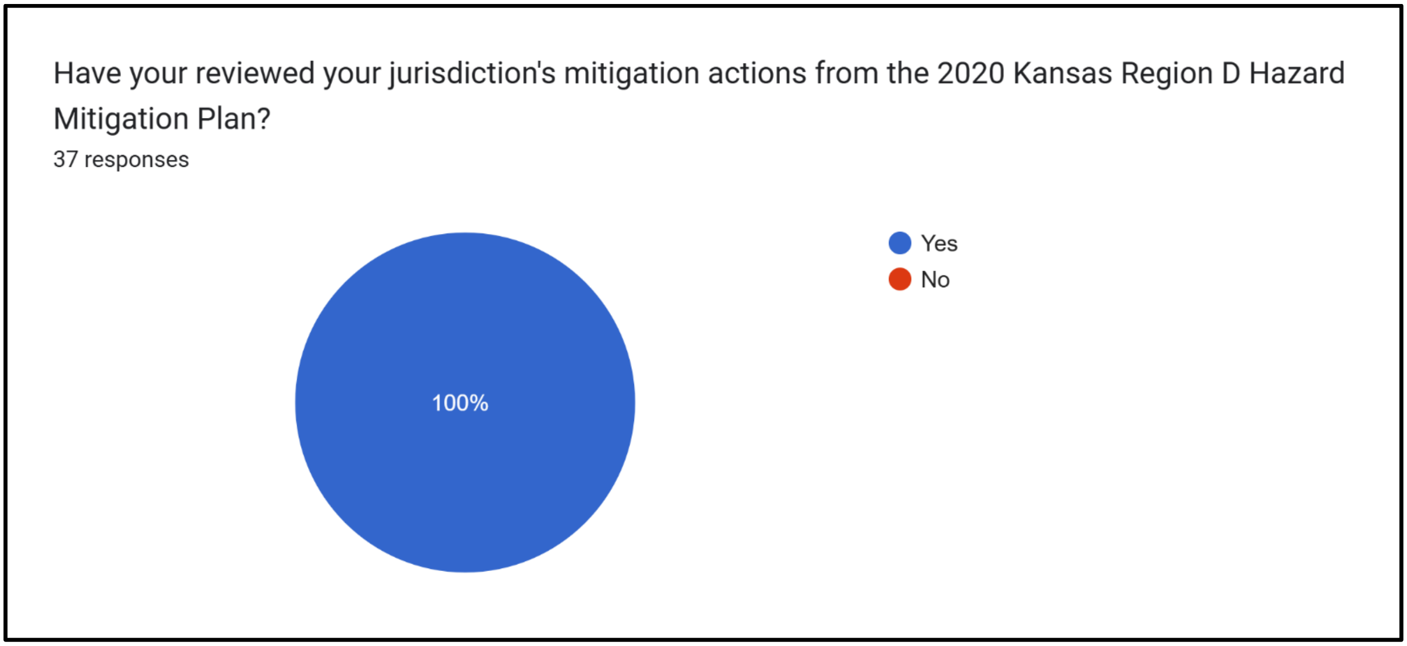
37 responses

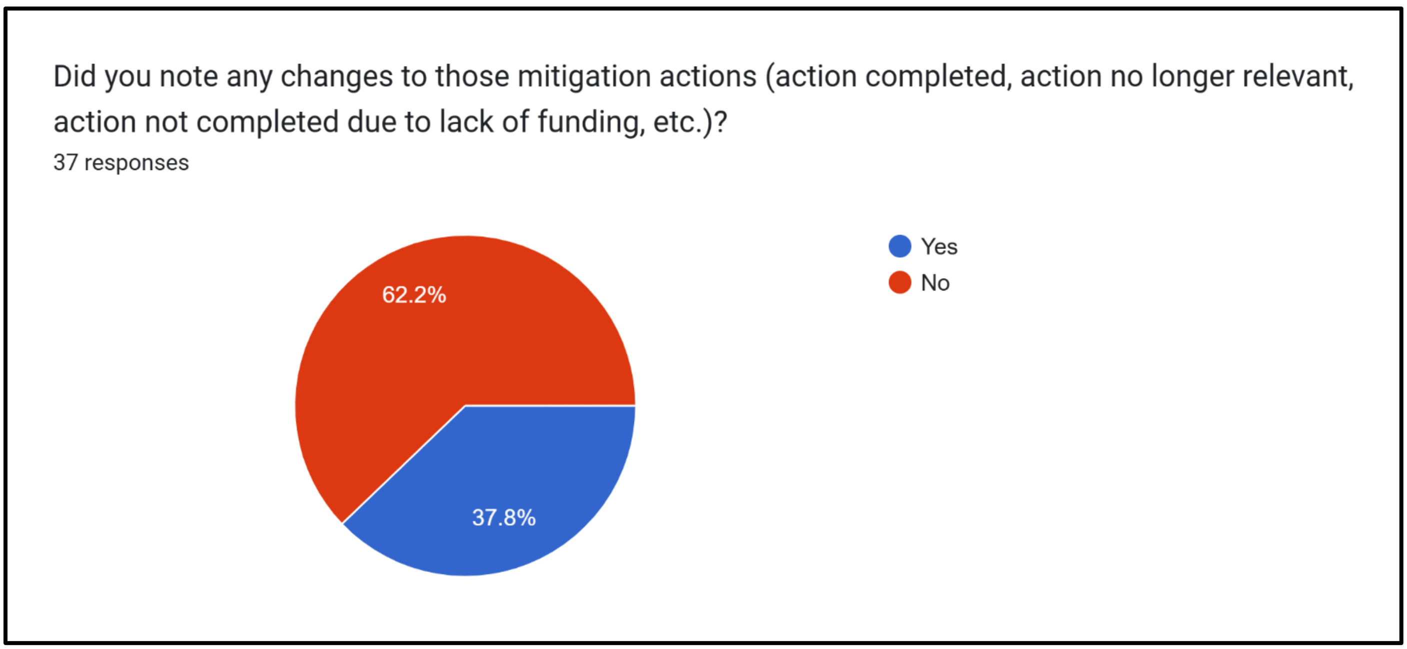


Did you note any changes in your jurisdiction's capability assessment?

37 responses







Are there any additional mitigation actions you would like to be considered for your jurisdiction?

- No
- no
- Not at this time
- NO
- Not at this time.
- No
- I do not know what potential mitigation actions are possible so I cannot answer.
- I think we have covered all the changes we would like to have made
- Some sort of storm shelter for travelers.

- Not at this time.
- none
- Not at present time
- yes
- Severe weather shelter

Is there anything else concerning hazard mitigation that you would like us to know?

- No
- no
- Not at this time
- Not at this time.
- Again, I don't know enough about what is possible to answer the question.
- I feel like all of our questions and concerns have been answered.
- Not at this time.
- No, not at this time.
- Concerning our healthcare organization we are working to increase awareness of the increase of violence against healthcare workers as well as increase our mitigation of incidents by enhancing our security measures as well as training of staff. This increase in this specific hazard can be difficult to mitigate due to our duty to serve patients however we have been using what resources we have to do our best in this effort.
- not at this time
- NO
- Not at present time
- No right now

Final Survey

Appendix C – Jurisdictional Hazard Mitigation Actions

Clark County and Participating Jurisdictions 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	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Emergency Manager, Facilities Director	High	1, 3	$10,000 to $50,000 per location	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Clark County-2	Conduct regular hazard mitigation information programs for all citizens.	All hazards	Emergency Manager	High	1, 2	Staff Time	General fund	Five years	Carried over due to lack of staff
Clark County-3	Institute a county-wide building code utilizing the latest IBC codes.	All hazards	Emergency Manager, Zoning Director	Low	1,2	Staff Time	General fund	Five years	Carried over due to lack of staff
Clark County-4	Upgrade and expand warning network throughout the county, especially in currently underserved areas.	All hazards	Emergency Manager	High	1, 2	Site and size dependent	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Clark County-5	Mail updated information to all agricultural producers concerning emerging threats.	Agricultural Infestation	Emergency Manager	High	1, 2	Staff Time and $500	General fund	Five years	Carried over due to lack of staff
Clark County-6	Map all infrastructure and facilities within dam inundation areas.	Dam/Levee Failure	Emergency Manager	Medium	1, 2, 4	$10,000 per location	HMGP, General fund	Five years	New
Clark County-7	Complete education campaign for citizens on the benefits of replacing water intensive landscaping with natural, low water plantings	Drought	Emergency Manager	Low	1,2,3	Volunteers and Staff Time	General fund	Five years	New
Clark County-8	Identify and prepare county building for usage as heat/cold shelters.	Extreme Temperatures	Facilities Director	Medium	1, 2	$2,000 per facility	General fund	Three years	New
Clark County-9	Become a participant in the NFIP.	Flood	Emergency Manager	High	1, 2	Staff time	General fund	Three years	New
Clark County-10	Enter CRS Program.	Flood	Emergency Manager	High	1,2	Staff time	NA	Three years	New
Clark County-11	Construct rainwater retention/detention ponds at strategic locations.	Flood	Public Works Director	Medium	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding

Clark County and Participating Jurisdictions 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-12	Purchase protective window film for all county facility windows to reduce the risk of airborne debris injuries during extreme wind events.	Severe Weather, Tornado	Emergency Manager	Low	1,2	Facility size dependent	HMGP, General fund	Five years	New
Clark County-13	Construct community safe rooms throughout the county to required building standards	Severe Weather, Tornado	Emergency Manager	High	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Clark County-14	Create defensible space buffers at all county facilities	Wildfire	Public Works Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	As required	New
Clark County-15	Increase public and fire department training on wildland-urban interface fire prevention.	Wildfire	Emergency Management Coordinator	medium	3	$30 per student per training session	Kansas Forest Service and federal grants	Three to five years	Not started, lack of funding
Clark County-16	Become a Firewise Community.	Wildfire	Emergency Management Coordinator	Low	3	Staff time	General fund	Three years	Not started, lack of staff
Clark County-17	Provide hazardous materials handling and transportation information to citizens and businesses.	Hazardous Materials Event	Emergency Manager	High	1, 2	$50 per trainee	HMGP, General fund	As required	New
Clark County-18	Conduct active shooter drills and exercises for all county personnel.	Terrorism	County Sheriff	Low	1, 2	Data size dependent	General fund	Five years	New
Ashland-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Ashland-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding

