WRIGHT COUNTY
IOWA

2026 Multi-Jurisdictional Hazard Mitigation Plan



2026 Plan Update
Developed by Wright County
with Professional Assistance from Witt O'Briens

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EXECUTIVE SUMMARY

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. The Wright County Multi-Jurisdictional Hazard Mitigation Plan analyzes these risks and identifies potential cost-effective mitigation solutions. Wright County and participating jurisdictions have updated the plan pursuant to the requirements of the Disaster Mitigation Act of 2000 and to maintain eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) Grant Programs.

The Wright County Multi-Jurisdictional Hazard Mitigation Plan covers the following jurisdictions that participated in the planning process:

- Wright County
- Belmond
- Clarion
- Dows*
- Eagle Grove
- Goldfield
- Rowan
- Woolstock
- Belmond-Klemme Public School District
- Clarion-Goldfield-Dows Public School District
- Eagle Grove Public School District

**Note: Portions of Dows' corporate limits extends into adjacent Franklin County. The Hazard Mitigation Planning area will include the full corporate limits of this city, including the portion in the adjacent county.*

The original Wright County Multi-Jurisdictional Hazard Mitigation Plan was approved by FEMA on August 8, 2013. It was updated for the first time in 2019 and is being updated again now in accordance with the five-year expiration cycle established by FEMA.

Additional stakeholders were also invited to participate in and comment on the update of the plan, including private businesses, community groups, private non-profit entities, adjacent communities, state and federal agencies, academia, and local regional agencies that have a stake in mitigation planning in Wright County.

The plan update process followed a methodology prescribed by FEMA, which began with the assembly of the Hazard Mitigation Planning Committee (HMPC). The HMPC updated the risk assessment that identified and profiled hazards that pose a risk to the Wright County planning area, assessed the vulnerability to these hazards, and examined the capabilities in place to mitigate them. The planning area is vulnerable to several hazards that are identified, profiled, and analyzed in this plan.

Based upon the risk assessment, the HMPC reviewed the previously developed goals for reducing risk from hazards. The validated goals are listed below:

- **Goal 1**: Increase capabilities within Wright County entities to mitigate the effects of hazards by enhancing existing or designing and adopting new policies that will reduce damaging effects of hazards.
- **Goal 2**: Protect the most vulnerable populations, buildings, and critical facilities within Wright County through the implementation of cost effective and technically feasible mitigation projects.
- **Goal 3**: Improve the level of responder, government, business and citizen awareness and preparedness for disasters.

- **Goal 4**: Develop programs to assure that response agencies, governments, educational institutions, and local businesses are able to operate during times of disaster.

The committee then identified actions that could be taken to achieve these goals, which are identified in Chapter 5. The HMPC developed an implementation plan for each action, which identifies priority level, background information, responsible agency, timeline, cost estimate, potential funding sources, and more.

1.INTRODUCTION AND PLANNING PROCESS

1.1 BACKGROUND

Each year in the United States, disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated.

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." Mitigation is also highly cost effective. According to the National Institute of Building Sciences, federally-funded hazard mitigation saves $6 in avoided future losses for every $1 in project costs.

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are determined, prioritized, and implemented. Wright County and the incorporated cities and public school districts that participated in this plan update developed a Multi-Jurisdictional Hazard Mitigation Plan that was approved by FEMA on August 8, 2013 (hereafter referred to as the 2013 Wright County Hazard Mitigation Plan). The plan was updated in 2019, and FEMA approved the update in early 2020. This current planning effort serves to update the 2019 plan and incorporate new hazard and risk information.

This plan documents the hazard mitigation planning process undertaken by the Wright County Hazard Mitigation Planning Committee (HMPC). It identifies relevant hazards and vulnerabilities in the planning area and sets forth an updated mitigation strategy to decrease vulnerability and increase resiliency and sustainability in Wright County.

The Wright County Multi-Jurisdictional Hazard Mitigation Plan is a multi-jurisdictional plan that geographically covers the participating jurisdictions within Wright County's boundaries (hereinafter referred to as the planning area). The following jurisdictions participated in the planning process:

- Unincorporated Wright County
- Belmond
- Clarion
- Dows
- Eagle Grove
- Galt
- Goldfield
- Rowan
- Woolstock
- Belmond-Klemme Public School District
- Clarion-Goldfield-Dows Public School District
- Eagle Grove Public School District

This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002 (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act.) Additionally, this plan is prepared in accordance with the 2025 Local Mitigation Planning Handbook published by FEMA.

While the Disaster Mitigation Act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288).

1.2 PURPOSE

Wright County and other participants created and updated this Multi-Jurisdictional Hazard Mitigation Plan to guide hazard mitigation and risk reduction efforts throughout the planning area, and to better protect people and property from the effects of hazard events. This plan demonstrates the jurisdictions' commitments to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This plan was also developed to make Wright County and the participating jurisdictions eligible for certain federal grant programs, specifically the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance (HMA) grants including the Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC) program, and the Flood Mitigation Assistance (FMA) Program.

Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery by protecting critical community facilities, reducing liability exposure, and minimizing overall hazard impacts and disruptions. The Wright County planning area has been affected by hazards in the past and the participating jurisdictions are therefore committed to reducing future impacts from hazard events and becoming eligible for mitigation-related federal funding.

1.3 PLAN ORGANIZATION

This Wright County Multi-Jurisdictional Hazard Mitigation Plan update is organized as follows:

- Executive Summary
- Chapter 1: Introduction and Planning Process
- Chapter 2: Planning Area Profile and Capabilities
- Chapter 3: Capability Assessment
- Chapter 4: Risk Assessment
- Chapter 5: Mitigation Strategy
- Chapter 6: Plan Implementation and Maintenance
- Annexes
- Appendices

1.4 PLANNING PROCESS

44 CFR Requirement 201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

On September 15, 2025, Wright County entered into an agreement with Witt O'Brien's, a consulting firm hired to help with the plan update. Witt O'Brien's role was to:

- Assist in establishing the Hazard Mitigation Planning Committee (HMPC) as defined by the Disaster Mitigation Act (DMA),

- Ensure the updated plan meets the DMA requirements as established by federal regulations and following FEMA's planning guidance,
- Facilitate the entire planning process,
- Identify the data requirements that HMPC participants could provide and conduct the research and documentation necessary to augment that data,
- Assist in facilitating the public input process,
- Produce the draft and final plan update documents, and
- Coordinate the Iowa Homeland Security and Emergency Management and FEMA plan reviews.

1.4.1 MULTI-JURISDICTIONAL PARTICIPATION

Wright County invited the incorporated cities, public school districts, and various other stakeholders in

44 CFR Requirement §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

mitigation planning to participate in or support the Wright County Multi-Jurisdictional Hazard Mitigation Plan update process. The jurisdictions that elected to participate in this plan are listed above in **Section 1.1**. Each jurisdiction that chose to participate in the planning process and development of the plan was required to meet participation requirements defined at the first planning meeting, which include the following:

- Designate a representative to serve on the HMPC.
- Participate in at least one of the three HMPC planning meetings by either direct representation or authorized representation.
- Provide data for and assist in the development of the updated risk assessment that describes how various hazards impact their jurisdiction.
- Provide data to describe current capabilities.
- Develop/update mitigation actions (at least one) specific to each jurisdiction
- Provide comments on plan drafts as requested.
- Inform the public, local officials, and other interested parties about the planning process and provide opportunities for them to comment on the plan; and
- Formally adopt the mitigation plan.

Table 1.1 describes each community's participation in more detail. A complete list of all representatives of the agencies and organizations that participated in the Wright County HMPC, meeting sign in sheets, and other planning process documentation is provided in Appendix A.

TABLE 1.1 JURISDICTIONAL PARTICIPATION IN PLANNING PROCESS

Jurisdiction	Participation (HMPC Meetings, Worksheets, etc.)
Wright County	• Participated in all HMPC meetings • Validated critical facilities for all communities • Validated stakeholders • Reviewed jurisdictional capabilities and mitigation actions • Published HMP draft for public review.
Belmond	• Participated in second and third HMPC meetings • Reviewed and validated critical facilities, capabilities, and mitigation actions
Clarion	• Participated in second HMPC meeting • Reviewed and validated critical facilities, capabilities, and mitigation actions
Dows	• Participated in all HMPC meetings • Reviewed and validated critical facilities, capabilities, and mitigation actions
Eagle Grove	• Participated in third HMPC meeting • Reviewed and validated critical facilities, capabilities, and mitigation actions
Galt	
Goldfield	• Participated in all HMPC meetings • Reviewed and validated critical facilities, capabilities, and mitigation actions
Rowan	
Woolstock	
Belmond-Klemme Public School District	• Participated in first HMPC meeting • Reviewed and validated critical facilities, capabilities, and mitigation actions

Jurisdiction	Participation (HMPC Meetings, Worksheets, etc.)
Clarion-Goldfield-Dows Public School District	• Participated in all HMPC meetings • Reviewed and validated critical facilities, capabilities, and mitigation actions
Eagle Grove Public School District	• Participated in second and third HMPC meetings • Reviewed and validated critical facilities, capabilities, and mitigation actions

1.4.2 HMPC MEETINGS

The process to update the hazard mitigation plan took place between Fall 2025 and Summer 2026. Within that timeframe, three HMPC meetings occurred. The HMPC communicated during the planning process with a combination of webinars, phone interviews, and email correspondence. The meeting minutes for each of the meetings are included in **Appendix A.** More detailed information about these HMPC meetings is provided below in Table **1.2.**

TABLE 1.2 SCHEDULE OF HMPC MEETINGS

Meeting	Topic	Date
HMPC Meeting #1: Kick-off Meeting	Introduction to DMA, the planning process, hazard identification and public input strategy. Distribution of data collection guide to jurisdictions. Preliminary hazard data. Discussion of compiled GIS data for critical facility inventory.	November 13, 2025
HMPC Meeting #2: Hazard Review and Survey Discussion	Review of draft Risk Assessment, update plan goals, instructions to update status of previous mitigation actions	March 23, 2026
HMPT Meeting #3: Plan Actions and Maintenance	Development of new mitigation actions, mitigation action planning and prioritization. Determined process to monitor, evaluate, and update plan.	April 20, 2026

1.4.2.1 Initial Coordination Call

Witt O'Brien's and Wright County worked together to establish the framework and process for this planning effort. The planning process resulting in the preparation of this plan document officially began with an initial coordination Conference Call/Webinar on October 28th, 2025. Participants of the meeting included the Wright County Emergency Management Coordinator and the Witt O'Brien's Mitigation Planning team. The purpose of this meeting was to determine the jurisdictions and other stakeholders that would be invited to participate on the HMPC, set tentative planning meeting dates, identify GIS needs and resources, discuss the hazards to be included in the plan update, consider options for the flood risk assessment methodology, and develop an initial public participation strategy. Detailed meeting minutes are included in **Appendix A.**

1.4.2.2 HMPC Meeting #1: Kick Off Meeting

After the initial coordination meeting, a formal Kick-off planning conference call/webinar was held on November 13th, 2025. During the kick-off meeting, Witt O'Brien's presented information on the scope and purpose of the plan, participation requirements of HMPC members, and the proposed project work plan and schedule. Plans for public involvement and coordination with other agencies and departments were discussed. Witt O'Brien's also introduced hazard identification requirements and data needs. The HMPC discussed potential hazards as well as past events and impacts and refined the identified hazards to be relevant to Wright County.

1.4.2.3 HMPC Meeting #2: Hazard Review and Survey Discussion

On March 23rd, 2026 the HMPC met for its first meeting in 2026. Given that the previous meeting was before the holiday season, the second HMPC meeting began with a quick refresher of what events had taken place since December 2025, as well as a discussion of what the HPMC members should expect in the months ahead. After this, the group reviewed the public feedback that was received through the first public survey, and this led to a broader conversation about whether the HMPC members were surprised by any of the feedback or largely agreed with the public responses. Regarding the identification of hazards, HMPC members agreed with public feedback that tornadoes and windstorms likely posed a significant risk to all participating jurisdictions. Additionally, HMPC members were mostly in agreement that communication with county residents could be improved if additional resources were available.

1.4.2.4 HMPC Meeting #3: Plan Actions and Maintenance

On April 20th, 2026, the HMPC reconvened to discuss the recent plan development progress as well as next steps and outstanding items. The topics covered in this meeting included the process by which participating jurisdictions would review existing mitigation actions and explore new possibilities, how the plan would be maintained, updated, and evaluated by participating jurisdictions, how continued public engagement would be supported, and whether the HMPC members had any questions about the plan draft or recommendations for future consideration. Additionally, the HMPC members were reminded of the importance of having each jurisdiction participate in the plan development process. In this meeting it was determined that each jurisdiction would receive a copy of the plan pages containing their capability assessment and mitigation actions—participating jurisdictions would then have several weeks to review the information to ensure that the plan accurately captured their information.

1.4.3 PUBLIC ENGAGEMENT

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

To provide an opportunity for the public to comment during the drafting stage, the committee determined that the most effective method would be dissemination of a survey. Copies of publications are included in **Appendix B**.

One of the ways in which the HMPC sought public participation and input was through online surveys. The use of online surveys in hazard mitigation planning increased during the COVID-19 pandemic, primarily out of necessity. This increase in the use of online surveys demonstrated that they were a viable option for collecting public input and revealed a number of benefits over in-person activities. First, online surveys do not require respondents to be available at a specific time, eliminating one of the barriers to participation at in-person events such as town halls. Second, online surveys are accessible wherever internet connectivity exists. This is particularly useful in rural settings such as Wright County, as eliminating extended travel

times for in-person events removes another barrier to public participation. Lastly, online surveys are easy to facilitate and can be a smaller burden for communities that have limited resources.

The first public survey was posted and available for residents to complete from January 5th, 2026, to February 5th, 2026. The survey was made available online through Microsoft Forms—participating jurisdictions received a link and QR code for the survey, and they were asked to share the link and QR code through social media, community newsletters, website updates, and other avenues through which participating jurisdictions communicate with their residents. The survey asked the public and stakeholders to indicate their opinion on their concern for the different hazards that pose a risk to the community, emergency preparedness, and mitigation strategies. The survey received 46 separate responses during the period in which it was open to the public. A copy of the survey questions and responses are provided in **Appendix B**. The responses received from community members were shared with HMPC members and discussed during the second HMPC meeting. The HMPC members felt that the planning priorities, profiled hazards, and mitigation goals were largely aligned with the feedback received. HMPC members also agreed to keep the feedback in mind when reviewing and updating mitigation actions.

The draft base plan and community Annexes were made available on the Wright County website for public review in July 2026, along with a survey requesting community feedback on the plan. The survey was open for public comment from [Date] to [Date]. *[description of feedback and how it was incorporated]*. Copies of the announcement, survey, and public feedback on the plan are provided in **Appendix B**.

1.4.4 STAKEHOLDER ENGAGEMENT

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

FEMA guidance directs local hazard mitigation planning efforts to create opportunities for the participation of community stakeholders. Stakeholders invited to participate should include each of the following categories:

- Local or regional entities involved in hazard mitigation activities
- Agencies that have the authority to regulate development
- Neighboring communities
- Representatives of area businesses, academic institutions, or other private organizations
- Representatives of nonprofit or community-based organizations

Stakeholders were identified collaboratively through multiple meetings with participating jurisdictions. Some stakeholders, particularly entities involved with hazard mitigation and those with authority to regulate development, were extended invites to the HMPC meetings. All stakeholders were sent a copy of the first draft of the plan and were asked to provide feedback. Community stakeholders were also asked to participate in the second public survey, which asked a variety of questions about how well the first draft identified risks and vulnerabilities, whether the proposed mitigation actions adequately addressed all hazards, whether the mitigation actions were realistic and actionable, and the respondent's level of support for the mitigation actions. Feedback provided by the stakeholders was considered for integration

in the final plan. A list of stakeholders for each of the five categories listed above can be found in **Appendix C.**

1.5 INTEGRATION OF OTHER DATA, REPORTS, STUDIES, AND PLANS

The HMPC collected and reviewed a wide variety of existing technical data, reports, and plans, including hazard information provided by the US Drought Monitor, FEMA, USACE, NOAA, USGS, Iowa DNR, and other sources, which contributed to the hazard profiles included in this plan. The previous Wright County hazard mitigation plan, Iowa State Hazard Mitigation Plan, and local plans helped inform capability assessments and update mitigation actions. FIRM data, Iowa DNR, Iowa DOT, and local input reinforced risk and vulnerability assessments. Specific resources or organizations which contributed to the development of this plan include, or from which data regarding locations and impacts of previous hazard events were collected, included:

- Coalition to Support Iowa's Farmers
- Des Moines Register News Data Central
- Environmental Protection Agency, heat-related deaths
- Environmental Protection Agency, Surf Your Watershed
- Federal Emergency Management Agency, Community Status Book
- Federal Emergency Management Agency, National Flood Hazard Layer
- Federal Emergency Management Agency, Presidential Disaster Declarations
- Federal Emergency Management Agency, Taking Shelter from the Storm, 3rd Edition
- Federal Emergency Management Agency, Wright County Flood Insurance Rate Maps
- Hazards Vulnerability Research Institute, Social Vulnerability Index
- High Plains Regional Climate Center
- Iowa Communications Network
- Iowa Department of Agriculture and Land Stewardship, Division of Soil Conservation and Water Quality
- Iowa Department of Agriculture and Land Stewardship - Sensitive Crop Registry
- Iowa Department of Agriculture, Agricultural Statistics bulletin
- Iowa Department of Education, Bureau of Information and Analysis Services
- Iowa Department of Natural Resources, Animal Feeding Operations
- Iowa Department of Natural Resources, Dam Safety Program Inventory of Dams for Wright County
- Iowa Department of Natural Resources, NPDES
- Iowa Department of Public Health Center for Acute Disease Epidemiology
- Iowa Department of Public Safety
- Iowa Department of Transportation's Office of Traffic and Safety
- Iowa Homeland Security and Emergency Management Department
- Iowa State Hazard Mitigation Plan, 2023
- Iowa State University, College of Agriculture and Life Sciences
- Iowa State University, Department of Agronomy, Environmental Mesonet
- Iowa State University, Extension Office, Distribution of Ash Trees in Iowa
- Iowa Utilities Board
- Karl, T.R., J.M. Melillo, and T.C. Peterson (eds). 2009. Global Climate Change Impacts in the United States. U.S. Global
- Midwestern Regional Climate Center
- National Drought Mitigation Center, U.S. Drought Monitor & Drought Impact Reporter

- National Flood Insurance Program Rate Maps
- National Flood Insurance Program Repetitive / Severe Repetitive Loss Data
- National Flood Insurance Program Policy and Loss Statistics
- National Oceanic and Atmospheric Administration, Storm Prediction Center
- National Oceanic and Atmospheric Administration, National Climatic Data Center
- National Oceanic and Atmospheric Administration | National Centers for Environmental Information Storm Events Database
- National Park Service, National Register of Historic Places
- National Severe Storms Laboratory
- National Transportation Safety Board
- National Weather Service
- Natural Resources Conservation Service, Web Soil Survey
- Pipeline and Hazardous Materials Safety Administration
- Stanford University, National Performance of Dams Programs
- Tornado and Storm Research Organization (TORRO), Department of Geography, Oxford Brooks University
- Tornado History Project
- U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory
- U.S. Army Corps of Engineers, National Inventory of Dams
- U.S. Army Corps of Engineers, National Levee Database
- U.S. Census Bureau, Building Permit Data
- U.S. Census Bureau, Decennial Census, 2000-2020
- U.S. Census Bureau, American Community Survey, 5-year Estimates, 2026
- U.S. Department of Agriculture Cropland Data Layer (CropScrape)
- U.S. Department of Agriculture National Agricultural Statistics Service, 2022 Census of Agriculture
- U.S. Department of Agriculture, Emerald Ash Borer County Detection Map
- U.S. Department of Agriculture, Risk Management Agency Crop Insurance Statistics
- U.S. Department of Agriculture, Secretarial Disaster Declarations
- U.S. Department of Transportation
- U.S. Fish and Wildfire Services, Threatened and Endangered Species
- U.S. Geological Survey
- University of Nebraska, National Drought Mitigation Center
- University of Wisconsin-Madison, Department of Forest Ecology and Management, SILVIS Lab
- Wright County Assessor's Office
- Wright County Conservation Board
- Wright County Emergency Management
- Wright County, Iowa Multi-jurisdictional Hazard Mitigation Plan, 2013
- Wright County, Iowa Multi-jurisdictional Hazard Mitigation Plan, 2019

1.6 UPDATES TO REFLECT CHANGES IN PRIORITIES

None of the communities participating in this planning process reported significant changes in community priorities since the last plan update. The mitigation strategy has been updated to reflect progress made towards previous actions, but the overall community goals related to hazard mitigation remain the same for all participants that were part of the 2019 plan.

2. PLANNING AREA PROFILE AND CAPABILITIES

This chapter provides a general profile of Wright County, as well as details on existing capabilities, plans, and programs that enhance their ability to implement mitigation strategies. More detailed information for each of the participating jurisdictions listed below can be found in their respective Annexes. Each annex describes the jurisdiction's community profile, capability assessment, risk assessment, and mitigation actions.

2.1 WRIGHT COUNTY PLANNING AREA PROFILE

Figure 2.1 provides a map of the Wright County planning area. The planning area boundaries include the unincorporated areas of Wright County as well as the following incorporated cities:

- Belmond
- Clarion
- Dows*
- Eagle Grove
- Galt
- Goldfield
- Rowan
- Woolstock

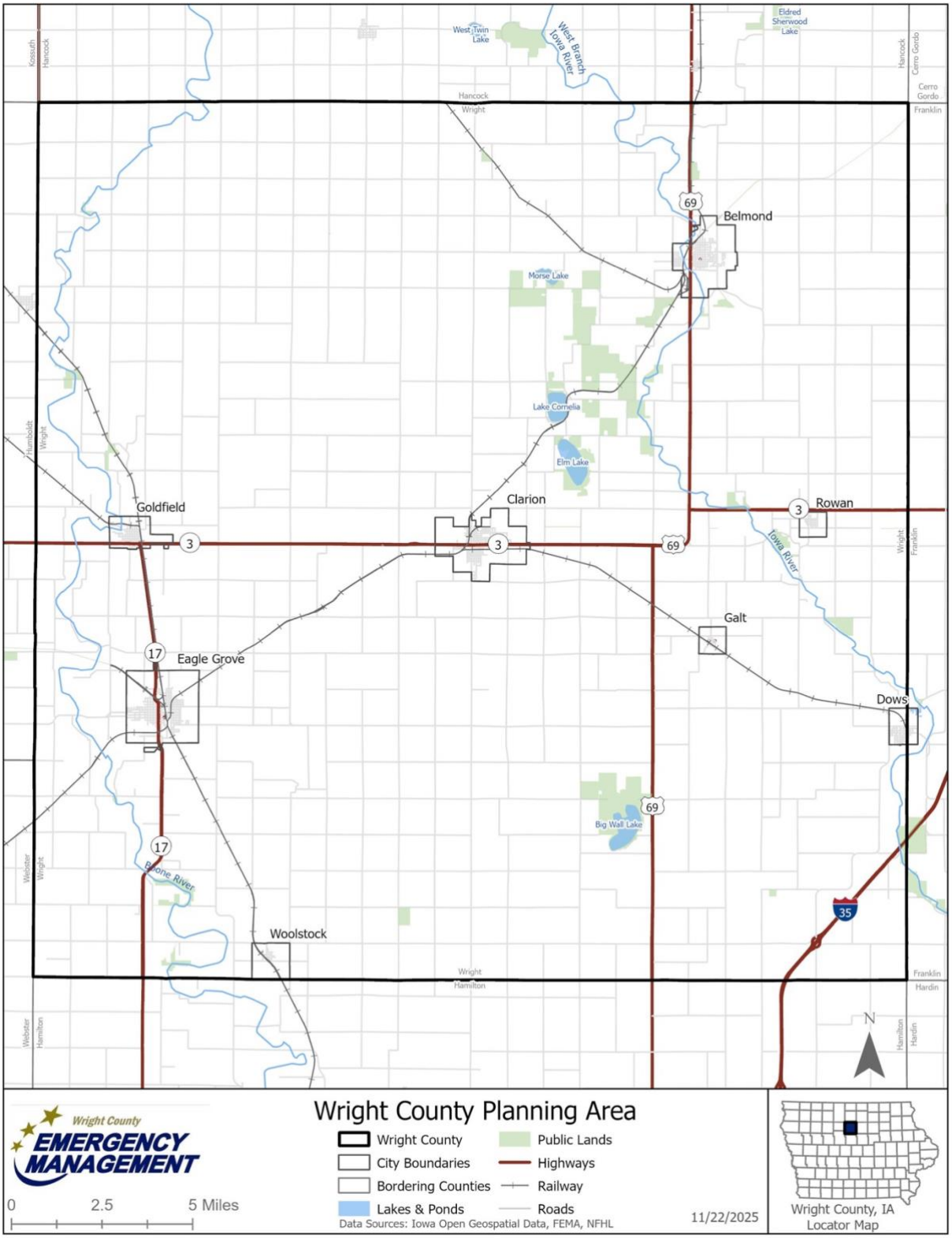
**Note: Portions of Dows' corporate limits extends into adjacent Franklin County. The Hazard Mitigation Planning area will include the full corporate limits of this city, including the portion in the adjacent county.*

The following school districts participated in development of this plan and are also included in the planning area:

- Belmond-Klemme Public School District
- Clarion-Goldfield-Dows Public School District
- Eagle Grove Public School District

The school districts are discussed in additional detail in **Section 2.2.**

FIGURE 2.1 WRIGHT COUNTY PLANNING AREA



2.1.1 GEOGRAPHY AND TOPOGRAPHY

Wright County is located in north central Iowa. Major roads include I-35, US Highway 3, Highway 17 and Highway 69. Wright County is located in the Des Moines Lobe landform region of Iowa. The poorly drained flats and rich black soils of this region have been extensively tiled and converted ton intensive agricultural uses. The City of Clarion is the County seat. Wright County comprises approximately 580 square miles and has an estimated population of 12,729 (2024). [1]

Adjacent counties include:

- Hancock County (north)
- Franklin County (east)
- Hardin County (southeast)
- Hamilton County (south)
- Webster County (southwest)
- Humboldt County (west)

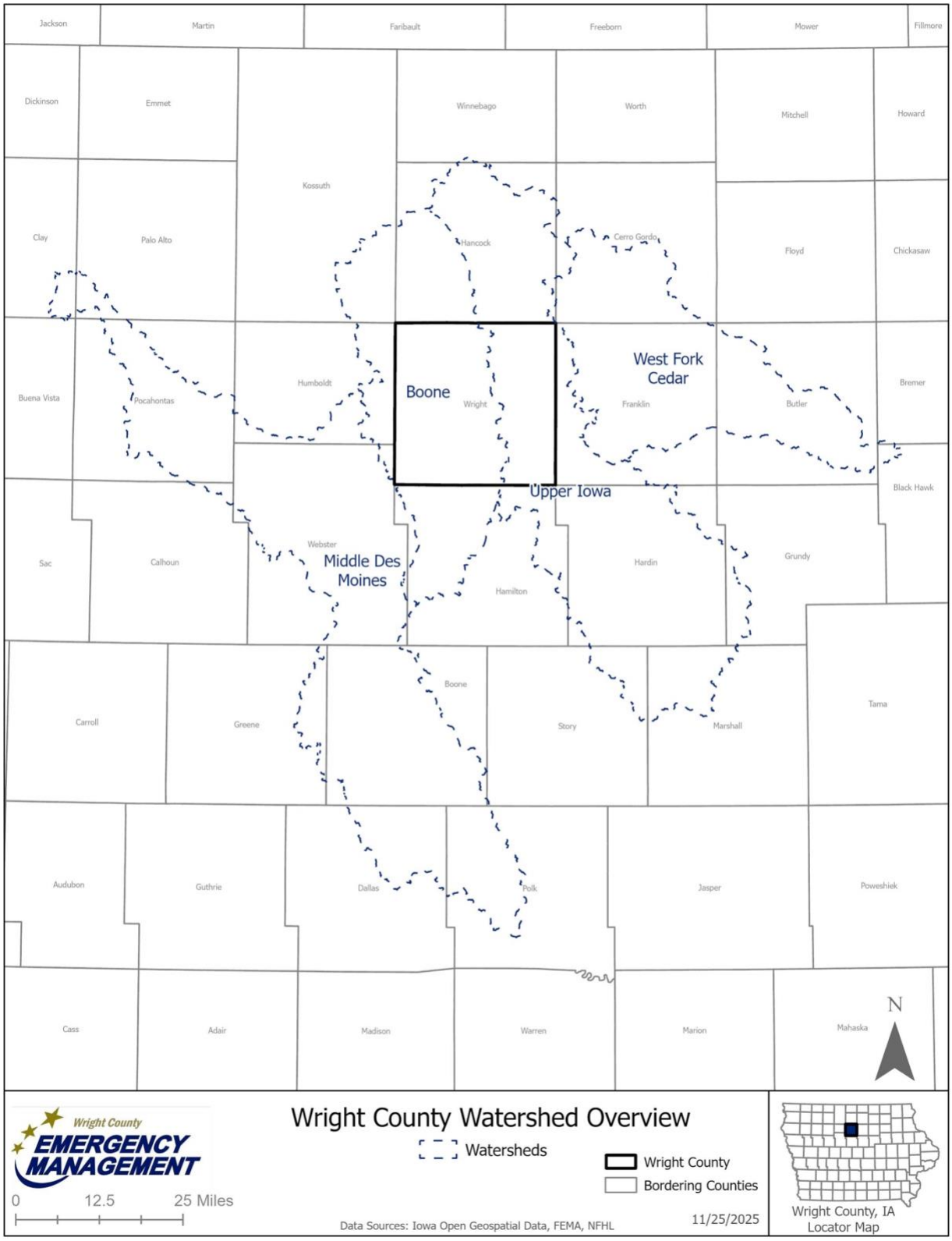
2.1.2 MAJOR RIVERS AND WATERSHEDS

As depicted in **Figure 2.2,** Wright County crosses four watersheds:

- **Middle Des Moines Watershed (07100004)**—this watershed crosses a very small portion of Wright County at the southwest corner of the county.
- **Upper Iowa (07080207)**—this watershed crosses over roughly one-third of the eastern side of Wright County
- **Boone (07100005)**—this watershed crosses over roughly two-thirds of the western side of Wright County.
- **West Fork Cedar (07080204)**—this watershed crosses a very small portion of Wright County at the northeast corner of the county

[1] "QuickFacts: Wright County, Iowa." Census Bureau QuickFacts, United States Census Bureau, 2025, www.census.gov/quickfacts/fact/table/wrightcountyiowa/PST045224. Accessed 16 June 2026.

FIGURE 2.2 IOWA WATERSHEDS



2.1.3 HISTORY

Wright County was officially organized in 1855 and was named after Silas Wright and Joseph Albert Wright, who were influential Governors from the States of New York and Indiana. Many of the County's earlier settlers migrated from these states. Prior to its organization, Wright County was part of Delaware, Polk, Boone, and Webster Counties and only consisted of hunters and trappers who traveled into the area. The first settlements began in 1854. The first settlers were William H. Montgomery, William Stryker, and Minter Brassfield, each of which came with their families to Wright County within a few weeks of one another.

The first election took place in 1855 during the month of August. At this time, the original County Seat was established in Eagleville, which was a town that was platted west of present-day Eagle Grove, but never fully built. The Courthouse was located in a log cabin owned by S.B. Hewett, Sr. In 1858, the County seat was moved to "Liberty", which today is known as Goldfield. The County Seat made its final move in 1865 to Grant, which was chosen for its central location. In June of 1870, the city of Grant was renamed Clarion, after Clarion, Pennsylvania.

After the organization of the County Seat in Grant, now Clarion, a decision on whether to move the old courthouse from Liberty, now Goldfield, or build a new one could not be reached. The problem was finally resolved in November 1865, when the courthouse committee contracted Perry & Nees to build a two-story, frame building for $5,600. **Figure 2.3** shows the Wright County Courthouse

Approximately twenty years later, in the 1890 election, the voters approved the building of a new courthouse and jail. The present-day courthouse was fully constructed in 1892. The red brick building has since undergone extensive remodeling to the interior and exterior, which was completed in 1974.

FIGURE 2.3 WRIGHT COUNTY COURTHOUSE

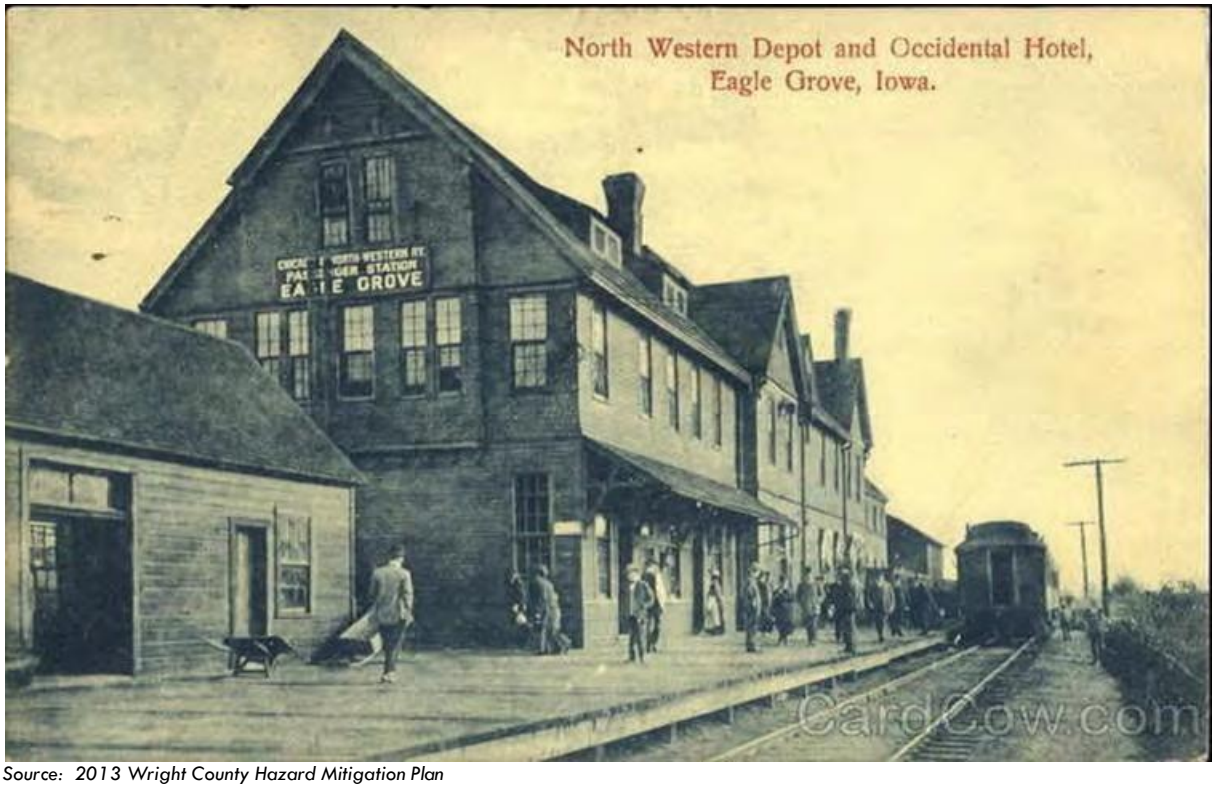


Source: Wright County, http://www.wrightcounty.org/index.php

The first railroad completed in Wright County was the Burlington, Cedar Rapids and Northern Railway, which reached Clarion in 1881. A few months later, the Chicago & North Western Railway reached Goldfield, having been at Eagle Grove a few months before. **Figure 2.4** displays the North Western Depot. A branch of the Iowa Central Railway was also soon pushed through to Belmond and reached Clarion by August of 1895. By 1915, approximately 12 miles of rail lines ran through Wright County, including lines run by Chicago and Northwestern, Chicago and Iowa, Chicago, Rock Island, and Pacific and Chicago Great Western.