Clark County and Participating Jurisdictions 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-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Medium	1, 2	$2,000 per facility	General fund	Three years	New
Ashland-4	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	On-going
Ashland-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Ashland-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Ashland-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Ashland-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
Ashland-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Ashland-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Ashland-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Ashland-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions

Clark County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Englewood-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Englewood-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2x	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Englewood-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	High	1, 2	$2,000 per facility	General fund	Three years	New
Englewood-4	Become a participant in the NFIP.	Flood	Mayor	High	1, 2	Staff time	General fund	Three years	New
Englewood-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Englewood-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Englewood-7	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
Englewood-9	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Englewood-10	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Englewood-11	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions

Clark County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Minneola-1	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Minneola-2	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Medium	1, 2	$2,000 per facility	General fund	Three years	New
Minneola-3	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	On-going
Minneola-4	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Minneola-5	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Minneola-6	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Minneola-7	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
Minneola-8	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Minneola-9	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Minneola-10	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions

Clark County and Participating Jurisdictions 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 219 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 219 Superintendent	High	1, 2	\$10,000 - \$50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 219 2	Conduct a native, low water planting program for all school facilities	Drought	USD 219 Superintendent	Low	1, 2	\$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 219 3	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 219 Superintendent	Medium	1, 2	\$500	District general fund	Five years	New
USD 219 4	Construct rainwater gardens adjacent to paved areas.	Flood	USD 219 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 219 5	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 219 Superintendent	High	1, 2	\$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 219 6	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 219 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 219 7	Conduct regular staff and student active shooter trainings.	Terrorism	USD 219 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New

Clark County and Participating Jurisdictions 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 220 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	Wildfire, Flood, Extreme Temperature, Severe Weather, Tornado	USD 220 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 220 2	Conduct hazard mitigation education programs for students.	All hazards	USD 220 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 220 3	Conduct a native, low water planting program for all school facilities	Drought	USD 220 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 220 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 220 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 220 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 220 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 220 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 220 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 220 7	Conduct regular staff and student active shooter trainings.	Hazard	USD 220 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New

Clark County and Participating Jurisdictions 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 Health Center-1	Panic button installation in ERs and Lab	Workplace Violence, Terrorism	AHC CEO	High	1, 2	Staff time	HMGP, Hospital budget	Two years	New
Ashland Health Center-2	Generator to cover all facility electrical needs	Utility/ Infrastructure Failure	AHC CEO	High	1, 2	$300,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Ashland Health Center-3	Redundant Server	Infrastructure Failure, Cybersecurity	AHC CEO	High	1,2	$1,000,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Ashland Health Center-3	Intercom System throughout facility	All Hazards	AHC CEO	High	1, 2, 3	$200,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Ashland Health Center-4	Secondary Internet Service Provider (ISP)	Infrastructure Failure, Cybersecurity	AHC CEO	High	1, 2	$50,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Minneola District Hospital-1	Conduct education campaign on importance of hazard mitigation for all patients and staff relating to medical care.	All hazards	Director	High	1,2	Staff time	Hospital budget	Two years	New
Minneola District Hospital-2	Purchase and install emergency generators for facilities.	All hazards	Director	High	1,2	$30,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Minneola District Hospital-3	Construct safe room(s) for all hospital facilities.	Tornado, Windstorm	Director	High	1,2	$1,000,000	HMGP, Hospital budget	Five years	Not started, lack of funding
CMS Electric Cooperative 1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
CMS Electric Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding

Clark County and Participating Jurisdictions 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 Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Southern Pioneer Electric COOP -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Southern Pioneer Electric COOP -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Southern Pioneer Electric COOP -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New

Finney County and Participating Jurisdictions 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	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Emergency Manager, Facilities Director	High	1, 3	$10,000 to $50,000 per location	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Finney County-2	Conduct regular hazard mitigation information programs for all citizens.	All hazards	Emergency Manager	High	1, 2	Staff Time	General fund	Five years	Carried over due to lack of staff
Finney County-3	Institute a county-wide building code utilizing the latest IBC codes.	All hazards	Emergency Manager, Zoning Director	Low	1,2	Staff Time	General fund	Five years	Carried over due to lack of staff
Finney County-4	Mail updated information to all agricultural producers concerning emerging threats.	Agricultural Infestation	Emergency Manager	High	1, 2	Staff Time and $500	General fund	Five years	Carried over due to lack of staff
Finney County-5	Complete education campaign for citizens on the benefits of replacing water intensive landscaping with natural, low water plantings	Drought	Emergency Managers	Low	1,2,3	Volunteers and Staff Time	General fund	Five years	New
Finney County-6	Identify and prepare county building for usage as heat/cold shelters.	Extreme Temperatures	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Finney County-7	Continue to participate in, and enforce provisions of, NFIP.	Flood	NFIP Administrator	High	1, 2	Per property cost	General fund	On-going	On-going
Finney County-8	Enter CRS Program.	Flood	Emergency Manager, NFIP Administrator	High	1,2	Staff time	General fund	Three years	New
Finney County-9	Construct rainwater retention/detention ponds at strategic locations.	Flood	NFIP Administrator, Public Works Director	Medium	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Finney County-10	Purchase protective window film for all county facility windows to reduce the risk of airborne debris injuries during extreme wind events.	Severe Weather, Tornado	Emergency Manager	Low	1,2	Facility size dependent	HMGP, General fund	Five years	New

Finney County and Participating Jurisdictions 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-11	Construct community safe rooms throughout the county to required building standards	Severe Weather, Tornado	Emergency Manager	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Finney County-12	Construct snow fences along major transportation routes.	Severe Winter Weather	Public Works Director	Low	1, 2	$25,000 - $100,000 per location	HMGP, PDM, General fund	Ten years	New
Finney County-13	Create defensible space buffers at all county facilities	Wildfire	Public Works Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	As required	New
Finney County-14	Increase public and fire department training on wildland-urban interface fire prevention.	Wildfire	Emergency Management Coordinator	Low	3	$30 per student per training session	Kansas Forest Service and federal Greeleys	Three to five years	Not started, lack of funding
Finney County-15	Become a Firewise Community.	Wildfire	Emergency Management Coordinator	Low	3	Staff time	General fund	Three years	Not started, lack of staff
Finney County-16	Purchase cloud storage backup for all jurisdictional electronic records.	Cybersecurity Incident	IT Director	High	1, 2	Data size dependent	General fund	Five years	New
Finney County-17	Provide hazardous materials handling and transportation information to citizens and businesses.	Hazardous Materials Event	Emergency Manager	High	1, 2	$50 per trainee	HMGP, General fund	As required	New
Finney County-18	Identify and map all structurally deficient bridges.	Infrastructure Failure	Public Works Director	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Finney County-19	Conduct active shooter drills and exercises for all county personnel.	Terrorism	County Sheriff	Low	1, 2	Data size dependent	General fund	Five years	New
Garden City-1	Purchase and install critical facility backup generators in conjunction	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC,	Five years	Carried over lack of funding

Finney County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	with hardening existing electrical systems.						General fund		
Garden City-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Garden City-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Garden City-4	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	On-going
Garden City-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Garden City-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Garden City-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Garden City-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
Garden City-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Garden City-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions

Finney County and Participating Jurisdictions 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-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Garden City-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
Holcomb-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Holcomb-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Holcomb-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Holcomb-4	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	On-going
Holcomb-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Holcomb-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Holcomb-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Holcomb-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC,	Ten years	New

Finney County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							General fund		
Holcomb-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Holcomb-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Holcomb-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Holcomb-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
GCCC 1	Purchase and install college facility backup generators in conjunction with hardening existing electrical systems.	All hazards	GCCC Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
GCCC 2	Conduct hazard mitigation education programs for students.	All hazards	GCCC Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
GCCC 3	Conduct a native, low water planting program for all school facilities	Drought	GCCC Superintendent	Low	1, 2	$10,000 -per location	HMGP, BRIC, District general fund	Ten years	New
GCCC 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	GCCC Superintendent	Medium	1, 2	$500	District general fund	Five years	New
GCCC 5	Construct rainwater gardens adjacent to paved areas.	Flood	GCCC Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District	As required	New

Finney County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							general fund		
GCCC 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	GCCC Superintendent	High	1, 2	$1,000,000 - per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
GCCC 7	Install high wind, hail, and fire-resistant roofing on all college facilities.	Severe Weather, Tornado, Wildfires	GCCC Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 363 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 363 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 363 2	Conduct hazard mitigation education programs for students.	All hazards	USD 363 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 363 3	Conduct a native, low water planting program for all school facilities	Drought	USD 363 Superintendent	Low	1, 2	$10,000 -per location	HMGP, BRIC, District general fund	Ten years	New
USD 363 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 363 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 363 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 363 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New

Finney County and Participating Jurisdictions 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 363 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 363 Superintendent	High	1, 2	$1,000,000 - per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 363 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 363 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 363 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 363 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 457 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 457 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 457 2	Conduct hazard mitigation education programs for students.	All hazards	USD 457 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 457 3	Conduct a native, low water planting program for all school facilities	Drought	USD 457 Superintendent	Low	1, 2	$10,000 -per location	HMGP, BRIC, District general fund	Ten years	New
USD 457 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 457 Superintendent	Medium	1, 2	$500	District general fund	Five years	New