While the construction of the railroad lines greatly aided in the settlement of Wright County, so did the cost of land with good soil. In 1880, Wright County had 785 farms, a majority of which were occupied by the owners who worked them. In 1905, the number of farms went up to 1,688. Since this time, the County has developed into an important corn and soybean production area. [2]

FIGURE 2.4 NORTHWESTERN DEPOT AND OCCIDENTAL HOTEL, EAGLE GROVE, IOWA



Source: 2013 Wright County Hazard Mitigation Plan

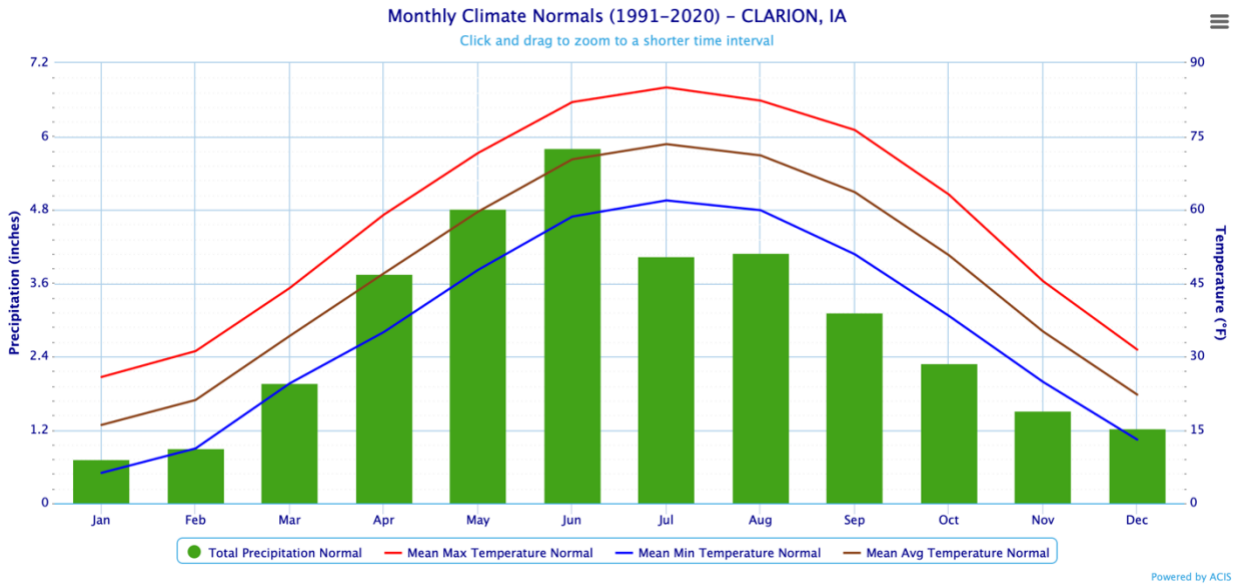
2.1.4 CLIMATE

The temperatures in Wright County vary greatly from season to season, from very cold winters, to warm, humid, summers. Wright County, like the entire State of Iowa, is within the humid continental zone. July is typically the hottest month with an average high temperature of 85 degrees Fahrenheit. The coldest winter month is January with an average low of 6 degrees Fahrenheit. Seasons fluctuate from being very wet to very dry, and temperatures can fluctuate greatly in spring and autumn months. Average annual

[2] *History of county Governments in Iowa*, Iowa State Association of Counties, 1992 and *History of Wright County, Iowa*, Birdsall, 1915

precipitation is approximately 34 inches. **Figure 2.5** and **Table 2.1** provide monthly climate normals for Clarion, Iowa (the location of the county's only weather station) from 1991 to 2021.

FIGURE 2.5. MONTHLY CLIMATE NORMALS (1991-2020), CLARION, IA



Source: NWS

TABLE 2.1 MONTHLY CLIMATE NORMALS (1991-2020), CLARION, IA

Month	Total Precipitation Normal (inches)	Mean Max Temperature Normal (°F)	Mean Min Temperature Normal (°F)
January	0.73	25.8	6.2
February	0.91	31.1	11.2
March	1.96	44.0	24.5
April	3.75	59.0	35.0
May	4.81	71.6	47.7
June	5.81	82.0	58.6
July	4.04	85.0	61.9
August	4.10	82.3	59.9
September	3.13	76.3	50.9
October	2.29	63.1	38.3
November	1.52	45.4	24.8
December	1.22	31.4	13.0
Annual	34.27	58.1	36.0

Source: NWS

2.1.5 POPULATION AND DEMOGRAPHICS

According to the U.S. Census Bureau, the Wright County population decreased 1.7% from 2020 to 2024. This change follows a persistent pattern of decreasing population. The County population decreased 2.2 percent from 2010 to 2020 and 3.4% from 2010 to 2016. The jurisdiction with the largest decrease was Rowan, with a decrease of just over 22%. **Table 2.2** provides the populations for each city and the unincorporated county for the 2010 decennial census, the 2016 Annual Population Estimates, and the 2020 decennial census with the number and percent change from 2010 to 2020.

TABLE 2.2 WRIGHT COUNTY POPULATION 2010-2020 BY CITY

Jurisdiction	2010 Census Population	2016 Population Estimate	2020 Census Population	% Change 2010-2020
Belmond	2,376	2,324	2,463	-3.7%
Clarion	2,850	2,765	2,810	-1.4%
Dows*	538	511	521	-3.2%
Eagle Grove	3,583	3,427	3,602	-.5%
Galt	32	31	26	-18.8%
Goldfield	635	607	636	.2%
Rowan	158	157	123	-22.2%
Woolstock	168	163	183	8.93%
Unincorporated Wright County	2,889	2,794	2,415	-16.4%
Total	**13,229**	**12,779**	**12,943**	**-2.16%**

*Source: U.S. Census Bureau: 2010 Decennial Census, 2016 Population Estimates, 2020 Decennial. *portions of this city extend into adjacent county – the population total is for the entire corporate limits including portion in adjacent county. Unincorporated Wright County Population was estimated by subtracting populations of incorporated cities from the total Wright County populations.*

Table 2.3 provides historic population estimates since 1900 and shows a 30% decrease in population from 1900 to 2024. A few decades showed slight growth in population, but the downward trend has held steady for most of the past century.

TABLE 2.3 HISTORICAL CHANGE IN POPULATION SINCE 1900, WRIGHT COUNTY

Decade/ Year	Population	% Change
1900	18,227	--
1910	17,951	-1.51%
1920	20,348	13.35%
1930	20,216	-0.65%
1940	20,038	-0.88%
1950	19,652	-1.93%
1960	19,447	-1.04%
1970	17,294	-11.07%
1980	16,319	-5.64%
1990	14,269	-12.56%
2000	14,334	0.46%
2010	13,229	-5.66%
2016	12,779	-3.40%
2020	12,943	+1.28%
2024	12,729	-1.65%

Source: U.S. Census Bureau

According to the 2024 ACS estimates, 6.6% of the population is under age 5 and 22.5% of the population is over age 65 in Wright County. This is a slight increase from 2016, which indicates the

population makeup of Wright County is trending younger and older. Additionally, 11% of Wright County residents are living in poverty.

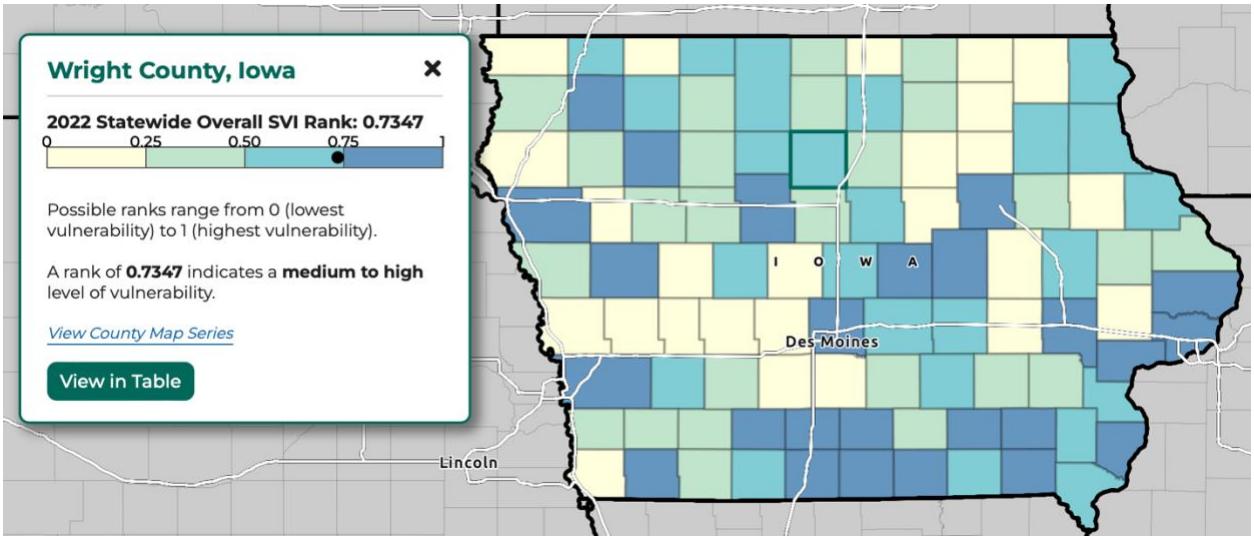
The Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry Social Vulnerability Index (hereafter, CDC/ATSDR SVI or SVI) is a place-based index, database, and mapping application designed to identify and quantify communities experiencing social vulnerability. The Geospatial Research, Analysis & Services Program (GRASP) maintains the CDC/ATSDR SVI to help public health officials and local planners better prepare for and respond to emergency events with the goal of decreasing human suffering, economic loss, and health inequities.

The current SVI uses 16 variables (derived from the U.S. Census) from the 5-Year American Community Survey (ACS) to identify communities that may be disproportionally impacted before, during, and after disasters. These variables are grouped into four themes that cover major areas of social vulnerability. [3]

Figure 2.6 shows that Wright County has a high Social Vulnerability Index of .7347. The high index indicates that Wright County is generally less able to cope and recover from disasters than other areas. The social vulnerability factors that are driving the high score are poverty, old age or childhood, single parent households, and lack of English language proficiency.

[3] Centers for Disease Control and Prevention. "Social Vulnerability Index." Place and Health - Geospatial Research, Analysis, and Services Program (GRASP), 22 Oct. 2024, www.atsdr.cdc.gov/place-health/php/svi/index.html.

FIGURE 2.6 COUNTY COMPARISON WITHIN THE STATE FOR SOCIAL VULNERABILITY INDEX, 2022



Source: CDC SVI

Table 2.4 and **Table 2.5** provide additional demographic and economic indicators for Wright County. The Wright County values are for all of Wright County, including the incorporated cities.

TABLE 2.4 UNEMPLOYMENT, INCOME, AND POVERTY DEMOGRAPHICS, WRIGHT COUNTY, IOWA

Jurisdiction	Population 18 Years and Over	Unemployment Rate (2025)[4]	Median Household Income	Percent Below Poverty Level
Wright County	9,474	2.5 %	$64,033	11%
Belmond	1,846	-	$56.528	17.6%
Clarion		-	$64,625	14.3%
Dows	394	-	$78,000	7.2%
Eagle Grove	2,449	-	$63,135	22.5%
Galt*	34	-	N/A**	N/A**
Goldfield	517	-	$53,492	13.2%
Rowan	143	-	$56,875	23.4%
Woolstock	140	-	$85,000	5.5%

Source: U.S. Census, 2023 American Community Survey, 5-year Estimates,
**Portions of this city extend into adjacent county – the census data is for the entire corporate limits including portion in adjacent county and U.S. Bureau of Labor Statistics*
***Accurate household income and poverty was not available for Galt from the census; the margin of error was larger than the figure itself due to Galt's small population*

[4] "Unemployment Rate in Wright County, IA." Stlouisfed.org, 2026, fred.stlouisfed.org/series/IAWRIG7URN. Accessed 16 June 2026.

TABLE 2.5 EDUCATIONAL ATTAINMENT, WRIGHT COUNTY, IOWA

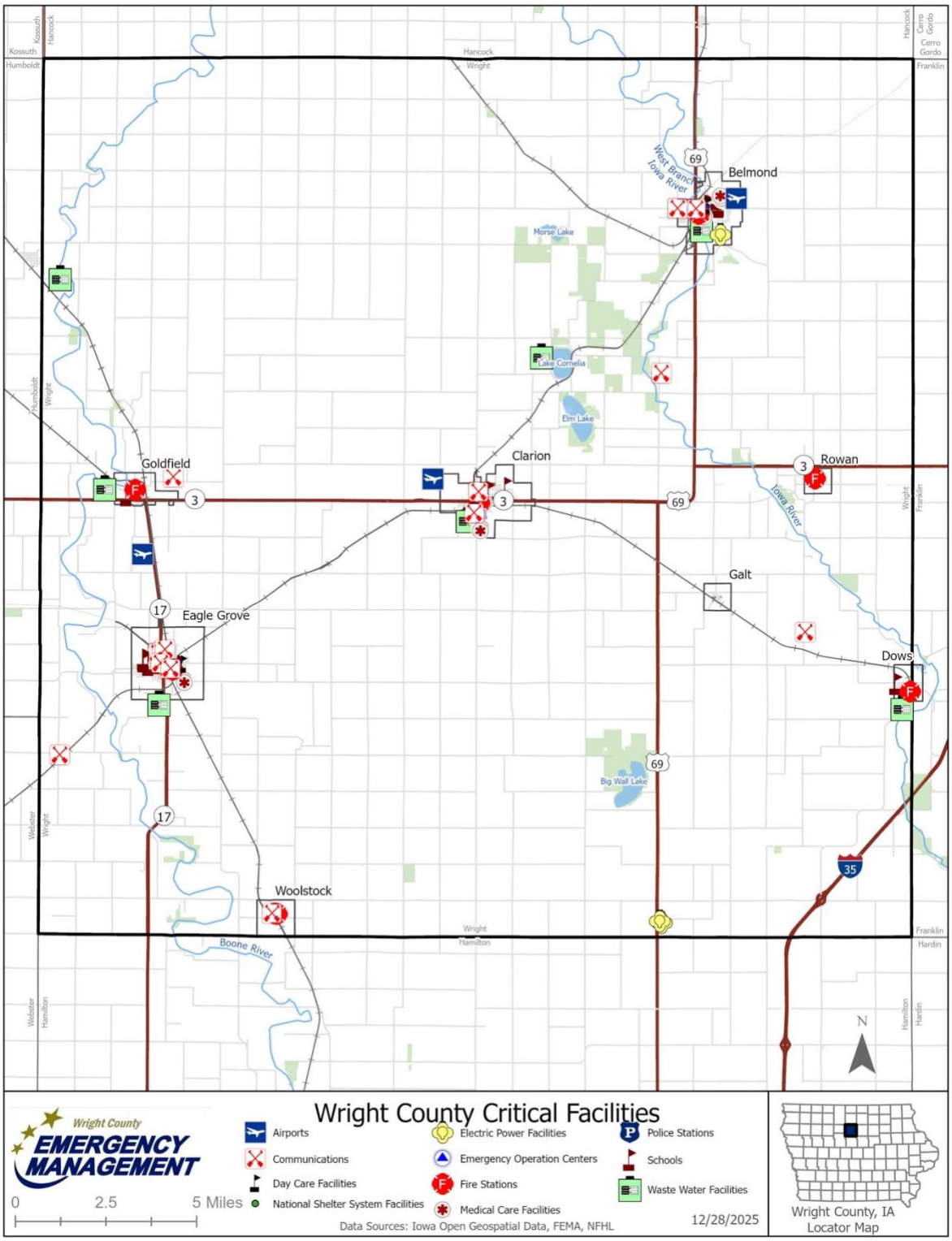
Jurisdiction	No Degree	High School Diploma	Some College	Bachelor's Degree	Post-Graduate Degree
Wright County	7%	35%	34%	18%	5%
Belmond	4%	32%	35%	23%	6%
Clarion	10%	27%	38%	16%	10%
Dows	6%	30%	45%	16%	3%
Eagle Grove	11%	47%	23%	16%	2%
Galt*	13%	29%	29%	29%	0%
Goldfield	10%	32%	38%	15%	6%
Rowan	15%	45%	32%	8%	0%
Woolstock	9%	38%	42%	11%	1%

*Source: U.S. Census, 2023 American Community Survey, 5-year Estimates, *portions of this city extend into adjacent county – the census data is for the entire corporate limits including portion in adjacent county.*

2.1.6 CRITICAL FACILITIES

Critical facilities are the systems and structures that are essential to a jurisdiction's continued functioning, the failure of which would cause significant disruption. **Figure 2.7** displays the location of the 106 critical facilities within Wright County.

FIGURE 2.7 WRIGHT COUNTY CRITICAL FACILITIES



2.1.7 OCCUPATIONS AND EMPLOYERS

Table 2.6 provides occupation statistics for the incorporated cities and the county as a whole for the civilian employed population 16 years and over.

TABLE 2.6 OCCUPATION STATISTICS, WRIGHT COUNTY, IOWA

Jurisdiction	Civilian employed population 16 years and over	Management, business, science and arts occupation	Computer, engineering and science	Education, Legal, and Community Service, Arts and Media	Healthcare and Technical	Service	Sales and Office	Natural Resources	Production and Trasnport
Wright County	5,808	2,166	147	557	402	801	921	876	1,044

*Source: U.S. Census, 2023 American Community Survey, 5-year Estimates, *portions of these cities extend into adjacent counties – the census data is for the entire corporate limits including portions in adjacent counties.*

The industries contributing most significantly to employment in Wright County are healthcare, manufacturing, food production and agriculture, and biosciences. The main employers in those industries are listed below.

Healthcare

- Iowa Specialty Hospital

Manufacturing

- Hagie Manufacturing
- Cascades Moulded Pulp

Food Production and Agriculture

- Prestage Foods of Iowa
- Centrum Valley Farms, Daybreak Foods, and Iowa Cage Free
- Bayer Iowa Production Co.
- Syngenta
- Ag Processing Inc.
- Gold-Eagle Cooperative
- North Central Cooperative
- New Max Merger Cooperative
- Dows Farmers Cooperative
- NEW Cooperative

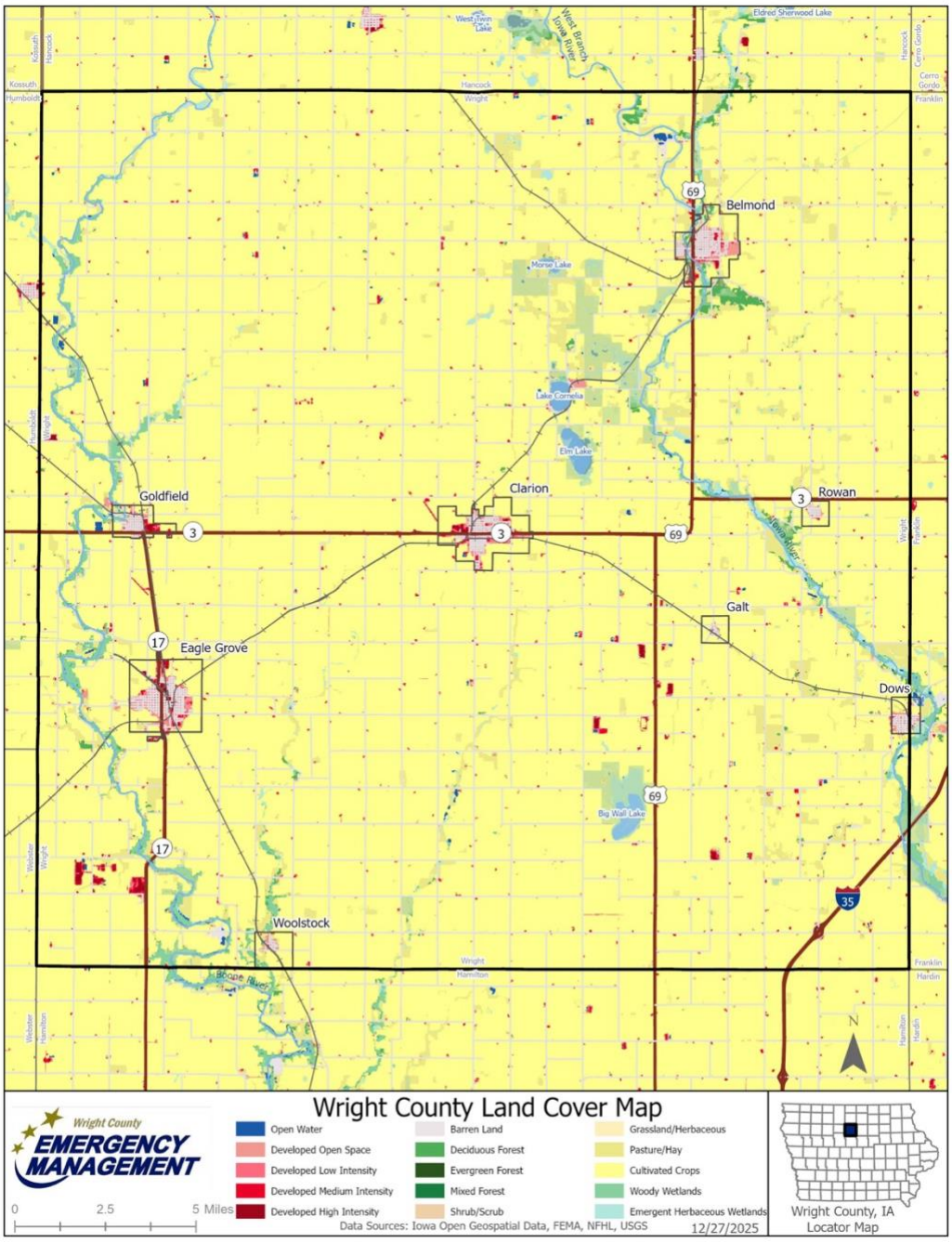
Biosciences

- Corn, LP
- Zoetis

2.1.8 AGRICULTURE

Because of the climate conditions and fertility of the soils in Wright County, agriculture and livestock are important contributors to the local economy. **Figure 2.8** displays the extensive coverage of cultivated crops within the County.

FIGURE 2.8 WRIGHT COUNTY LAND COVERAGE


Belmond
Clarion
Goldfield
Rowan
Galt
Eagle Grove
Dows
Woolstock
Lake Cornelia
Elm Lake
Morse Lake
Big Wall Lake
Eldred Sherwood Lake
West Twin Lake
West Branch Iowa River
Boone River
Prairie River
Wright County
EMERGENCY MANAGEMENT
Wright County Land Cover Map
Open Water
Developed Open Space
Developed Low Intensity
Developed Medium Intensity
Developed High Intensity
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
0
2.5
5 Miles
Data Sources: Iowa Open Geospatial Data, FEMA, NFHL, USGS
12/27/2025
N
Wright County, IA
Locator Map

According to the 2022 Census of Agriculture, there were 734 farms in the County covering 369,835 acres. Since 2012, the number of farms has decreased but the number of acres has increased, reflecting farm business consolidation and industry growth. Crop and livestock production are visible parts of the agricultural economy, but many related businesses contribute by producing, processing, and marketing farm and food products. These businesses generate income, employment, and economic activity throughout the region. The average size of a farm in Wright County is 504 acres. The most commonly produced crops in the County are corn, soybeans, and forage, and the most common livestock are layers, hogs, pigs, cattle, and calves.

2.2 PUBLIC SCHOOL DISTRICTS

This section includes general profile information for three Wright County school districts that are participants in this plan. The school districts with buildings in the planning area are as follows.

- Belmond-Klemme Public School District
- Clarion-Goldfield-Dows Public School District
- Eagle Grove Public School District

Figure 2.9 shows the boundaries of the school districts in Wright County and **Table 2.7** provides location and enrollment information for each school district. See the School District Annex for more information.

FIGURE 2.9 WRIGHT COUNTY, IOWA PUBLIC SCHOOL DISTRICTS

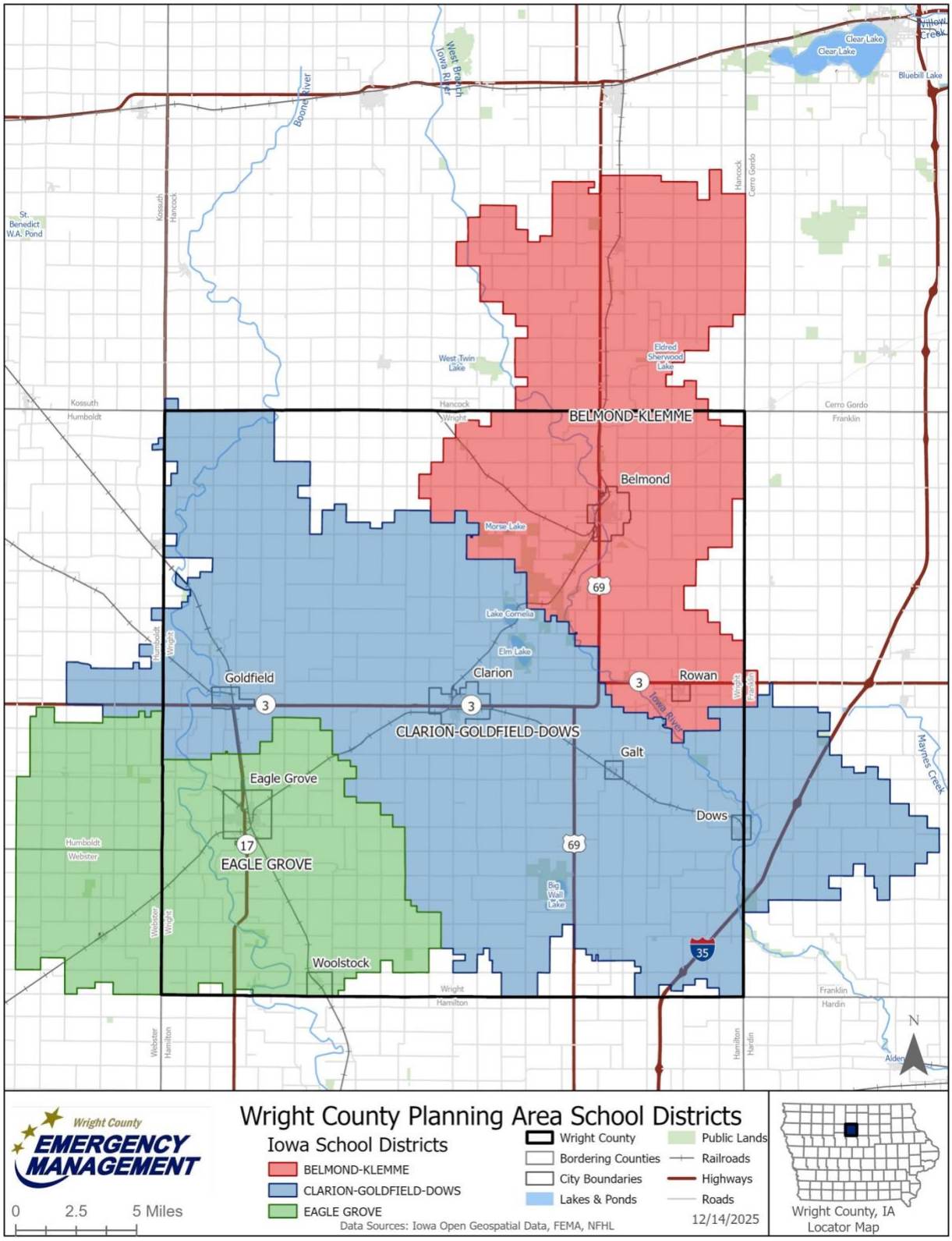


TABLE 2.7 WRIGHT COUNTY SCHOOL DISTRICT ENROLLMENT, FALL 2025

District Name	Total Enrollment
Belmond-Klemme	622
Clarion-Goldfield-Dows	938
Eagle Grove	915.
Grand Total	**2,474**

Source: Iowa Department of Education https://educate.iowa.gov/pk-12/data/data-collections/certified-enrollment/public-schools

3. CAPABILITY ASSESSMENT

Capability and capacity are two defining features of a community's resilience. Capability refers to the "tools" available to the community, whereas capacity is the ability to use those tools. The capability assessment is a self-assessment of each participant's capabilities and provides specific details about the resources available to them. These capabilities cover four different areas:

- Planning/Regulatory Tools and Programs
- Staff and Technical Capabilities
- Fiscal Capacity
- NFIP Participation

This section of the base plan provides capability assessment information for Wright County. For other plan participants, capability assessment information is provided in the relevant plan annex.

3.1 CAPABILITY OVERVIEW

The jurisdiction of Wright County includes all unincorporated areas within the County boundaries. The Wright County government structure is a County Board of Supervisors with five members.

Chapter 29C of the Code of Iowa creates the State Emergency Management Division and the local Emergency Management Commissions. County emergency management commissions are composed of a member of the board of supervisors, the sheriff, and the mayor from each city within the county. The commission appoints a coordinator to manage the emergency management agency. The Wright County Emergency Management Commission consists of eight County town mayors and their representatives, a member of the Board of Supervisors, and the County Sheriff.

The Emergency Management Coordinator is responsible for planning, administration, coordination, training and support for local governments and their departments on behalf of the commission. The Board of Supervisors has appointed the Emergency Management Coordinator as the County Homeland Security Director and advisor to the county for all homeland security issues.

3.2 PLANNING AND REGULATORY TOOLS AND PROGRAMS

Planning is a strong tool to mitigate hazards that pose a risk to the planning area. Planning and regulatory capabilities are the codes, ordinances, policies, laws, plans and programs that guide growth and development. These capabilities can either support risk reduction or create areas that are more vulnerable to disaster. Common planning capabilities include comprehensive or master plans, housing plans, capital improvement programs, transportation plans, economic development strategies, disaster recovery plans and others. Local plans have specific actions or policies that support community goals and drive decisions.

TABLE 3.1 WRIGHT COUNTY PLANNING CAPABILITIES

Planning Mechanism	Wright County
Capital Improvement Plan (CIP)	No
Comprehensive Plan	Yes
Community Wildfire Protection Plan (CWPP)	No

Planning Mechanism	Wright County
Comprehensive Emergency Management Plan (CEMP)	No
Critical Facilities Plan	In Progress
General Plan	No
Continuity of Operations Plan (COOP)	Under Development
Debris Management Plan	Yes
Disaster Recovery Plan	Yes
Economic Development Plan	Yes
Emergency Operations Plan (EOP)	Under Development
Environmental Impact Report (EIR)	No
Evacuation Plan	No
Flood Response Plan	No
Floodplain Management Plan/Flood Mitigation Plan	Yes
Hazard Mitigation Plan	Yes
Historic Preservation Plan	No
Land Use Plan	Yes
Natural Resource Protection Plan (NRPP)	No
Open Space Management Plan	No
Transportation Plan	Yes
Threat Hazard Identification and Risk Assessment (THIRA)	Yes
Watershed Plan	Yes

Source: Wright County jurisdictions

Wright County adopted a zoning ordinance for unincorporated lands in 1991, which includes zoning (building) permits as part of the requirement. The permits acknowledge land use compliance and can be found in Article XIV of the Zoning Ordinance for Unincorporated Areas. However, Wright County does not enforce a structural building code such as the International Building Code (IBC) or International Residential Code (IRC). Additionally, the County has a Floodplain Ordinance which states that any development in the 100-year floodplain is required to complete a floodplain permitting process which would be reviewed by the County. No zoning districts within the County are excluded from this regulation. In addition to the table below, Wright County has site plan review requirements and a landfill transfer station.

TABLE 3.2 WRIGHT COUNTY REGULATORY TOOLS AND PROGRAMS

Tools and Programs	Wright County
Building Codes	No
Citizen Corps – Community Emergency Response Team (CERT)	No
Community Rating System (CRS Program of the NFIP)	No
Emergency Management Accreditation Program (EMAP)	No
Fire Code	No
Firewise Community	No
Floodplain Management/Flood Damage Prevention Ordinance	Yes
Land Use/Development Planning	Yes
National Flood Insurance Program (NFIP)	Yes
Post Disaster Redevelopment/Reconstruction Plan/Ordinance	No
Storm Ready	Yes
Stormwater Management Plan/Ordinance	Yes
Subdivision Regulations/Ordinance	Yes
Unified Development Ordinance	No
Zoning Ordinance	Yes

Source: Wright County jurisdictions

Ability to Expand Planning and Regulatory Capability

Overall, Wright County has increased the number of planning mechanisms in place since the last plan update which includes the THIRA and Debris Management Plan. To improve in this capability the County and the participating jurisdictions may seek to invest time and resources into development of the plans or planning mechanisms that are not in place as noted in the table below. Planning mechanisms the County may consider developing include the CEMP and Evacuation Plan among others. Wright County and its participating jurisdictions have several regulatory tools and programs in place to mitigate against hazards but could still improve on implementing more in the future. Regulatory tools and programs that would be helpful to implement across all participating jurisdictions include the StormReady program and floodplain/stormwater management ordinances as flooding is a high risk to the County as a whole.

3.3 STAFF AND TECHNICAL CAPABILITIES

For successful implementation of a mitigation program, it is necessary to have a broad range of people involved who can inform and contribute to holistic mitigation actions through diverse backgrounds and experience. People with the necessary expertise to influence outcomes can include local planners, engineers, building inspectors, emergency managers, floodplain managers, Geographic Information Systems (GIS) analysts and grant writers, among others.

Table 3.3 provides a summary of Wright County's staffing capabilities.

TABLE 3.3 WRIGHT COUNTY STAFFING CAPABILITIES

Staffing Capabilities	Wright County
Emergency Manager	Yes
Engineers or professional trained in construction practices related to buildings and/or infrastructure	Yes
Environmental Justice Specialists	No
Fiscal Management or Procurement Specialists	Yes
Floodplain Manager	Yes
Housing Specialist(s)	No
Land Surveyors	No
Land Use/Management/Development Planning	Yes
Planners or engineers with an understanding of natural and/or human caused hazards	Yes
Recreation/Green Space Specialist(s)	No
Resource Development Staff or Grant Writing	No
Scientists familiar with the hazards of the community	No
Staff experienced with Geographic Information Systems (GIS) or HAZUS	Yes
Staff with education or expertise to assess the community's vulnerability to hazards	Yes
Transportation Manager/Traffic Engineer	Yes

Source: Wright County jurisdictions

Ability to Expand Staff and Technical Capability

Overall, Wright County has several of the staffing capabilities in place that are critical in order to mitigate against hazards such as an emergency manager and floodplain manager. However, many of the participating jurisdictions lack staffing capabilities across the board. In order to improve the staffing capability in Wright County, participating jurisdictions in coordination with the County may seek to obtain technical staff and personnel such as Grant Writing staff that could assist in applying for grants to fund future mitigation projects.

3.4 FINANCIAL CAPACITY

Mitigation projects require financial capital to be successfully implemented. A variety of programs and grant opportunities are available to support these efforts. The ability to identify relevant funding sources and navigate the application process is essential for maximizing resources and achieving stronger community outcomes. **Table 3.4** provides a summary of Wright County's financial capabilities.

In addition to the funding sources listed below, Wright County has utilized funding from the Emergency Management Performance Grant (EMPG) and FEMA Public Assistance (PA) programs.

TABLE 3.4 WRIGHT COUNTY FINANCIAL CAPABILITIES

Financial Capabilities	Wright County
Capital Improvement Programming	Yes
Community Development Block Grants (CDBG)	Yes
Development Impact Fees	Yes - Permit Fees
FEMA Hazard Mitigation Assistance Grants (HMPG, FMA,BRIC)	Yes
Gas/Electric Utility Fees	Yes
General Obligation, Revenue, and/or Special Tax Bonds	Yes
Homeland Security Grants (HSGP)	No
Infrastructure Investment and Jobs Act (IIHA)	No
Infrastructure State Revolving Fund Loan	No
Partnering Agreements or Intergovernmental Agreements	No
Sewer/Water Fees	Yes
Special Purpose Tax (or taxing districts)	Yes
Stormwater Utility Fees	Yes
USDA Grants	No
USDA Rural Development Agency Grants	No
US Economic Development Administration Grants	No

Source: Wright County jurisdictions

Ability to Expand Financial Capability

Overall, Wright County engages with various financial capabilities to potentially fund current and future hazard mitigation projects through fees, bonds, and federal grants. However, Wright County has not received funding from other funding sources such as HSGP, IIHA, State Revolving Fund Loan, and other USDA grants. Wright County may look to apply for such grants in the future to improve their financial capability in obtaining grant money and funding mitigation projects. Obtaining grant writing staff may assist with these efforts as well and improve not only the staff capability but their financial capability.

3.5 NFIP PARTICIPATION

Participation in the National Floodplain Insurance Program (NFIP) is a key element of any community's local floodplain management and flood mitigation strategy. Wright County and several participating jurisdictions participate in the NFIP. Three communities in Wright County (Galt, Rowan, and Woolstock) do not participate and have been sanctioned by the NFIP, making them ineligible for federal flood insurance and associated financial benefits.

An NFIP capability assessment is required as part of the local hazard mitigation plan. **Table 3.5** provides a summary of Wright County's NFIP capabilities.

TABLE 3.5 WRIGHT COUNTY NFIP CAPABILITIES

NFIP CapaBilities	Wright County
Has your community adopted a floodplain management ordinance that meets NFIP minimum criteria?	Yes
Has your community adopted the latest effective Flood Insurance Rate Map (FIRM)?	Yes – 2/20/2013
Do you regulate/permit development in the Special Food Hazard Area (SFHA)?	Yes, through planning and zoning
Which position or agency is in charge of NFIP compliance for your community?	Wright County Planning and Zoning Administrator
How do you implement the substantial improvement/substantial damage provisions of your floodplain management ordinance?	Yes, through planning and zoning

ABILITY TO EXPAND CAPABILITY

The lack of floodplain management regulation and NFIP participation in Galt, Rowan, and Woolstock could exacerbate current flood risk for the county. To improve the NFIP capability, the County may coordinate with Galt, Rowan and Woolstock to take steps to participate in the NFIP. Additionally, the County may consider participating in the Community Rating System (CRS), a voluntary incentive program under the National Flood Insurance Program (NFIP) that rewards communities for implementing flood mitigation practices that exceed minimum requirements.

4. RISK ASSESSMENT

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

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property and infrastructure within Wright County to these hazards. The goal of the risk assessment is to estimate the potential loss in the planning area, including loss of life, personal injury, property damage and economic loss, from hazard events. The risk assessment process allows communities in the planning area to better understand their potential risk to the identified hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

The risk assessment for Wright County and participating jurisdictions followed a four-step process methodology:

- **Step 1**—Describe Hazards
- **Step 2**—Identify Community Assets
- **Step 3**—Analyze Risks
- **Step 4**—Summarize Vulnerability

This chapter is divided into six main parts:

- **Section 4.1 Hazard Identification** identifies the hazards that threaten the planning area, and the methodology utilized to score or rank the hazards;
- **Section 4.2 Assets at Risk** provides the planning area's total exposure to natural hazards, considering critical facilities and other community assets at risk;
- **Section 4.3 Development Since 2019 Plan Update** discusses what changes in development have occurred since the previous Hazard Mitigation Plan;
- **Section 4.4 Future Land Use and Development** discusses areas of planned future development;
- **Section 4.5 Hazard Profiles and Vulnerability** for each hazard, this section is divided into two parts:
  1) Hazard Profile: discusses the threat to the planning area, the geographic location/extent at risk, previous occurrences of hazard events and probability of future occurrence; and
  2) Vulnerability Assessment: further discusses specific assets at risk as well as loss estimates where applicable. Specifically, where data is available, this section defines and quantifies populations, natural, cultural, and historic resources, buildings, critical facilities and other community assets at risk to natural hazards with estimates of potential losses to those assets;
- **Section 4.6 Hazard Analysis Summary** provides a tabular summary of the hazard ranking for each jurisdiction in the planning area.

4.1 HAZARD IDENTIFICATION

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

The hazards identified for this plan update are listed below in alphabetical order:

- Animal/Plant/Crop Disease
- Drought
- Extreme Heat
- Flash Flood
- Grass or Wildland Fire
- Hazardous Materials
- Human Disease
- Infrastructure Failure
- River Flooding
- Severe Winter Storm
- Terrorism
- Thunderstorm, Lightning, and Hail
- Tornado/Windstorm
- Transportation Incident

Earthquakes, expansive soils, and radiological incidents were removed from the previous hazard mitigation plan update due to the limited risk posed to the planning area, as determined by the HMPC.

4.1.1 DISASTER DECLARATION HISTORY

Federal and/or state declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. FEMA also issues emergency declarations, which are more limited in scope and do not include the long-term federal recovery programs of major disaster declarations. Determinations for declaration type are based on scale and type of damages and institutions or industrial sectors affected.

Table 4.1 lists federal disaster declarations that included Wright County for the period from 1965 to 2025. Since 1965, there have been 23 federal disaster declarations, which equates to a disaster declaration approximately once every 2.6 years.

TABLE 4.1 FEDERAL DISASTER DECLARATIONS THAT INCLUDED WRIGHT COUNTY, IOWA 1965-2025

Disaster Number	Declaration Date	Title	Incident Begin Date	Incident End Date
193	4/22/1965	Flooding	4/22/1965	4/22/1965
248	8/4/1968	Heavy Rains & Flooding	8/4/1968	8/4/1968
269	8/14/1969	Heavy Rains & Flooding	8/14/1969	8/14/1969
590	7/1/1979	High Winds & Tornadoes	7/1/1979	7/1/1979
928	12/26/1991	Ice Storm	10/31/1991	11/29/1991

Disaster Number	Declaration Date	Title	Incident Begin Date	Incident End Date
996	7/9/1993	Severe Storms & Flooding	4/13/1993	10/1/1993
1230	7/2/1998	Severe Storms, Tornadoes and Flooding	6/13/1998	7/15/1998
1518	5/25/2004	Severe Storms, Tornadoes, and Flooding	5/19/2004	6/24/2004
3239	9/10/2005	Hurricane Katrina Evacuation	8/29/2005	10/1/2005
1688	3/14/2007	Severe Winter Storms	2/23/2007	3/2/2007
3275	3/30/2007	Snow	2/28/2007	3/2/2007
1763	5/27/2008	Severe Storms, Tornadoes, and Flooding	5/25/2008	8/13/2008
1930	7/29/2010	Severe Storms, Flooding, and Tornadoes	6/1/2010	8/31/2010
4126	7/2/2013	Severe Storms, Tornadoes, and Flooding	5/19/2013	6/14/2013
4184	7/24/2014	Severe Storms, Tornadoes, Straight-Line Winds, and Flooding	6/14/2014	6/23/2014
4234	7/31/2015	Severe Storms, Tornadoes, Straight-Line Winds, and Flooding	6/20/2015	6/25/2015
4289	10/31/2016	Severe Storms and Flooding	9/21/2016	10/3/2016
4386	8/20/2018	Severe Storms, Tornadoes, Straight-Line Winds, and Flooding	6/6/2018	7/2/2018
4421	3/23/2019	Severe Storms and Flooding	3/12/2019	6/15/2019
3480	3/13/2020	COVID-19 Pandemic	1/20/2020	5/11/2023
4483	3/23/2020	COVID-19 Pandemic	1/20/2020	5/11/2023
4642	2/23/2022	Severe Storms, Straight-line Winds, and Tornadoes	12/15/2021	12/15/2021
4784	5/24/2024	Severe Storms, Tornadoes, and Flooding	5/20/2024	5/31/2024

Source: https://www.fema.gov/disaster/4870/designated-areas

The U.S. Department of Agriculture's Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans (EM) to producers suffering losses in those counties, and in counties that are contiguous to a designated county. In addition to EM eligibility, other emergency assistance programs, such as Farm Service Agency (FSA) disaster assistance programs, have historically used disaster designations as an eligibility requirement trigger.

Table 4.2 provides the USDA Secretarial disaster declarations that included Wright County from 2012 to 2025. Since 2012, there have been 11 USDA secretarial disaster declarations, which is approximately a disaster declaration once every year. Several of the disaster declarations indicated below, have a Drought Fast Track. An USDA Drought Fast Track is an expedited Secretarial disaster designation process that automatically qualifies agricultural counties for USDA emergency assistance.

TABLE 4.2 USDA SECRETARIAL DISASTER DECLARATIONS INCLUDING WRIGHT COUNTY (2012-2024)

County	Crop Disaster Year	Designation Number	Drought	Flood, Flash Flooding	Excessive Rain, Moisture, Humidity	Wind, High Winds	Fire, Wildfire	Heat, Excessive Heat High Temp. (Incl. Low Humidity)	Insects	Begin Date	Description of Disaster
Wright	2012	S3310	1	0	0	1	1	1	1	7/24/2012	Drought-FAST TRACK
Wright	2012	S3337	1	0	0	1	1	1	1	8/7/2012	Drought-FAST TRACK
Wright	2012	S3361	1	0	0	1	1	1	1	8/21/2012	Drought-FAST TRACK
Wright	2013	S3498	1	0	0	1	1	1	1	3/15/2013	Drought-FAST TRACK
Wright	2013	S3605	0	1	1	0	0	0	0	4/1/2013	Excessive rain, flooding, cool temperatures
Wright	2013	S3614	1	0	0	1	1	1	1	8/27/2013	Drought-FAST TRACK
Wright	2013	S3618	1	0	0	0	0	0	0	7/15/2013	Drought
Wright	2020	S4835	1	0	0	0	0	0	0	8/18/2020	Drought-FAST TRACK
Wright	2022	S5315	1	0	0	0	0	0	0	10/11/2022	Drought-FAST TRACK
Wright	2023	S5514	1	0	0	0	0	0	0	8/29/2023	Drought-FAST TRACK
Wright	2024	S5684	1	0	0	0	0	0	0	4/1/2024	Drought-FAST TRACK

Source: U.S. Department of Agriculture; https://www.fsa.usda.gov/resources/disaster-assistance-program/disaster-designation-information

4.1.2 HAZARD IDENTIFICATION PROCESS

The 2023 State Hazard Mitigation Plan identifies 19 hazards that were considered to be of substantive threat in Iowa. Of these, 13 were found by the HMPC to represent sufficient risk to Wright County to be profiled in this plan update. They are:

- Animal/Plant/Crop Disease
- Drought
- Extreme Heat
- Flooding (which the HMPC decided to profile as two separate hazards – Flash Flood and River Flooding)
- Grass or Wildland Fire
- Hazardous Materials
- Human Disease
- Infrastructure Failure
- Severe Winter Storm
- Terrorism
- Thunderstorm/Lightning/Hail
- Tornado/Windstorm
- Transportation Incident

Six the 19 hazards identified in the 2023 State Hazard Mitigation Plan were eliminated from further review. The justification for exclusion of these hazards is as follows:

- **Dam/Levee Failure** – Not included in previous plan. There is only one dam in Wright County, and it is a Low Hazard dam approximately 5 feet in height and located on the Boone River. The City of Goldfield owns the structure. According to the City, the dam no longer functions. Therefore, failure of such dam would result in little-to-no impacts to the City or downstream. There are no levees in Wright County.
- **Landslide** – Not included in the previous plan. Very few slopes are present in the County. Therefore, the HMPC determined that landslides are not a threat.
- **Sinkholes** – Not included in the previous plan. There is no history of occurrence in the County and no known conditions that would result in formation of sinkholes.
- **Earthquakes –** Profiled in the previous plan. There is very limited earthquake risk in Wright County, and the HMPC determined that they are not likely to take mitigation action related to this hazard.
- **Expansive Soils –** Profiled in the previous plan. There is very limited expansive soil risk in Wright County, and the HMPC determined that they are not likely to take mitigation action related to this hazard.
- **Radiological Hazards –** Profiled in the previous plan. There is very limited radiological risk to Wright County, and the HMPC determined that they are not likely to take mitigation action related to this hazard.

4.1.3 MULTI-JURISDICTIONAL RISK ASSESSMENT

For this multi-jurisdictional plan, the risks are assessed for each jurisdiction where they deviate from the risks facing the entire planning area. The planning area is fairly uniform in terms of climate and topography as well as building construction characteristics. Accordingly, the geographic areas of occurrence for weather-related hazards do not vary greatly across the planning area for most hazards. The more urbanized areas within the planning area have more assets that are vulnerable to the weather-related hazards and varied development trends impact the future vulnerability. Similarly, more rural

areas have more assets (crops/livestock) that are vulnerable to drought. These differences are discussed in greater detail in the vulnerability sections of each hazard.

The City of Dows has a portion of their corporate limits that extends into adjacent Franklin County. The risk assessment update will include the full corporate boundaries of this City.

4.1.4 HAZARD SCORING METHODOLOGY

To maintain a reporting format consistent with the *2023 Iowa State Hazard Mitigation Plan*, the HMPC used the same methodology to score and prioritize the hazards. This prioritization was based on a hazard scoring system that considers four elements of risk: probability, magnitude/severity, warning time, and duration. **Table 4.3** provides definitions for each of the four elements along with associated rating levels.

TABLE 4.3 HAZARD SCORE ELEMENT DEFINITIONS AND RATING SCALES

Element/Score	Definitions
Probability: Reflects the likelihood of the hazard occurring again in the future, considering both the hazard's historical occurrence and the projected likelihood of the hazard occurring in any given year.	
1—Unlikely	Less than 10% probability in any given year (up to 1 in 10 chance of occurring), history of events is less than 10% likely or the event is unlikely but there is a possibility of its occurrence.
2—Occasional	Between 10% and 20% probability in any given year (up to 1 in 5 chance of occurring), history of events is greater than 10% but less than 20% or the event could possibly occur.
3—Likely	Between 20% and 33% probability in any given year (up to 1 in 3 chance of occurring), history of events is greater than 20% but less than 33% or the event is likely to occur.
4—Highly Likely	More than 33% probability in any given year (event has up to a 1 in 1 chance of occurring), history of events is greater than 33% likely or the event is highly likely to occur.
Magnitude/Severity: Assessment of severity in terms of injuries and fatalities, personal property, and infrastructure and the degree and extent with which the hazard affects the jurisdiction.	
1—Negligible	Less than 10% of property severely damaged, shutdown of facilities and services for less than 24 hours, and/or injuries /illnesses treatable with first aid.
2—Limited	10% to 25% of property severely damaged, shutdown of facilities and services for more than a week, and/or injuries/illnesses that do not result in permanent disability.
3—Critical	25% to 50% of property severely damaged, shutdown of facilities and services for at least 2 weeks, and/or injuries/illnesses that result in permanent disability.
4—Catastrophic	More than 50% of property severely damaged, shutdown of facilities and services for more than 30 days, and/or multiple deaths.
Warning Time: Rating of the potential amount of warning time that is available before the hazard occurs. This should be taken as an average warning time.	
1	More than 24 hours warning time
2	12 to 24 hours warning time
3	6 to 12 hours warning time
4	Minimal or no warning time (up to 6 hours warning)
Duration: A measure of the duration of time that the hazard will affect the jurisdiction.	
1	Less than 6 hours
2	Less than 1 day
3	Less than 1 week
4	More than one week

Using the rating scales described in the table above, the formula used to determine each hazard's score, including weighting factors, is provided below:

(Probability x .45) + (Magnitude/Severity x .30) + (Warning Time x .15) + (Duration x .10) = SCORE

Based on the hazard's overall weighted score, the hazards are categorized as follows:

- High (3.0-4.0)
- Moderate (2.0-2.9)
- Low (1.0-1.9).

The HMPC decided on providing an overview of the hazard ranking scores for the planning area as a whole. The results of this overview are provided below in **Table 4.4** Additionally, the hazard ranking overview is provided at the beginning of each hazard profile and vulnerability section. A detailed hazard summary by jurisdiction for participating jurisdictions is provided at the conclusion of each hazard profile and vulnerability section to provide a summary of how the hazard varies by jurisdiction.

TABLE 4.4 WRIGHT COUNTY PLANNING AREA HAZARD RANKING RESULTS

Hazard	Probability	Magnitude	Warning Time	Duration	CPRI	Planning Significance
Animal/Plant/Crop Disease	1	3	4	4	2.35	Moderate
Drought	4	3	1	4	3.25	High
Extreme Heat	3	2	1	3	2.40	Moderate
Flash Flood	4	1	2	1	2.50	Moderate
Grass or Wildland Fire	2	2	4	1	2.20	Moderate
Hazardous Materials	3	1	4	1	2.35	Moderate
Human Disease	2	2	2	4	2.20	Moderate
Infrastructure Failure	4	2	4	3	3.30	High
River Flooding	4	3	1	4	3.25	High
Severe Winter Storm	4	2	3	4	3.25	High
Terrorism	1	4	4	4	2.65	Moderate
Thunderstorm/Lightning /Hail	4	2	2	2	2.90	Moderate
Tornado/Windstorm	4	4	3	1	3.55	High
Transportation Incident	4	4	4	1	3.70	High

4.2 ASSETS AT RISK

As part of the update to the *Wright County Multi-Jurisdictional Hazard Mitigation Plan*, participating jurisdictions assessed the vulnerability of the following types of facilities below:

- **Critical Facilities:** Those facilities that are essential in providing utility or direction either during the response to an emergency or during the recovery operation.
- **Essential Facilities:** Those facilities that if damaged, would have devastating impacts on disaster response and/or recovery.
- **High Potential Loss Facilities:** Those facilities that would have a high loss or impact on the community.
- **Transportation and Lifeline Facilities:** Those facilities and infrastructure that are critical to transportation, communications, and necessary utilities.

Table 4.5 is a summary of the inventory of critical and essential facilities and infrastructure in the planning area. In total, there are 106 critical facilities in the County. This list was compiled from several sources, including the *2019 Wright County Multi-Jurisdictional Hazard Mitigation Plan*, GIS data provided by Wright County, and the HAZUS Critical Facilities list. The full list of critical facilities is included in **Appendix D**. **Appendix D** is a non-public appendix and is maintained by Wright County Emergency Management.

TABLE 4.5 INVENTORY OF CRITICAL/ESSENTIAL AND INFRASTRUCTURE BY JURISDICTION

Type	Belmond	Clarion	Dows	Eagle Grove	Galt	Goldfield	Rowan	Unincorporated	Woolstock	Grand Total
Day Care Center	1	1	0	2	0	0	0	0	0	4
Electric Power Facility	1	0	0	1	0	0	0	2	0	4
EOC	0	1	0	0	0	0	0	0	0	1
Fire Station	1	1	1	1	0	1	1	0	2	8
Medical Care Facility	5	6	1	3	0	0	0	0	1	16
National Shelter System Facility	0	0	0	1	0	0	0	0	0	1
Police Station	1	2	0	1	0	0	0	0	0	4
School	5	3	3	7	0	1	0	0	0	19
Tier II Facility	8	11	2	14	0	4	2	3	3	47
Wastewater Treatment Plant	1	1	0	1	0	0	0	0	0	3
Grand Total	**23**	**26**	**7**	**31**		**6**	**3**	**5**	**5**	**106**

Source: 2019 Wright County Multi-Jurisdictional Hazard Mitigation Plan Wright County GIS Data, FEMA HAZUS Critical Facilities

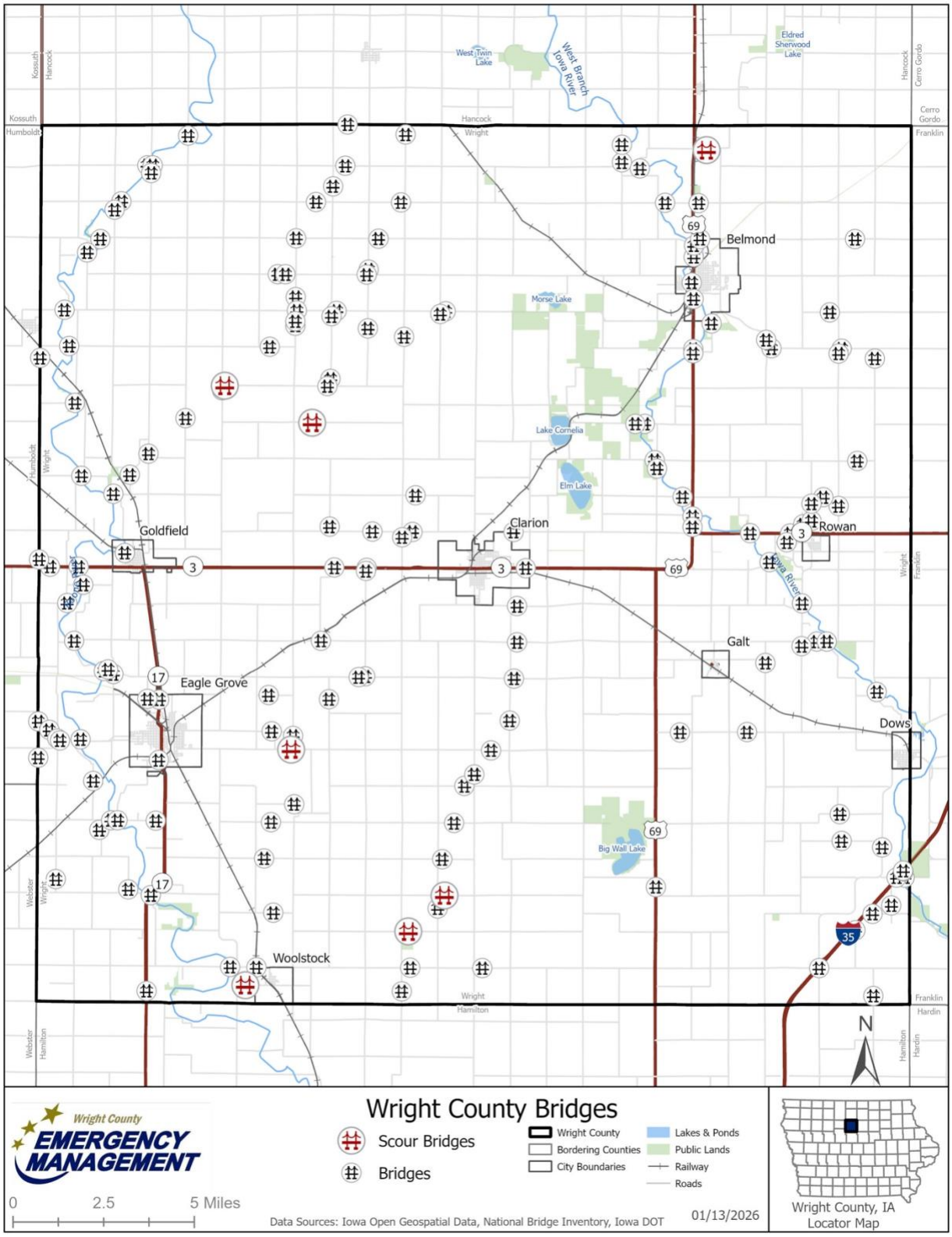
4.2.1 Other Assets

Assessing the vulnerability of the planning area to disaster also involves inventorying the natural, historic, cultural and economic assets of the area. This is important for the following reasons:

- The plan participants may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing about them ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts is higher.
- The rules for reconstruction, restoration, rehabilitation and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.
- Losses to economic assets (e.g., major employers or primary economic sectors) could have severe impacts on a community and its ability to recover from disaster.

Figure 4.1 shows the locations of the bridges and scour bridges within Wright County.

FIGURE 4.1 BRIDGES IN WRIGHT COUNTY



4.2.2 Threatened and Endangered Species

Table 4.6 details the 26 Federally Threatened, Endangered, Proposed and Candidate Species in Wright County, Iowa.

TABLE 4.6 THREATENED AND ENDANGERED SPECIES IN WRIGHT COUNTY

Common Name	Scientific Name	Class	State Status
Bald Eagle	Haliaeetus leucocephalus	Birds	Sensitive (S)
Barn Owl	Tyto alba	Birds	Endangered (E)
Black Tern	Chlidonias niger	Birds	Sensitive (S)
Forster's Tern	Sterna forsteri	Birds	Sensitive (S)
Henslow's Sparrow	Ammodramus henslowii	Birds	Threatened (T)
King Rail	Rallus elegans	Birds	Endangered (E)
Blacknose Shiner	Notropis heterolepis	Fish	Threatened (T)
Topeka Shiner	Notropis topeka	Fish	Threatened (T) – Federal Status E
Creeper	Strophitus undulatus	Freshwater Mussels	Threatened (T)
Acadian Hairstreak	Satyrium acadicum	Insects	Sensitive (S)
Regal Fritillary	Speyeria idalia	Insects	Sensitive (S)
Wild Indigo Dusky Wing	Erynnis baptisiae	Insects	Sensitive (S)
Northern Long-eared Bat	Myotis septentrionalis	Mammals	Threatened (T) Federal Status
Buckbean	Menyanthes trifoliata	Plants	Threatened (T)
Earleaf Foxglove	Tomanthera auriculata	Plants	Sensitive (S)
Frost Grape	Vitis vulpina	Plants	Sensitive (S)
Hill's Thistle	Cirsium hillii	Plants	Sensitive (S)
Silverweed	Potentilla anserina	Plants	Threatened (T)
Glomerate Sedge	Carex aggregata	Plants	Sensitive (S)
Great Plains Ladies'-tresses	Spiranthes magnicamporum	Plants	Sensitive (S)
Slender Cotton Grass	Eriophorum gracile	Plants	Threatened (T)
Slender Ladies'-tresses	Spiranthes lacera	Plants	Threatened (T)
Small White Lady's Slipper	Cypripedium candidum	Plants	Sensitive (S)
Western Prairie Fringed Orchid	Platanthera praeclara	Plants	Threatened (T)
Blanding's Turtle	Emydoidea blandingii	Reptiles	Threatened (T)
Smooth Green Snake	Liochlorophis vernalis	Reptiles	Sensitive (S)

Source: Iowa Department of Natural Resources
https://programs.iowadnr.gov/naturalareasinventory/pages/RepDistinctSpeciesByCounty.aspx?CountyID=99

4.2.3 Natural Resources

The Wright County Conservation Board states that there are 35 parks and various trails, wetlands and natural areas around the county encompassing over 2,400 acres. The County is home to Cornelia Park and

a portion of the 33-mile Three Rivers Trail. Wright County offers opportunities for boating, camping, hiking, water skiing, and picnicking.

4.2.4 Historic Resources

The National Register of Historic Places is the official list of the Nation's cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources.

The National Register is administered by the National Park Service under the Secretary of the Interior. Properties listed in the National Register include districts, sites, buildings, structures and objects that are significant in American history, architecture, archeology, engineering and culture. **Table 4.7** provides the list of properties on the National Register in Wright County.

TABLE 4.7 PROPERTIES AND LANDMARKS ON THE NATIONAL REGISTER IN HISTORIC PLACES, WRIGHT COUNTY

City	Resource	Address	Year Listed
Clarion	Wright County Courthouse	Central Ave.	1981
Clarion	Burlington, Cedar Rapids and Northern Railroad Passenger Station	302 S. Main	1988
Clarion	Cornelia Lake Bridge	Over inlet of Cornelia Lake	1998
Dows	Burlington, Cedar Rapids & Northern Passenger Depot--Dows	200 Railroad St.	1993
Dows	Quasdorf Blacksmith and Wagon Shop	Jct. of Train and W. Railroad Sts.	1994
Dows	Fillmore Block	Jct. of Ellsworth and Garfield	1998
Eagle Grove	Eagle Grove Public Library	401 W. Broadway	1977
Goldfield	Boone River Bridge	Buchanan Ave. over Boone R.	1998

Source: National Park Service, https://www.nps.gov/subjects/nationalregister/database-research.htm#table

4.2.5 Agriculture and the Economy

Agriculture plays an important role in the Wright County economy (see **Table 4.8**). There has been an increase in land area and the average size of farms form the 2018 to 2022 Census of Agriculture. Wright County makes up 2% of state agriculture sales. Top crops in the County consists of corn for grain, soybeans, forage, corn for silage/green crop, oats for grain. Top livestock in the County consists of cattle and calves, goats, hogs and pigs, horses and ponies, layers, and sheep and lambs. The majority of producers are male, 35 years and older, and white.

TABLE 4.8 AGRICULTURAL STATISTICS FOR WRIGHT COUNTY

2022 Census of Agriculture	
Total Land in Farms (acres)	369,835
Number of Farms	734
Average Farm Size (acres)	464
Market Value of All Agricultural Products	$719,410,000
Market Value of All Crops	$372,500,000
Market Value of All Livestock	$346,345,000

Source: Iowa Agricultural Statistics Bulletin, USDA, National Agricultural Statistics Service, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Iowa/cp19197.pdff

4.3 DEVELOPMENT SINCE 2019 PLAN UPDATE

This section provides information on development that has occurred since the 2019 Wright County Multi-Jurisdictional Hazard Mitigation Plan Update in Wright County.

According to the U.S. Census Bureau, the Wright County population decreased about 3% from 2010 to 2023. **Table 4.9** provides the population change statistics for all cities in Wright County as well as the County as a whole.

In general, an increase in population corresponds to an increase in vulnerability because more people may be exposed to potential hazard impacts, including injury, displacement, property damage, service disruptions, and other disaster-related consequences. As population increases in parts of Wright County, there may also be greater demand on emergency services, transportation networks, utilities, shelters, medical facilities, and other community resources before, during, and after hazard events.

As demonstrated by the table below, some communities in Wright County, including Belmond, Dows, Eagle Grove, Galt, Rowan, and Woolstock, experienced population increases in recent years, resulting in a slight increase in population exposure. Conversely, Clarion, Goldfield, and Wright County as a whole experienced population decreases, corresponding to a slight decrease in population exposure.

TABLE 4.9 WRIGHT COUNTY POPULATION CHANGE, 2010-2023

Jurisdiction	2010 Census Population	2016 Population Estimate	2020 Census Population	2023 Population Estimates	# Change 2010-2023	% Change 2010-2023
Belmond	2,376	2,324	2,463	2,678	+302	+12.7%
Clarion	2,850	2,765	2,810	2,775	-75	-2.63%
Dows	538	511	521	544	+6	+1.1%
Eagle Grove	3,583	3,427	3,601	3,588	+5	+.4%
Galt	32	31	26	42	+10	+31.25%
Goldfield	635	607	634	616	-19	-3%
Rowan	158	157	123	209	+51	+32.28%
Woolstock	168	163	144	183	+15	+8.9%
Unincorporated	2,889	2,794	2,621	2,182	-707	-24.47%
Total	**13,229**	**12,779**	**12,943**	**12,817**	**-412**	**-3.11%**

*Source: U.S. Census Bureau: 2010 Decennial Census, 2016 Population Estimates, 2020 Decennial Census, 2023 Population Estimates. *portions of this city extend into adjacent county – the population total is for the entire corporate limits including portion in adjacent county. Unincorporated Wright County Population was estimated by subtracting populations of incorporated cities from the total Wright County populations.*

Table 4.10 provides the change in the number of housing units within the planning area from 2010 to 2023. Housing units within Wright County has decreased 18% since 2010 which is decreasing at a larger rate than the decrease in population noted in the table above.

A decrease in housing stock can contribute to lower hazard exposure and overall community vulnerability because there are less residential structures that may be affected by hazard events. Fewer housing units can decrease the potential for property damage, displacement, utility disruptions, emergency response needs, debris generation, and recovery costs following a disaster. However, a decrease in housing units disproportionate to the decrease in population, may signal a housing crisis or similar issue that leave residents with fewer housing options. This could cause displacement and explain the decrease in population or drive residents to seek unstable housing or experience homelessness.

Only one community in Wright County—Galt—experienced an increase in housing units from 2010-2023; all other communities, as well as the county as a whole, saw a reduction in the number of housing units. It is important to acknowledge that the degree to which additional housing increases vulnerability depends on where new housing is located, the type and condition of the structures, the quality of construction, and whether development occurs in areas exposed to hazards such as flooding, severe storms, extreme heat, or other identified risks.

TABLE 4.10 CHANGE IN HOUSING UNITS, 2010-2023

Jurisdiction	2010 Housing Units	2015 Housing Units	2023 Housing Units	# Change 2010-2023	% Change 2010-2023
Belmond	1,197	1,208	1,107	-90	-7.5%
Clarion	1,346	1,291	1,341	-5	-.37%
Dows	305	308	235	-70	-22.95%
Eagle Grove	1,649	1,672	1,329	-320	-19.4%
Galt	17	32	23	+6	+35.3%
Goldfield	313	318	272	-41	-13.1%
Rowan	95	97	84	-11	-11.58%
Woolstock	100	94	82	-18	-18%
Unincorporated	1,507	1,490	879	-628	-41.67%
Total	**6,529**	**6,510**	**5,352**	**-1,177**	**-18%**

Source: U.S. Census Bureau: 2010 Decennial Census and 2015 American Community Survey, 5-year Estimates, and 2023 American Community Survey
Note: Unincorporated Wright County Housing Units were estimated by subtracting housing units of incorporated cities from the total Wright County populations.

4.4 FUTURE LAND USE AND DEVELOPMENT

The following sections provide details regarding future growth, land use and development. The information in this section comes from the *Wright County 2019 Multi-jurisdictional Hazard Mitigation Plan*, information provided by each of the participating jurisdictions as well as other sources, cited throughout. Where available, maps are provided to facilitate consideration of hazard areas in future development plans as well as any potential growth area.

Table 4.11 provides the population projections for Wright County by Woods & Poole Economics, Inc. According to these projections, the population of Wright County will decline through the year 2040. Overall, the population in Wright County has decreased in line with the projections. However, the population is decreasing at a slower rate than the projections stated shown in the table below.

TABLE 4.11 WRIGHT COUNTY 2010 POPULATION AND PROJECTIONS, 2010-2040

2010 Population	2020 Population	2020 Population Projection	2025 Population Projection	2030 Population Projection	2035 Population Projection	2040 Population Projection
13,229	12,943	12,346	12,142	11,943	11,746	11,552

Source: 2010 Population from the U.S. Census Bureau 2010 Decennial Census; Population Projections from the "2010 State Profile: Iowa", Woods & Poole Economics, Inc, Inc., www.woodsandpoole.com Prepared by: http://www.iowadatacenter.org State Library of Iowa, State Data Center Program

4.5 HAZARD PROFILES AND VULNERABILITY

4.5.1 HAZARD PROFILE OVERVIEW

4.5.1.1 Hazard Profile Methodology

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

Each hazard identified in **Section 4.1.2** is profiled individually in this section in alphabetical order. The level of information presented in the profiles varies by hazard based on the information available. With each update of this plan, new information will be incorporated to provide better evaluation and prioritization of the hazards that affect the planning area. Detailed profiles for each of the identified hazards include information categorized as follows:

- **Hazard Description**: This section consists of a general description of the hazard and the types of impacts it may have on a community. It also includes the ratings assigned to the hazard relative to typical warning times and duration of hazard events as described in **Table 4.3**.
- **Geographic Location/Extent**: This section describes the geographic location of the hazard in the planning area. Where available, maps are utilized to indicate the specific locations of the planning area that are vulnerable to the subject hazard. This section also provides information as to the extent of the hazard (i.e. the size or degree of impacts).
- **Previous Occurrences**: This section includes information on historic incidents and their impacts.
- **Probability of Future Occurrences**: The frequency of past events is used to gauge the likelihood of future occurrences. Where possible, the probability or chance of occurrence was

calculated based on historical data. For each hazard, the probability is assigned a rating as defined in **Table 4.3**.

4.5.1.2 Vulnerability Assessment Methodology

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

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

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

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

Requirement §201.6(c)(2)(ii): (As of October 1, 2008) [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged in floods.

Following the hazard profile for each hazard is the vulnerability assessment. The vulnerability assessment further defines and quantifies populations, buildings, critical facilities and other community assets at risk to natural hazards. The vulnerability assessments were conducted based on the best available data and the significance of the hazard.

Detailed profiles for each of the identified hazards include information categorized as follows:

Vulnerability Overview: This section consists of a general overview narrative of the planning area's vulnerability to the hazard. Within this section, the magnitude/severity of the hazard is discussed. The magnitude of the impact of a hazard event (past and perceived) is related directly to the vulnerability of the people, property and the environment it affects. This is a function of when the event occurs, the location affected, the resilience of the community and the effectiveness of the emergency response and disaster recovery efforts.

Critical Facilities: This section provides the potential losses and damage to the critical facilities in Wright County based on the risk posed from each hazard. More detailed information on the number of critical facilities at risk and impacted are provided for those hazards that have a defined hazard boundary such as the 100-year or 500-year floodplain.

Cultural/Historic/Natural Resources: This section provides the potential losses and damage to the cultural, historic, natural resources in Wright County based on the risk posed from each hazard. More detailed information on the number of resources at risk and impacted are provided for those hazards that have a defined hazard boundary such as the 100-year or 500-year floodplain.

People: This section provides the impact, injuries, and fatalities to the people in Wright County based on the risk posed from each hazard. More detailed information on the number of people at risk are provided for those hazards that have in depth historic information.

Structures and Systems: This section provides the potential losses to existing development. Where data is available, this section provides estimated financial losses as well as the methodology used.

Future Development: This section provides information on how vulnerability to this hazard will be impacted by planned future development, as well as information for jurisdictions to consider in planning future development.

Hazard Summary by Jurisdiction: For hazards that vary by jurisdiction, this section will provide an overview of how the hazard varies, followed by a table indicating the probability, magnitude, warning time and duration rankings for each participating jurisdiction with the resulting hazard score and level.

4.5.2 ANIMAL/PLANT/CROP DISEASE

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
1	3	4	4	2.35	Moderate

Agricultural infestation is the naturally occurring infection of animals, plants, or crops that can alter them to become unfit for consumption or use. Due to Iowa's overall substantial agricultural industry and related facilities and locations, the potential for infestation of animals, plants, or crops poses a significant risk to the economy of the State. Iowa cropland is vulnerable to disease and other agricultural pests. Some level of agricultural infestation is normal in Iowa. The concern is when the level of an infestation escalates suddenly, or a new infestation appears, overwhelming normal control efforts. The levels and types of agricultural infestation appear to vary by many factors, including cycles of heavy rains and drought. This section describes Animal Disease, Plant Disease, and Crop Disease and how it impacts Wright County below.

Animal Disease

Animal disease is a naturally occurring infection of livestock with insects, vermin, or diseases that render the livestock unfit for consumption or use. Based on the 2022 Agriculture Census, Wright County makes up 2% of total state sales for agriculture. With this substantial agricultural industry and related facilities throughout the County, the potential for infestation of livestock poses a significant risk to the economy in the planning area.

The Iowa Department of Agriculture and Land Stewardship (IDALS) monitors and reports on the following animal reportable diseases in Iowa:

- African Swine Fever
- Avian Influenza
- Bovine Spongiform Encephalopathy (BSE) Disease
- Chronic Wasting Disease
- Exotic Newcastle Disease
- Foot and Mouth Disease
- Johne's Disease
- Newcastle Disease
- New World Screwworm
- Pseudo rabies
- Rabbit Hemorrhagic Disease Virus (RHDV)
- Scrapie
- West Nile Virus

Producers are required by state law to report any of the reportable animal diseases to the IDALS's Bureau of Animal Industry. The IDALS's Bureau of The Center for Agriculture Security is the lead coordinating bureau for any emergency response for an agriculture incident.