Finney County and Participating Jurisdictions 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 457 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 457 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 457 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 457 Superintendent	High	1, 2	$1,000,000 - per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 457 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 457 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 457 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 457 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
Lane-Scott Electric Cooperative -1	Conduct danger tree clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Lane-Scott Electric Cooperative -2	Inspect poles and replace or harden marginal poles.	All hazards	Operations Director	High	1, 2	$100,000 per year	System budget	Continuous	On-going
Midwest Energy 1	Conduct tree and vegetation clearance around utility infrastructure.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Midwest Energy -2	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Pioneer Electric Cooperative -1	Conduct tree and vegetation clearance around utility	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going

Finney County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	infrastructure, including overhead lines.								
Pioneer Electric Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Pioneer Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Sunflower Electric-1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Sunflower Electric-2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Sunflower Electric-3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Victory Electric Cooperative -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Victory Electric Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Victory Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Wheatland Electric Cooperative -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going

Finney County and Participating Jurisdictions 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 Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Wheatland Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
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	District funds, HMGP. BRIC	Five years	In progress
PWJD81-2	Provide education programs for flood safety, dam safety, and dam failure.	Flood, Dam and Levee Failure	Director	High	3	$2,000	District funds	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	District funds, HMGP. BRIC	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	District funds	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	District funds, HMGP. BRIC	Five years	Not started, lack of funding

Ford County and Participating Jurisdictions 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	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Emergency Manager, Facilities Director	High	1, 3	$10,000 to $50,000 per location	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Ford County-2	Conduct regular hazard mitigation information programs for all citizens.	All hazards	Emergency Manager	High	1, 2	Staff Time	General fund	Five years	Carried over due to lack of staff
Ford County-3	Institute a county-wide building code utilizing the latest IBC codes.	All hazards	Emergency Manager, Zoning Director	Low	1,2	Staff Time	General fund	Five years	New
Ford 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	Extension Agent, Emergency Manager	Medium	3	Staff Time	General fund	Four years	Not started, lack of staff
Ford County-5	Research funding options for dam and levee development, certification, maintenance, and inspection programs	Dam/ Levee Failure	Floodplain Manager	Medium	1,2	Staff time	General fund	Five years	Not started, lack of staff
Ford County-6	Complete education campaign for citizens on the benefits of replacing water intensive landscaping with natural, low water plantings	Drought	Emergency Managers	Low	1,2,3	Volunteers and Staff Time	General fund	Five years	New
Ford County-7	Identify and prepare county building for usage as heat/cold shelters.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Ford County-8	Continue to participate in, and enforce provisions of, NFIP.	Flood	NFIP Administrator	High	1, 2	Staff time	General fund	On-going	On-going
Ford County-9	Educate and promote local jurisdictional participation in the NFIP.	Flood	Emergency Manager, NFIP Administrator	High	1,2	Staff time	General Fund	On-going	On-going

Ford County and Participating Jurisdictions 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 a program to acquire and preserve parcels of land subject to repetitive flooding from willing and voluntary property owners.	Flood	NFIP Administrator, County Planners	High	1,2	Staff time, acquisition cost property dependent	HMGP, BRIC, General fund	Four years	Not started, lack of funding
Ford County-11	Seek funding options to complete a stormwater drainage study and plan for the county that will lead to a stormwater management ordinance.	Flood	Floodplain Manager	High	1,2	$40,000	HMGP, BRIC, General fund	Five years	Not started, lack of funding
Ford County-12	Build drainage culverts based on the stormwater drainage study.	Flood	Director Public Works, Floodplain Manager	High	1,2	Dependent on Stormwater drainage study	HMGP, BRIC, General fund	Five years	Not started, lack of funding
Ford County-13	Identify flash-flood prone areas and complete projects to minimize flooding.	Flood	Mitigation Officer, Floodplain Manager	High	1,2	Staff time and project dependent	HMGP, BRIC, General fund	Five years	Not started, lack of funding
Ford County-14	Conduct an engineering study of select bridges in the county for possible improvements.	Flood, Infrastructure Failure	County Engineer, Director Public Works	Medium	1,2	$40,000	HMGP, BRIC, General fund	Five years	Not started, lack of funding
Ford County-15	Purchase protective window film for all county facility windows to reduce the risk of airborne debris injuries during extreme wind events.	Severe Weather, Tornado	Emergency Manager	Low	1,2	Facility size dependent	HMGP, General fund	Five years	New
Ford County-16	Construct community safe rooms throughout the county to required building standards	Severe Weather, Tornado	Emergency Manager	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Ford County-17	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Emergency Manager	Medium	3	Staff Time	General fund	Three years	Not started, lack of staff
Ford County-18	Create defensible space buffers at all county facilities	Wildfire	Public Works Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	As required	New

Ford County and Participating Jurisdictions 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-19	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	1,2,3	$350 per workshop	General fund	On-going	Not started, lack of staff
Ford County-20	Become a Firewise Community.	Wildfire	Emergency Management Coordinator	Low	3	Staff time	General fund	Three years	Not started, lack of staff
Ford County-29	Purchase cloud storage backup for all jurisdictional electronic records.	Cybersecurity Incident	IT Director	High	1, 2	Data size dependent	General fund	Five years	New
Ford County-21	Provide hazardous materials handling and transportation information to citizens and businesses.	Hazardous Materials Event	Emergency Manager	High	1, 2	$50 per trainee	HMGP, General fund	As required	New
Ford County-22	Identify and map all structurally deficient bridges.	Infrastructure Failure	Public Works Director	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Ford County-23	Conduct active shooter drills and exercises for all county personnel.	Terrorism	County Sheriff	Low	1, 2	Data size dependent	General fund	Five years	New
Bucklin-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Bucklin-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Bucklin-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Bucklin-4	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	On-going
Bucklin-5	Construct rainwater retention/detention ponds or other	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC,	As required	New

Ford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	flood control projects at strategic locations.						General fund		
Bucklin-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Bucklin-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Bucklin-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
Bucklin-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Bucklin-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Bucklin-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Bucklin-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
Dodge City - 1	Purchase emergency generators and/or transfer switches to provide backup power for critical facilities, including Dodge City's City Hall, Police Stations, Fire Stations, and Municipal Services Building	All Hazards	City Manager, Director of Facilities and Construction	Medium	1, 2	$150,000	HMGP, BRIC, General Fund	Five years	Not started, lack of funding
Dodge City - 2	Research funding options and consider the purchase of additional Public Works equipment to assist	All Hazards	City Manager, Director or Public Works	Medium	1, 2	$200,000	HMGP, BRIC, General Fund	Five years	Not started, lack of funding

Ford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	residents in the case of weather emergencies								
Dodge City - 3	Purchase equipment to upgrade current communications equipment	All Hazards	City Manager	Medium	4	$740,000	HMGP, BRIC, General Fund	Five years	Not started, lack of funding
Dodge City - 4	Implement a preventative tree maintenance program along major traffic routes to reduce falling debris and blocked roadways	All Hazards	City Manager, Director of Parks and Recreation	Medium	1, 2	$10,000	General Fund	Five years	Not started, lack of funding
Dodge City - 5	Research funding options to maintain the Arkansas River bed and camera pipe penetrations in the area of the city owned levee	Dam or Levee Failure	City Manager, Director of Engineering Services	High	1, 2	Staff time	HMGP, BRIC, General Fund	Five years	Not started, lack of funding
Dodge City - 6	Seek funding for the Managed Aquifer Recharge project	Drought	City Manager, Director of Engineering Services	High	1, 2	Staff time	HMGP, BRIC, General Fund	Five years	Not started, lack of funding
Dodge City - 7	Design and build a water treatment facility to remove nitrate from drinking water	Drought	City Manager, Director of Engineering Services, Director of Public Works	High	1, 2	Scope unknown	HMGP, BRIC, General Fund	Ten years	Not started, lack of funding
Dodge City - 8	Enhance and upgrade all water infrastructure to better withstand hazard events	Drought	City Manager, Director of Engineering Services, Director of Public Works	High	1, 2	Location dependent	HMGP, BRIC, General Fund	Ten years	Not started, lack of funding
Dodge City - 9	Provide a secondary water main to Wright	Drought	City Manager, Director of Engineering Services,	High	1, 2	Scope unknown	HMGP, BRIC, General Fund	Ten years	Not started, lack of funding

Ford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
			Director of Public Works						
Dodge City - 10	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Dodge City - 11	Continued participation in NFIP	Flood	NFIP Administrator	High	1, 2	Staff Time	General Fund	Continuous	On-going
Dodge City - 12	Continued enforcement of floodplain ordinance (NFIP)	Flood	NFIP Administrator	High	1, 2	Staff Time	General Fund	Continuous	On-going
Dodge City - 13	Clean and protect drainage ways and storm water apparatus	Flood	City Manager, Director of Engineering Services	High	1, 2	Location and equipment dependent	HMGP, BRIC, General Fund	Five years	Not started, lack of funding
Dodge City - 14	Construct community safe rooms	Severe Weather, Tornado	City Manager, Director of Development Services	High	1,2,3	$1,000,000	General Fund	Five years	Not started, lack of funding
Dodge City - 15	Provide additional airport hangars and water resources at Airport for area fire protection	Wildfire	City Manager, Director of Public Works	High	1, 2	$1,000,000	HMGP Poist Fire, BRIC, General Fund	Five years	Not started, lack of funding
Dodge City - 16	Clear areas identified as a fire risk and implement a wildland fire separation program	Wildfire	City Manager, Fire Chief, Fire Marshal	High	1, 2	Location dependent	HMGP Post Fire, BRIC, General Fund	Five years	Not started, lack of funding
Dodge City - 17	Purchase and install new surveillance cameras and building security components at critical facilities	Terrorism	City Manager, Police Chief	Medium	1, 2	$60,000	HMGP, BRIC, General Fund	Five years	Not started, lack of funding