- **Avian influenza (Bird Flu)**: is a viral disease mainly affecting birds but has mutated to infect other animals such as cows. Avian Influenza cases have increased during the past several years and has been detected all of the United States, including Iowa. Human infections are rare and typically occur from interactions with infected animals. However, there is concern of Avian Influenza mutating to infect and spread person to person. If such a scenario were to occur, Avian

Influenza would likely cause an epidemic or pandemic. Since 2003, there have been 990 human bird flu cases across 25 countries, including 475 deaths which is a 48% fatality rate. [5]

- **Bovine Spongiform Encephalopathy (BSE) "mad cow" Disease**: is a chronic, degenerative disease affecting the central nervous system of cattle. Cases have been found world-wide since 1986. In May 2023, an atypical BSE case (the 7th in the U.S. since 2003) was identified in a cow from Tennessee, that had originated from South Carolina.
- **Chronic Wasting Disease (CWD):** is a 100% fatal, neurological disease of farmed and wild deer and elk. The disease has been identified in wild and captive mule deer, white-tailed deer and North American elk, and in captive black-tailed deer. The first case of CWD in Iowa was found in 2012 on a hunting preserve in the southeastern part of the State. CWD has been slowly increasing its footprint to include 29 counties and 523 positive wild deer. [6]
- **Exotic Newcastle Disease (END)**: is a contagious and fatal viral disease affecting all species of birds. There was an epidemic of END in California in 2003 that resulted in the death of millions of chickens and other birds and costing millions of dollars. END is likely one of the most infectious diseases of poultry in the world. END is so virulent that many birds die without showing any clinical signs. [7]
- **Johne's (yo-knees) Disease:** is a contagious, chronic and eventually fatal infection that affects the small intestine of ruminants, including cattle, sheep and goats. Johne's, also called Para tuberculosis, is a slow progressive wasting disease with an incubation period of usually 2 or more years. Johne's is a reportable disease, but not a quarantinable disease. [8]
- **Pseudo Rabies** is a viral disease most prevalent in swine, often causing newborn piglets to die. Older pigs can survive infection, becoming carriers of the pseudo rabies virus for life. Other animals infected from swine die from pseudo rabies, which is also known as Aujeszky's disease and "mad itch." Infected cattle and sheep can first show signs of pseudo rabies by scratching and biting themselves. In dogs and cats, pseudo rabies can cause sudden death. The virus does not cause illness in humans. Due to an extensive eradication program, Iowa and the rest of United States are free of pseudo rabies.[9]
- **Scrapie** is a fatal, degenerative disease affecting the central nervous system of sheep and goats that is very similar to BSE (mad cow disease), although it does not cause disease in humans, and has been present in the U.S. for over 50 years. Infected flocks that contain a high percentage of susceptible animals can experience significant production losses. In these flocks, over a period of several years, the number of infected animals increases and the age at onset of clinical signs decreases making these flocks economically unviable. Animals sold from infected flocks spread scrapie to other flocks. The presence of scrapie in the U.S. also prevents the export of breeding stock, semen and embryos to many other countries. Currently there is a national program underway to eradicate scrapie in the U.S.[10]

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[5] "Indian Scientists Predict How Bird Flu Could Spread to Humans." The Transmission, 30 Dec. 2025, www.unmc.edu/healthsecurity/transmission/2025/12/30/indian-scientists-predict-how-bird-flu-could-spread-to-humans/. Accessed 16 June 2026.

[6] "Chronic Wasting Disease." Department of Natural Resources, 29 Jan. 2025, www.iowadnr.gov/things-do/hunting-trapping/types-hunting-trapping/deer-hunting/deer-health/chronic-wasting-disease.

[7] "Newcastle Disease | Iowa Department of Agriculture and Land Stewardship." Iowaagriculture.gov, iowaagriculture.gov/animal-industry-bureau/newcastle-disease.

[8] "Johne's Disease Control Program | Iowa Department of Agriculture and Land Stewardship." Iowaagriculture.gov, 2026, iowaagriculture.gov/animal-industry-division/johnes-disease-control-program. Accessed 16 June 2026.

[9] "Disease Alert: Pseudorabies." www.aphis.usda.gov, www.aphis.usda.gov/livestock-poultry-disease/swine/pseudorabies.

[10] "Iowa Scrapie Program | Iowa Department of Agriculture and Land Stewardship." Iowaagriculture.gov, 2025, iowaagriculture.gov/animal-industry-division/iowa-scrapie-program.

Disease outbreaks can also occur in wild animal populations. The IDALS's Bureau of Animal Industry also monitors wild animal species and game throughout the state as well as diseases that may impact them.

Plant and Crop Disease

A plant disease outbreak or a pest infestation could negatively impact crop production and agriculturally dependent businesses. There are two types of plant diseases:

- **Non-infectious (abiotic)**: not caused by a living parasitic organism, usually an environmental factor. Examples include nutrition deficiencies and deficient or excessive water caused by temperature, meteorological conditions or toxic chemicals.
- **Infectious (biotic)**: caused by a living parasitic organism such as fungi, bacteria, viruses, mycoplasmas, and nematodes.

An extreme outbreak or infestation could potentially result in billions of dollars in production losses across the U.S. The cascading net negative economic effects could result in wide-spread business failures, reduction of tax revenues, harm to other state economies, and diminished capability for this country to compete in the global market.

Many factors influence disease development in plants, including hybrid/variety genetics, plant growth stage at the time of infection, weather (e.g., temperature, rain, wind, hail, etc.), single versus mixed infections, and genetics of the pathogen populations. The two elements of coordination and communication are essential when plant diseases or pest infestations occur.

The United States Department of Agriculture/Animal Plant Health Inspection Service, Iowa Department of Agriculture and Land Stewardship, local producers, local government, assessment teams and state government entities must work together to effectively diagnose the various plant hazards to determine if immediate crop quarantine and destruction is required. Iowa State University, College of Agriculture and Life Sciences, has The Plant and Insect Diagnostic Clinic that provides diagnosis of plant problems (plant diseases, insect damage, and assessment of herbicide damage) and the identification of insects and weeds from the field, garden, and home. Specific plant pests can vary from year to year [11].

Emerald Ash Borer

The HMPC is also aware of the emerald ash borer pest that threatens Iowa's forests and urban landscape. This pest is a slender, emerald, green beetle that is ½ inch long, and responsible for the destruction of approximately 20 million ash trees within the U.S. Emerald Ash Borer has made its way into Iowa and has become an increasing threat. EAB was unknown to North America until its discovery in southeast Michigan in 2002. EAB originates from Asia and has now been found in 37 states. In 2010, EAB was first discovered in Iowa in Allamakee County.

4.5.2.1 Duration

Animal, crop, and plant diseases can vary in duration depending on the type of disease and the nature of the outbreak.

4.5.2.2 Geographic Location/Extent

All of Wright County is subject to animal/livestock incidents and agricultural infestations. According to the 2022 Census of Agriculture, there were 734 farms in the County covering 369,835 acres of land. The total value of agricultural products sold is $719,410,000, and at its most extreme, livestock or crop disease

[11] "Plant and Insect Diagnostic Clinic." Yard and Garden, 11 June 2026, yardandgarden.extension.iastate.edu/pidc. Accessed 16 June 2026.

could eliminate the entirety of this economic value.[12] Wright County produces 52% of its sales from crops and 48% of sales from livestock, poultry, and products. **Figure 4.2** shows that the majority of the land in Wright County, outside the incorporated areas, is agricultural use, with primary crops of corn and soybeans.

[12]"Percent of State Agriculture Sales." USDA, 2022.

FIGURE 4.2 WRIGHT COUNTY CROPLAND DATA LAYER

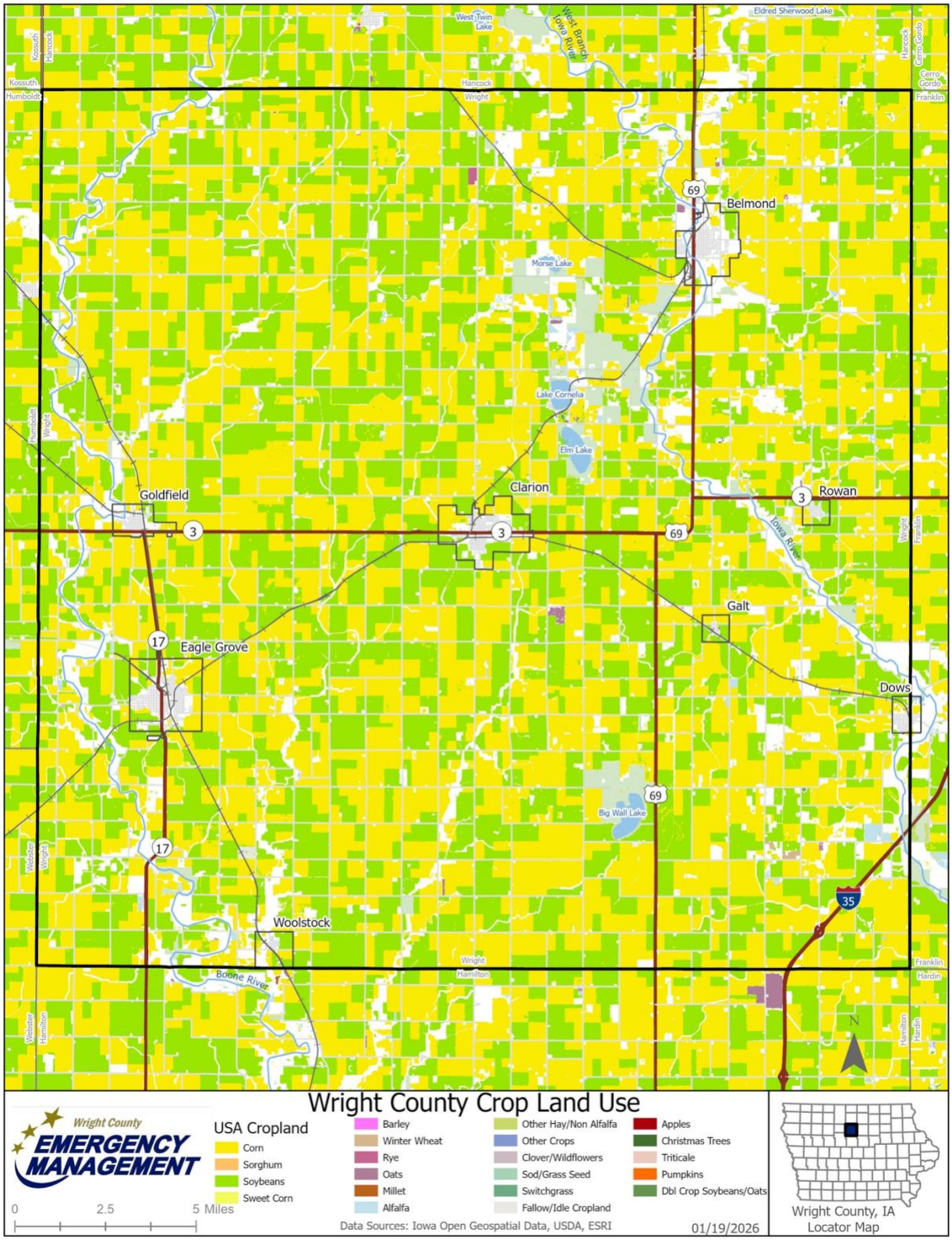
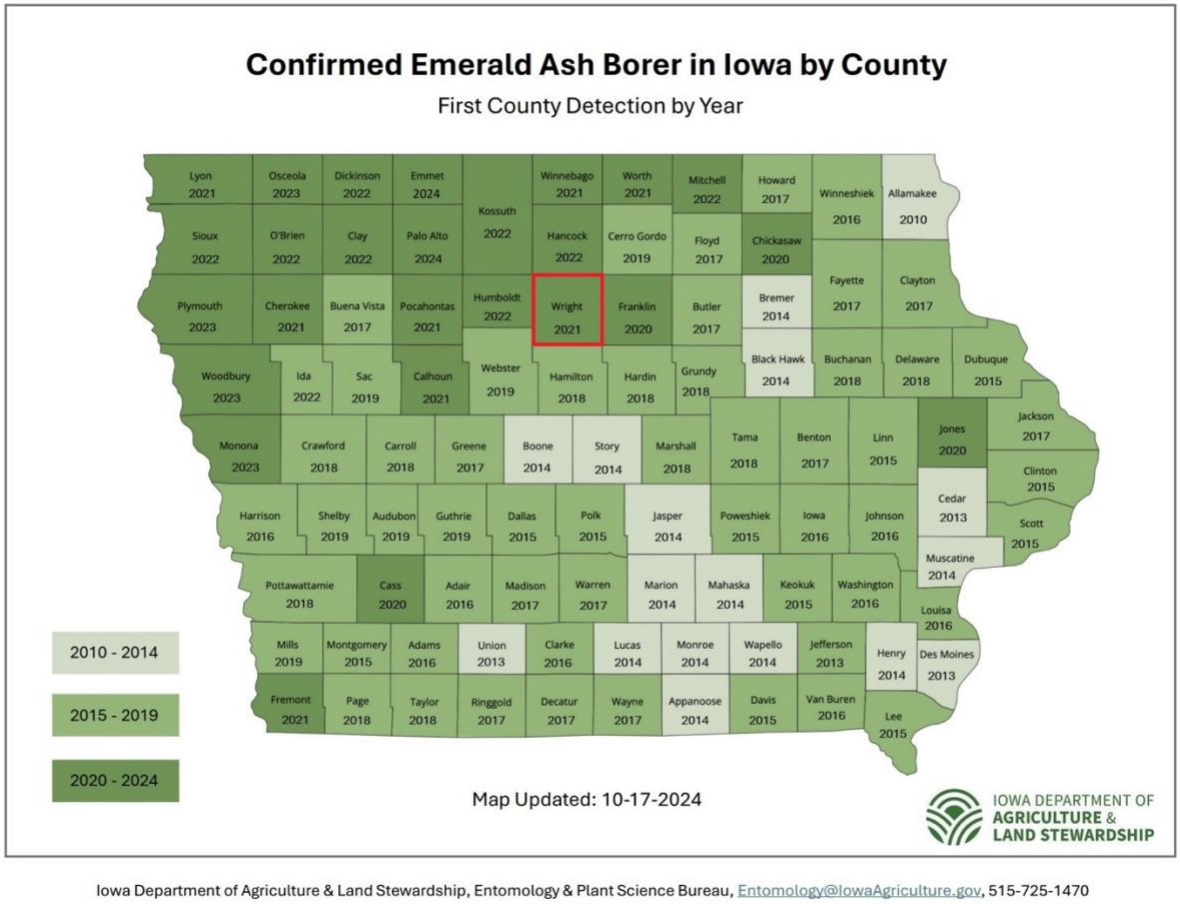


Figure 4.3 shows the counties in the U.S. in which the Emerald Ash Borer has been detected. As of 2026, EAB is widespread throughout Iowa and is officially in 99 counties. Wright County, outlined in red, first detected Emerald Ash Borer in 2021.

FIGURE 4.3 USDA EMERALD ASH BORER COUNTY DETECTION MAP



Iowa Department of Agriculture & Land Stewardship, Entomology & Plant Science Bureau, Entomology@IowaAgriculture.gov, 515-725-1470

4.5.2.3 Previous Occurrences

Avian Influenza

Beginning in April of 2015, there were a significant number of confirmed diagnoses of avian influenza in the State of Iowa. As a result, on Friday May 1, 2015, Governor Branstad declared a state of emergency to respond to the outbreak. In recent years, the USDA Animal and Plant Health Inspection Service (APHIS) confirmed highly pathogenic avian influenza (HPAI) in a commercial flock in the U.S. on February 8, 2022. Since then, the USDA has been responding to detections and mitigation efforts to reduce virus transmission among poultry production and trade. As of Jan 2026, there have been over 185.08 million birds infected since the outbreak on February 8, 2022. Based on USDA data, there have

been two reported incidents in Wright County for HPAI in commercial table egg layer on October 31, 2022, and November 6, 2022. In those two incidents, over 2 million birds were affected. [13]

Bovine Spongiform Encephalopathy (BSE) (A.K.A. Mad Cow Disease)

To date, BSE has been confirmed in Great Britain, Belgium, France, Germany, Spain, Switzerland, Japan, Canada, and the United States. In the United States, the first positive BSE cow was discovered in Washington. As a result of a surveillance program from June 2004 to March 2006, two additional positive domestic cows were found; one each in Texas and Alabama. Since 1997 FDA implemented a feed ban prohibiting the feeding of feedstuff derived from ruminants to other ruminants. The results of this ban and enhanced surveillance indicate that while BSE is present, it is at an extremely low level in U.S. cattle. There have been no recent reports of Mad Cow Disease in Iowa.

Chronic Wasting Disease

The first case of CWD in Iowa was found in 2012 on a hunting preserve in the southeastern part of the state. In that case, it was determined the CWD-positive mature buck had been transferred to the hunting preserve from a deer farm in north central Iowa. Subsequent testing found CWD at the deer farm. The farm was placed under quarantine, but the owners sued for compensation. The litigation prevented the farm from being depopulated of deer until August 2014. The Iowa Department of Agriculture and Land Stewardship conducted testing, and the results were released in early October 2014, stating that 284 of 356 deer (80 percent) from a captive herd in north-central Iowa tested positive for chronic wasting disease. This finding represents the highest number of CWD-positive animals detected at a facility according to wildlife health officials (Milwaukee-Wisconsin Journal Sentinel, October 4, 2014). In 2014, the first case of CWD was found in a wild deer in Allamakee County. Then in 2015, two wild deer tested positive for CWD in Allamakee County.

Since 2002, the Iowa Department of Natural Resources has tested 111,391 wild deer for CWD and 556 wild deer have tested positive. Within Wright County, there have been no wild deer that have tested positive for CWD. However, there are deer nearby that have tested positive. [14]

Scrapie

Since 1993, there have been 86 herds that have been infected with Scrapie. Steady progress has been made in eradicating Scrapie due to the National Scrapie Eradication Program. The last case of Scrapie in an Iowa producer's herd was in a goat herd in January 2014. This producer also had sheep that had been diagnosed with Scrapie in 2013. The height of Scrapie cases occurred from 2002 to 2008. [15]

Rabies

In Wright County, there had not been a confirmed case of rabies before 2011.

4.5.2.4 Probability of Future Occurrence

The entire planning area experiences some level of agricultural loss every year as a result of naturally-occurring diseases that impact animals/livestock. The concern is when the level of an infestation escalates suddenly, or a new infestation appears, overwhelming normal control efforts. Normal control efforts

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[13] "HPAI Confirmations in Commercial and Backyard Flocks." Www.aphis.usda.gov, 20 June 2024, www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections/commercial-backyard-flocks.

[14] "Chronic Wasting Disease." Arcgis.com, Iowa DNR, 2025, iowadnr.maps.arcgis.com/apps/instant/portfolio/index.html?appid=a147b070307c4eccb08a25f749a8a948.

[15] Scrapie Eradication Progress. Iowa Department of Agriculture. [accessed 2026]. https://iowaagriculture.gov/sites/default/files/animal-industry/pdf/Scrapie/Scrapie%20Eradication%20Progress%20122120.pdf.

include crop insurance and employment of various other agricultural practices that limit impact. Based on previous occurrences and the high volume of animals and crop in the County, the probability of future occurrence for animal, plant, and crop disease is **Unlikely**.

4.5.2.5 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

Since Wright County is a rural, agricultural community, animal, plant, and crop diseases pose a **Medium** risk to the community. A widespread infestation of animals/livestock and crops could impact the economy of the County, which could severely impact the economic stability of the County.

Structures and Systems

Buildings, infrastructure, and critical facilities are generally not vulnerable to this hazard. The impacts are primarily economic and environmental, rather than structural effects.

Crops

Table 4.12 provides the annual crop losses for insurable crops that result from disease, infestation, and wildlife. The insurable loss is adjusted to estimate losses to all insurable crops by considering that 91 percent of insurable crops in the State were insured (2024 Iowa Crop Insurance Profile from USDA's Risk Management Agency).

TABLE 4.12 ESTIMATED INSURABLE CROP LOSSES RESULTING FROM DISEASE, INFESTATION, AND WILDLIFE

Crop Insurance Paid-10 yrs.	Adjusted 10-year Losses	Annual Estimated Losses
$69,892.26	$76,804.68	$7,680.47

Source: USDA Risk Management Agency; adjust loss calculation by Witt O'Brien's

Approximation of potential direct losses from a maximum threat event fall in a range of 1-50 percent of annual crop receipts. The market value of all crops sold in Wright County in 2022 was $372,955,000. Based on a worst-case scenario where 50 percent of crop production is lost in a given year due to agricultural infestations, the total direct costs could exceed $186 million.

The U.S. Forest Service estimates that Wright County has up to 5,000 Ash trees in the County. Removal of debris if an infestation would occur would be challenging and costly. If only 10 percent of the Ash trees were impacted in Wright County that could translate to 500 trees. It is estimated that it costs $682 to replace each Ash tree. In Wright County, this translates to over $341,000 for replacement costs due to the disease.

According to the U.S. Department of Agriculture's Risk Management Agency, during the 10-year period from 2016-2025, combined crop insurance payments for damages resulting from insects, plant disease and wildlife totaled $69,892.26 in Wright County. The Iowa Statewide average for insurable crop acres with insurance is 91 percent (USDA Risk Management Agency, 2024 Iowa Crop Insurance Profile). It is likely that Wright County will continue to see similar damages in the future or increased damages due to changing weather patterns and severe weather events.

Animals

Disease is an ever-present threat to livestock. Damages to livestock from disease depend on conditions such as the host, the agent (germ), and the environment. Rough estimates of potential direct losses from a maximum threat event fall in a range of 1-75 percent of livestock receipts. The market value of all livestock in Wright County in 2022 was $346,454,000. Based on a worst-case scenario where 75 percent of livestock is lost in a given year due to agricultural infestations, the total direct costs could exceed $259 million.

Critical Facilities

Animal, plant, and crop diseases have limited impact on critical facilities due to the hazard directly impacting animals, plants, and crops and related industries.

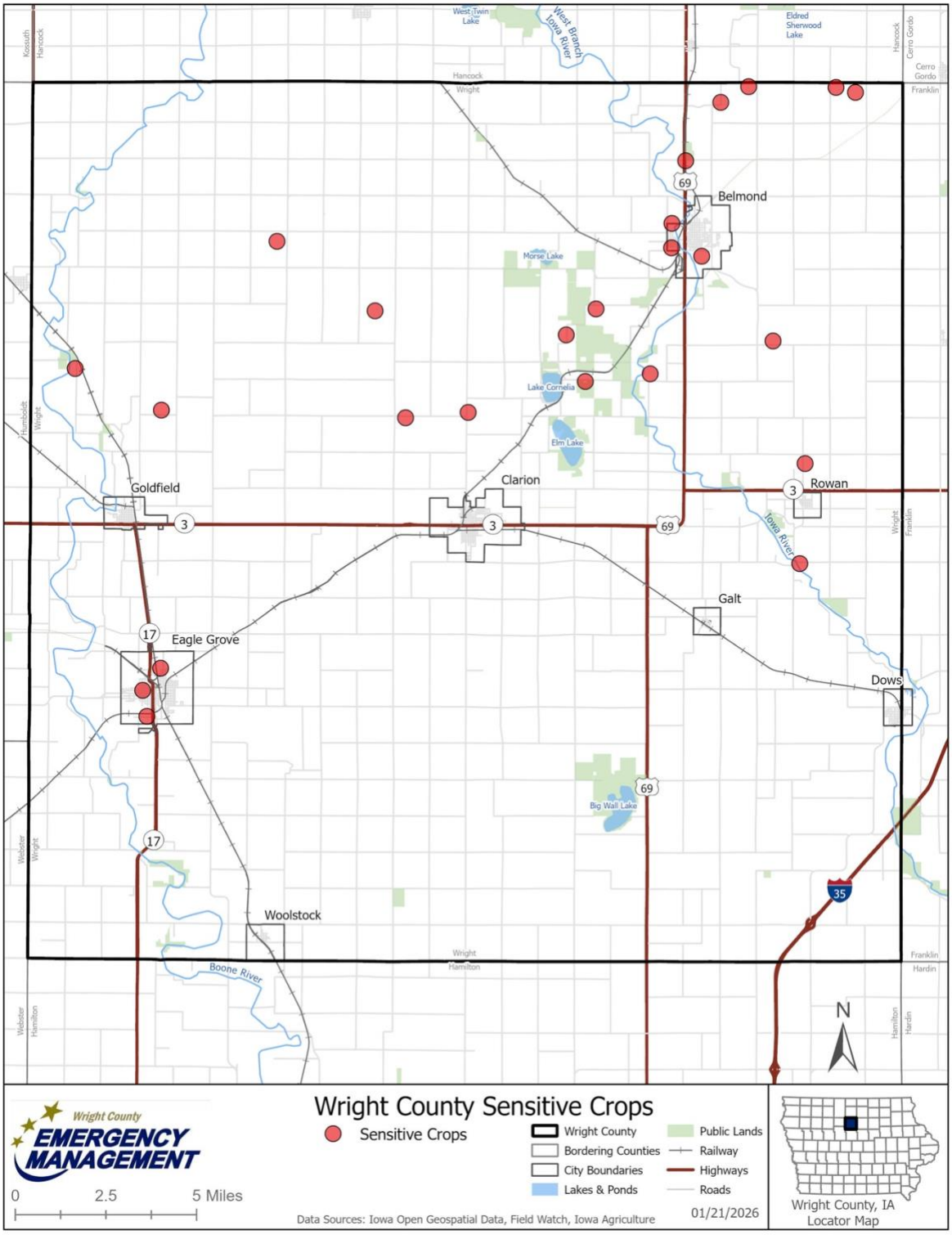
Population

Animal, plant, and crop diseases can impact the population through food supply chain disruptions, increased food prices, local employment, and potential health impacts from zoonotic diseases such Highly Pathogenic Avian Influenza (HPAI).

Natural, Cultural, and Historic Resources

Sensitive crops are those that are more susceptible to stress from environmental factors such as weather and crop diseases. There are several areas within Wright County that have sensitive crops and would be more vulnerable to disease. **Figure 4.4** displays the areas across that County that have sensitive crops. The northern half of the County contain more sensitive crops with the exception of Eagle Grove.

FIGURE 4.4 WRIGHT COUNTY SENSITIVE CROPS



Future Development

Future development is not expected to significantly impact the planning area's vulnerability to this hazard due to the overall decrease in population and likely decrease or stagnant development in the County. However, according to the 2022 USDA Census, Wright County has increased farm acreage and sales. If crop production and numbers of animals/livestock increases, the amount vulnerable to infestation also increases. In regard to the Emerald Ash Borer, the Iowa Department of Natural Resources recommends that other native tree species be planted in lieu of Ash trees to avoid increasing vulnerability to infestation of the Emerald Ash Borer.

Hazard Summary by Jurisdiction

The magnitude determinations discussed in the vulnerability overview sections were factored into the following hazard summary table (**Table 4.13**) to show how this hazard varies by jurisdiction. It has been determined that the magnitude of animal/crop/plant disease would be slightly less in the cities and for the school districts due to less agriculture within city limits. However, an infestation of the Emerald Ash Borer would likely have a larger impact in the incorporated areas, and the economy of incorporated areas is heavily dependent on agriculture. As a result, the magnitude in the unincorporated area was determined to be a 3 and the magnitude in the incorporated areas was determined to be a 2. School districts would have limited Ash trees to dispose of in the event of infestation. Therefore, the magnitude was determined to be a 1.

TABLE 4.13 ANIMAL/CROP/PLANT DISEASE HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	1	3	4	4	2.35	Moderate
Belmond	1	2	4	4	2.05	Moderate
Clarion	1	2	4	4	2.05	Moderate
Dows	1	2	4	4	2.05	Moderate
Eagle Grove	1	2	4	4	2.05	Moderate
Galt	1	2	4	4	2.05	Moderate
Goldfield	1	2	4	4	2.05	Moderate
Rowan	1	2	4	4	2.05	Moderate
Woolstock	1	2	4	4	2.05	Moderate
Belmond-Klemme CSD	1	1	4	4	1.75	Low
Clarion-Goldfield-Dows CSD	1	1	4	4	1.75	Low
Eagle Grove CSD	1	1	4	4	1.75	Low

4.5.3 DROUGHT

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
4	3	1	4	3.25	High

Drought is generally defined as a condition of moisture levels significantly below normal for an extended period of time over a large area that adversely affects plants, animal life, and humans. There are four types of drought conditions relevant to Iowa:

- **Meteorological:** drought is defined on the basis of the degree of dryness (in comparison to some "normal" or average amount) and the duration of the dry period. A meteorological drought must be considered as region-specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region.
- **Hydrological:** drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (e.g., streamflow, reservoir and lake levels, ground water). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrologic al droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow, and ground water and reservoir levels. As a result, these impacts are out of phase with impacts in other economic sectors.
- **Agricultural:** drought focus is on soil moisture deficiencies, differences between actual and potential evaporation, reduced ground water or reservoir levels. Plant water demand depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil.
- **Socioeconomic:** drought refers to when physical water shortage begins to affect people.

The four different types of drought can all occur in Iowa. Although drought is not predictable, long-range outlooks may indicate an increased chance of drought, which can serve as a warning. A drought period can last for months, years, or even decades. It is rarely a direct cause of death, though the associated heat, dust and stress can all contribute to increased mortality.

4.5.3.1 Duration

Drought conditions occur over a long period of time and is a slow-moving phenomenon. Drought is an extended period of unusually dry weather when there is not enough rain. However, drought may look different and have different thresholds than other regions. For example, a drought in Atlanta, Georgia could be a very wet period based on the climate in Phoenix, Arizona. The end of a drought can be difficult to determine. While a single rainstorm will provide short-term relief from a drought, it might take weeks or months before levels of precipitation return to normal.[16] Historically, drought conditions in Iowa have lasted several years.

Droughts are sometimes differentiated between short- and long-term drought. Short-term drought can have impacts on agriculture and grasslands, and the drought classification can rapidly change. Long-term

16 U.S. Drought Monitor. 'Drought Classification.' U.S. Drought Monitor, National Drought Mitigation Center. Https://Droughtmonitor.Unl.Edu/About/Aboutthedata/Droughtclassification.Aspx.

drought has a great impact on hydrology and ecology. [17] The definitions for all three are described more below.

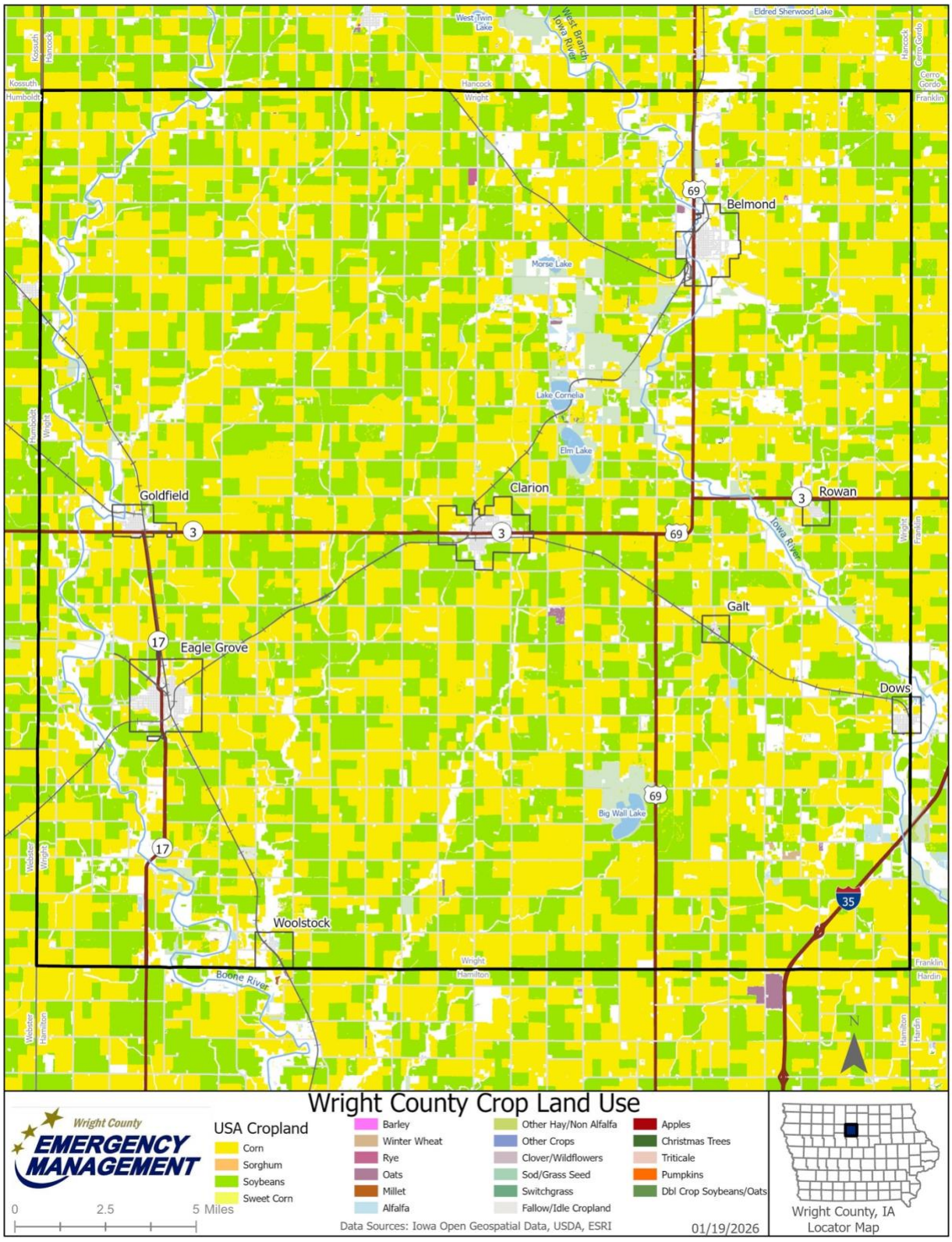
- **S**: Short-term, typically less than 6 months (agriculture, grasslands)
- **L**: Long-term, typically more than 6 months (hydrology, ecology)
- **SL**: area contains both short- and long-term impacts

4.5.3.2 Geographic Location

Although the entire planning area in Wright County is at risk to the effects of drought, agricultural areas are more vulnerable to the immediate effects of drought due to financial loss that can significantly impact the economy and livelihoods. **Figure 4.5** below displays the locations of various cropland uses in Wright County.

17 "When Does A Drought Begin And End? | U.S. Geological Survey." N.D. Www.Usgs.Gov. USGS. Accessed 2025. Https://Www.Usgs.Gov/Faqs/When-Does-A-Drought-Begin-And-End.

FIGURE 4.5 WRIGHT COUNTY CROPLAND DATA LAYER



4.5.3.3 Previous Occurrences

According to the Iowa Environmental Mesonet, the mean annual precipitation for Wright County is 32.61 inches. During average years, this represents enough rainfall to prevent drought; however, successive years of below-average rainfall are the cause drought impacts in the planning area.

Table 4.14 provides the rainfall history at the Clarion weather station from 2000 to 2021. The lowest annual precipitation since 2000 occurred in 2020. Years below the average rainfall include 2003, 2004, 2006, 2011-2013, 2017, 2020, and 2021 (listed in red within the table). Data beyond 2021 was not obtainable as the weather station in Clarion did not report data past 2021.

TABLE 4.14 MONTHLY AND ANNUAL PRECIPITATION TOTALS, 2000 TO 2021, CLARION, IOWA WEATHER STATION

YEAR	ANNual precipitation
2000	37.96
2001	37.51
2002	32.82
2003	29.11
2004	30.75
2005	35.37
2006	28.08
2007	45.55
2008	40.69
2009	37.37
2010	50.06
2011	27.66
2012	26.15
2013	29.14
2014	41.84
2015	35.91
2016	38.49
2017	26.01
2018	55.53
2019	43.79
2020	25.08
2021	27.68
MEAN	**35.6**

Source: Iowa Environmental Mesonet, Report generated January 4, 2026, Site information: IA141, Clarion https://mesonet.agron.iastate.edu/climodat/index.phtml?network=IACLIMATE&station=IA1541&report=17

According to the National Drought Mitigation Center's Drought Impact Reporter, during the period from January 2007 through January 2026, nine droughts were reported to affect Wright County. Impacts of

recent drought periods in Iowa that affected Wright County are provided below. Unless otherwise indicated, these impacts are from the National Climatic Data Center.

- **August 1, 2001:** In what became a rather tough growing season, drought developed in Iowa during the month of July and became serious in August. During the early part of the growing season, excessive rainfall caused significant planting delays across the state. Once the crop was planted, cool and cloudy weather settled into the state slowing crop maturation. Once the warm weather finally arrived, rainfall tailed off significantly. Very little rainfall was reported during the month of July, however crops flourished with the moisture that was available. During the last half of July, temperatures began to soar into the 90s quite regularly. Temperatures were in the 90s to around 100 for most of the first 10 to 12 days of August with virtually no rainfall. Moisture reserves ran out during the critical time of pod filling for the soybeans and at the tasseling for the corn. Another factor that complicated the situation was the soil moisture profile over central and southwest Iowa. After two years of drought, rain began falling during the last fall of 2000 and continued into the spring of 2001. Though soil moisture was replenished in part, a layer of dry soil remained below the moistened layer, preventing root development below the moist layer. Reports indicate losses estimated between one third and one half in parts of central and southwest Iowa. A few locations had verifiable corn crop losses approaching 80%. Overall, losses for the season were closer to the 15% range. Damage to the corn crop was a little over $350 million, with about $225 million in losses to the soybean crop, and about a two million dollar loss to the oat crop.
- **August 1, 2003:** Dry weather settled in over Iowa during the month. The last widespread rain occurred on July 9th. The increasingly dry conditions became a primary concern as the month progressed. An extended period of heat and humidity from the 15th to 25th saw highs into the 90s to over 100 degrees Fahrenheit in some locations. By month's end drought indices had worsened to severe to extreme drought across south central Iowa and at least moderate drought over the remainder of the HSA. Waterloo had its driest August on record, Des Moines its 3rd driest and Ottumwa its 8th driest. A cold front brought only a brief respite from the intense heat, as temperatures rebounded into the 90s to near 100 degrees Fahrenheit on the 24-26th. Des Moines Airport reached the century mark for the first time since July 29, 1999, reaching 100 Fahrenheit. on the 24th and 101 F. on the 25th. This was followed by a slow cool down as several pushes of cooler air traversed the state. Unfortunately there was only widely scattered convection across the HSA on the 27th and 28th, providing little significant drought relief. Light to moderate rainfall on the 31st fell across primarily the southern one half of the HSA, with the heaviest amounts in the southeast. The end of the month saw numerous records approached or established for an all-time record dry August. At Waterloo the 0.08" broke the previous dry August record of 0.37" set in 1955, while Des Moines had its 3rd driest August ever with 0.31" (driest 0.14" in 1909). Many stations had from 10 to 25 percent of normal rainfall. The drought in south central Iowa as shown by the Palmer Drought Index reached the Extreme category (-4.09) for the first time in this event by August 30th. Statewide NWS Cooperative station data compiled by the Iowa State Climatologist's office showed August temperatures averaged 74.3 F. or 3.0 degrees above the 30-year (1971-2000) mean, ranking as the 18th warmest in 131 years. Precipitation statewide was 0.96" or 3.23" below than normal, ranking as the driest August on record. For the summer as a whole (June-August) it was the 65th warmest (72.0 F. or 0.4 degrees above normal) and the 18th driest (9.55" or 1.93" below normal). The dry conditions caused deterioration in the states crops. Estimates place yield reductions of about 10% on the corn crop, or a loss of about $210 million. Losses on the soybean crop were around 30%, or a loss of about $435 million.
- **July 1, 2012:** Very warm and dry weather that began in the spring continued into the summer. Temperatures warmed sharply the last few days of June. The heat persisted into July. Temperatures for the month of July were among the warmest on record. In Des Moines, the monthly mean temperature was the second highest of record, only eclipsed by July of 1936. Rainfall was in short supply across the state. Much of the state recorded less than 50% of normal rainfall for the month, with a few locations under 10% of normal. In addition, extended

periods of temperatures above 95 F resulted in problems with pollination of the crops. Rapid deterioration of the corn and soybean crop took place with several periods of temperatures in excess of 100 degrees. By the end of the month, officials estimated that 20% of the crop yield had been lost to the drought. At the current price, the loss total was in excess of $2.25 billion. As of 31 July, the USDA reported that Secretarial Primary Drought Designations had been listed for 21 counties in the Des Moines CWA, with 11 receiving Contiguous Designation. The primary counties were Butler, Bremer, Hamilton, Hardin, Grundy, Black Hawk, Boone, Story, Marshall, Tama, Polk, Jasper, Poweshiek, Marion, Mahaska, Lucas, Monroe, Wapello, Wayne, Appanoose, and Davis. Contiguous counties included Wright, Franklin, Webster, Greene, Dallas, Madison, Warren, Clarke, Taylor, Ringgold, and Taylor. The drought conditions continued into August.