Ford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
City of Ford-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
City of Ford-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
City of Ford-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
City of Ford-4	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	On-going
City of Ford-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
City of Ford-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
City of Ford-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
City of Ford-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
City of Ford-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding

Ford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
City of Ford-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
City of Ford-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
City of Ford-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
Spearville-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Spearville-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Spearville-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Spearville-4	Become a participant in the NFIP.	Flood	Mayor	High	1, 2	Staff time	General fund	Three years	New
Spearville-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Spearville-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Spearville-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New

Ford County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Spearville-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
Spearville-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Spearville-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Spearville-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Spearville-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
DCCC 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	DCCC President	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
DCCC 2	Conduct hazard mitigation education programs for students.	All hazards	DCCC President	Medium	1, 2, 3	$2,000	District general fund	As required	New
DCCC 3	Conduct a native, low water planting program for all school facilities	Drought	DCCC President	Low	1, 2	$10,000 -per location	HMGP, BRIC, District general fund	Ten years	New
DCCC 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	DCCC President	Medium	1, 2	$500	District general fund	Five years	New

Ford County and Participating Jurisdictions 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 5	Construct rainwater gardens adjacent to paved areas.	Flood	DCCC President	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
DCCC 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	DCCC President	High	1, 2	$1,000,000 - per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
DCCC 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	DCCC President	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
DCCC 8	Conduct regular staff and student active shooter trainings.	Terrorism	DCCC President	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 381 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 381 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 381 2	Conduct hazard mitigation education programs for students.	All hazards	USD 381 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 381 3	Conduct a native, low water planting program for all school facilities	Drought	USD 381 Superintendent	Low	1, 2	$10,000 -per location	HMGP, BRIC, District general fund	Ten years	New

Ford County and Participating Jurisdictions 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 381 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 381 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 381 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 381 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 381 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 381 Superintendent	High	1, 2	$1,000,000 - per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 381 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 381 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 443 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 443 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 443 2	Conduct hazard mitigation education programs for students.	All hazards	USD 443 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 443 3	Conduct a native, low water planting program for all school facilities	Drought	USD 443 Superintendent	Low	1, 2	$10,000 -per location	HMGP, BRIC, District general fund	Ten years	New

Ford County and Participating Jurisdictions 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 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 443 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 443 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 443 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 443 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 443 Superintendent	High	1, 2	$1,000,000 - per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 443 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 443 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 443 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 443 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 459 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 459 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 459 2	Conduct hazard mitigation education programs for students.	All hazards	USD 459 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New

Ford County and Participating Jurisdictions 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 459 3	Conduct a native, low water planting program for all school facilities	Drought	USD 459 Superintendent	Low	1, 2	$10,000 -per location	HMGP, BRIC, District general fund	Ten years	New
USD 459 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 459 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 459 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 459 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 459 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 459 Superintendent	High	1, 2	$1,000,000 - per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 459 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 459 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 459 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 459 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
Bucklin Hospital District-1	Conduct education campaign on importance of hazard mitigation for all patients and staff relating to medical care.	All hazards	Director	High	1,2	Staff time	Hospital budget	Two years	New

Ford County and Participating Jurisdictions 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 Hospital District-2	Purchase and install emergency generators for facilities.	All hazards	Director	High	1,2	$30,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Bucklin Hospital District-3	Construct safe room(s) for all hospital facilities.	Severe Weather, Tornado	Director	High	1,2	$1,000,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Sunflower Electric-1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Sunflower Electric-2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Sunflower Electric-3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Victory Electric Cooperative -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Victory Electric Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Victory Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
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	District funds, HMGP. BRIC	Five years	In progress
PWJD81-2	Provide education programs for flood safety, dam safety, and dam failure.	Flood, Dam and Levee Failure	Director	High	3	$2,000	District funds	Five years	Not started, lack of funding

Ford County and Participating Jurisdictions 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 and keep silt from filling streams and lakes.	Flood, Dam and Levee Failure	Director	High	1,2,3	$5,000,000	District funds, HMGP. BRIC	Five years	Not started, lack of funding
PWJD81-4	Assist counties in the Pawnee Watershed District in updating and/or implementing zoning regulation to keep structures from being built or upgraded in breach path below flood control dams.	Flood, Dam and Levee Failure	Director	High	1,2	Staff Time	District funds	Continuous	In progress
PWJD81-5	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during flood events or dam failure.	Flood, Dam and Levee Failure	Director	High	1,2	$100,000	District funds, HMGP. BRIC	Five years	Not started, lack of funding

Gray County and Participating Jurisdictions 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	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Emergency Manager, Facilities Director	High	1, 3	$10,000 to $50,000 per location	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Gray County-2	Conduct regular hazard mitigation information programs for all citizens.	All hazards	Emergency Manager	High	1, 2	Staff Time	General fund	Five years	Carried over due to lack of staff
Gray County-3	Institute a county-wide building code utilizing the latest IBC codes.	All hazards	Emergency Manager, Zoning Director	Low	1,2	Staff Time	General fund	Five years	New
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	Extension Agent, Emergency Manager	Medium	3	Staff Time	General fund	Four years	Not started, lack of staff
Gray County-5	Map all infrastructure and facilities within dam inundation areas.	Dam/Levee Failure	Emergency Manager	Medium	1, 2, 4	$10,000 per location	HMGP, General fund	Five years	New
Gray County-6	Complete education campaign for citizens on the benefits of replacing water intensive landscaping with natural, low water plantings	Drought	Emergency Managers	Low	1,2,3	Volunteers and Staff Time	General fund	Five years	New
Gray County-7	Identify and prepare county building for usage as heat/cold shelters.	Extreme Temperatures	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Gray County-8	Become a participant in the NFIP.	Flood	Emergency Manager	High	1, 2	Staff time	General fund	Three years	New
Gray County-9	Enter CRS Program.	Flood	Emergency Manager	High	1,2	Staff time	General Fund	Three years	New
Gray County-10	Develop a program to acquire and preserve parcels of land subject to repetitive flooding from willing and voluntary property owners.	Flood	Public Works Director	Medium	1, 2	Staff time, acquisition cost property dependent	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding

Gray County and Participating Jurisdictions 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-11	Purchase protective window film for all county facility windows to reduce the risk of airborne debris injuries during extreme wind events.	Severe Weather, Tornado	Emergency Manager	Low	1,2	Facility size dependent	HMGP, General fund	Five years	New
Gray County-12	Construct community safe rooms throughout the county to required building standards	Severe Weather, Tornado	Emergency Manager	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Gray County-13	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Emergency Manager	Medium	3	Staff Time	General fund	Three years	Not started, lack of staff
Gray County-14	Create defensible space buffers at all county facilities	Wildfire	Public Works Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	As required	New
Gray County-15	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	1,2,3	$350 per workshop	General fund	On-going	Not started, lack of staff
Gray County-16	Become a Firewise Community.	Wildfire	Emergency Management Coordinator	Low	3	Staff time	General fund	Three years	Not started, lack of staff
Gray County-17	Purchase cloud storage backup for all jurisdictional electronic records.	Cybersecurity Incident	IT Director	High	1, 2	Data size dependent	General fund	Five years	New
Gray County-18	Provide hazardous materials handling and transportation information to citizens and businesses.	Hazardous Materials Event	Emergency Manager	High	1, 2	$50 per trainee	HMGP, General fund	As required	New
Gray County-19	Identify and map all structurally deficient bridges.	Infrastructure Failure	Public Works Director	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Gray County-20	Conduct active shooter drills and exercises for all county personnel.	Terrorism	County Sheriff	Low	1, 2	Data size dependent	General fund	Five years	New
Cimarron-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding

Gray County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Cimarron-2	Install evacuation route signage in any potential dam failure inundation areas.	Dam/Levee Failure	Mayor	Medium	1, 2, 4	$5,000 per location	HMGP, General fund	Five years	New
Cimarron-3	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	New
Cimarron-4	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Cimarron-5	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	New
Cimarron-6	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Cimarron-7	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	New
Cimarron-8	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	Carried over, lack of funding
Cimarron-9	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
Cimarron-10	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	New
Cimarron-11	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	New

Gray County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Cimarron-12	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Cimarron-13	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
Copeland-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Copeland-2	Upgrade/repair existing water supply infrastructure.	Drought	City Manager	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	New
Copeland-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Copeland-4	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	New
Copeland-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Copeland-6	Meet requirements and join the CRS program.	Flood	City Manager	Low	1, 2	Staff time	General fund	Three years	New
Copeland-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Copeland-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	Carried over, lack of funding

Gray County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Copeland-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	New
Copeland-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	New
Copeland-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Copeland-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	New
Ensign-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Ensign-2	Upgrade/repair existing water supply infrastructure.	Drought	City Manager	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Ensign-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Ensign-4	Become a participant in the NFIP.	Flood	City Manager	High	1, 2	Staff time	General fund	Three years	New
Ensign-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Ensign-6	Meet requirements and join the CRS program.	Flood	City Manager	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff

Gray County and Participating Jurisdictions 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-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Ensign-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
Ensign-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Ensign-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Ensign-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Ensign-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
Ingalls-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	-	-	-	-	-	-	-	Completed
Ingalls-2	Upgrade/repair existing water supply infrastructure.	Drought	Public Works Director	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	New
Ingalls-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Mayor	Medium	1, 2	$2,000 per facility	General fund	Three years	New