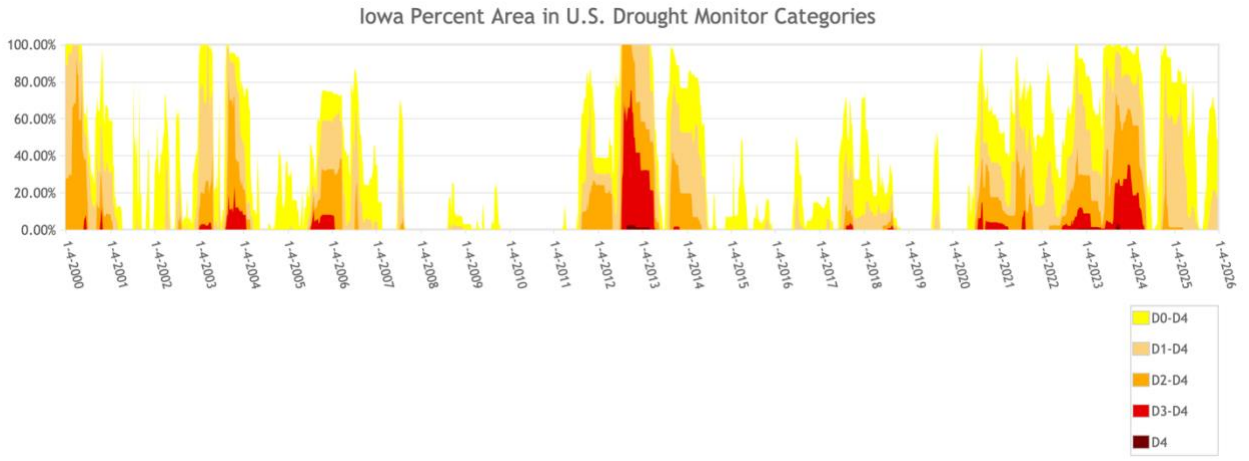
- **August 1, 2012:** Drought conditions that began in late June continued through July and into August. Very warm and dry weather that began in the spring continued through the summer. Temperatures warmed sharply the last few days of June. The heat persisted into August. Temperatures for the month of August were cooler than July, and in fact, just above normal. For the three summer months of June, July, and August, temperatures were among the top 10 warmest on record. Rainfall was in short supply across the state. Much the state recorded less than 50% of normal rainfall for the month, with a few locations under 25% of normal. The south quarter fared a little better with a few locations receiving close to normal rainfall for the month. In addition, extended periods of temperatures above 90 degrees Fahrenheit combined with dewpoint temperatures falling into the 50s at times, resulted in additional stress. The rapid deterioration of the corn and soybean crop that took place in July slowed as much of the damage had already occurred in July. By the end of the month, officials estimated that 15% of the soybean crop and 20% of the corn crop yield had been lost to the drought. At the current price, the loss total was in excess of $2.6 billion. As of August 31st, the USDA reported that Secretarial Primary Drought Designations had been listed for 42 of the counties in the Des Moines CWA, with the remaining nine receiving Contiguous Designations. The drought conditions continued into September.
- **September 1, 2012:** Drought conditions that began in late June continued through the summer and into September. Very warm and dry weather that began in the spring continued through the summer. Temperatures remained well above normal into August but began to temper during the latter portion of the month. September began well above normal for the first week, but the fall transition began after that. For the month of September, temperatures averaged fairly close to normal. Rainfall was in short supply across the state. Much of the state recorded less than 50% of normal rainfall for the month, with a few locations under 25% of normal. The rapid deterioration of the corn and soybean crop that took place in July slowed as much of the damage had already occurred in July. No significant damage occurred in September in spite of the dry conditions and early freeze of much of the state on the 23rd. Harvest activities were more than two weeks ahead of normal. Indications were that yields of the corn crop were around 140 bu/ac and 43.5 bu/ac for the bean crop. These values were about 20% and 15% below normal for corn and beans respectively. At the current price, the loss total was in excess of $2.6 billion. As of October 3rd, the USDA reported that Secretarial Primary Drought Designations had been listed for all 51 of the counties in the Des Moines CWA. The drought conditions continued into October.
- **October 1, 2012:** Drought conditions that began in late June continued through the summer and into October. Very warm and dry weather that began in the spring continued through the summer. Temperatures remained well above normal into August but began to temper during the latter portion of the month. Temperatures cooled in October with the month averaging near to a little below normal. It was the first cooler than normal month in 13 months across the CWA. More widespread rainfall began by the middle of the month with a fairly widespread event on the 13th. The rapid deterioration of the corn and soybean crop that took place in July slowed as much of the damage had already occurred in July. No significant damage occurred in September in spite of the dry conditions and early freeze across much of the state

on the 23rd. Harvest activities continued at a fast pace with nearly all activities complete by the middle of October. This was three to four weeks ahead of normal. Indications were that yields of the corn crop were around 140 bu/ac and 43.5 bu/ac for the bean crop. These values were about 20% and 15% below normal for corn and beans respectively. At the current price, the loss total was in excess of $2.6 billion. By late September, the USDA reported that Secretarial Primary Drought Designations had been listed for all 51 of the counties in the Des Moines CWA. The drought conditions continued through the month and into November as it will take many months to recharge the soil. No significant damage occurred in October, and it is unlikely that water restrictions would occur before the spring, thus this will be the final entry unless conditions worsen.

- **August 1, 2013:** Serious drought conditions gripped the state through the summer months. Initial sub-soil moisture was good at the beginning of the growing season. The recharged soil was sufficient to maintain the crops through a good part of the summer. Rainfall remained low through August as well and crops deteriorated rapidly under the warmer than normal and very dry conditions. Rainfall for the summer was between 1/3 and 2/3rds of normal across much of the Des Moines CWA. A large part of the CWA received under 5% of normal rainfall in August, with most areas under 20%. Crop loss through the month was around 10%. This translated to over $600 million in crop loss for the corn crop, and about $350 million for soybeans.
- **July 6, 2016:** The corn yield potential was down in parts of Iowa, but it was too early to determine how much was lost, according to Mark Licht, Iowa State University Extension cropping systems agronomist at Ames. Some livestock producers were likely needing to supplement water in pastures as creeks run low.
- **September 29, 2022**: The Iowa state fire marshal stated that five counties in northwest Iowa have burn bans, including Cherokee, O'Brien, Sioux, Plymouth, and Crawford counties. A field fire near Sibley in Osceola County on September 25 consumed a combine and up to 50 acres of soybeans. Local farmers disced around the fire to contain it.
- **July 24, 2023**: Crop conditions were deteriorating in Iowa as soil moisture declined, and temperatures rose. Only 63% of the corn and 58% of the soybeans were in good to excellent condition, much lower than at the same time last year.
- **March 15, 2024**: Burn bans were in effect for many counties in the ITC Midwest electric transmission service territory as much of the region was in drought. In response, ITC Midwest was reviewing additional safety precautions and reminding landowners to observe burn ban restrictions, and when permitted, use caution when burning to prevent damage to utility power lines and poles.
- **October 7, 2024**: After the driest September on record in Iowa, plenty of soybeans and corn have been harvested. Forty-six counties have enacted burn bans as the dry conditions increase the fire risk. Several combine and equipment fires were reported.

Figure 4.6 shows drought conditions over the past 25 years from 2000 to 2025. Severe drought occurred from 2012 to 2013. In recent years, drought conditions have been occurring more frequently and more severe.

FIGURE 4.6 IOWA PERCENT AREA IN THE U.S. DROUGHT MONITOR CATEGORIES



Source: USDM https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx

4.5.3.4 Extent

NOAA's National Climatic Data Center uses the U.S. Palmer Drought Indices and the Standardized Precipitation Index to monitor and predict drought conditions. Lack of precipitation for a given area is the primary contributor to drought conditions. The various types of drought indices are described in more detail below.

- **Palmer Z Index** monitors short-term monthly moisture conditions when depart from normal.
- **Palmer Drought Severity Index** measures the duration and intensity of the long-term (meteorological) drought patterns.
- **Palmer Hydrological Drought Index** measures long-term (hydrological) drought and wet conditions reflecting groundwater and reservoir levels.
- **Standardized Precipitation Index** is a probability index that considers only precipitation. This is important to farmers to estimate soil moisture.

The prevalent drought indicator is the U.S. Drought Monitor (USDM). The USDM identifies areas in drought and labels them by intensity using four categories of drought, D1 (the least intense) to D4 (the most intense). It also describes areas with no drought and uses the D0 category to indicate abnormally dry areas that could be entering or recovering from drought, shown in **Table 4.15**.

TABLE 4.15 USDM DROUGHT MONITOR CATEGORIES

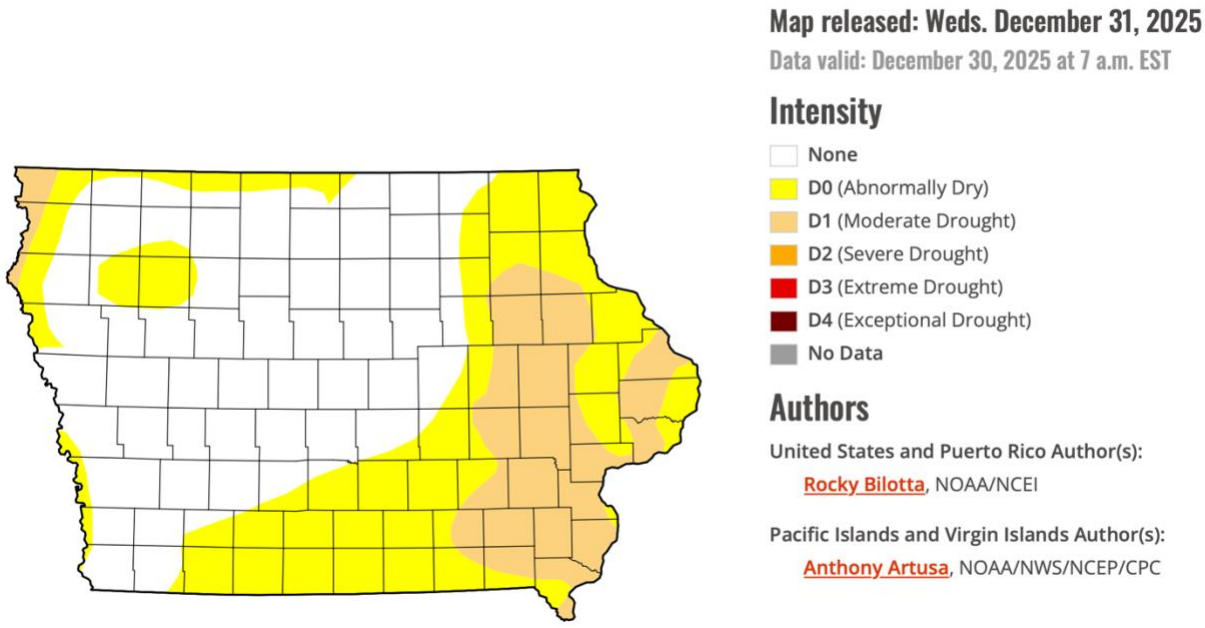
CATEGORY	DESCRIPTION
None (Gray)	Normal or wet conditions
D0 (Light Yellow)	Abnormally Dry
D1 (Light Orange)	Moderate Drought
D2 (Orange)	Severe Drought

CATEGORY	DESCRIPTION
D3 (Red)	Extreme Drought
D4 (Dark Red)	Exceptional Drought

Source: USDA

Figure 4.7 shows the overall drought assessment for the State of Iowa as assessed by the U.S. Drought Monitor on December 30, 2025. Based on the map, the State of Iowa is experiencing abnormally dry and moderately dry conditions. As of December 30, 2025, drought conditions are not impacting Wright County.

FIGURE 4.7 DROUGHT CONDITIONS IN IOWA | DECEMBER 30, 2025



Source: USDM https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?IA

4.5.3.5 Probability of Future Occurrence

Based on the USDM data, there have been nine reported drought events from 2007 to 2025 and indicates a drought event occurring once every other year. The probability of future occurrence is **Highly Likely.**

Climate Change Impacts

Climate change studies have shown increases in precipitation, rather than decreases. However, drought cycles still persist and grow in severity. Climate change studies have also shown some increases in average temperatures. If this occurs during a drought cycle, the drought impacts will be exacerbated and increased agricultural losses will be sustained.

4.5.3.6 Vulnerability Assessment

In order to understand how vulnerable the County is to drought, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

Wright County jurisdictions are impacted by drought because it is an expensive weather disaster and due to the high production of agriculture and importance to the local economy. Drought reduces agricultural productivity and causes a strain on urban water supplies. In Wright County, farmers bear the most direct stress from drought as wells may run dry, crops wilt and die, and forage for livestock becomes scarce and costly. Therefore, drought poses a **High** risk to the County.

Structures and Systems

Areas associated with agricultural use are vulnerable to drought conditions which could result in a decrease in crop production or a decrease in available grazing area for livestock. Drought has minimal effect on houses and buildings. In severe prolonged droughts, structures could be impacted through cracks in foundation which can comprise the integrity and safety of the building. Additional impact to structures could include landscaping and dried vegetation which can exacerbate urban fire and wildfire risk.

Agriculture

Systems impacted by droughts include water systems and agriculture. Based on the EWG's Farm Subsidy Database, since 1995, there have been $201,043,165,101 in indemnities and $144,986,239,708 in premium subsidies. Crop indemnities are payments from crop insurance policies made to farmers to compensate for financial losses to lower yields likely from disasters such as droughts. The majority of indemnities are caused by drought at 34.8%. [18]

Table 4.16 details the sum of crop indemnities from 2018 to 2025. Based on the data, Wright County has experienced the highest number of indemnities in 2025.

[18] Farm Ewg. 2022. EWG's Farm Subsidy Database. Ewgorg. [accessed 2026 Jun 16]. https://farm.ewg.org/cropinsurance.php?fips=19197&summpage=IN_TOPREGIONS_COUNTY&regionname=WrightCounty.

TABLE 4.16 RISK MANAGEMENT AGENCY INDEMNITIES

Year	Sum of Indemnity ($)
2025	$11,431,935
2024	$4,273,319
2023	$2,743,674
2022	$286,636
2021	$855,615
2020	$2,194,867
2019	$1,358,002
2018	$1,843,310

Source: https://www.rma.usda.gov/tools-reports/crop-indemnity-maps

Wright County is majority farmland. Therefore, the planning area has a high exposure to this hazard. Aside from agricultural impacts, other losses related to drought include increased costs of fire suppression and damage to roads and structural foundations due to the shrink dynamic of expansive soils during excessively dry conditions.

Water

There are two main sources of drinking water in Iowa which includes public water supplies and private wells accessing groundwater. Public water supplies regularly serve 25 or more individuals and include city water utilities, rural water supplies, and mobile home parks as well as other systems. Private wells generally services 25 individuals or less and private well owners are responsible for maintaining the well's water quality. About 7% of Iowa residents access water from private wells.

Prolonged droughts can exacerbate the risk of water shortages which can dry wells from private well users and create water security issues. Public water sources could become unstable as well and increase the need for mutual aid among other water resources to maintain clean and safe drinking water for residents. Additionally, public water sources likely will increase water rates which may be difficult for residents to pay, especially low-income communities.

Critical Facilities

All critical facilities may be impacted by drought and more so by water shortages during extreme drought conditions. Wright County has water treatment facilities and other critical facilities that would be impacted by drought and subsequent, cascading impacts such as water shortages. Police and fire stations, schools, municipal buildings, and healthcare providers all rely on water supplied by external utilities for drinking water, sanitation, and emergency services. During periods of severe drought, wholesale supply reductions or mandatory conservation measures could limit non-essential water use and create operational challenges, particularly for fire suppression systems, health and sanitation in schools, and healthcare facilities requiring reliable water for patient care.

The Cybersecurity & Infrastructure Security Agency's Drought and Infrastructure Planning Guide notes that cascading impacts are common in drought, with dependencies across water, healthcare, transportation, and energy sectors. **Table 4.17** outlines the potential impacts that drought can have on FEMA community lifelines.

TABLE 4.17 WRIGHT COUNTY COMMUNITY LIFELINES IMPACT FROM DROUGHT

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		Droughts and water shortages are unlikely to directly damage or disrupt communications .
Energy (Power & Fuel)		Energy production, particularly in facilities that rely on water for cooling or hydroelectric power, can be affected. There may also be increased competition for available water between energy producers and other users.
Food, Hydration, Shelter		A regional drought may impact agricultural production, leading to food shortages or increased food prices. If the drought is severe and prolonged, it could also lead to challenges in providing adequate shelter and housing, especially for vulnerable populations.
Hazardous Materials		Droughts and water shortages do not typically lead to hazardous materials releases. However, reduced water supplies may complicate firefighting efforts, including any which involve hazardous materials.
Health & Medical		Reduced water quality and quantity can lead to health issues, including dehydration and sanitation-related diseases. Healthcare facilities may also face challenges in maintaining operations with limited water supplies.
Safety & Security		Drought can increase the risk of wildfires, strain emergency services, and potentially lead to conflicts over scarce resources.
Transportation		Streets, railroads, bridges, and other transportation infrastructure is unlikely to be damaged by drought or water shortages.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Water & Wastewater Systems		This is the most directly affected lifeline. Drought conditions can significantly reduce water availability for domestic, agricultural, and industrial uses. Water quality may also be affected, and wastewater treatment processes might be strained due to lower water volumes.

Population

Drought presents hazards to public health in extreme cases, where drinking water production cannot keep up with demand. Water wells become less productive during drought and a failure of remaining productive wells (due to power outage, etc.) can cause public drinking water supplies to become compromised. Higher costs to water services due to a shortage of water, may be particularly burdensome for low- and moderate-income households. Additionally, the elderly and young children may be at greater risk of experiencing adverse health effects resulting from reduced water quality. Manual laborers, athletes, and other individuals whose livelihoods require above-average water consumption are also at an increased risk of both economic and physical stress during droughts.

Natural, Cultural, and Historic Resources

Prolonged droughts can lead to stressed vegetation, tree mortality, soil compaction, erosion, and loss of habitat or shade, which in turn degrades the experience, heritage value, and functions of these areas. Local parks and natural areas within the County may experience the impacts of drought due water restrictions in efforts to conserve water.

Historic buildings and cultural sites, especially those with older materials or landscaping features, may suffer from foundation settling, cracking, or damage due to dry soils and lack of moisture. Water-dependent ornamental features may fail, and visual or functional assets (fountains, vegetation) may deteriorate. Without adequate watering, maintenance, and adaptive planning, these assets are susceptible to cumulative damage that erodes their historic and cultural integrity over time.

Future Development

Increases in acreage planted with crops would increase the exposure to drought-related agricultural losses. In addition, increases in population add additional strain on water supply systems to meet the growing demand for treated water. Many of the USDA disaster declarations are due to Drought and are fast tracked to quickly receive federal aid and support for crop damage. Overall, unrelated to agriculture, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years.

Hazard Summary by Jurisdiction

As discussed in the drought previous occurrences and vulnerability sections, the majority of the damages seen historically as a result of drought are to crops and other agriculture-related activities. Therefore, the magnitude of the impacts is greater in the unincorporated areas. In the cities, the frequency of drought conditions would be the same, but the magnitude would be less with lawns and local gardens affected, and leading to expansive soil problems around foundations. If drought conditions are severe and prolonged, water supplies could also be affected.

TABLE 4.18 DROUGHT HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL

Wright County	4	3	1	4	3.25	High
Belmond	4	3	1	4	3.25	High
Clarion	4	3	1	4	3.25	High
Dows	4	3	1	4	3.25	High
Eagle Grove	4	3	1	4	3.25	High
Galt	4	3	1	4	3.25	High
Goldfield	4	3	1	4	3.25	High
Rowan	4	3	1	4	3.25	High
Woolstock	4	3	1	4	3.25	High
Belmond-Klemme CSD	4	3	1	4	3.25	High
Clarion-Goldfield-Dows CSD	4	3	1	4	3.25	High
Eagle Grove CSD	4	3	1	4	3.25	High

4.5.4 EXTREME HEAT

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
3	2	1	3	2.4	Moderate

Extreme heat refers to prolonged periods of dangerously high temperatures, often exceeding 90 degrees Fahrenheit, that may be accompanied by high humidity. These events, commonly known as "heat waves," can cause serious health impacts, including heat-related illnesses and fatalities. According to the National Weather Service, heat is the leading weather-related cause of death in the United States[19]. On average, extreme heat contributes to more than a thousand deaths annually nationwide. Vulnerable groups include infants and children, older adults, people with chronic health conditions, pregnant women, individuals with disabilities, and residents with limited access to cooling or reliable housing.

Extreme heat events are likely to occur in the summer months when temperatures increase, and high pressure develops. In the summer months, the average maximum temperature is between 71 to 85 degrees Fahrenheit.

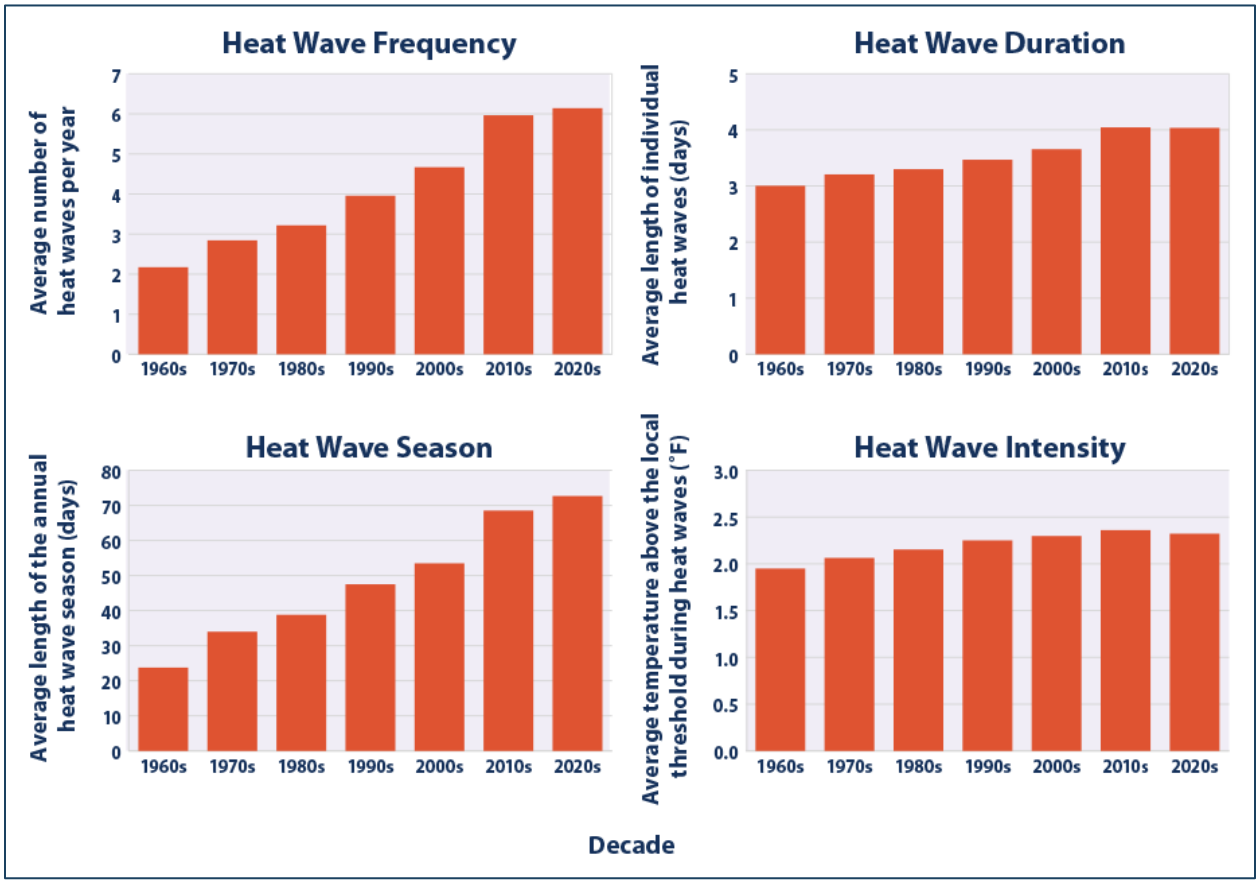
4.5.4.1 Duration

Periods of extreme heat can last days or even weeks during extreme heat events. In recent years, the average heat wave in major U.S. urban areas has been about a day longer than the average heat wave in the 1960's[20]. **Figure 4.8** shows the increase in the average length of the annual heat wave season (days) as well as the change in frequency, duration, and intensity over the past several decades. Iowa and Wright County experience similar lengths in extreme heat events or heat waves as the U.S.

[19] "Extreme Heat | Ready.Gov." 2019. Ready.Gov. FEMA. 2019. Https://Www.Ready.Gov/Heat.

[20] EPA. 2021. "Climate Change Indicators: Heat Waves." US EPA. US EPA. February 4, 2021. Https://Www.Epa.Gov/Climate-Indicators/Climate-Change-Indicators-Heat-Waves.

FIGURE 4.8 HEAT WAVE CHARACTERISTICS IN THE UNITED STATES BY DECADE, 1961-2021, EPA



Source: EPA

Extreme heat generally develops over a period of hours to days. In many cases, high temperatures build gradually as heatwaves persist or intensify, though sudden spikes can occur during rapid shifts in weather patterns. While the onset of extreme heat is slower compared to some other hazards, its impacts can escalate quickly once dangerous thresholds are reached, particularly when overnight temperatures remain elevated and prevent cooling. [21]

4.5.4.2 Geographic Location

The entire planning area is subject to extreme heat and all participating jurisdictions are affected. Urbanized areas may experience hotter temperatures due increased impervious spaces (concrete) known as the heat island effect. The incorporated cities within Wright County likely will experience the effects of the heat island effect as they are more buildings, sidewalks, parking lots where concrete and other impervious spaces are built.

[21] Us Department Of Commerce, NOAA. 2024. "What Is The Heat Index?" WWW.Weather.Gov. NOAA. 2024. Https://WWW.Weather.Gov/Ama/Heatindex.

4.5.4.3 Extent

Based on previous occurrences, Wright County experiences high temperatures up to 102 degrees Fahrenheit which can pose a high risk to public health and essential services. It is expected that high temperatures are to continue to worsen in the future.

NWS Heat Alerts

The National Weather Service issues heat-related advisories and warnings when there is a potential threat of heat affecting the specified geographical area. **Table 4.19** describes the different alerts used by the National Weather Service to warn the public of extreme heat.

TABLE 4.19 NATIONAL WEATHER SERVICE HEAT ALERTS

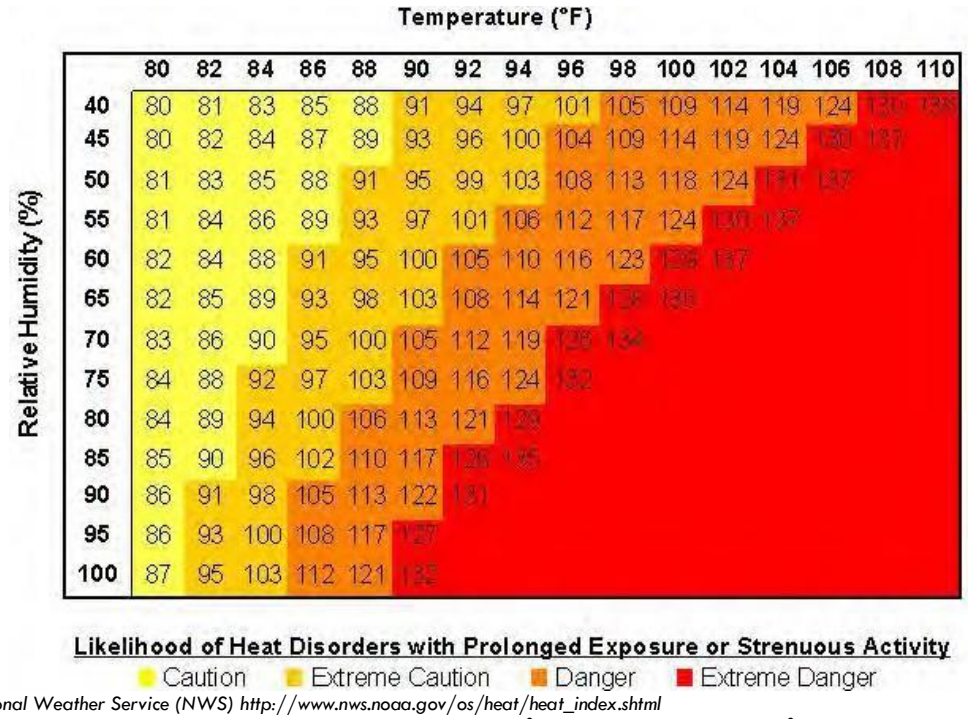
Heat-Related Alert	Description
Excessive Heat Warning (Dark Purple)	An Excessive Heat Warning is issued within 12 hours of the onset of extremely dangerous heat conditions. The general rule of thumb for this Warning is when the maximum heat index temperature is expected to be 105° or higher for at least 2 days and night-time air temperatures will not drop below 75°; however, these criteria vary across the country, especially for areas not used to extreme heat conditions. If you don't take precautions immediately when conditions are extreme, you may become seriously ill or even die.
Excessive Heat Watches (Dark Red)	Heat watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. A Watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain.
Heat Advisory (Orange)	A Heat Advisory is issued within 12 hours of the onset of extremely dangerous heat conditions. The general rule of thumb for this Advisory is when the maximum heat index temperature is expected to be 100° or higher for at least 2 days, and night-time air temperatures will not drop below 75°; however, these criteria vary across the country, especially for areas that are not used to dangerous heat conditions. Take precautions to avoid heat illness. If you don't take precautions, you may become seriously ill or even die.
Excessive Heat Outlooks (Light Yellow)	The outlooks are issued when the potential exists for an excessive heat event in the next 3-7 days. An outlook provides information to those who need considerable lead-time to prepare for the event.

Source: National Weather Service (NWS)

The Heat Index

The Heat Index Chart in **Figure 4.9** uses both of these factors to produce a guide for the apparent temperature or relative intensity of heat conditions. During these conditions, the human body has difficulties cooling through the normal method of the evaporation of perspiration. Health risks rise when a person is overexposed to heat.

FIGURE 4.9 HEAT INDEX CHART



Source: National Weather Service (NWS) http://www.nws.noaa.gov/os/heat/heat_index.shtml
Note: Exposure to direct sun can increase Heat Index values by as much as 15°F. The shaded zone above 105°F corresponds to a HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

The most dangerous place to be is in a permanent home, with little or no air conditioning. Those at greatest risk for heat-related illness include people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. However, even young and healthy individuals are susceptible if they participate in strenuous physical activities during extreme heat events. In agricultural areas, the exposure of farm workers, as well as livestock, to extreme heat is a major concern. **Table 4.20** lists typical symptoms and health impacts of exposure to extreme heat.

TABLE 4.20 TYPICAL HEALTH IMPACTS OF EXTREME HEAT

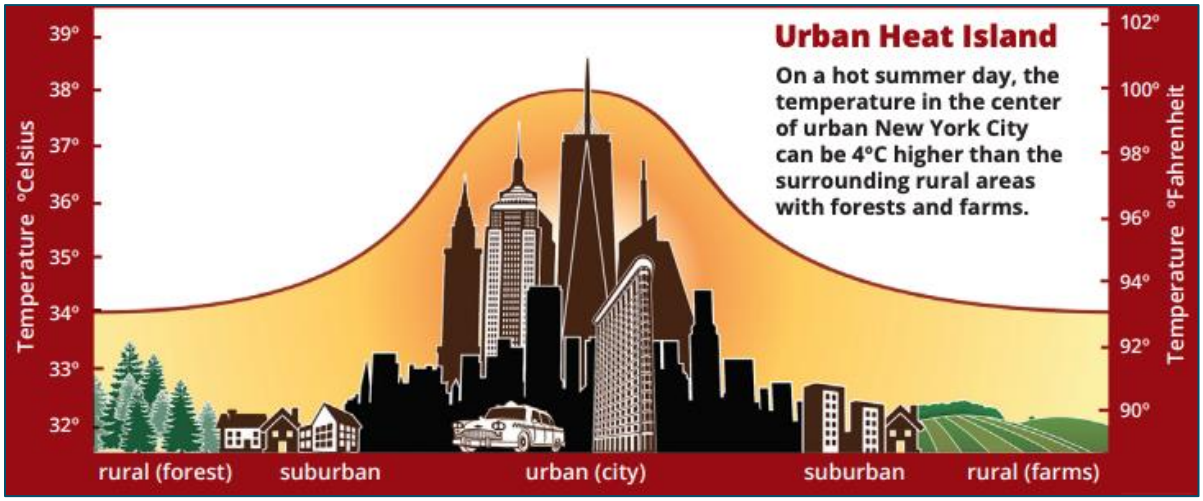
Classification	Heat Index	Effect on the Body
Caution (Light Yellow)	80°F-90°F	Fatigue possible with prolonged exposure and/or physical activity
Extreme Caution (Yellow)	90°F-103°F	Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
Danger (Orange)	103°F-124°F	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged and/or physical activity
Extreme Danger (Dark Red)	125F or higher	Heat stroke highly likely

The National Weather Service has a system in place to initiate alert procedures (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for issuing excessive heat alerts is when the maximum daytime Heat Index is expected to equal or exceed 105 degrees Fahrenheit (°F) and the nighttime minimum Heat Index is 80°F or above for two or more consecutive days.

Urban Heat Islands

While the cities in Wright County are not large urban areas, development even in small cities can experience higher temperatures than rural areas. This phenomenon is known as the Urban Heat Island effect and can increase the retention of heat and heat exposure to a population. A review of research studies and data found that in the United States, the heat island effect results in daytime temperatures in urban areas about 1–7°F higher than temperatures in outlying areas and nighttime temperatures about 2–5°F higher. Humid regions and cities with larger and denser populations experience the greatest temperature differences. Research predicts that the heat island effect may strengthen in the future as the structure, spatial extent, and population density of urban areas change and grow. **Figure 4.10** depicts the differences in temperatures between urban and rural areas.

FIGURE 4.10 URBAN HEAT ISLAND



Source: Climate at a Glance 2025

4.5.4.4 Previous Occurrences

Extreme heat is prevalent in Iowa and Wright County, occurring every year. Since 1950, there have been three reported events causing $135,000 in damages according to the NOAA Storm Events Database. It is likely that not all extreme heat events are reported and recorded in the database.

On average, the hottest months of the year are July and August. **Table 4.21** shows the highest maximum temperature recorded for each year (2000-2020) at the planning area's only NWS station, in Clarion, IA. The years with the highest maximum temperatures include 2012, 2013, and 2018 at 100 degrees or more.

TABLE 4.21 MONTHLY HIGHEST MAX TEMPERATURE FOR NWS STATION - CLARION, IA

Year	Temperature
2000	98
2001	92
2002	93
2003	97
2004	91

Year	Temperature
2005	96
2006	97
2007	95
2008	93
2009	95
2010	95
2011	99
2012	101
2013	102
2014	91
2015	96
2016	95
2017	94
2018	100
2019	91
2020	98

`

Source: NWS

The following summarizes the National Weather Service Advisories, Watches, and Warnings for Heat or Excessive Heat in Wright County from 2000 to 2025 (25 years of data). Since 2020, there have been 21 Heat Advisories, two Extreme Heat Watches, three Excessive Heat Watches, and two Excessive Warnings.

- 46 Heat Advisories
- 2 Extreme Heat Watches
- 8 Excessive Heat Watches
- 7 Excessive Warnings

The National Climatic Data Center reported one regional heat event and two regional excessive heat events in and around the Wright County planning area from 2000 to 2025. Additionally, the NOAA Storms Events Database detailed one extreme heat event in 2019. All previous events are detailed in further detail below.

August 5, 2001 – Regional Heat Event - Very warm and humid conditions that began in the last part of July continued into August. Temperatures during the day warmed into the 90s, with overnight lows remaining in the 70s. Dew point temperatures held in the mid 70s to low 80s through most of the time. An elderly woman passed away in Des Moines on the 5th. She was found in her home with the windows closed and temperatures in the house in excess of 100 degrees F. She had succumbed to the heat.

July 15, 2011 – Regional Excessive Heat Event - A large area of high pressure developed in the upper atmosphere by the middle of July. Heat built up over Iowa, aided by the severe drought to the south across Kansas, Oklahoma, and Texas. Temperatures rose into the 90s each day through the period. Though most days did not see 100-degree heat, the dewpoint and overnight lows were very significant. Low temperatures during most of the nights were in the 70s, with many of the nights in the mid to upper 70s. Dewpoint temperatures failed to fall below 70 through most of the period, with frequent excursions in the upper 70s to low 80s. These conditions caused considerable stress on livestock. Reports indicated that at least 4,000 head of cattle and thousands of turkeys were killed by the suffocating heat. Livestock losses were estimated in the $5 to $10 million dollar range.

July 20, 2016 - Regional Excessive Heat Event - A warm front lifted through the state on the 20th, allowing southerly winds to bring about high temperatures in the low 90s along with dew points in the upper 70s to 80s at times. As a result, heat index values easily eclipsed the 100-105-degree range and at times exceeded 110. Additionally, overnight lows did not provide much in the way of relief with many areas seeing lows in the mid and even upper 70s at times.

July 18, 2019 – Excessive Heat Event - A large area of high pressure strengthened across the area through the week resulting in hot temperatures and high humidity values in place across Iowa for a prolonged period of time. This led to high heat index values through much of the period, especially during the afternoon and early evening hours. Little relief was felt during the overnight hours as low temperatures remained in the 70s to 80s. Heat index values were consistently in the 105 to 115 degree Fahrenheit range during much of the daytime period. The event did not cause any injuries, deaths, or property damage.

Crop Damages

According to the USDA's Risk Management Agency, insured payments in Wright County for damages to crops as a result of heat from 2016-2025 totaled $53,117.68. **Table 4.22** shows the insurable crop insurance claims paid in Wright County as a result of heat.

TABLE 4.22 CLAIMS PAID IN WRIGHT COUNTY FOR CROP LOSS AS A RESULT OF HEAT (2016-2025)

Year	Acres Affected	Insurance Paid for Heat
2020	171.0776	$32,164.48
2022	28.57	$1,228.20
2025	99.6	$19,725.00
Totals	299.2476	$53,117.68

Source: Crop Insurance Paid is from the USDA's Risk Management Agency for 2016-2025;
Note: There were no claims paid as a result of Heat from 2016-2020, 2021, or 2023-2024.

4.5.4.5 Probability of Future Occurrence

Based on the previous NWS heat products, there have been 46 heat advisories issued from 2000 to 2025, which equates to almost two heat advisories issued each year. Therefore, based on previous occurrences, the probability of extreme heat events occurring in the future is **Likely**.

Climate Change Impacts

The following climate change impacts relative to Extreme Heat were included in the *2010 Climate Change Impacts on Iowa* report developed by the Iowa Climate Change Impacts Committee. Nighttime temperatures have increased more than daytime temperatures since 1970. Iowa's humidity has risen substantially, especially in summer, which now has 13 percent more atmospheric moisture than 35 years ago as indicated by a 3-5 degree Fahrenheit rise in dew-point temperature. This fuels convective thunderstorms that provide more summer precipitation. Both of these impacts could increase the number extreme heat events in the planning area as well as the potential for negative impacts on people and agriculture.

Despite the fact that Iowa ranks first in hog and fifth in cattle production nationwide, there is a lack of information about the effects of climate change on animal production in Iowa. High temperatures have been shown to reduce summer milk production, impair immunological and digestive functions of animals, and increase mortality rates among dairy cattle.

In general, domestic livestock can adapt to gradual changes in environmental conditions; however, extended periods of exposure to extreme conditions greatly reduce productivity and is potentially life threatening.

4.5.4.6 Vulnerability Assessment

In order to understand how vulnerable the county is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

Since Wright County is a predominately rural, agriculture community, extreme heat events can pose a high risk to crop and animal production which can disrupt the local economy. Extreme heat events can pose a public health risk and cause heat-related illness, especially in young children, older adults, and individuals with certain medical conditions. Additionally, these events can increase wildfire risk and exacerbate drought conditions. Due to climate change, extreme temperatures will continue and are expected to increase in the coming decades. Therefore, extreme heat poses a **Medium** risk to the County.

Structures and Systems

According to the ten-year period from USDA's Risk Management Agency, the number of claims paid for crop damages as a result of heat was $53,117.68. According to the 2024 Iowa Crop Insurance Profile Report issued by the USDA's Risk Management Agency, 91 percent of Iowa insurable crops were insured. To factor in estimated losses to insurable crops that are not insured, the 91 percent crop insurance coverage was factored in to provide an adjusted estimate of losses. According to this calculation, estimated annualized losses total $5,837.11 (see **Table 4.23**). Considering the value of crops from the 2022 Census of Agriculture as baseline crop exposure, the estimated annual losses from heat was determined to be minimal compared to the value of the insurable crops.

TABLE 4.23 ESTIMATED INSURABLE ANNUAL CROPS LOST RESULTING FROM HEAT

10-Year Extreme Heat Insurance Paid	Adjusted 10-Year Heat Losses (considering 91% insured)	Estimated Annualized Losses	2022 Value of Crops	Annualized Crop Loss Ratio (Losses/Value)
$53,117.68	$58,371.08	$5,837.11	$372,955,000	~0.00%

Source: Crop value is from USDA 2022 Census of Agriculture; Crop Insurance Paid is from the USDA's Risk Management Agency for 2016-2025.; Crop Insurance Coverage is from USDAs 2024 State Crop Insurance Profile for Iowa

Extreme heat can also cause a strain on the electricity delivery infrastructure which can be overloaded during peak use of electricity to power air conditioning during extreme heat events. Another type of infrastructure damage that can occur as a result of extreme heat is road damage. When asphalt is exposed to prolonged extreme heat, it can cause buckling of asphalt-paved roads, driveways, and parking lots.

Critical Facilities

Extreme heat can significantly affect all eight FEMA Community Lifelines by compromising the structural integrity and operational reliability of critical facilities and infrastructure. During extreme heat events, it is likely that food, hydration, and shelter, as well as health and medical lifelines would be disrupted. **Table 4.24** describes the potential vulnerabilities of lifelines to extreme heat.

TABLE 4.24 POTENTIAL VULNERABILITIES OF LIFELINES FROM EXTREME HEAT

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		Power outages can disable cell towers and data centers, disrupting emergency alerts, coordination, and public information systems.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Energy (Power & Fuel)		High temperatures drive up electricity demand, often leading to grid overloads, brownouts, or outages. Fuel infrastructure may also be affected by heat-related mechanical failures or transportation delays
Food, Hydration, Shelter		Water systems can be stressed by increased demand and evaporation, potentially affecting supply and quality. Agricultural systems may suffer crop losses or livestock stress, impacting food availability. Cooling shelters may be needed for vulnerable populations, especially during prolonged heat waves.
Hazardous Materials		Extreme heat can increase the risk of chemical reactions or spills, especially in facilities storing volatile substances. Emergency response to such incidents may be complicated by heat conditions.
Health & Medical		Hospitals and clinics may see surges in patients with heat-related illnesses. Facilities without adequate cooling or backup power may struggle to maintain safe conditions for patients and staff.
Safety & Security		Law enforcement and emergency response agencies may face increased call volumes due to heat-related incidents, while personnel working outdoors are at higher risk of heat stress. Wildfire risk may also rise, straining firefighting resources.
Transportation		Roads may buckle, rail lines can warp, and vehicle engines may overheat, all of which disrupt the movement of people and goods. Public transit systems may also experience delays or reduced service.
Water & Wastewater Systems		Water and wastewater systems may experience reduced supply due to evaporation and increased demand, while treatment processes can be strained by heat-related equipment failures or chemical imbalances.

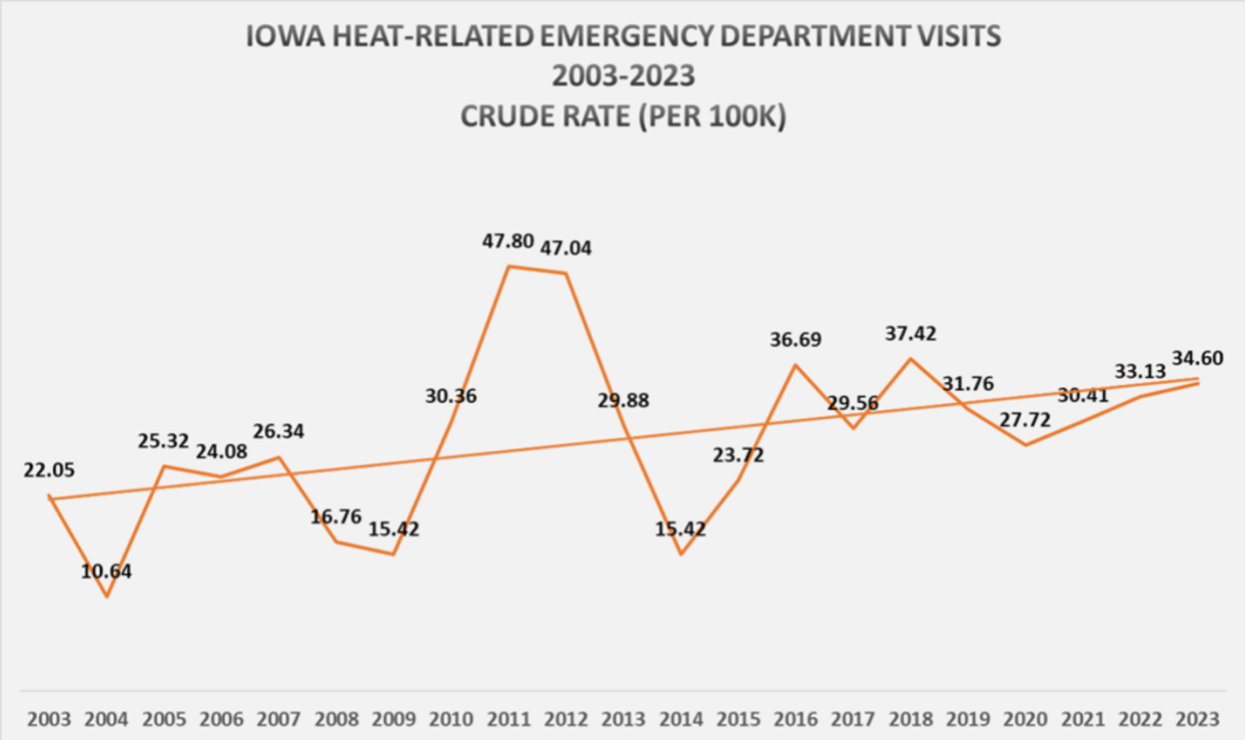
Population

Those at greatest risk for heat-related illness and deaths include people 65 years of age and older, people who are overweight, and people who are ill or on certain medications.

Overall, Iowa is already older than the country as a whole. About 15 percent of its population is over 65 years, compared with 13 percent nationally. Wright County's population over 65 years is higher than the national and state average at 20.9 percent. The participating jurisdictions with the highest percent of adults 65 and over in descending order are the cities of Dows, Rowan, Belmond, Clarion, Woolstock, Goldfield, Eagle Grove, and Galt.

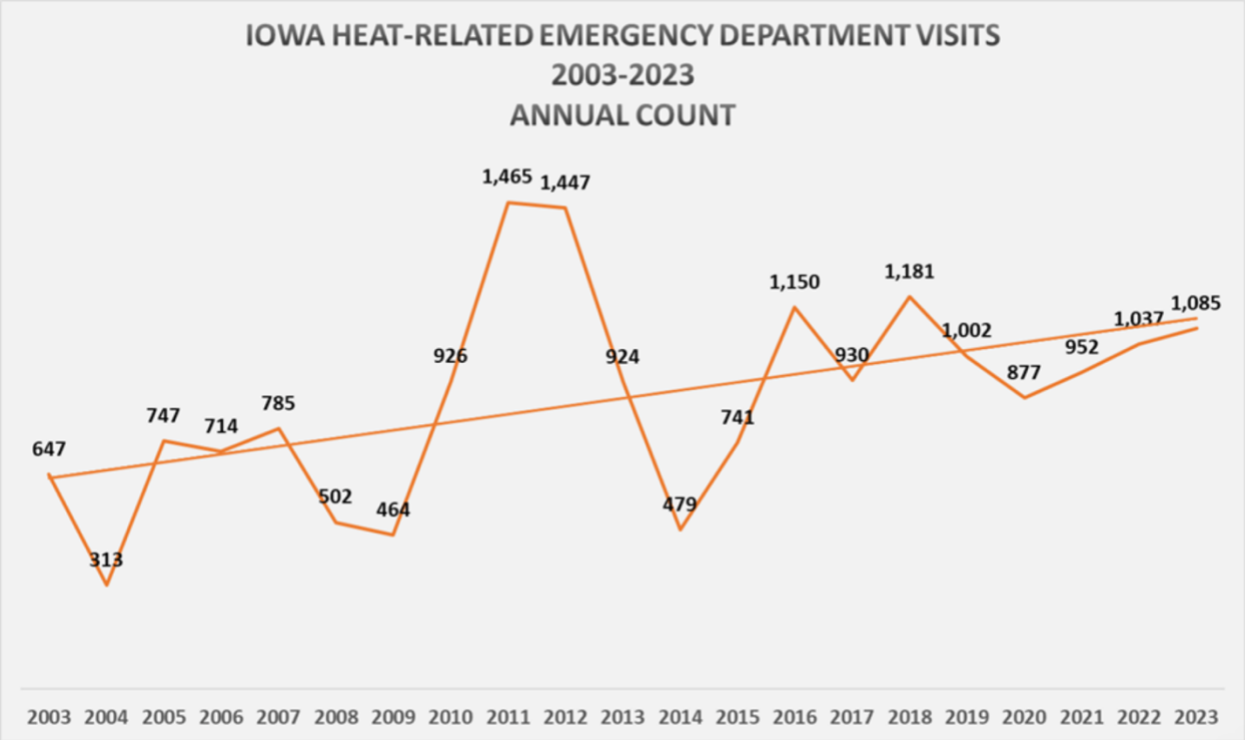
To understand the severity of extreme heat impacts to Iowa, and by proxy Wright County, **Figure 4.11** to **Figure 4.12** show the rate and number of heat related emergency department visits. The year with the highest rates of emergency departments visits occurred in 2011 and 2012.

FIGURE 4.11 IOWA HEAT RELATED ED VISITS 2003-2023 PER 100K



Source: Iowa Environmental Council

FIGURE 4.12 IOWA HEAT RELATED ED VISITS 2003-2023 ANNUAL COUNTS



Source: Iowa Environmental Council

Natural, Cultural, and Historic Resources

Extreme heat can significantly affect natural, historic, and cultural resources in Wright County. Prolonged high temperatures and drought conditions can stress ecosystems, reduce biodiversity, and increase the risk of wildfires, especially in forested and agricultural areas. These changes threaten native species and disrupt ecological balance, which in turn affects the natural heritage of the County.

Historic buildings and cultural landmarks are also vulnerable. Materials like wood, brick, and stone can deteriorate more rapidly under extreme heat, leading to cracking, warping, and fading. Additionally, some historic buildings were built before the invention of central air conditioning and may lack proper cooling, posing risk to its inhabitants. Some historic buildings may not upgrade its system in order to preserve the integrity of the building. In humid areas, humidity levels may further damage interiors and promote mold growth. Cultural traditions and outdoor events may be disrupted due to unsafe heat conditions, reducing community engagement and tourism.

Future Development

Overall, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years. Since Wright County is not experiencing large population growth, the number of people vulnerable to extreme heat is not increasing.

Impacts on Crops

Despite great improvements in yield potential over the last several years, crop production remains highly dependent on climate in conjunction with other variables. The overall effect of climate change on crop productivity in Iowa remains unclear, as positive climatic events could be overridden by the impacts of poor management or genetics, or favorable management and genetics could override negative climate events

Regardless of these interactions, it is certain that climate changes will affect future crop production. Greenhouse and growth chamber studies suggest increases in atmospheric carbon dioxide (CO2) will

generally have a substantial positive effect on crop yields by increasing plant photosynthesis and biomass accumulation.

Greater precipitation during the growing season, as we have been experiencing in Iowa, has been associated with increased yields; however, excessive precipitation early in the growing season adversely affects crop productivity. Waterlogged soil conditions during early plant growth often result in shallower root systems that are more prone to diseases, nutrient deficiencies and drought stress later in the season.

An increase in temperature, especially during nighttime, reduces corn yield by shortening the time in which grain is accumulating dry matter (the grain fill period). According to research, Iowa's nighttime temperatures have been increasing more rapidly than daytime temperatures.

The current changes in precipitation, temperature, wind speeds, solar radiation, dew-point temperatures, and cloud cover imply less ventilation of crops and longer dew periods. Soybean plants in particular readily absorb moisture, making harvest problematic. One adaptive approach to these conditions involves farmers purchasing larger harvesting equipment to speed harvest, compensating for the reduced daily time suitable for soybean harvest.

The recent extreme weather events involving greater intensity and amount of rainfall have increased the erosive power of Iowa's precipitation, resulting in significant erosion of topsoil. The impact of climate change on the erosive force of precipitation in the U.S. is expected to increase by as much as 58%. These rates are expected to increase exponentially as precipitation continues to rise.

Hazard Summary by Jurisdiction

Extreme heat is a regional hazard and impacts all jurisdictions in the planning area equally. **Table 4.25** details the hazard by jurisdiction.

TABLE 4.25 EXTREME HEAT HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	3	2	1	3	2.4	Moderate
Belmond	3	2	1	3	2.4	Moderate
Clarion	3	2	1	3	2.4	Moderate
Dows	3	2	1	3	2.4	Moderate
Eagle Grove	3	2	1	3	2.4	Moderate
Galt	3	2	1	3	2.4	Moderate
Goldfield	3	2	1	3	2.4	Moderate
Rowan	3	2	1	3	2.4	Moderate
Woolstock	3	2	1	3	2.4	Moderate
Belmond-Klemme CSD	3	2	1	3	2.4	Moderate
Clarion-Goldfield-Dows CSD	3	2	1	3	2.4	Moderate
Eagle Grove CSD	3	2	1	3	2.4	Moderate

4.5.5 FLASH FLOOD

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
4	1	2	1	2.5	Moderate

A flash flood is an event that occurs when water levels rise at an extremely fast rate as a result of intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil or impermeable surfaces. Ice jam flooding is a form of flash flooding that occurs when ice breaks up in moving waterways and then stacks on itself where channels narrow. This creates a natural dam, often causing flooding within minutes of the dam formation. River Flooding is discussed separately in **Section 4.5.10.**

Dam Failure causes another type of flash flooding. However, there is only one dam in Wright County that is inventoried in the National Inventory of Dams, and it is a Low Hazard Dam, indicating failure would flood open land or agricultural use land only.

Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. Flash flooding is an extremely dangerous form of flooding which can reach full peak in only a few minutes and allows little or no time for protective measures to be taken by those in its path. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding often results in higher loss of life, both human and animal, than slower developing river and stream flooding.

In some cases, flooding may not be directly attributable to a river, stream, or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will find the lowest elevations–areas that are often not in a floodplain. This type of flooding, often referred to as sheet flooding, is becoming increasingly prevalent as development outstrips the ability of the drainage infrastructure to properly carry and disburse the water flow.

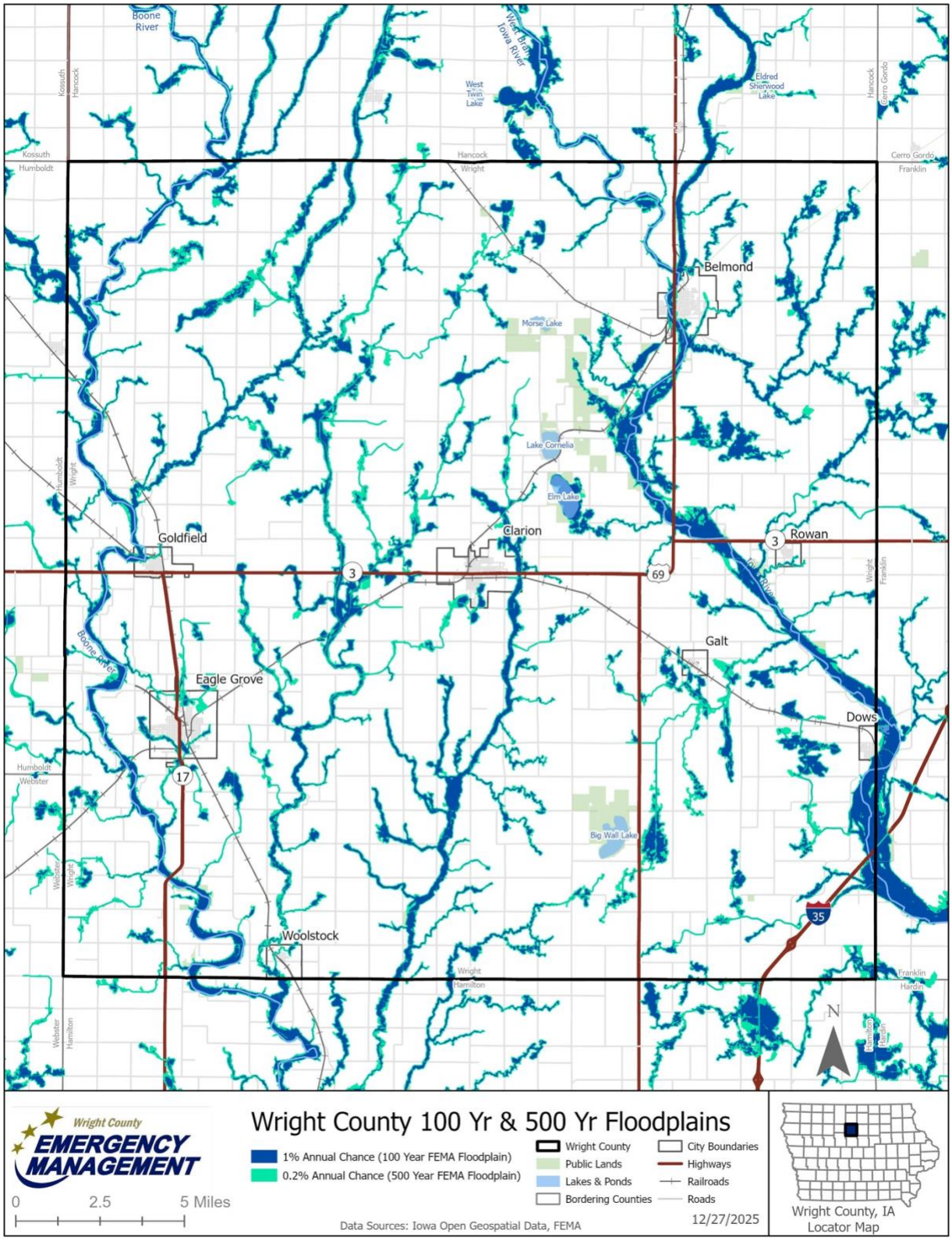
In certain areas, aging storm sewer systems are not designed to carry the capacity currently needed to handle the increased storm runoff. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns. This combined with rainfall trends and rainfall extremes all demonstrate the high probability, yet generally unpredictable nature of flash flooding in the planning area.

Although flash floods are somewhat unpredictable, there are factors that can point to the likelihood of flash floods occurring. Weather surveillance radar is being used to improve monitoring capabilities of intense rainfall. This, along with knowledge of the watershed characteristics, modeling techniques, monitoring, and advanced warning systems increases the warning time for flash floods.

4.5.5.1 Geographic Location/Extent

As presented in the *Wright County 2025 Comprehensive Plan*, Wright County includes two major tributaries of the Mississippi River, including the Boone River and the upper portion of the Iowa River. The Boone Watershed intercepts the entire western and central portion of Wright County and is an area of gently flat to rolling hills. **Figure 4.13** displays the 100-year and 500-year floodplains which are located throughout the County. These areas are at risk of flooding and the subsequent impacts. Flash flood events can occur both within the floodplain and outside of the floodplain.

FIGURE 4.13 WRIGHT COUNTY 100-YEAR AND 500-YEAR FLOODPLAINS



Prior to subsurface drainage, this region had abundant wetlands, many of which were interconnected prairie potholes. Now a large portion of the region is artificially drained to support row crop agriculture. According to the USDA and NRCS Rapid Watershed Assessment, approximately half of the soils in the watershed are poorly drained; 93% of these poorly drained soils are in row crop agriculture. A common source of agricultural drainage is the use of subsurface or artificial drainage, which commonly causes excess nutrients and pollutants to enter the streams, since water is poorly filtered.

A portion of the Upper Iowa River Watershed crosses through the eastern part of Wright County, which consists of nearly level to gently rolling hills with relatively short slopes. Like the Boone Watershed, most of the wet soils have been artificially drained to maximize crop production. Approximately 38% of the soils in the watershed are poorly drained, of this, nearly 83% percent is in row crop agriculture. As mentioned, the row crop agriculture land is drained using subsurface drainage, to increase agricultural production. The use of such drainage lowers the water table making what would be a wetland or wet meadow area, dryer, more productive farm land. Flash flooding occurs in those locations of the planning area that are low-lying and/or do not have adequate drainage to carry away the amount of water that falls during intense rainfall events.

The National Weather Service has various flash flooding products that are issued to the public to provide information regarding upcoming and current flash flood threats (see **Table 4.26**). The extent or magnitude of flash flood event can vary based on the intensity of rainfall, location, distribution, topography, soil type, vegetation, and other factors. Wright County has experienced dozens of flash flood events and over $1,000,000 in property and crop damage over the past several years. It is expected that flash flood events will continue to pose similar impacts in the future. The range of impacts can vary from ponding to road closures and flooded homes. For more information on extent, see the extent section for River Flooding.

TABLE 4.26 NATIONAL WEATHER SERVICE FLASH FLOODING PRODUCTS

Product	What It Means	You Should...
Hazardous Weather Outlook	Will there be any threat of flash flooding in the next several days?	If there is a threat of flash flooding, check back later for updated forecasts and possible watches and warnings.
Flash Flood Watch	There is a threat of flash flooding within the next 48 hours, either as a result of heavy rain, ice jams, or the threat of a dam break.	Monitor weather conditions closely, especially if you live in an area prone to flash flooding.
Flash Flood Warning	There is an immediate threat for flash flooding in the warned area, especially in low-lying and poor drainage areas. These warnings are updated frequently with Flash Flood Statements.	If you live in an area susceptible to flash flooding, be prepared to evacuate and head to higher ground. Be very cautious when driving in the warned area, especially at night or while it is still raining. You may not be able to see a flooded road until it is too late!
Areal Flood Warning	The threat of flash flooding is over, but there is still significant standing water in the affected area.	Areal flood warnings will typically list locations and roads impacted by the flooding. Try to avoid these locations until the water has receded.

Source: National Weather Service

Dams

Additionally, as mentioned prior, dams can cause flash flooding due to failures or breaches. **Figure 4.14** shows the dams within Wright County. There are five dams within the County, of which two are low-head

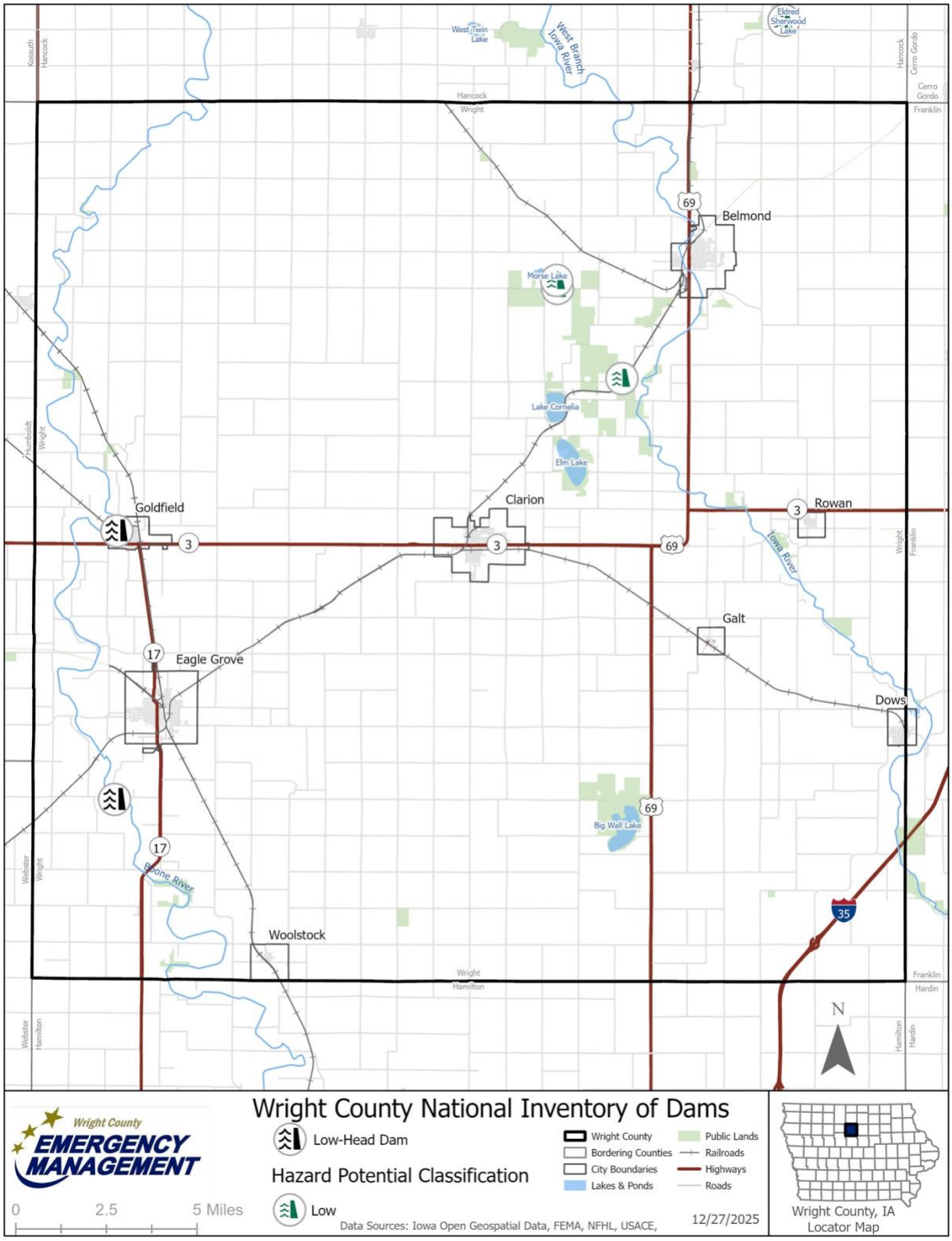
dams and three are low hazard potential dams. A low-head dam is primarily a threat to individual recreationalists directly on or in the water, rather than to downstream property or communities. A low hazard potential dam is one of the three standard dam hazard classifications, which are described in more detail in **Table 4.27.** Both type of dams pose a low impact to economic, community, and environmental losses compared to significant and high hazard dams.

TABLE 4.27 DAM HAZARD CLASSIFICATIONS

HAZARD CLASS	ANTICIPATED LOSS OF HUMAN LIFE	ECONOMIC, ENVIRONMENTAL, AND LIFELINE LOSSES	DESCRIPTION OF CLASSIFICATION
High	Probable. One or more expected.	Yes (but not necessary for this classification)	Dams assigned to high hazard potential classification are those where failure or mis-operation will probably cause loss of human life.
Significant	None	Yes	Dams assigned to the significant hazard potential classification are those dams where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
Low	None	Low and generally limited to owner	Dams assigned with the low hazard potential classification are those where failure or disoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

According to federal dam safety guidelines, the above hazard potential classification system should be utilized with the understanding that the failure of any dam or water-retaining structure, no matter how small, could represent a danger to downstream life and property. Whenever there is an uncontrolled release of stored water, there is the possibility of someone, regardless of how unexpected, being in its path.

FIGURE 4.14 - WRIGHT COUNTY DAMS



4.5.5.2 Previous Occurrences

Based on the Iowa Environmental Mesonet, there have been 40 flood warnings issued for Wright County by the National Weather Service.

Information from the NCDC was obtained from 1997 to June 2025 to determine previous occurrences for flash flood in the planning area. During this time period there were 24 reported flood incidents. No deaths or injuries were reported for any of the events. Since 1997 there have been $1,385,000 in property damage and $675,000 in crop damage. **Table 4.28** provides a summary of the NCDC data.

TABLE 4.28 NCDC WRIGHT COUNTY, IOWA FLASH FLOOD EVENTS SUMMARY, 1997-JUNE 2025

Location	Date	Property Damage	Crop Damage
ROWAN	6/22/97	$100,000	$50,000
COUNTYWIDE	7/10/00	$75,000	$100,000
EAGLE GROVE	5/21/04	$50,000	$20,000
COUNTYWIDE	6/26/05	$50,000	$5,000
CLARION	6/22/07	$100,000	$250,000
EAGLE GROVE	8/19/07	$30,000	$5,000
FLORENCE	8/21/07	$100,000	$0
GOLDFIELD	8/28/07	$10,000	$10,000
CLARION ARPT	5/6/08	$25,000	$0
EAGLE GROVE	6/4/08	$50,000	$0
GOLDFIELD	6/4/08	$25,000	$0
EAGLE GROVE ARPT	6/8/08	$25,000	$0
CLARION ARPT	6/8/08	$20,000	$0
FLORENCE	6/22/10	$500,000	$25,000
CLARION	6/23/10	$50,000	$10,000
HOLMES	6/25/10	$100,000	$0
CLARION	7/23/10	$15,000	$0
ROWAN	9/23/16	$50,000	$200,000
GOLDFIELD	9/23/16	$10,000	$0
EAGLE GROVE	7/7/24	$0	$0
CLARION ARPT	7/7/24	$0	$0
CLARION	7/7/24	$0	$0
EAGLE GROVE	7/7/24	$0	$0
OLAF	6/25/25	$0	$0

Source: NCDC

Flash flood events with significant property loss (>$100,000) include the following:

- **June 22, 1997 Flash Flooding** - Continuing from what occurred during the afternoon, thunderstorms expanded over northern Iowa. What occurred as the storms over the north

central counties drifted north was a merger of two areas. Intense thunderstorms formed over southwest Minnesota and eastern South Dakota during the afternoon. These storms moved southeast, while the storms from Iowa moved north. When the two merged over south-central Minnesota, a mesoscale vorticity maximum was formed. The storms then all drifted south into Iowa. Initially, the storms produced very large hail. Hail up to three and one-half inches in diameter fell in and around Forests City in Winnebago County. Windows and mirrors were smashed on two to three dozen cars at the 3M packaging plant there. Paint was also stripped off of some of the cars. There were two cases in the Westgate Addition, also in Forest City, where hail went through the screens, two thermopane windows, and the venetian blinds...then landed on the on the floor. In one case, the hailstone landed 7 feet away from the window inside the house, on a bed. Later reports from Forest City indicate that 450 roofs in the area were damaged to the point that they needed to be replaced. The storm that produced the large hail produced a VIL value of 96 Kg/m/m on the WSR-88D display. Hail was widespread from the storms, however there was not much in the way of wind reported. Considerable damage was done to crops in the area, though it will be harvest time before the extent of the damage is totally known. The storms also produced copious amounts of rainfall. Flash flooding became a problem in a four-county area extending from west of Mason City to west of Waterloo.

- **June 22, 2007 Flash Flooding** - A rather complex weather situation unfolded during the day on the 22nd. The situation was complicated by the convection that occurred during the previous night. An outflow boundary from the previous night's convection pushed south across the CWA, reaching the southern part by sunrise. This boundary combined with a quasi-stationary frontal boundary that was across the southern counties. The atmosphere became unstable quite rapidly during the late morning and early afternoon. Surface low pressure was located over southwest Iowa, with a warm front extending east South of the warm front temperatures warmed to around 90 F. with dew points in the upper 60s to low 70s. Surface based CAPE rose to 3000 to 4000 J/kg with the lifted index falling into the -8 to -10 C. range. The cap broke by around 1800 UTC as an MCS began to develop over central Iowa. The environment was fairly favorable with 30 to 40 kts of effective shear and precipitable water values around 1.5 inches. Available cape in the -10 to -30 C. layer of the atmosphere was in the 300 to 500 J/kg range. DCAPE values were between 600 and 800 J/kg. As the complex evolved, the primary modes of severe weather were hail and high wind. The freezing level was lower than the previous day, at 13,900 feet and many of the storms contained at least some hail. The hail was not overly large, with most reports in the three quarter to one inch range. During the storms evolution, there were several bow echo segments, resulting in high winds. Rainfall of 2 to 4 inches was common in central, into north central and parts of northeast Iowa. Spotty reports of up to 6 inches in a 2 to 3-hour period were received. There were numerous reports of water flowing over highways as well as bridge and highway washouts.
- **August 21, 2007 Flash Flooding -** Water was reported in basements due to heavy rains. Flooding was also reported in Goldfield and Eagle Grove.
- **June 22, 2010 Flash Flooding -** Street flooding in Clarion. Town still without power. EM reports nearly every town in Wright County has street flooding.
- **June 25, 2010 Flash Flooding -** Highway 3 closed by flooding.
- **July 23, 2010 Flash Flooding –** Flash flooding throughout the County
- **July 7, 2024 Flash Flooding -** Following showers and thunderstorms over Iowa during the morning hours with a passing shortwave, an additional shortwave arriving in the Central Plains with the aid of increased lift and MUCAPE values around 1000 J/kg overhead brought another round of scattered showers and storms into the afternoon and evening hours. These multiple rounds of convection, along with the slow-moving nature of some storms led to heavy rainfall and eventually flash flooding, particularly over Wright county. Reports of flooded roads and rainfall totals averaging between 3-5 inches were common.