Gray County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Ingalls-4	Become a participant in the NFIP.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Ingalls-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	Carried over, lack of funding
Ingalls-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	New
Ingalls-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Mayor	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Ingalls-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Mayor	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	Carried over, lack of funding
Ingalls-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Mayor	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Carried over, lack of funding
Ingalls-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	New
Ingalls-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Ingalls-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	New
Montezuma-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Montezuma-2	Upgrade/repair existing water supply infrastructure.	Drought	City Manager	High	1,2	Location and size dependent	HMGP, BRIC,	Five years	New

Gray County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							General fund,		
Montezuma-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Montezuma-4	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	New
Montezuma-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Montezuma-6	Meet requirements and join the CRS program.	Flood	City Manager	Low	1, 2	Staff time	General fund	Three years	New
Montezuma-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Montezuma-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	Carried over, lack of funding
Montezuma-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	New
Montezuma-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	New
Montezuma-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Montezuma-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	New

Gray County and Participating Jurisdictions 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	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 102 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 102 2	Conduct hazard mitigation education programs for students.	All hazards	USD 102 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 102 3	Conduct a native, low water planting program for all school facilities	Drought	USD 102 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 102 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 102 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 102 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 102 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 102 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 102 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 102 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 102 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New

Gray County and Participating Jurisdictions 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 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 102 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 371 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 371 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 371 2	Conduct hazard mitigation education programs for students.	All hazards	USD 371 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 371 3	Conduct a native, low water planting program for all school facilities	Drought	USD 371 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 371 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 371 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 371 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 371 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 371 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 371 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding

Gray County and Participating Jurisdictions 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 371 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 371 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 371 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 371 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 476 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 476 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 476 2	Conduct hazard mitigation education programs for students.	All hazards	USD 476 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 476 3	Conduct a native, low water planting program for all school facilities	Drought	USD 476 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 476 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 476 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 476 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 476 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New

Gray County and Participating Jurisdictions 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 476 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 476 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 476 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 476 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 476 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 476 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 477 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 477 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 477 2	Conduct hazard mitigation education programs for students.	All hazards	USD 477 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 477 3	Conduct a native, low water planting program for all school facilities	Drought	USD 477 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 477 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 477 Superintendent	Medium	1, 2	$500	District general fund	Five years	New

Gray County and Participating Jurisdictions 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 477 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 477 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 477 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 477 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 477 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 477 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 477 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 477 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
CMS Electric Cooperative -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
CMS Electric Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
CMS Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Midwest Energy -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going

Gray County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Midwest Energy -2	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Pioneer Electric Cooperative -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Pioneer Electric Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Pioneer Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Sunflower Electric-1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Sunflower Electric-2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Sunflower Electric-3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Victory Electric Cooperative -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Victory Electric Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Victory Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New

Gray County and Participating Jurisdictions 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 Cooperative -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Wheatland Electric Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Wheatland Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
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	$15,000,00 0	District funds, HMGP. BRIC	Five years	In progress
PWJD81-2	Provide education programs for flood safety, dam safety, and dam failure.	Flood, Dam and Levee Failure	Director	High	3	$2,000	District funds	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	District funds, HMGP. BRIC	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	District funds	Continuous	In progress
PWJD81-5	Research and pursue funding for the installation of alternative forms of public warning and mass notification systems during	Flood, Dam and Levee Failure	Director	High	1,2	$100,000	District funds, HMGP. BRIC	Five years	Not started, lack of funding

Gray County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
	potential flood events or dam failure.								

Haskell County and Participating Jurisdictions 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	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Emergency Manager, Facilities Director	High	1, 3	$10,000 to $50,000 per location	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Haskell County-2	Conduct regular hazard mitigation information programs for all citizens.	All hazards	Emergency Manager	High	1, 2	Staff Time	General fund	Five years	Carried over due to lack of staff
Haskell County-3	Institute a county-wide building code utilizing the latest IBC codes.	All hazards	Emergency Manager, Zoning Director	Low	1,2	Staff Time	General fund	Five years	Carried over due to lack of staff
Haskell 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	Extension Agent, Emergency Manager	Medium	3	Staff Time	General fund	Four years	Not started, lack of staff
Haskell County-5	Complete education campaign for citizens on the benefits of replacing water intensive landscaping with natural, low water plantings	Drought	Emergency Managers	Low	1,2,3	Volunteers and Staff Time	General fund	Five years	Carried over due to lack of staff
Haskell County-6	Identify and prepare county building for usage as heat/cold shelters.	Extreme Temperatures	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	Carried over due to lack of staff
Haskell County-7	Become a participant in the NFIP.	Flood	Emergency Manager	High	1, 2	Staff time	General fund	Three years	In progress
Haskell County-8	Enter CRS Program.	Flood	Emergency Manager	High	1,2	Staff time	General Fund	Three years	In progress
Haskell County-9	Develop a program to acquire and preserve parcels of land subject to repetitive flooding from willing and voluntary property owners.	Flood	Public Works Director	Medium	1, 2	Staff time, acquisition cost property dependent	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Haskell County-10	Purchase protective window film for all county facility windows to reduce the risk of airborne debris injuries during extreme wind events.	Severe Weather, Tornado	Emergency Manager	Low	1,2	Facility size dependent	HMGP, General fund	Five years	New

Haskell County and Participating Jurisdictions 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-11	Construct community safe rooms throughout the county to required building standards	Severe Weather, Tornado	Emergency Manager	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Complete
Haskell County-12	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Emergency Manager	Medium	3	Staff Time	General fund	Three years	Not started, lack of staff
Haskell County-13	Create defensible space buffers at all county facilities	Wildfire	Public Works Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	As required	New
Haskell County-14	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	1,2,3	$350 per workshop	General fund	On-going	Not started, lack of staff
Haskell County-15	Become a Firewise Community.	Wildfire	Emergency Management Coordinator	Low	3	Staff time	General fund	Three years	Not started, lack of staff
Haskell County-16	Purchase cloud storage backup for all jurisdictional electronic records.	Cybersecurity Incident	IT Director	High	1, 2	Data size dependent	General fund	Five years	New
Haskell County-17	Provide hazardous materials handling and transportation information to citizens and businesses.	Hazardous Materials Event	Emergency Manager	High	1, 2	$50 per trainee	HMGP, General fund	As required	New
Haskell County-18	Identify and map all structurally deficient bridges.	Infrastructure Failure	Public Works Director	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Haskell County-19	Conduct active shooter drills and exercises for all county personnel.	Terrorism	County Sheriff	Low	1, 2	Data size dependent	General fund	Five years	In progress
Satanta-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Satanta-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC,	Five years	Not started, lack of funding

Haskell County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							General fund,		
Satanta-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Satanta-4	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	On-going
Satanta-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Satanta-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Satanta-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Satanta-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
Satanta-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Satanta-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Satanta-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New

Haskell County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Satanta-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
Sublette-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Sublette-2	Upgrade/repair existing water supply infrastructure.	Drought	City Manager	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Sublette-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Sublette-4	Become a participant in the NFIP.	Flood	Mayor	High	1, 2	Staff time	General fund	Three years	New
Sublette-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Sublette-6	Meet requirements and join the CRS program.	Flood	City Manager	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Sublette-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Sublette-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New

Haskell County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Sublette-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Sublette-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Sublette-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
USD 374-1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 374 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 374-2	Conduct hazard mitigation education programs for students.	All hazards	USD 374 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 374-3	Conduct a native, low water planting program for all school facilities	Drought	USD 374 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 374-4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 374 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 374-5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 374 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 374-6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 374 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District	Ten years	Carried over due to lack of funding

Haskell County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							general fund		
USD 374-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 374 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 374-8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 374 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	Ongoing
USD 507-1	Conduct hazard mitigation education programs for students.	All hazards	USD 507 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 507-2	Conduct a native, low water planting program for all school facilities	Drought	USD 507 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 507-3	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 507 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 507-4	Construct rainwater gardens adjacent to paved areas.	Flood	USD 507 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 507-5	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 507 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding, Grade

Haskell County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
									School Complete
USD 507-6	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 507 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 507-7	Conduct regular staff and student active shooter trainings.	Terrorism	USD 507 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	Ongoing
Satanta District Hospital-1	Conduct education campaign on importance of hazard mitigation for all patients and staff relating to medical care.	All hazards	Director	High	1,2	Staff time	Hospital budget	Two years	New
Satanta District Hospital-2	Harden electronic and internet infrastructure against cyberattacks.	All hazards	Director	High	1,2	$30,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Midwest Energy-1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Midwest Energy-2	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Pioneer Electric Cooperative-1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Pioneer Electric Cooperative-2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding

Haskell County and Participating Jurisdictions 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 Electric Cooperative-3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Southern Pioneer Electric Cooperative-1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Southern Pioneer Electric Cooperative-2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Southern Pioneer Electric Cooperative-3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Sunflower Electric-1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Sunflower Electric-2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Sunflower Electric-3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Victory Electric Cooperative-1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Victory Electric Cooperative-2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding

Haskell County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Victory Electric Cooperative-3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New

Hodgeman County and Participating Jurisdictions 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	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Emergency Manager, Facilities Director	High	1, 3	$10,000 to $50,000 per location	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Hodgeman County-2	Conduct regular hazard mitigation information programs for all citizens.	All hazards	Emergency Manager	High	1, 2	Staff Time	General fund	Five years	Carried over due to lack of staff
Hodgeman County-3	Institute a county-wide building code utilizing the latest IBC codes.	All hazards	Emergency Manager, Zoning Director	Low	1,2	Staff Time	General fund	Five years	New
Hodgeman 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	Extension Agent, Emergency Manager	Medium	3	Staff Time	General fund	Four years	Not started, lack of staff
Hodgeman County-5	Map all infrastructure and facilities within dam inundation areas.	Dam/Levee Failure	Emergency Manager	Medium	1, 2, 4	$10,000 per location	HMGP, General fund	Five years	New
Hodgeman County-6	Complete education campaign for citizens on the benefits of replacing water intensive landscaping with natural, low water plantings	Drought	Emergency Managers	Low	1,2,3	Volunteers and Staff Time	General fund	Five years	New
Hodgeman County-7	Identify and prepare county building for usage as heat/cold shelters.	Extreme Temperatures	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Hodgeman County-8	Become a participant in the NFIP.	Flood	Emergency Manager	High	1, 2	Staff time	General fund	Three years	New
Hodgeman County-9	Enter CRS Program.	Flood	Emergency Manager	High	1,2	Staff time	General Fund	Three years	New
Hodgeman County-10	Develop a program to acquire and preserve parcels of land subject to repetitive flooding from willing and voluntary property owners.	Flood	Public Works Director	Medium	1, 2	Staff time, acquisition cost property dependent	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding

Hodgeman County and Participating Jurisdictions 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-11	Purchase protective window film for all county facility windows to reduce the risk of airborne debris injuries during extreme wind events.	Severe Weather, Tornado	Emergency Manager	Low	1,2	Facility size dependent	HMGP, General fund	Five years	New
Hodgeman County-12	Construct community safe rooms throughout the county to required building standards	Severe Weather, Tornado	Emergency Manager	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Hodgeman County-13	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Emergency Manager	Medium	3	Staff Time	General fund	Three years	Not started, lack of staff
Hodgeman County-14	Create defensible space buffers at all county facilities	Wildfire	Public Works Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	As required	New
Hodgeman County-15	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	1,2,3	$350 per workshop	General fund	On-going	Not started, lack of staff
Hodgeman County-16	Become a Firewise Community.	Wildfire	Emergency Management Coordinator	Low	3	Staff time	General fund	Three years	Not started, lack of staff
Hodgeman County-17	Purchase cloud storage backup for all jurisdictional electronic records.	Cybersecurity Incident	IT Director	High	1, 2	Data size dependent	General fund	Five years	New
Hodgeman County-18	Provide hazardous materials handling and transportation information to citizens and businesses.	Hazardous Materials Event	Emergency Manager	High	1, 2	$50 per trainee	HMGP, General fund	As required	New
Hodgeman County-19	Identify and map all structurally deficient bridges.	Infrastructure Failure	Public Works Director	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Hodgeman County-20	Conduct active shooter drills and exercises for all county personnel.	Terrorism	County Sheriff	Low	1, 2	Data size dependent	General fund	Five years	New
Hanston-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding

Hodgeman County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Hanston-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Hanston-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Hanston-4	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	On-going
Hanston-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Hanston-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Hanston-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Hanston-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
Hanston-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Hanston-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Hanston-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New

Hodgeman County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Hanston-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
Jetmore-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Jetmore-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Jetmore-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Jetmore-4	Become a participant in the NFIP.	Flood	Mayor	High	1, 2	Staff time	General fund	Three years	New
Jetmore-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Jetmore-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Jetmore-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Jetmore-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New

Hodgeman County and Participating Jurisdictions 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-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Jetmore-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Jetmore-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Jetmore-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
Marena Township-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Director of Board	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	New
Marena Township-2	Plant low water native vegetation near all facilities.	Drought	Director of Board	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	New
Marena Township-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Director of Board	Low	1, 2	$2,000 per facility	General fund	Three years	New
Marena Township-4	Become a participant in the NFIP.	Flood	Director of Board	High	1, 2	Staff time	General fund	Three years	New
Marena Township-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Director of Board	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Marena Township-6	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Director of Board	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New

Hodgeman County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Marena Township-7	Create defensible space buffers at all critical facilities	Wildfire	Director of Board	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Hodgeman Hospital-1	Conduct education campaign on importance of hazard mitigation for all patients and staff relating to medical care.	All hazards	Director	High	1,2	Staff time	Hospital budget	Two years	New
Hodgeman Hospital-2	Purchase and install emergency generators for facilities.	All hazards	Director	High	1,2	$30,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Hodgeman Hospital-3	Construct safe room(s) for all hospital facilities.	Tornado, Windstorm	Director	High	1,2	$1,000,000	HMGP, Hospital budget	Five years	Not started, lack of funding
USD 227 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 227 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 227 2	Conduct hazard mitigation education programs for students.	All hazards	USD 227 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 227 3	Conduct a native, low water planting program for all school facilities	Drought	USD 227 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 227 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 227 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 227 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 227 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District	As required	New

Hodgeman County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							general fund		
USD 227 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 227 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 227 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 227 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 227 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 227 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
Hodgeman County Health Center-1	Conduct education campaign on importance of hazard mitigation for all patients and staff relating to medical care.	All hazards	Director	High	1,2	Staff time	Hospital budget	Two years	New
Hodgeman County Health Center-2	Harden electronic infrastructure against failures through the installation of generators.	All hazards	Director	High	1,2	$60,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Horse Thief Reservoir District-1	Purchase and provide adequate communications system(s) for staff, campers, and event participants at Horse Thief Reservoir.	Multi-Hazard	Director	High	1,2	$500,000	HMGP, General fund	Five years	Not started, lack of funding
Horse Thief Reservoir District-2	Construct two safe rooms and/or shelters for campers and staff	Multi-Hazard	Director	High	3	$1,000,000	HMGP, General fund	Five years	Not started, lack of funding
Lane-Scott Electric Cooperative -1	Conduct danger tree clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going

Hodgeman County and Participating Jurisdictions 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-Scott Electric Cooperative -2	Inspect poles and replace or harden marginal poles.	All hazards	Operations Director	High	1, 2	$100,000 per year	System budget	Continuous	On-going
Midwest Energy -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Midwest Energy -2	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Sunflower Electric-1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Sunflower Electric-2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Sunflower Electric-3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Victory Electric Cooperative -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Victory Electric Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Victory Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
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	$15,000,00 0	District funds, HMGP. BRIC	Five years	In progress

Hodgeman County and Participating Jurisdictions 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	Provide education programs for flood safety, dam safety, and dam failure.	Flood, Dam and Levee Failure	Director	High	3	$2,000	District funds	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	District funds, HMGP. BRIC	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	District funds	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	District funds, HMGP. BRIC	Five years	Not started, lack of funding

Lane County and Participating Jurisdictions 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	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Emergency Manager, Facilities Director	High	1, 3	$10,000 to $50,000 per location	HMGP, BRIC, General fund	Ten years	On-Going EM Building has been adding generators when funds are available
Lane County-2	Conduct regular hazard mitigation information programs for all citizens.	All hazards	Emergency Manager	High	1, 2	Staff Time	General fund	Five years	Carried over due to lack of staff
Lane County-3	Institute a county-wide building code utilizing the latest IBC codes.	All hazards	Register of Deeds, Zoning Director	Low	1,2	Staff Time	General fund	Five years	Need for county zoning certification
Lane 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	Extension Agent, Emergency Manager	Medium	3	Staff Time	General funds	Four years	Ongoing, Not started, lack of staff
Lane County-5	Complete education campaign for citizens on the benefits of replacing water intensive landscaping with natural, low water plantings	Drought	Emergency Managers County Fire Chief	Low	1,2,3	Volunteers and Staff Time	General fund	Five years	Publishing awareness with media source notification
Lane County-6	Identify and prepare county building for usage as heat/cold shelters.	Extreme Temperatures	Facilities Director Emergency Management	Low	1, 2	$2,000 per facility	General fund	Three years	Ongoing, County has opened up building for warming shelters
Lane County-7	Continue to participate in, and enforce provisions of, NFIP.	Flood	NFIP Administrator	High	1, 2	Per property cost	General fund	On-going	On-going
Lane County-8	Enter CRS Program.	Flood	Emergency Manager,	Low	1,2	Staff time	General Fund	Three years	New On-going

Lane County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
			NFIP Administrator						
Lane County-9	Conduct NFIP community workshops to provide information and incentives for property owners to acquire flood insurance.	Flood	NFIP Administrator	Medium	1, 2	Staff time, acquisition cost property dependent	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Lane County-10	Purchase protective window film for all county facility windows to reduce the risk of airborne debris injuries during extreme wind events.	Severe Weather, Tornado	Emergency Manager	Low	1,2	Facility size dependent	HMGP, General fund	Five years	New
Lane County-11	Construct community safe rooms throughout the county to required building standards	Severe Weather, Tornado	Emergency Manager	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Lane County-12	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Emergency Manager	Medium	3	Staff Time	General fund	Three years	Put out educational post on Facebook page
Lane County-13	Create defensible space buffers at all county facilities.	Wildfire	Public Works Director	Low	1, 2	Facility size dependent	HMGP, BRIC, General fund	As required	New On-Going
Lane County-14	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	1,2,3	$350 per workshop	General fund	On-going	We have started to educate our community with publication
Lane County-15	Become a Firewise Community.	Wildfire	Emergency Management Coordinator	Low	3	Staff time	General fund	Three years	Not started, lack of staff
Lane County-16	Purchase cloud storage backup for all jurisdictional electronic records.	Cybersecurity Incident	IT Director	High	1, 2	Data size dependent	General fund	Five years	On-Going

Lane County and Participating Jurisdictions 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 Has just implemente d a It Department for Firewall protection
Lane County-17	Provide hazardous materials handling and transportation information to citizens and businesses.	Hazardous Materials Event	Emergency Manager	High	1, 2	$50 per trainee	HMGP, General fund	As required	On-Going LEPC has Teir II reports available at Em Office
Lane County-18	Identify and map all structurally deficient bridges.	Infrastructure Failure	Public Works Director	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	On-Going Bridges already have an inspection plan
Lane County-19	Conduct active shooter drills and exercises for all county personnel.	Terrorism	County Sheriff	Low	1, 2	Data size dependent	General fund	Five years	New On-going
Dighton-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	On-Going
Dighton-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	On-Going Limited funding
Dighton-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	County Buildings are available for sheltering