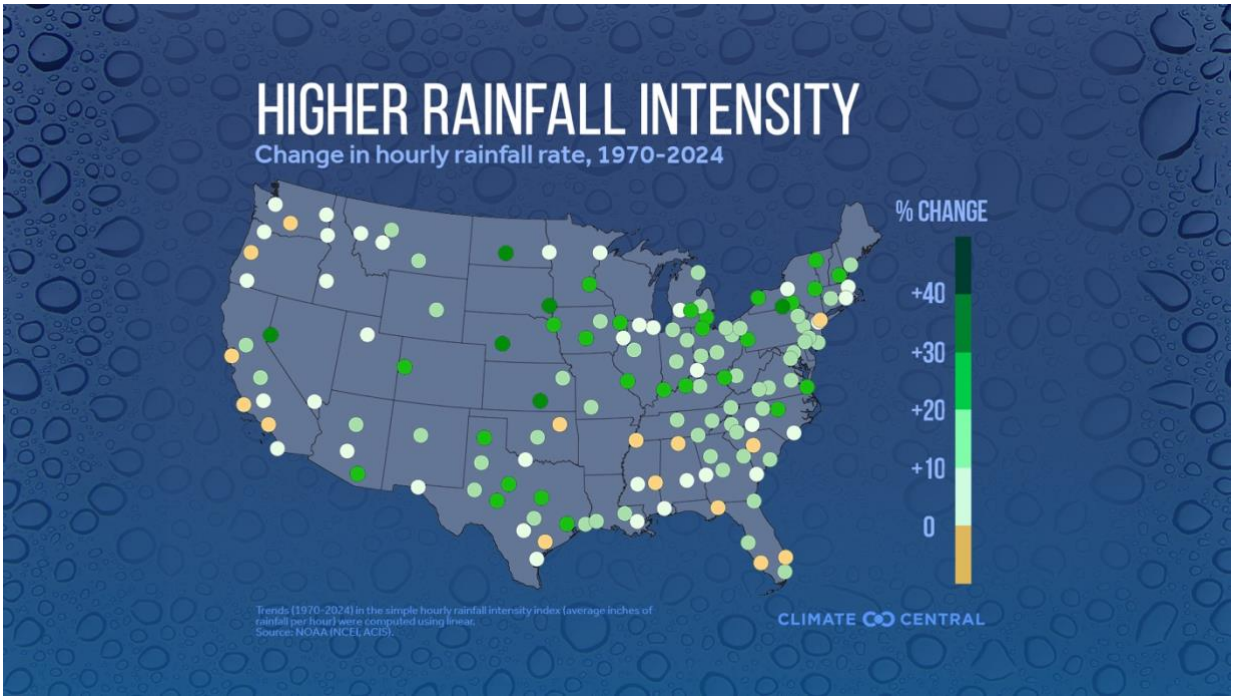
- **June 25, 2025 Flash Flooding -** A band of rain across north central Iowa produced three to four inches of rain, resulting in road closures to flash flooding.

4.5.5.3 Probability of Future Occurrence

The frequency of past events is used to gauge the likelihood of future occurrences. The events from NCDC that occurred on the same day were combined to determine the total number of 24 flash flood events in the planning area over the 28-year period from 1997 to 2025. This translates to a greater than .85-percent likelihood of flash flood somewhere in the planning area in any given year. Therefore, the probability of future occurrence is **Highly Likely**.

According to Climate Central, areas across the U.S. are experiencing an increase in rainfall intensity. **Figure 4.15** shows that locations across Iowa are experiencing up to 30% change in higher rainfall intensity from 1970 to 2024. If this trend increases, flash flood events and their associated impacts will likely occur more often in the planning area.

FIGURE 4.15 INCREASE IN VERY HEAVY PRECIPITATION IN THE U.S., 1970-2024



Source: Climate Central

4.5.5.4 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

Water over low-lying roads and bridges is the most frequent impact associated with flash flooding that has occurred in the planning area. This can cause wash out of bridge abutments and erosion/scour damage on roads. There is potential for loss of life if motorists drive into moving water. However, public education campaigns have helped to educate citizens about the dangers of driving through moving water. Building damage is generally limited to water in basements where rain is too intense for drainage systems and natural drainage to carry water away from the structure. In addition, when combined storm/sanitary sewer systems are overloaded, this can result in sewer back-up. Generally, flash-flooding is short in duration and government services and business operations are not impacted. Therefore, flash flood poses a **Medium** risk to the County.

Critical Facilities

Critical facilities, such as hospitals, emergency operations centers, fire stations, schools, nursing homes, and water treatment plants, face varying levels of risk from flash flood events depending on their location, structural resilience, and operational readiness. Based on the information presented in the River Flooding profile, there are three critical facilities in the county that are within the 100-year floodplain:

- A communications facility in Belmond
- A wastewater facility in Belmond
- A tier 2 facility in Eagle Grove

The vulnerability of critical facilities also depends on their ability to maintain continuity of operations. Facilities with emergency plans, trained staff, and coordination with local emergency management

agencies are better equipped to respond and recover. Conversely, those lacking these resources may experience prolonged disruptions, affecting public safety and essential services across the County.

Critical services such as emergency response, healthcare, and public safety may be compromised when facilities are damaged or inaccessible. Power outages from downed lines and damaged substations can halt operations at hospitals, shelters, and emergency centers, while communication failures limit the ability to issue warnings, evacuations, and coordinate response efforts. **Table 4.29** details the potential vulnerabilities of lifelines from flash flood.

TABLE 4.29 POTENTIAL VULNERABILITIES OF LIFELINES FROM FLASH FLOOD

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		Flooding can damage telecom infrastructure, interrupting emergency alerts and coordination among agencies.
Energy (Power & Fuel)		Electrical systems and fuel supplies are vulnerable to water damage, leading to outages and service disruptions.
Food, Hydration, Shelter		Floodwater may contaminate drinking water sources, damage food supply chains, and displace residents, increasing demand for temporary shelter.
Hazardous Materials		Flooding can lead to spills or leaks from industrial sites, wastewater systems, and storage facilities, posing environmental and health risks.
Health & Medical		Hospitals and clinics may experience structural damage, power outages, and limited access, reducing their ability to provide care during emergencies.
Safety & Security		Flooded emergency response facilities and blocked roadways can delay law enforcement, fire, and rescue operations.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Transportation		Roads, bridges, and transit systems may be submerged or eroded, hindering evacuation, supply delivery, and access to services.
Water & Wastewater Systems		Flooding can overwhelm water treatment plants and sewer systems, leading to contamination, service disruptions, and public health hazards.

People

Flash floods presents a serious risk to residents across Wright County, particularly in low-lying areas with a history of flood events. Populations most at risk include older adults, low-income families, and individuals without access to flood insurance, lack of accessible emergency alert and notifications, or reliable transportation. The impacts of flooding on people can be severe, ranging from physical danger and property damage to long-term disruptions in housing, healthcare, and employment. Flooding can also lead to emotional stress and financial instability.

Natural, Cultural, and Historic Resources

Flash floods can cause significant damage to Wright County's natural, historic, and cultural assets. Natural areas such as wetlands, forests, and waterways may experience erosion, pollution, and habitat loss, reducing their ecological value and ability to buffer future flood events. These changes can also affect recreational and conservation areas.

Historic buildings and cultural landmarks are at risk of structural damage, deterioration, and loss of historically significant materials. Flooding may also disrupt cultural traditions tied to specific locations or community spaces. Mitigation efforts should focus on identifying vulnerable sites, implementing protective measures like elevation or floodproofing, and preserving documentation of at-risk resources.

Structures

When roads and bridges are inundated by water, damage often occurs as the water scours materials around bridge abutments and gravel roads. At this time, there are 19 bridges in Wright County that are classified as "scour critical" bridges. See **Section 4.2** "Assets at Risk", for a map of all bridges in Wright County.

Additionally, flood waters can cause erosion undermining road beds. In some instances, steep slopes that are saturated with water may cause mud or rock slides onto roadways. These damages can cause costly repairs for state, county, and city road/bridge maintenance departments. When sewer back-up occurs, this can result in costly clean-up for home and business owners as well as present a health hazard. Based on previous occurrences, there have been over $1,300,000 in damages in property damage and $675,000 in crop damage from flash flood events.

Future Development

In planning future development, jurisdictions in the planning area should avoid development in low-lying areas near rivers and streams or where interior drainage systems are not adequate to provide drainage

during heavy rainfall events. Future development should also take into consideration the impact of additional impervious surfaces to water run-off and drainage capabilities during heavy rainfall events. Overall, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years.

Hazard Summary by Jurisdiction

For the jurisdictions mentioned in previous occurrences section, the probability was determined to be "highly likely" (4). For the remaining jurisdictions, the probability was determined to be "occasional" (2). For the school districts, the probability was also determined to be "occasional". Although impacts were not mentioned for some cities or the school districts, flash flooding can still occur in the future if the amount of rainfall received in a given time exceeds the capability of drainage features and natural drainage to carry the water away. More information can be found in **Table 4.30**.

TABLE 4.30 FLASH FLOOD HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	4	1	2	1	2.50	Moderate
Belmond	4	1	2	1	2.50	Moderate
Clarion	4	1	2	1	2.50	Moderate
Dows	2	1	2	1	1.6	Low
Eagle Grove	4	1	2	1	2.50	Moderate
Galt	2	1	2	1	1.6	Low
Goldfield	4	1	2	1	2.50	Moderate
Rowan	4	1	2	1	2.50	Moderate
Woolstock	2	1	2	1	1.6	Low
Belmond-Klemme CSD	2	1	2	1	1.6	Low
Clarion-Goldfield-Dows CSD	2	1	2	1	1.6	Low
Eagle Grove CSD	2	1	2	1	1.6	Low

4.5.6 GRASS OR WILDLAND FIRE

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
2	1	4	1	1.90	Low

A grass fire is a fire that occurs predominately in grassy areas which can burn quicker and spread faster. A wildland fire is a term to broadly encompass fires that occurs in vegetated areas such as trees, grasses, and shrubs.

Wildland/Grass fires are frequently associated with lightning and drought, as dry conditions make vegetation more flammable. As new development encroaches into the wildland/urban interface more and more structures and people are at risk. On occasion, ranchers and farmers intentionally set fire to vegetation to restore soil nutrients or alter the existing vegetation growth. Also, individuals in rural areas frequently burn trash, leaves and other vegetation debris. These fires have the potential to get out of control to spread and grow.

The risk of Wildland/Grass fires is a real threat to landowners across the State. The National Weather Service monitors the conditions that might be conducive to fires in the State on a daily basis so that wildfires can be predicted and hopefully prevented.

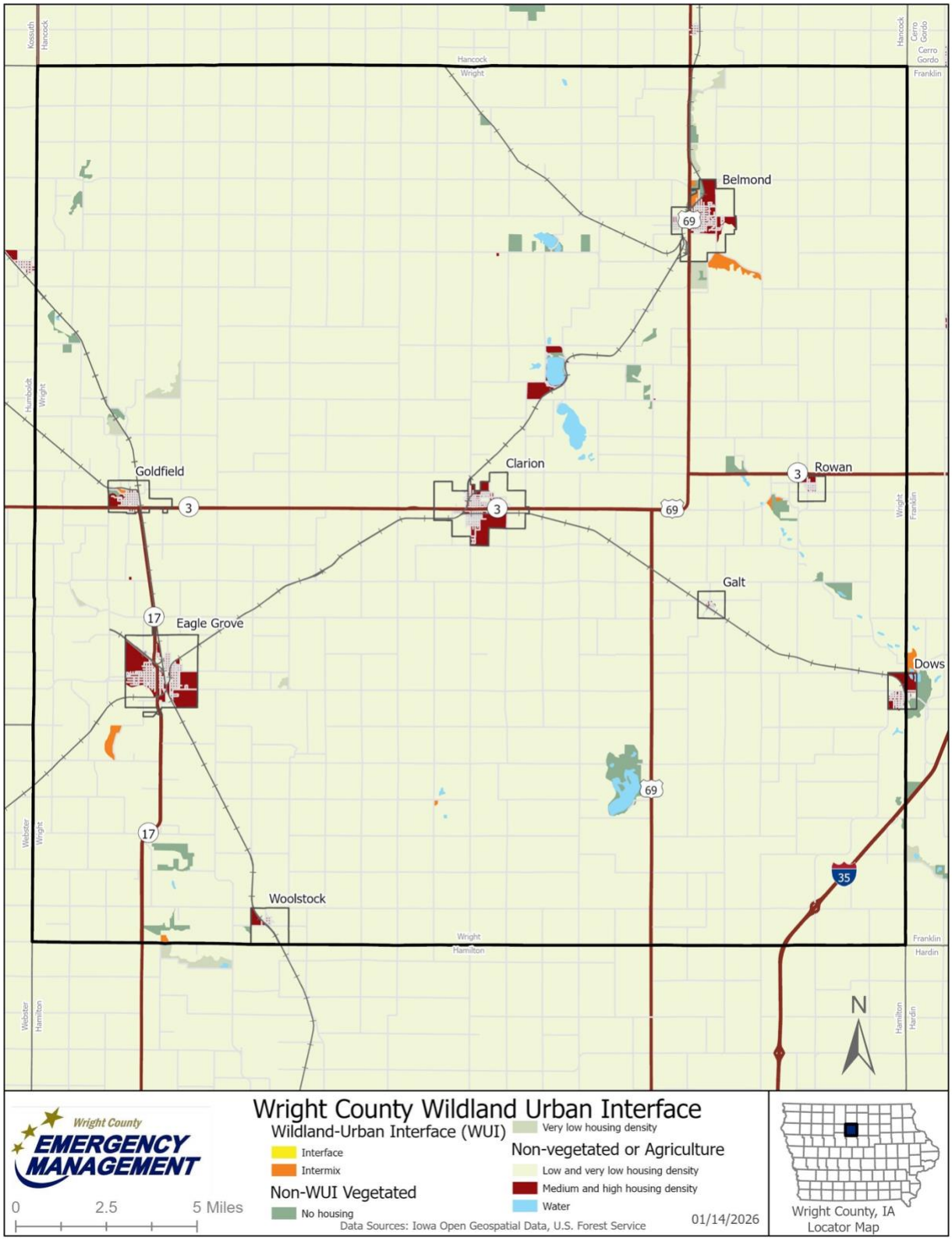
The risk factors considered are:

- High temperature
- High wind speed
- Fuel moisture (greenness of vegetation)
- Low humidity
- Little or no cloud cover

4.5.6.1 Geographic Location/Extent

Wildland/Grass fires are most likely to occur in the Wildland Urban Interface (WUI). This is the area where houses meet or intermingle with undeveloped wildland vegetation. Within the WUI, there are two specific areas identified: 1) Interface and 2) Intermix. The interface areas are those areas that intermingle with wildland areas. As can be seen in **Figure 4.16**, WUI areas are located within or right outside the six major cities within Wright County, shown in mostly orange (Intermix).

FIGURE 4.16 WRIGHT COUNTY WILDLAND URBAN INTERFACE



Iowa's urban/rural interface (areas where development occurs within or immediately adjacent to wildland, near fire-prone trees, brush, and/or other vegetation), is growing as metro areas expand into natural forest, prairies and agricultural areas that are in permanent vegetative cover through the Conservation Reserve Program (CRP). The State has the largest number of CRP contracts in the nation, totaling over 1.5 million acres. Most of this land is planted in cool and warm season grass plantings, tree plantings and riparian buffer strips. There is an additional 230,000 acres in federal ownership and conservation easements.

Fire severity refers to the effects of a fire on the environment, typically focusing on the loss of vegetation both above ground and below ground but also including soil impacts. There are three categories of fire severity:

- **Low**: A fire that has limited effect on overstory trees.
- **Moderate**: A fire producing variable, moderate effects on overstory trees, averaging 30 to 80% of the vegetation killed, and/or moderate soil exposure.
- **High**: A fire producing a high percent of overstory tree mortality (>80%) and/or extensive mineral soil exposure.

The worst wildfire in Iowa's history was the great fire of 1910, which burned more than three million acres and led to 86 fatalities, and was a "high" severity fire. Wildfires of all three levels of severity are possible in Wright County due to the presence of WUI areas.

4.5.6.2 Previous Occurrences

No wildfires have been recorded in Wright County. According to the National Fire Incident Reporting System (NFIRS), there have been two prescribed fire incidents in Wright County since 2017. Prescribed fires are a planned, low-intensity fire set by trained professionals in a specific area. It is used to manage natural landscapes, reduce hazardous vegetation buildup, and prevent larger, uncontrolled wildfires.

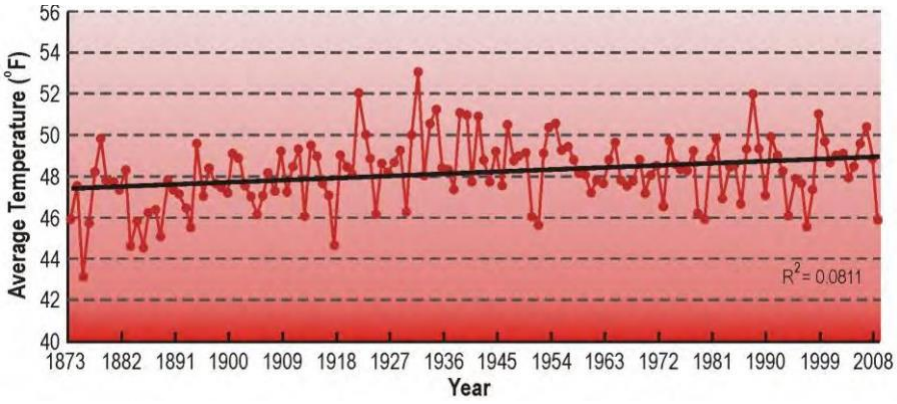
4.5.6.3 Probability of Future Occurrence

Due to the limited previous occurrences in Wright County, the probability of future occurrence for damaging events for this hazard is **Possible**.

Climate Change Impact

According to the *2010 Climate Change Impacts on Iowa* report, by the Iowa Climate Change Impacts Committee, the annual average temperature has been increasing over the last 136 years. **Figure 4.17** shows this data graphically. If Iowa were to experience a severe drought, which has occurred in the past, the slow and steady rise in statewide annual mean temperature, masked in summer by moist surface conditions during non-drought years, could lead to an abrupt switch to extreme summer heat.

FIGURE 4.17 ANNUAL AVERAGE OF STATEWIDE DAILY AVERAGE TEMPERATURE



Source: 2010 Climate Change Impacts on Iowa report, by the Iowa Climate Change Impacts Committee, Data from the Iowa Climatology Bureau, 2010

4.5.6.4 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

Areas that are most vulnerable to wildfire are agricultural areas where land is burned, rural areas where trash and debris are burned, and the wildland-urban interface/intermix areas. Since there are several WUI areas in the County, wildfires and grass fires pose a **Medium** risk the County.

Critical Facilities

There are no critical facilities in WUI areas in Wright County. Critical facilities across the County may be vulnerable to disruption or damage from WUI fires, particularly those located near forested or undeveloped areas. Critical facilities that could be at risk for fires that expanded beyond the WUI area including emergency operations centers, fire stations, hospitals, schools, water treatment plants, power substations, and communication infrastructure. While there are no critical facilities within the WUI areas, wildfires can burn, grow, and travel to potentially pose a risk to critical facilities nearby. Wildfires can impact critical facilities in several ways:

- Direct damage from flames or radiant heat, especially for facilities constructed with combustible materials or lacking defensible space.
- Service disruption due to damaged power lines, water systems, or communication towers.
- Restricted access caused by road closures or hazardous conditions, which can delay emergency response and evacuation efforts.
- Overburdened emergency services, particularly in rural areas with limited firefighting resources and mutual aid capacity.

Protecting critical facilities from wildfire impacts is essential to maintaining public safety and continuity of operations during emergencies. This requires proactive mitigation measures such as fuel reduction, defensible space maintenance, fire-resistant construction, and integration of wildfire risk into facility sitting and capital improvement planning. While wildfires can cause significant damage to critical facilities, it is unlikely that wildfires will occur, cause damage, and disrupt critical facilities within the County.

Wildfires can significantly disrupt all eight of FEMA's community lifelines, especially in areas where critical infrastructure and services are located near wildland-urban interface areas. **Table 4.31** describes the potential vulnerabilities of lifelines from Grass and Wildland fires.

TABLE 4.31 POTENTIAL VULNERABILITIES OF LIFELINES FROM GRASS AND WILDLAND FIRES

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		Grass and Wildland fires can damage telecommunications infrastructure, including cell towers and fiber optic lines, disrupting emergency alerts and coordination among response agencies.
Energy (Power & Fuel)		Grass and Wildland fires can damage power lines, substations, and fuel storage sites, leading to outages and fuel supply disruptions. Restoration may be delayed in remote or heavily impacted areas.
Food, Hydration, Shelter		Grass and Wildland fires may damage water treatment and distribution systems, affecting potable water supplies. Displacement of residents may increase demand for emergency shelter and food assistance, especially in rural areas with limited resources.
Hazardous Materials		Grass and Wildland fires near industrial or agricultural facilities may ignite or release hazardous materials, posing risks to public health and the environment.
Health & Medical		Smoke and poor air quality can worsen respiratory conditions and strain healthcare systems. Medical facilities may face increased patient loads or evacuation if directly threatened by fire.
Safety & Security		Grass and Wildland fires can threaten law enforcement facilities, fire stations, and emergency operations centers. Evacuations, road closures, and degraded visibility may delay emergency response and reduce public safety.
Transportation		Road closures due to fire or smoke can hinder evacuations and emergency access. Damage to roads, bridges, or rail lines can disrupt regional mobility and supply chains.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Water & Wastewater Systems		Grass and Wildland fires can damage water treatment plants, pump stations, storage tanks, and distribution lines, leading to service interruptions or contamination.

People

Populations across Wright County face varying degrees of vulnerability to Grass and Wildland fires, depending on factors such as proximity to wildland areas, housing density, socioeconomic conditions, and access to emergency services. Vulnerable populations include:

- Residents in rural or isolated areas, where emergency response times may be longer and fire suppression resources are limited.
- Low-income households, which may lack the resources to implement defensible space, retrofit homes, or evacuate quickly.
- Elderly individuals and those with disabilities, who may require additional assistance during evacuations or sheltering.
- Mobile home communities, which are more susceptible to fire damage due to construction materials and density.
- Individuals with health conditions due to smoke and poor air quality.

In urbanizing areas, the expansion of housing into fire-prone zones increases the number of people and structures exposed to wildfire hazards. Public awareness, preparedness, and access to early warning systems also vary across the County, influencing how effectively communities can respond to fire threats. While wildfires can cause significant damage to the population, it is less likely that Grass and Wildland fires will occur within the County compared to other hazards. Based on previous occurrences there have only been two reported prescribed fires in the County and no people were impacted.

Natural, Cultural, and Historic

Grass and Wildland fires can pose a risk to the County's natural, historic, and cultural resources. Wildfires can degrade ecosystems by destroying native vegetation, fragmenting wildlife habitats, and increasing soil erosion and water pollution. Smoke and airborne pollutants also impact air quality, affecting both environmental and human health.

Culturally and historically significant sites, such as cemeteries and historic buildings, are vulnerable to direct fire damage and indirect impacts from suppression efforts and post-fire erosion. Additionally, traditional cultural landscapes and sacred sites may be lost or altered, disrupting Indigenous and local heritage practices. As development expands into WUI zones, the risk to these resources grows, especially in areas that may not be traditionally fire-prone but are increasingly exposed due to climate change and land use shifts. Proactive mitigation strategies, including mapping vulnerable sites and engaging communities, are essential to protect these irreplaceable assets.

Structures

Wildfires can be responsible for extensive damage to crops, the environment and occasionally residential or business facilities. Homes built in rural areas are more vulnerable since they are in closer proximity to land that is burned, and homeowners are more likely to burn trash and debris in rural locations. The

vulnerability of structures in rural areas is exacerbated due to the lack of hydrants for firefighting and the distance required for firefighting vehicles and personnel to travel to respond. Potential losses to crops and rangeland are additional concerns. The only fires to have occurred based on available data were two prescribed fires and no structures were impacted or damaged.

Future Development

Future development in the Wildland-Urban Interface/Intermix areas would increase vulnerability to this hazard. Overall, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years.

Hazard Summary by Jurisdiction

Grass or Wildland fires can occur in all jurisdictions. However, the magnitude is potentially worse in jurisdictions with more wildland/urban intermix areas. Grass and Wildland fires are more likely to occur in the unincorporated portions of Wright County and these areas are more vulnerable due to more homes built in rural areas in closer proximity to land/trash/debris that is burned. Additionally, homes in these more rural areas do not have hydrants in most cases and are farther from firehouses. Wildland/Grass fires can occur in city limits. However, the magnitude is generally lower due to proximity to firefighting services. There is less potential for wildland/grass fires impacting schools due to general locations away from Wildland Urban Interface Areas. As with the cities, if a Wildland/Grass fires were to occur near school buildings, the magnitude would be lower due to close proximity to firefighting services. More information can be found in **Table 4.32**.

TABLE 4.32 GRASS AND WILDLAND FIRE HAZARD SUMMARY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	2	2	4	1	2.20	Moderate
Belmond	2	2	4	1	2.20	Moderate
Clarion	2	1	4	1	1.90	Low
Dows	2	1	4	1	1.90	Low
Eagle Grove	2	2	4	1	2.20	Moderate
Galt	2	1	4	1	1.90	Low
Goldfield	2	1	4	1	1.90	Low
Rowan	2	1	4	1	1.90	Low
Woolstock	2	1	4	1	1.90	Low
Belmond-Klemme CSD	2	1	4	1	1.90	Low
Clarion-Goldfield-Dows CSD	2	1	4	1	1.90	Low
Eagle Grove CSD	2	1	4	1	1.90	Low

4.5.7 HAZARDOUS MATERIALS

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
3	1	4	1	2.35	Moderate

A hazardous substance is one that may cause damage to persons, property, or the environment when released to soil, water, or air. Chemicals are manufactured and used in increasing types and quantities. Each year over 1,000 new synthetic chemicals are introduced and as many as 500,000 products pose physical or health hazards and can be defined as "hazardous chemicals". Hazardous substances are categorized as toxic, corrosive, flammable, irritant, or explosive. Hazardous material incidents generally affect a localized area.

Fixed Hazardous Materials Incident

A fixed hazardous materials incident is the accidental release of chemical substances or mixtures during production or handling at a fixed facility.

Transportation Hazardous Materials Incident

A transportation hazardous materials incident is the accidental release of chemical substances or mixtures during transport. Transportation hazardous materials incidents in Wright County can occur during highway or air transport. Highway accidents involving hazardous materials pose a great potential for public exposures. Both nearby populations and motorists can be impacted and become exposed by accidents and releases. If airplanes carrying hazardous cargo crash, or otherwise leak contaminated cargo, populations and the environment in the impacted area can become exposed.

Pipeline Incident

A pipeline transportation incident occurs when a break in a pipeline creates the potential for an explosion or leak of a dangerous substance (oil, gas, etc.) possibly requiring evacuation. An underground pipeline incident can be caused by environmental disruption, accidental damage, or sabotage. Inspection and maintenance of the pipeline system along with marked gas line locations and an early warning and response procedure can lessen the risk to those near the pipelines.

4.5.7.1 Geographic Location/Extent

This section provides geographic locations within Wright County impacted by each type of potential hazardous materials incident.

The potential extent or magnitude of hazardous materials incidents in Wright County could range from a small, slow leak to a large rupture where an explosion is possible. One of the deadliest hazardous materials incident occurred in Eagle Grove, Iowa on February 3, 1973. The incident caused over a dozen deaths due to an explosion from a natural gas leak and fire that leveled two buildings.

Responders and emergency professionals categorizes hazardous materials incidents into three levels. The following levels include:

- **Level 1 – Least Severe**: A minor incident involving a small known hazardous material release that local first responders can safely manage.
- **Level 2 – Moderately Severe**: moderate incident involving more resources and expertise beyond the abilities of initial first responders.
- **Level 3 – Most Severe**: the most severe incident and potentially large-scale, requiring a major response with multi-agency command and may require specialized teams.

With a hazardous material release, there are multiple potentially exacerbating or mitigating circumstances that will affect its severity or impact. Mitigating conditions are precautionary measures taken in advance to reduce the impact of a release. Primary and secondary containment or shielding by sheltering-in-place protects people and property from the harmful effects of a hazardous material release. Exacerbating conditions, characteristics that can enhance or magnify the effects of a hazardous material release include:

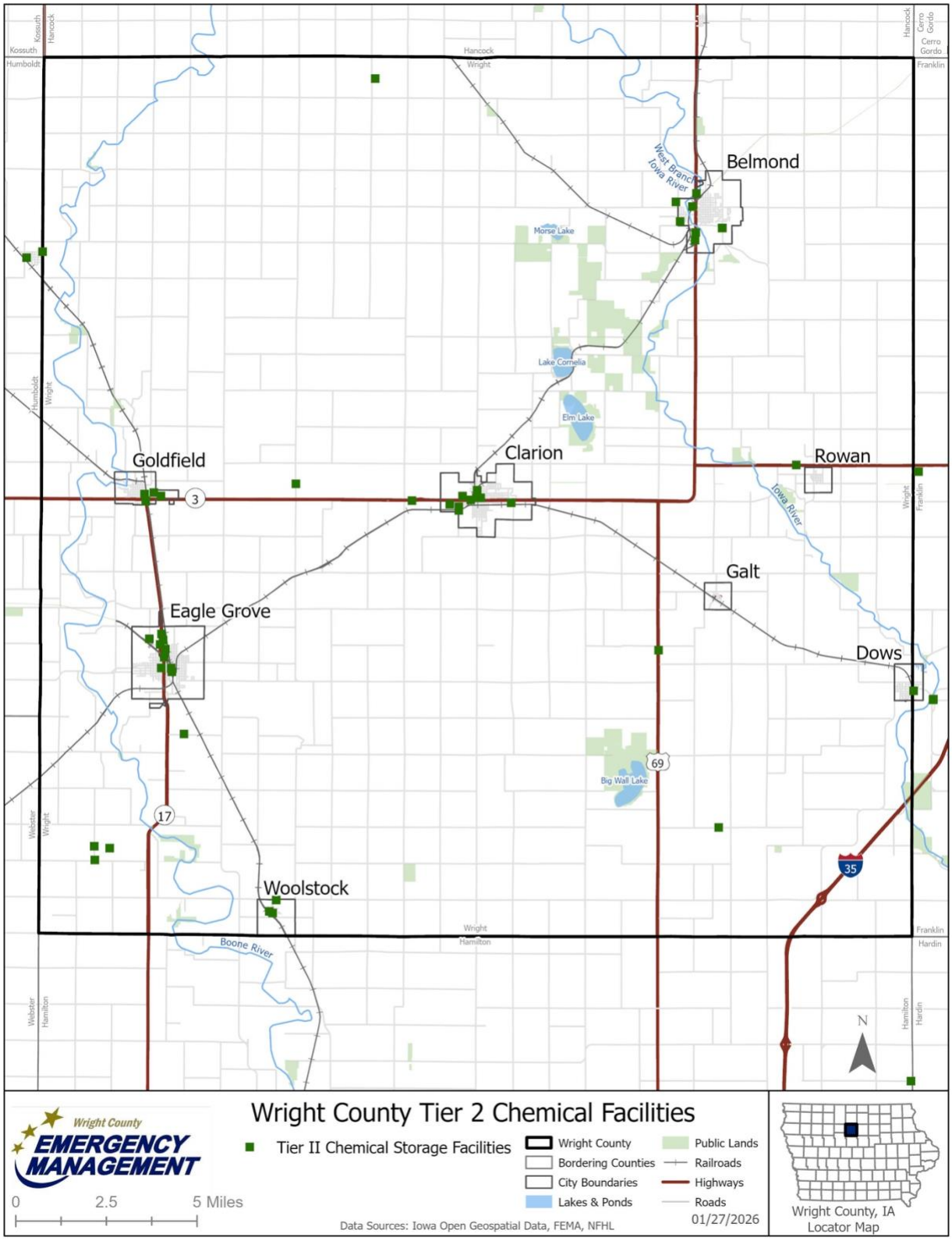
- Weather conditions that affect how the hazard occurs and develops.
- Micro-meteorological effects of buildings and terrain that alters dispersion of hazardous materials.
- Non-compliance with building or fire codes and maintenance failures such as fire protection and containment features.
- Type of material(s) released.
- Distance from emergency response teams.
- Training of emergency response teams/familiarity with hazardous material(s) properties.
- Accessibility of area.

The areas within closest proximity to the releases are generally at greatest risk, yet depending on the agent, a release can travel great distances or remain present in the environment for centuries in the case of radioactive materials.

Fixed Hazardous Materials Incident

According to the Iowa Department of Natural Resources, there are 44 sites in Wright County that because of the volume or toxicity of the materials on site were designated as Tier II Facilities under the Superfund Amendments and Reauthorization Act. **Figure 4.18** is a map showing the locations of Tier II Facilities within the County.

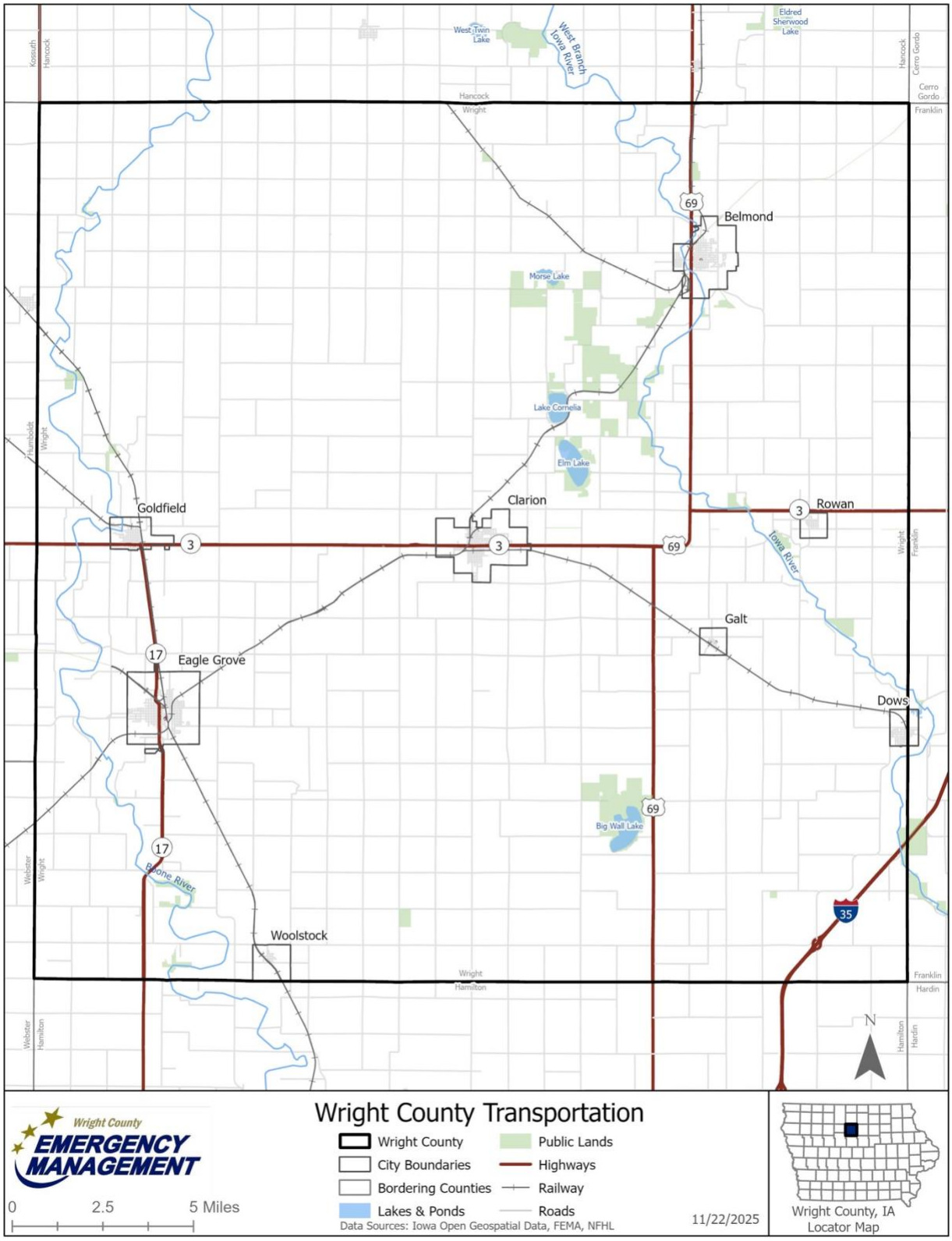
FIGURE 4.18 TIER II FACILITIES IN WRIGHT COUNTY



Transportation Hazardous Materials Incident

The transport of hazardous materials in Wright County can occur via trucks on the highways/roads and airplanes carrying hazardous cargo. Hazardous materials can be transported on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35, shown in **Figure 4.19**. Agriculture is important to the economy of Wright County. As a result, chemicals utilized in agriculture are frequently transported along county and local roadways.