Lane County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Dighton-4	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	On-going
Dighton-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	City Maintenance	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	ON-Going
Dighton-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Dighton-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	ON-Going due to lack of funding
Dighton-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	City Superintendent	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	NEW On-Going
Dighton-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Dighton-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Sheriff Department	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Dighton-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New On-going
Dighton-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
USD 468 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 468 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding

Lane County and Participating Jurisdictions 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 468 2	Conduct hazard mitigation education programs for students.	All hazards	USD 468 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 468 3	Conduct a native, low water planting program for all school facilities	Drought	USD 468 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 468 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 468 Superintendent	Medium	1, 2	$500	District general fund	Five years	on -going training
USD 468 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 468 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 468 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 468 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	on-going and some installed
USD 468 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 468 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New on-going
USD 468 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 468 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	On-going

Lane County and Participating Jurisdictions 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 482 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 482 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 482 2	Conduct hazard mitigation education programs for students.	All hazards	USD 482 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 482 3	Conduct a native, low water planting program for all school facilities	Drought	USD 482 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 482 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 482 Superintendent	Medium	1, 2	$500	District general fund	Five years	on -going training
USD 482 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 482 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 482 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 482 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	on-going and some installed
USD 482 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 482 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New on-going

Lane County and Participating Jurisdictions 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 482 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 482 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	On-going
Lane County Hospital -1	Conduct education campaign on importance of hazard mitigation for all patients and staff relating to medical care.	All hazards	Director	High	1,2	Staff time	Hospital budget	Two years	New
Lane County Hospital -2	Purchase and install emergency generators for facilities.	All hazards	Director	High	1,2	$30,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Lane County Hospital -3	Construct safe room(s) for all hospital facilities.	Tornado, Windstorm	Director	High	1,2	$1,000,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Lane-Scott Electric Cooperative -1	Conduct danger tree clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Lane-Scott Electric Cooperative -2	Inspect poles and replace or harden marginal poles.	All hazards	Operations Director	High	1, 2	$100,000 per year	System budget	Continuous	On-going
Midwest Energy -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Midwest Energy -2	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Sunflower Electric-1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Sunflower Electric-2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding

Lane County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Sunflower Electric-3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
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	$15,000,00 0	District funds, HMGP. BRIC	Five years	In progress
PWJD81-2	Provide education programs for flood safety, dam safety, and dam failure.	Flood, Dam and Levee Failure	Director	High	3	$2,000	District funds	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	District funds, HMGP. BRIC	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	District funds	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	District funds, HMGP. BRIC	Five years	Not started, lack of funding
S&T Telephone-1	Research and purchase a system to protect phone and internet systems from identified hazards.	All hazards	Director	High	1,2	$400,000	HMGP, General fund	Five years	Not started, lack of funding
S&T Telephone-2	Purchase and install all necessary equipment for a power upgrade to all booster stations.	All hazard	Director	High	1,2	$1,000,000	HMGP, General fund	Five years	Not started, lack of funding

Meade County and Participating Jurisdictions 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 critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Emergency Manager, Facilities Director	High	1, 3	$10,000 to $50,000 per location	HMGP, BRIC, General fund	Ten years	On going
Meade County-2	Conduct regular hazard mitigation information programs for all citizens.	All hazards	Emergency Manager	High	1, 2	Staff Time	General fund	Five years	On Going
Meade County-3	Promote awareness and training session focused on special needs population (education and awareness)	All Hazards	Emergency Manager	High	3	Staff Time	General fund	Two years	On-going
Meade County-4	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	General fund	Two years	Completed
Meade 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	Extension Agent, Emergency Manager	Medium	3	Staff Time	General fund	Four years	Not started, lack of staff
Meade County-6	Complete education campaign for citizens on the benefits of replacing water intensive landscaping with natural, low water plantings	Drought	Emergency Managers	Low	1,2,3	Volunteers and Staff Time	General fund	Five years	New
Meade County-7	Identify and prepare county building for usage as heat/cold shelters.	Extreme Temperatures	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	Need generators
Meade County-8	Become a participant in the NFIP.	Flood	Emergency Manager	High	1, 2	Staff time	General fund	Three years	New
Meade County-9	Meet requirements and join the CRS program.	Flood	Emergency Manager	Low	1, 2	Staff time	General fund	Three years	New
Meade County-10	Promote annual storm spotting class with the public to increase attendance and awareness.	Severe Weather, Tornado	Emergency Manager	High	3,4	Staff Time	General fund	Two years	On-going
Meade County-11	Construct community safe rooms throughout the county to required building standards	Severe Weather, Tornado	Emergency Manager	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC,	Ten years	Carried over due to lack of funding

Meade County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							General fund		
Meade County-12	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Emergency Manager	Medium	3	Staff Time	General fund	Three years	Not started, lack of staff
Meade County-13	Create defensible space buffers at all county facilities	Wildfire	Public Works Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	As required	Completed
Meade County-14	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	1,2,3	$350 per workshop	General fund	On-going	On-going
Meade County-15	Become a Firewise Community.	Wildfire	Emergency Management Coordinator	Low	3	Staff time	General fund	Three years	Not started, lack of staff
Meade County-16	Purchase cloud storage backup for all jurisdictional electronic records.	Cybersecurity Incident	IT Director	High	1, 2	Data size dependent	General fund	Five years	Not started
Meade County-17	Provide hazardous materials handling and transportation information to citizens and businesses.	Hazardous Materials Event	Emergency Manager	High	1, 2	$50 per trainee	HMGP, General fund	As required	Not started
Meade County-18	Identify and map all structurally deficient bridges.	Infrastructure Failure	Public Works Director	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Completed
Meade County-19	Conduct active shooter drills and exercises for all county personnel.	Terrorism	County Sheriff	Low	1, 2	Data size dependent	General fund	Five years	On-going
Fowler-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Fowler-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding

Meade County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Fowler-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	On going
Fowler-4	Become a participant in the NFIP.	Flood	Mayor	High	1, 2	Staff time	General fund	Three years	New
Fowler-5	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	New
Fowler-6	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	Not started, lack of funding
Fowler-7	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	Not started, lack of funding
Fowler-8	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Fowler-9	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Fowler-10	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	Not started
Fowler-11	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
City of Meade-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding

Meade County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
City of Meade-2	Upgrade/repair existing water supply infrastructure.	Drought	City Manager	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
City of Meade-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	On Going
City of Meade-4	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	Not started, lack of funding
City of Meade-5	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	Not started, lack of funding
City of Meade-6	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
City of Meade-7	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	On-going
City of Meade-8	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	On going
City of Meade-9	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
Plains-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding

Meade County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Plains-2	Upgrade/repair existing water supply infrastructure.	Drought	City Manager	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Plains-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	On going
Plains-4	Become a participant in the NFIP.	Flood	Mayor	High	1, 2	Staff time	General fund	Three years	New
Plains-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	Not started, lack of funding
Plains-6	Meet requirements and join the CRS program.	Flood	City Manager	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Plains-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	Not started, lack of funding
Plains-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	Not started, lack of funding
Plains-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Plains-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Plains-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	On ging

Meade County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Plains-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
USD 225 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 225 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 225 2	Conduct hazard mitigation education programs for students.	All hazards	USD 225 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	Not started, lack of funding
USD 225 3	Conduct a native, low water planting program for all school facilities	Drought	USD 225 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	Not started, lack of funding
USD 225 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 225 Superintendent	Medium	1, 2	$500	District general fund	Five years	Not started, lack of funding
USD 225	Construct rainwater gardens adjacent to paved areas.	Flood	USD 225 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	Not started, lack of funding
USD 225 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 225 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 225 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 225 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District	Five years	Not started, lack of funding

Meade County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							general fund		
USD 225 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 225 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	On going
USD 226 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 226 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 226 2	Conduct hazard mitigation education programs for students.	All hazards	USD 226 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	Not started, lack of funding
USD 226 3	Conduct a native, low water planting program for all school facilities	Drought	USD 226 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	Not started, lack of funding
USD 226 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 226 Superintendent	Medium	1, 2	$500	District general fund	Five years	Not started, lack of funding
USD 226 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 226 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	Not started, lack of funding
USD 226 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 226 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding

Meade County and Participating Jurisdictions 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 226 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 226 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	Not started, lack of funding
USD 226 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 226 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	On going
USD 483 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 483 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 483 2	Conduct hazard mitigation education programs for students.	All hazards	USD 483 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	Not started, lack of funding
USD 483 3	Conduct a native, low water planting program for all school facilities	Drought	USD 483 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	Not started, lack of funding
USD 483 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 483 Superintendent	Medium	1, 2	$500	District general fund	Five years	Not started, lack of funding
USD 483 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 483 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	Not started, lack of funding

Meade County and Participating Jurisdictions 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 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 483 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 483 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 483 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	Not started, lack of funding
USD 483 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 483 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	On Going
Artesian Valley Health Systems-1	Conduct education campaign on importance of hazard mitigation for all patients and staff relating to medical care.	All hazards	Director	High	1,2	Staff time	Hospital budget	Two years	Not started
Artesian Valley Health Systems-2	Purchase and install emergency generators for facilities.	All hazards	Director	High	1,2	$30,000	HMGP, Hospital budget	Five years	Not started, lack of funding
Artesian Valley Health Systems-3	Construct safe room(s) for all hospital facilities.	Severe Weather, Tornado	Director	High	1,2	$1,000,000	HMGP, Hospital budget	Five years	Not started, lack of funding
CMS Electric Cooperative -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
CMS Electric Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding

Meade County and Participating Jurisdictions 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 Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	On going
Southern Pioneer Electric Company -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Southern Pioneer Electric Company -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Southern Pioneer Electric Company -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	On going
Sunflower Electric-1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Sunflower Electric-2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Sunflower Electric-3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	On Going

Seward County and Participating Jurisdictions 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	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Emergency Manager, Facilities Director	High	1, 3	$10,000 to $50,000 per location	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Seward County-2	Conduct regular hazard mitigation information programs for all citizens.	All hazards	Emergency Manager	High	1, 2	Staff Time	General fund	Five years	Carried over due to lack of staff
Seward County-3	Upgrade and install warning sirens throughout underserved areas of the county.	All hazards	Emergency Manager	High	1,2	Location and size based	HMGP, General fund	Five years	Carried over due to lack of funding
Seward 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	Extension Agent, Emergency Manager	Medium	3	Staff Time	General fund	Four years	Not started, lack of staff
Seward County-5	Complete education campaign for citizens on the benefits of replacing water intensive landscaping with natural, low water plantings	Drought	Emergency Managers	Low	1,2,3	Volunteers and Staff Time	General fund	Five years	New
Seward County-6	Identify and prepare county building for usage as heat/cold shelters.	Extreme Temperatures	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Seward County-7	Continue to participate in, and enforce provisions of, NFIP.	Flood	NFIP Administrator	High	1, 2	Per property cost	General fund	On-going	On-going
Seward County-8	Enter CRS Program.	Flood	Emergency Manager, NFIP Administrator	High	1,2	Staff time	General Fund	Three years	New
Seward County-9	Conduct NFIP community workshops to provide information and incentives for property owners to acquire flood insurance.	Flood	NFIP Administrator	Medium	1, 2	Staff time, acquisition cost property dependent	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding

Seward County and Participating Jurisdictions 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-10	Purchase protective window film for all county facility windows to reduce the risk of airborne debris injuries during extreme wind events.	Severe Weather, Tornado	Emergency Manager	Low	1,2	Facility size dependent	HMGP, General fund	Five years	New
Seward County-11	Construct community safe rooms throughout the county to required building standards	Severe Weather, Tornado	Emergency Manager	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Seward County-12	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Emergency Manager	Medium	3	Staff Time	General fund	Three years	Not started, lack of staff
Seward County-13	Create defensible space buffers at all county facilities	Wildfire	Public Works Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	As required	New
Seward County-14	Develop and implement a wildfire prevention/education program.	Wildfire	Fire Chief, Emergency Manager	Medium	1,2,3	$350 per workshop	General fund	On-going	Not started, lack of staff
Seward County-15	Become a Firewise Community.	Wildfire	Emergency Management Coordinator	Low	3	Staff time	General fund	Three years	Not started, lack of staff
Seward County-16	Purchase cloud storage backup for all jurisdictional electronic records.	Cybersecurity Incident	IT Director	High	1, 2	Data size dependent	General fund	Five years	New
Seward County-17	Provide hazardous materials handling and transportation information to citizens and businesses.	Hazardous Materials Event	Emergency Manager	High	1, 2	$50 per trainee	HMGP, General fund	As required	New
Seward County-18	Identify and map all structurally deficient bridges.	Infrastructure Failure	Public Works Director	Medium	1, 2	$1,000,000 per facility	HMGP, BRIC, General fund	Ten years	Carried over due to lack of funding
Seward County-19	Conduct active shooter drills and exercises for all county personnel.	Terrorism	County Sheriff	Low	1, 2	Data size dependent	General fund	Five years	New
Kismet-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding

Seward County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Kismet-2	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Kismet-3	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Kismet-4	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	On-going
Kismet-5	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Kismet-6	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Kismet-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Kismet-8	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC, General fund	Ten years	New
Kismet-9	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Kismet-10	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Kismet-11	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New

Seward County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Kismet-12	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
Liberal-1	Purchase and install critical facility backup generators in conjunction with hardening existing electrical systems.	All hazards	Facilities Director	High	1, 2	$25,000 - $50,000 per facility	HMGP, BRIC, General fund	Five years	Carried over lack of funding
Liberal-2	Install evacuation route signage in any potential dam or levee failure inundation areas.	Dam/Levee Failure	Mayor	Medium	1, 2, 4	$5,000 per location	HMGP, General fund	Five years	New
Liberal-3	Upgrade/repair existing water supply infrastructure.	Drought	Mayor	High	1,2	Location and size dependent	HMGP, BRIC, General fund,	Five years	Not started, lack of funding
Liberal-4	Identify and prepare a jurisdictional building for usage as heat/cold shelter.	Extreme Temperature, Severe Winter Weather	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Three years	New
Liberal-5	Continued participation and compliance with the NFIP.	Flood	NFIP Coordinator	Medium	1,2	Staff Time	General fund	Continuous	On-going
Liberal-6	Construct rainwater retention/detention ponds or other flood control projects at strategic locations.	Flood	Public Works Director	Low	1, 2	Location and size dependent	HMGP, BRIC, General fund	As required	New
Liberal-7	Meet requirements and join the CRS program.	Flood	Mayor	Low	1, 2	Staff time	General fund	Three years	Carried over, lack of staff
Liberal-8	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	Facilities Director	Low	1, 2	$50,000 per location	HMGP, BRIC, General fund	Ten years	New
Liberal-9	Construct community saferooms in select jurisdictional buildings.	Severe Weather, Tornado	Facilities Director	High	1, 2	Facility size dependent	HMGP, BRIC,	Ten years	New

Seward County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							General fund		
Liberal-10	Purchase protective window film for all jurisdictional facilities	Severe Weather, Tornado	Facilities Director	Low	1,2	Facility size dependent	HMGP, General fund	Five years	Not started, lack of funding
Liberal-11	Educate residents about driving in winter storms and handling winter-related health effects.	Severe Winter Weather	Fire Chief	High	4	$1,000	General fund	Continuous	Carried over, staff restrictions
Liberal-12	Create defensible space buffers at all critical facilities	Wildfire	Fire Chief	High	1, 2	Facility size dependent	HMGP, General fund	As required	New
Liberal-13	Become a Firewise Community	Wildfire	Fire Chief	High	1, 2	Staff time	General fund	Five years	Carried over, staff restrictions
SCCC 1	Purchase and install college facility backup generators in conjunction with hardening existing electrical systems.	All hazards	GCCC Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
SCCC 2	Conduct hazard mitigation education programs for students.	All hazards	GCCC Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
SCCC 3	Conduct a native, low water planting program for all school facilities	Drought	GCCC Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
SCCC 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	GCCC Superintendent	Medium	1, 2	$500	District general fund	Five years	New
SCCC 5	Construct rainwater gardens adjacent to paved areas.	Flood	GCCC Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District	As required	New

Seward County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
							general fund		
SCCC 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	GCCC Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
SCCC 7	Install high wind, hail, and fire-resistant roofing on all college facilities.	Severe Weather, Tornado, Wildfires	GCCC Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 480 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 480 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 480 2	Conduct hazard mitigation education programs for students.	All hazards	USD 480 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 480 3	Conduct a native, low water planting program for all school facilities	Drought	USD 480 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 480 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 480 Superintendent	Medium	1, 2	$500	District general fund	Five years	New
USD 480 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 480 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New

Seward County and Participating Jurisdictions 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 480 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 480 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 480 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 480 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 480 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 480 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 483 1	Purchase and install school facility backup generators in conjunction with hardening existing electrical systems.	All hazards	USD 483 Superintendent	High	1, 2	$10,000 - $50,000 per facility	HMGP, BRIC, District general fund	Five years	Carried over due to lack of funding
USD 483 2	Conduct hazard mitigation education programs for students.	All hazards	USD 483 Superintendent	Medium	1, 2, 3	$2,000	District general fund	As required	New
USD 483 3	Conduct a native, low water planting program for all school facilities	Drought	USD 483 Superintendent	Low	1, 2	$10,000 - per location	HMGP, BRIC, District general fund	Ten years	New
USD 483 4	Conduct an extreme temperature awareness seminar to educate on risks and mitigation methods.	Extreme Temperature, Severe Winter Weather	USD 483 Superintendent	Medium	1, 2	$500	District general fund	Five years	New

Seward County and Participating Jurisdictions 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 5	Construct rainwater gardens adjacent to paved areas.	Flood	USD 483 Superintendent	Low	1, 2	Location and size dependent	HMGP, BRIC, District general fund	As required	New
USD 483 6	Construct safe rooms in all school buildings to required standards.	Severe Weather, Tornado	USD 483 Superintendent	High	1, 2	$1,000,000 -per location	HMGP, BRIC, District general fund	Ten years	Carried over due to lack of funding
USD 483 7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Tornado, Wildfires	USD 483 Superintendent	Low	1, 2	Facility size dependent	HMGP, BRIC, District general fund	Five years	New
USD 483 8	Conduct regular staff and student active shooter trainings.	Terrorism	USD 483 Superintendent	High	1, 2, 3	Location and size dependent	HMGP, BRIC, District general fund	As required	New
CMS Electric Cooperative -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
CMS Electric Cooperative -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
CMS Electric Cooperative -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Midwest Energy -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going

Seward County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Midwest Energy -2	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Pioneer Electric Company -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Pioneer Electric Company -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Pioneer Electric Company -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Southern Pioneer Electric Company -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Southern Pioneer Electric Company -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding
Southern Pioneer Electric Company -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New
Sunflower Electric -1	Conduct tree and vegetation clearance around utility infrastructure, including overhead lines.	All hazards	Operations Director	High	1, 2	$50,000 per year	System budget	Continuous	On-going
Sunflower Electric -2	Shorten distance between utility poles to mitigate downed lines during a hazard occurrence.	All hazards	Operations Director	High	1, 2	Distance, spec, and location dependent	System budget	Ten years	Carried over, lack of funding

Seward County and Participating Jurisdictions Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Current Status
Sunflower Electric -3	Encourage long-term decrease in consumer energy use through education programs.	All Hazards	Operations Director	High	1, 2, 3, 4	Staff Time	System budget	Continuous	New