FIGURE 4.19 WRIGHT COUNTY HIGHWAYS



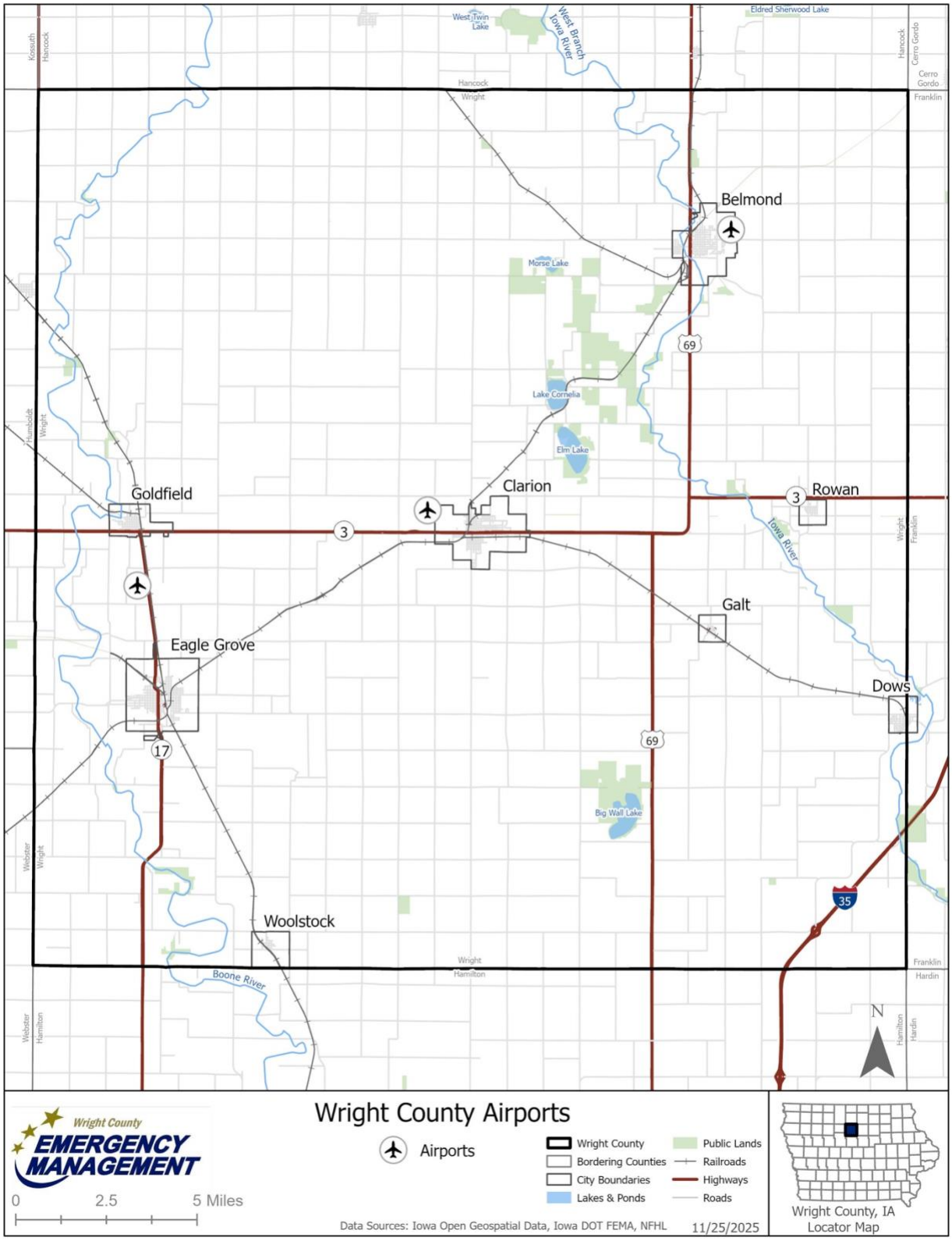
Rail Transport

Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Gove. There are also two additional smaller lines; one out of Clarion that runs southeast through Galt and Dows, and another line that runs northwest through Olaf, just south of Belmond. There is a rail line that has a higher gross volume, traveling through Goldfield, Eagle Grove, and Woolstock, with a few spur lines. See **Section 4.5.15**, Transportation Incident for more information.

Air Freight

There are three airports in Wright County; Belmond, Clarion, and Eagle Grove. Hazardous materials incidents can occur within these three airports across the County. For more information, see **Figure 4.20.**

FIGURE 4.20 WRIGHT COUNTY MUNICIPAL AIRPORTS



Pipeline Incident

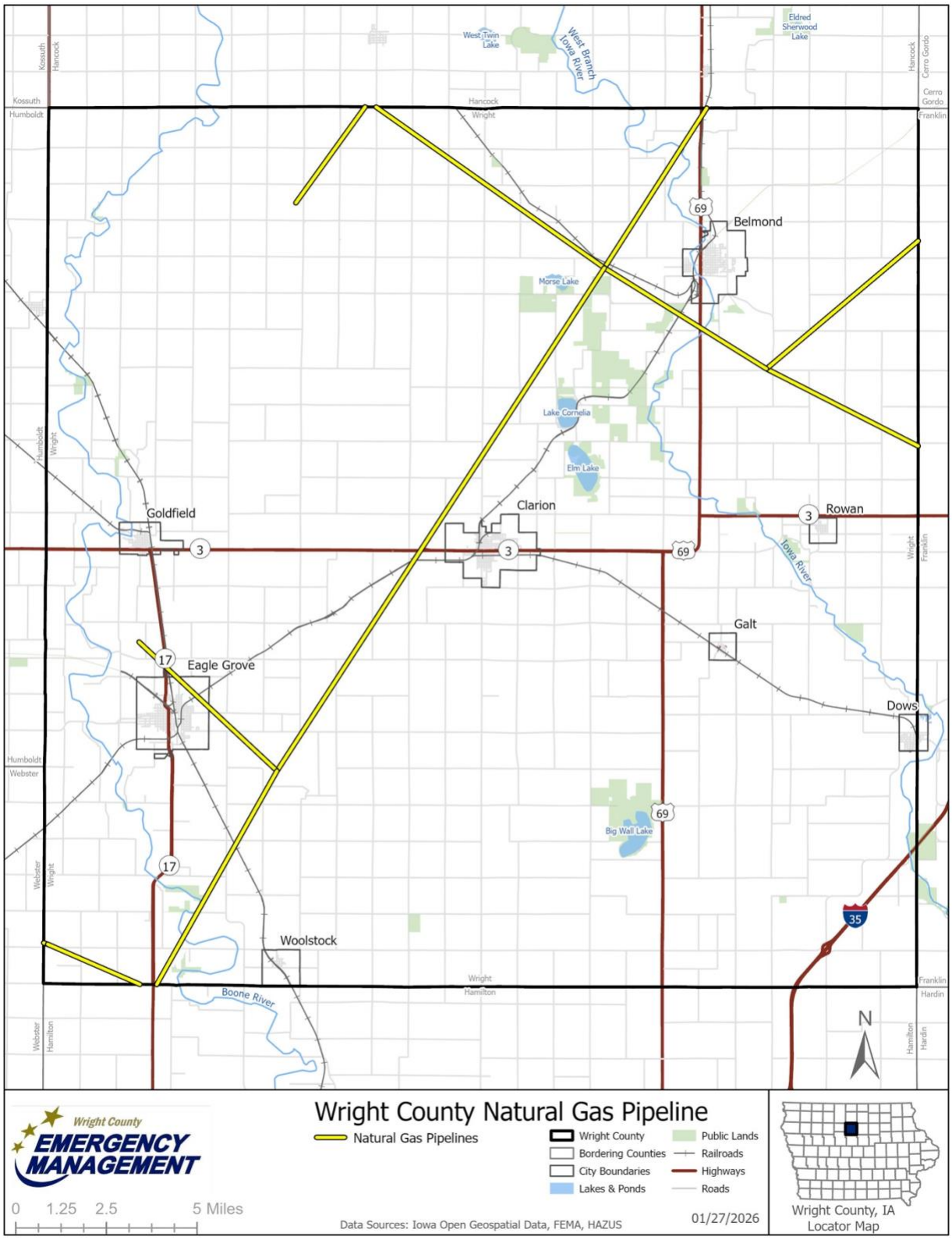
Figure 4.21 provides the locations of pipelines in Wright County. The data for this map consists of gas transmission pipelines and hazardous liquid trunklines. It does not contain gathering or distribution pipelines, such as lines which deliver gas to a customer's home. Therefore, not all pipelines in the County will be visible.

Any type of hazardous materials incident within a city that includes a large release of hazardous materials could affect large areas of the city in the right conditions, possibly even the entire city. This could necessitate evacuation of large areas. In the rural unincorporated areas where population densities are low, even in the event of a large release the number of homes that may need to be evacuated would be significantly lower than in an urban environment.

Immediate dangers from hazardous materials include fires and explosions. The release of some toxic gases may cause immediate death, disablement, or sickness if absorbed through the skin, injected, ingested, or inhaled. Contaminated water resources may be unsafe and unusable, depending on the amount of contaminant. Some chemicals cause painful and damaging burns if they come in direct contact with skin. Contamination of air, ground, or water may result in harm to fish, wildlife, livestock, and crops. The release of hazardous materials into the environment may cause debilitation, disease, or birth defects over a long period of time.

Loss of livestock and crops may lead to economic hardships within the community. The occurrence of a hazmat incident many times shuts down transportation corridors for hours at a time while the scene is stabilized, the product is off-loaded and reloaded on a replacement container.

FIGURE 4.21 PIPELINES IN WRIGHT COUNTY



4.5.7.2 Previous Occurrences

According to the EPA, from 2017 to 2024 (7 years), there have been 109 hazardous materials spills reported in Wright County. None of these was of a level of severity that required significant response or recovery resources or created a lasting community impact. **Table 4.33** provides a summary of the reported spills during this time period for each jurisdiction indicated in the database as well as the mode of the spill. According to this data, the most spills occurred in Goldfield and Belmond. The Toxics Release Inventory (TRI) tracks the management of certain toxic chemicals that may pose a threat to human health and the environment. Certain industrial facilities in the U.S. must report annually how much of each chemical is recycled, combusted for energy recovery, treated for destruction, and disposed of or otherwise released on- and off-site. This information is collectively referred to as production-related waste managed. **Figure 4.22** displays the production related waste produced each year in Wright County. 2015 was the year with the highest produced related waste produced[22].

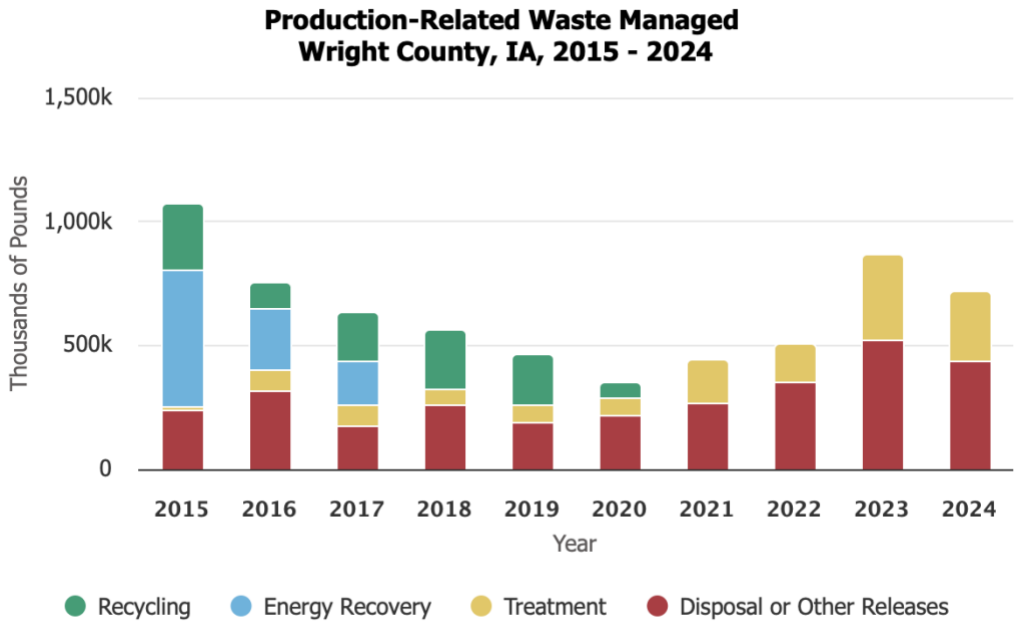
[22] US. 2024. 2024 TRI Factsheet for Wright County, IA | TRI Explorer | US EPA. Epagov. [accessed 2026 Jun 16]. https://enviro.epa.gov/triexplorer/tri_factsheet.factsheet?pzip=&pstate=IA&pcity=&pcounty=Wright&pyear=2024&pParent=TRI&pDataSet=TRIQ1.

TABLE 4.33 WRIGHT COUNTY HAZARDOUS MATERIALS SPILLS REPORTED TO EPA, 2017-2024 BY JURISDICTION

Jurisdiction	Total
Belmond	22
Eagle Grove	8
Galt	8
Goldfield	61
Grand Total	**109**

Source: EPA TRI https://www.epa.gov/toxics-release-inventory-tri-program/tri-basic-data-files-calendar-years-1987-present

FIGURE 4.22 WRIGHT COUNTY PRODUCTION WASTE MANAGED 2015-2024



Pipelines

The U.S. Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration maintains a database of pipeline incidents and mileage reports. **Table 4.34** details the number of pipeline incidents for the State of Iowa. The years with the highest number of pipeline incidents include 2008, 2012, and 2013. Additionally, 2011 had the highest total damage which was over $8,000,000.

TABLE 4.34 IOWA PIPELINE INCIDENTS (2006-2025)

Calendar Year	Number	Fatalities	Injuries	Total Cost As Reported
2006	8	0	0	$581,093
2007	5	0	0	$341,393
2008	14	0	0	$1,475,040
2009	10	0	0	$684,536
2010	12	0	3	$2,693,903
2011	12	0	0	$8,097,866
2012	14	0	2	$2,017,354
2013	14	0	0	$2,571,119
2014	8	0	0	$924,368
2015	4	0	1	$229,186
2016	6	0	0	$201,368
2017	5	0	0	$2,928,408
2018	4	0	0	$3,914,023
2019	8	0	0	$772,847
2020	9	0	0	$3,170,119
2021	11	0	0	$2,531,371
2022	8	0	0	$384,521
2023	3	0	0	$240,366
2024	3	0	0	$238,029
2025	6	0	0	$765,236
Grand Total	**164**	**0**	**6**	**$34,762,146**

4.5.7.3 Probability of Future Occurrence

From 2017 to 2024 (7 years), there have been 109 spills reported to Iowa DNR. This computes to an annual average of over 16 hazardous materials spills per year. Therefore, the probability of future occurrence of hazardous materials is determined to be **Likely**.

4.5.7.4 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

A hazardous materials incident can occur almost anywhere. All jurisdictions are considered to have at least some vulnerability to this hazard. People, pets, livestock, and vegetation in close proximity to facilities producing, storing, or transporting hazardous substances are at higher risk. Populations downstream, downwind, and downhill of a released substance are particularly vulnerable. Depending on the

characteristics of the substance released, more people in a larger area may be in danger from explosion, absorption, injection, ingestion, or inhalation.

Most of the hazardous materials incidents that have occurred in Wright County are localized and are quickly contained or stabilized. Depending on the characteristic of the hazardous material or the volume of product involved, the affected area can be as small as a room in a building or as large as 5 square miles or more. Many times, additional regions outside the immediately affected area are evacuated for precautionary reasons. More widespread effects occur when the product contaminates the municipal water supply or water system such as river, lake, or aquifer. Spills can be costly to clean up due to the specialized equipment and training, and disposal sites that are necessary. Since the majority of spills in the county are small and quickly maintained within existing capabilities, and the high volume of spills, hazardous materials pose a **Medium** risk.

Critical Facilities

Critical facilities, such as hospitals, emergency operations centers, fire stations, schools, nursing homes, and water treatment plants, face varying levels of risk from hazardous material (HazMat) incidents depending on their location, structural resilience, and operational readiness.

Facilities located near major transportation corridors or industrial zones are at higher risk of exposure to chemical spills, fires, or airborne toxins. These incidents can disrupt operations, damage infrastructure, and endanger occupants, especially in facilities that house vulnerable populations like the elderly or children. Additionally, facilities without proper ventilation systems, backup power, or shelter-in-place protocols are more susceptible to contamination and operational failure during a HazMat event. The vulnerability of critical facilities also depends on their ability to maintain continuity of operations. Facilities with emergency plans, trained staff, and coordination with local emergency management agencies are better equipped to respond and recover. Conversely, those lacking these resources may experience prolonged disruptions, affecting public safety and essential services across Wright County.

Power outages from downed lines and damaged substations can halt operations at hospitals, shelters, and emergency centers, while communication failures limit the ability to issue warnings, evacuations, and coordinate response efforts. **Table 4.35** details the potential vulnerabilities of the FEMA lifelines from hazardous materials.

TABLE 4.35 POTENTIAL VULNERABILITIES OF LIFELINES FROM HAZARDOUS MATERIALS

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		Infrastructure damage or contamination can disrupt communication towers or data centers. Reduced ability to issue public alerts, coordinate response, and maintain situational awareness.
Energy (Power & Fuel)		Fires or explosions from HazMat incidents can damage power lines, substations, or fuel storage facilities. Power outages affecting critical infrastructure and emergency response operations.
Food, Hydration, Shelter		Chemical spills can contaminate water sources and agricultural areas.
Hazardous Materials		Direct involvement of hazardous substances requires specialized response teams and equipment. Limited local capacity may delay containment, increasing exposure and environmental damage.
Health & Medical		HazMat exposure can cause respiratory, neurological, or skin-related health issues. Overburdened hospitals and clinics, especially in rural counties with limited capacity; potential contamination of medical facilities.
Safety & Security		Exposure to toxic substances can threaten public safety, requiring evacuations, shelter-in-place orders, and law enforcement support. Disruption of law enforcement operations and emergency management coordination, especially if facilities are contaminated or overwhelmed.
Transportation		HazMat spills on highways or rail lines can shut down major transportation routes. Delays in emergency response, supply chain disruptions, and increased risk to commuters and freight operators.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Water & Wastewater Systems		Contamination from chemical spills near surface water sources or groundwater wells, potentially leading to unsafe drinking water and service disruptions.

People

The risk and vulnerability to people from hazardous materials vary based on location, population characteristics, and emergency preparedness. Communities near major transportation routes, such as highways and rail lines, are at higher risk due to the frequent movement of hazardous substances. Industrial zones and agricultural areas with chemical storage facilities also present elevated risks of fixed-site incidents. These events can lead to chemical spills, fires, or airborne releases that threaten public health and safety.

Vulnerability is especially high among populations with limited mobility, such as the elderly, individuals with disabilities, and residents of schools, hospitals, and correctional facilities. These groups may face challenges during evacuation or shelter-in-place orders. Rural counties, while less densely populated, often lack specialized HazMat response teams and resources, which can delay containment and increase exposure. Additionally, low-income communities may struggle with access to protective equipment, transportation, and timely information, further increasing their vulnerability. Based on previous occurrences, there have been six injuries due to pipeline incidents.

Natural, Cultural, and Historic Resources

Hazardous Materials pose significant risks to natural, historic, and cultural resources across Wright County. These resources include wetlands, rivers, forests, historic buildings, archaeological sites, and culturally significant landmarks. A chemical spill or airborne release can contaminate soil and water, damage ecosystems, and degrade the physical integrity of historic structures. Natural resources such as wildlife habitats and water bodies are particularly vulnerable to long-term environmental damage, which can disrupt biodiversity and recreational use. Historic and cultural sites may suffer irreversible harm if exposed to corrosive or toxic substances, especially if they lack protective infrastructure or are located near transportation corridors or industrial zones.

Structures

The impact of this type of disaster will likely be localized to the immediate area surrounding the incident. The initial concern will be for people, then the environment. If contamination occurs, the spiller is responsible for the cleanup actions and will work closely with responders in the local jurisdiction, the Iowa Department of Natural Resources, and the Environmental Protection Agency to ensure that cleanup is done safely and in accordance with federal and state laws.

As mentioned, it is difficult to determine the potential losses to existing development because of the variable nature of a hazardous materials spill. For example, a spill of a toxic airborne chemical in a populated area could have greater potential for loss of life. By contrast a very small spill of a chemical in a remote rural area would be much less costly and possibly limited to remediation of soil. Based on previous occurrences, there have been over $34,000,000 in damages from pipeline incidents within the County.

Future Development

The number and types of hazardous chemicals stored and transported through Wright County will likely continue. Since the last plan update, there have been an increase in the number of Tier II facilities in the County. Therefore, the risk of has increased. However, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years.

Hazard Summary by Jurisdiction

Although spills do occur in the unincorporated area, they are primarily recorded in the database associated with the nearest city. The probability score was based on the number of spills for each jurisdiction during this period. More details can be found in **Table 4.36**.

TABLE 4.36 HAZARDOUS MATERIALS HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	2	1	4	1	1.90	Moderate
Belmond	4	1	4	1	2.80	High
Clarion	4	1	4	1	2.80	High
Dows	4	1	4	1	2.80	High
Eagle Grove	4	1	4	1	2.80	High
Galt	2	1	4	1	1.90	Moderate
Goldfield	3	1	4	1	2.35	Moderate
Rowan	2	1	4	1	1.90	Moderate
Woolstock	1	1	4	1	1.45	Low
Belmond-Klemme CSD	1	1	4	1	1.45	Low
Clarion-Goldfield-Dows CSD	1	1	4	1	1.45	Low
Eagle Grove CSD	1	1	4	1	1.45	Low

4.5.8 HUMAN DISEASE

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
2	3	2	4	2.50	Moderate

A human disease outbreak is a medical, health or sanitation threat to the general public (such as contamination, epidemic, plague and insect infestation). The outbreak may be spread by direct contact with an infected person or animal, ingesting contaminated food or water, vectors such as mosquitoes or ticks, contact with contaminated surroundings such as animal droppings, infected droplets, or by aerosolization.

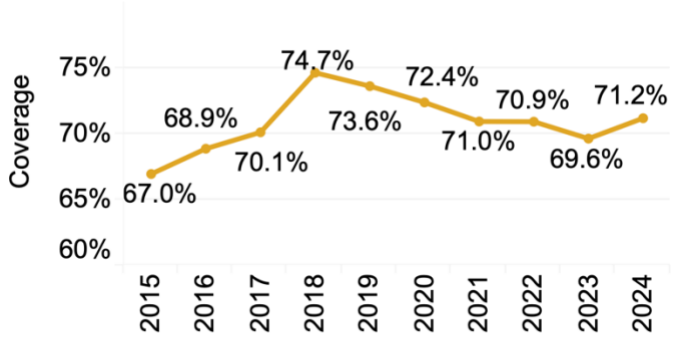
Iowa's public health and health care communities work to protect Iowans from infectious diseases and preserve the health and safety of Iowans by rapidly identifying and containing a wide range of biological agents. Local public health departments and the Iowa Department of Public Health, Center for Acute Epidemiology investigate disease "outbreaks" of routine illnesses. There are a number of biological diseases/agents that are of concern to the State of Iowa such as vaccine preventable disease, foodborne disease and community associated infections having significant impact on the morbidity of Iowans. The following descriptions are general, and it should be noted that individuals may experience more or less severe consequences.

Vaccine Preventable Disease

In the U.S., there are common infectious diseases that include polio, measles, diphtheria, pertussis, rubella, mumps, tetanus and Haemophilus influenzae type b that are now rare because of widespread use of vaccines. According to the CDC, among children born during 1994–2023, routine childhood vaccinations will have prevented approximately 508 million cases of illness, 32 million hospitalizations, and 1,129,000 deaths, resulting in direct savings of $540 billion and societal savings of $2.7 trillion.

According to the Iowa Department of Public Health, the 2-year-old County immunization rate for the 4-3-1-3-3-1-4 series (4 DTaP, 3 Polio, 1 MMR, 3Hib, 3 Hep B, 1 Varicella, 4 PCV by 24 months of age) was 71 percent for 2024. **Figure 4.23** shows the vaccination rate for this group since 2015. The 4-3-1-3-3-1-4 vaccines series completion rate increased 1.6% from 2023. Completion rates have also been decreasing since 2019 but increased in the past year. All vaccine types increased in coverage in 2024 with the largest percent increase for Hib (Haemophilus influenzae Type B) and Hep B (Hepatitis B) vaccine. This increase is promising, but coverage is still less than pre-pandemic years, further emphasizing the need to keep children up-to-date on recommended vaccines. Lowered childhood vaccination rates can lead to increased risk to diseases such as measles. In the past couple of years, there have been measles outbreaks across the County, which was previous eradicated in the early 2000's.

FIGURE 4.23 COUNTY IMMUNIZATION ASSESSMENT MAPS (2-YEAR OLD COVERAGE), SELECTED VACCINATION



Data Note: Data as of 1/7/2025. Childhood Immunization vaccine coverage rates calculated with IRIS Denominator.
Data can be accessed at https://hhs.iowa.gov/public-health/data/health/immunization/childhood-immunization-data

Influenza

Influenza (flu) is a viral infection of the nose, throat, bronchial tubes, and lungs. There are two main types of virus: A and B. Each type includes many different strains, which tend to change each year. In Iowa, influenza occurs most often in the winter months.

Influenza is highly contagious and is easily transmitted through contact with droplets from the nose and throat of an infected person during coughing and sneezing. Typical symptoms include headache, fever, chills, cough, and body aches. Although most people are ill for only a few days some may have secondary infections, such as pneumonia, and may need to be hospitalized. Anyone can get influenza, but it is typically more serious in the elderly and people with chronic illnesses such as cancer, emphysema, or diabetes or weak immune systems. It is estimated that thousands of people die each year in the United States from flu or related complications. In 2011, influenza and pneumonia combined was the 8th leading causes of death in Iowa with 657 deaths. In 2008, there were over 800 influenza/pneumonia deaths. In the recent 2025-2026 flu season, the U.S. experienced the highest level of flu in 25 years.

Pandemic Influenza

A pandemic is a global disease outbreak. A pandemic flu is a human flu that causes a global outbreak, or pandemic, of serious illness. A flu pandemic occurs when a new influenza virus emerges for which people have little or no immunity, and for which there is no vaccine.

This disease spreads easily person-to-person, causing serious illness, and can sweep across the country and around the world in a very short time. The Centers for Disease Control and Prevention (CDC) has been working closely with other countries and the World Health Organization to strengthen systems to detect outbreaks of influenza that might cause a pandemic and to assist with pandemic planning and preparation.

During 2009 and 2010, health professionals around the globe worked to combat the H1N1 influenza virus. This relatively mild and stable influenza virus circulated across the globe and caused one of the most robust worldwide vaccination campaigns since the 1970s. Health professionals continue to monitor the possibility of an avian (bird) flu pandemic associated with a highly pathogenic avian H5N1 virus. Since 2003, avian influenza has been spreading through Asia. A growing number of human H5N1 cases contracted directly from handling infected poultry have been reported in Asia, Europe, and Africa, and more than half the infected people have died. There has been no sustained human-to-human transmission

of the disease, but the concern is that H5N1 will evolve into a virus capable of human-to-human transmission.

An especially severe influenza pandemic could lead to high levels of illness, death, social disruption, and economic loss. Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines.

Pandemics are generally thought to be the result of novel strains of viruses. Because of the process utilized to prepare vaccines, it is impossible to have vaccine pre-prepared to combat pandemics. A portion of the human and financial cost of a pandemic is related to lag time to prepare a vaccine to prevent future spread of the novel virus. In some cases, current vaccines may have limited activity against novel strains.

COVID-19

In late 2019, the new SARS-CoV-2 coronavirus, named "COVID-19", caused a quickly spreading, widespread outbreak. Within months, the virus spread worldwide with close to one million cases and more than 50,000 deaths by early 2020 [23]. The COVID-19 pandemic triggered an unprecedented public health crisis that lasted over three years, with residual impacts that continue today.

The State of Iowa issued stay-at-home orders, mandated business and school closures, testing and vaccination campaigns, and ongoing public health advisories. Local businesses, particularly small retail and industrial employers that significantly impacted the economy. Schools had to transition to remote learning affecting families and students. Healthcare facilities across the region reported overcapacity, requiring the redirection of patients and mobilization of emergency resources. Mortality and morbidity rates disproportionately impacted older adults, essential workers, and residents with preexisting conditions.

Foodborne Disease

There are several agents that can cause illness when consumers eat contaminated food, beverages or water. Foodborne illness (food poisoning) can also be spread person-to-person as well as from contact with animals. **Table 4.37** is a list of common foodborne diseases.

TABLE 4.37 COMMON FOODBORNE DISEASE

Organism	Onset of Symptoms	Associated Food(s)
Botulism	12 - 36 hours	Canned fruits and vegetables
Campylobacter	2 - 5 days, range 1 - 10 days	Undercooked chicken or pork, unpasteurized milk
Cholera	12 - 72 hours	Undercooked or raw seafood, especially oysters
Cryptosporidium	7 days, range 1 - 12 days	Unpasteurized beverages, contaminated food or water, person-to-person
E. coli (shiga-toxin)	3 - 4 days, range 2 - 10 days	Undercooked ground meats, unpasteurized milk, contaminated fruits or vegetables, person-to-person
Giardia	7 - 10 days, range 3 - 25 days	Contaminated water, person-to-person
Hepatitis A	28 - 30 days, range 15 - 50 days	Raw produce, undercooked foods, person-to-person
Listeria	3 weeks, range 3 - 70 days	Soft cheeses, unpasteurized milk, ready-to-eat deli meats, hot dogs, undercooked poultry, unwashed raw vegetables
Norovirus	24 - 48 hours, range 10 - 50 hours	Contaminated ready-to-eat food, undercooked

[23] Horn A. 2020 Apr 24. U.S. Coronavirus Death Toll Passes 50,000. NPR. [accessed 2026 Jun 16]. https://www.npr.org/sections/coronavirus-live-updates/2020/04/24/844039508/u-s-coronavirus-death-toll-passes-50-000.

Organism	Onset of Symptoms	Associated Food(s)
		shellfish, person-to-person
Salmonella	12 - 36 hours, range 6 - 72 hours	Contaminated eggs, poultry, beef, raw fruits and vegetables, unpasteurized milk or juice, cheese
Shigella	1 - 3 days, range 12 - 96 hours	Contaminated food or water, person-to-person
Trichinosis	8 - 15 days, range 5 - 45 days	Raw or undercooked pork or wild game meat

Source: Iowa Department of Public Health, Center for Acute Disease Epidemiology http://www.idph.state.ia.us/Code/Foodborne.aspx).

4.5.8.1 Geographic Location/Extent

Pandemics and epidemics do not affect a single geographic location; all of Wright County is equally vulnerable. Transmission can occur anywhere people interact, but locations with higher numbers of individuals create more opportunities for disease to spread. Areas where people gather in close proximity—such as schools, community centers, houses of worship, retail corridors, and major employers—are especially susceptible to elevated spread. Public transit routes and regional mobility also contribute to the risk of rapid spread throughout the planning area. The potential extent of each type of human disease is described in the sections above.

4.5.8.2 Previous Occurrences

Pandemics and epidemics have had recurring and widespread effects on the County and across the world. While some events have been global in scale and others more localized, each has highlighted the vulnerability of the community to infectious disease and underscored the importance of preparedness and coordinated response. Since 1918, there have been multiple major epidemics or pandemics that are widely recognized by both the CDC and WHO, in addition to the COVID-19 pandemic. There have been four acknowledged pandemics in the past century:

- **2020 COVID-19 Pandemic** – The COVID-19 pandemic caused by the novel coronavirus SARS-CoV-2, which began in early 2020. COVID-19 triggered an unprecedented public health crisis that lasted over three years, with residual impacts that continue today. In Iowa, from 2020 to 2023, COVID-19 caused almost 900,000 infections and over 10,000 deaths. [24] To reduce transmission of the virus, stay-at-home orders were issued, business and school closed, testing and vaccination campaigns began, and the government issued public health advisories and emergencies. Local businesses, particularly small retail and industrial employers that make up a significant portion of the County's economy, faced extended disruptions. Schools transitioned to remote learning for significant periods, affecting families and students across the community. Healthcare facilities across the region reported overcapacity, requiring the redirection of patients and the mobilization of emergency resources. Mortality and morbidity rates within the County reflected the broader county pattern, with disproportionate impacts on older adults, essential workers, and residents with preexisting conditions.
- **2009 H1N1 Influenza**—The 2009 H1N1 Pandemic Influenza caused 659 hospitalizations with lab confirmed H1N1 since 9/1/09 and resulting in 41 fatalities. Typically, people who became ill were the elderly, the very young and people with chronic medical conditions and high-risk behaviors.
- **1977-1978 Flu Epidemic** - In 1977, the Soviet Union (Union of Soviet Socialist Republics [USSR]) notified the World Health Organization (WHO) about an outbreak of H1N1

[24] https://usafacts.org/answers/how-did-covid-19-affect-people-in-the-us/state/iowa/

influenza, which later spread to many countries. The H1N1 strain of 1977 reappeared after being absent from the world for over 20 years.

- **1968–69 Hong Kong flu (H3N2)** —This strain caused approximately 34,000 deaths in the United States and more than 700,000 deaths worldwide. It was first detected in Hong Kong in early 1968 and spread to the United States later that year. Those over age 65 were most likely to suffer fatal consequences. This virus returned in 1970 and 1972 and still circulates today.
- **1957–58 Asian flu (H2N2)** —This virus was quickly identified because of advances in technology, and a vaccine was produced. Infection rates were highest among school children, young adults and pregnant women. The elderly had the highest rates of death. A second wave developed in 1958. In total, there were about 70,000 deaths in the United States. Worldwide deaths were estimated between one and two million.
- **1918–19 Spanish flu (H1N1)** —This flu is estimated to have sickened 20-40 percent of the world's population. Over 20 million people lost their lives. Between September 1918 and April 1919, 500,000 Americans died. The flu spread rapidly; many died within a few days of infection, others from secondary complications. The attack rate and mortality was highest among adults 20-50 years old; the reasons for this are uncertain.

Table 4.38 provides the number of common reportable diseases in Wright County from 2015 to 2023.

TABLE 4.38 IOWA COMMON REPORTABLE DISEASES BY YEAR IN WRIGHT COUNTY

2015	2016	2017	2018	2019	2020	2021	2022	2023
3286	4916	3894	5356	4629	3367	3797	3444	3969

Source: Iowa Department of Public Health, Center for Acute Disease Epidemiology Annual Reports. 2015-2023, https://publications.iowa.gov/51602/1/Reportable%20Diseases%20By%20Year%201930%20-%202023.pdf

4.5.8.3 Probability of Future Occurrence

The likelihood of future pandemics or large-scale epidemics caused by novel pathogens is difficult to quantify with precision, but historical experience provides a reliable guide. Since 1918, there have been multiple global influenza pandemics. This recurrence demonstrates that while such events are relatively rare on an annual basis, they occur with enough regularity to be anticipated within the lifespan of a multi-decade planning horizon.

Based on observed historical frequency, the annual probability of a novel pandemic or epidemic affecting Wright County can be classified as **Possible**. Although multiple years may pass without significant new outbreaks, the emergence of another pandemic during the coming decades could occur. Factors that elevate this probability include global air travel, high-density living conditions, and close economic and social ties that increase exposure pathways.

Climate Change

Climate conditions can influence the spread of infectious diseases, and changes to these conditions can lead to new patterns. Temperature differences can affect where insect populations live and the diseases they may carry. Insects such as fleas, ticks, and mosquitoes can carry diseases like Lyme, West Nile, Malaria, and Zika. Additionally, changes in climate can increase the likelihood of new viruses occurring or mutating in different animal species and infecting humans.

4.5.8.4 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

Although infectious diseases do not respect geographic boundaries, several populations in Wright County are at specific risk to infectious diseases. Communicable diseases are most likely to spread quickly in congregate settings like the county's nursing homes, jails, and universities (45 within 100 miles of the County). The magnitude of an infectious disease outbreak is related to the ability of the public health and medical communities to stop the spread of the disease. Most disease outbreaks that cause critical numbers of deaths are communicable in nature, meaning that they are spread from person to person. Therefore, human disease poses a **Medium** risk to the County.

Critical Facilities

Infectious disease outbreaks can significantly disrupt the operation of critical facilities in Wright County. Healthcare facilities, including hospitals, clinics, and long-term care centers, are particularly vulnerable due to increased patient loads, limited surge capacity, and potential shortages of staff and medical supplies. These facilities must maintain continuity of operations while implementing infection control measures, such as isolation protocols and PPE usage.

Other essential facilities, such as emergency operations centers, law enforcement agencies, schools, and correctional institutions, may experience staffing shortages due to illness or quarantine, which can impair their ability to deliver vital services. Facilities that serve vulnerable populations are at heightened risk and require targeted mitigation strategies. Additionally, disruptions to communication systems, sanitation infrastructure, and supply chains can compound the impact, emphasizing the need for coordinated planning and resource support to ensure resilience during infectious disease events. **Table 4.39** details the potential vulnerabilities of lifelines from infectious diseases.

TABLE 4.39 POTENTIAL VULNERABILITIES OF LIFELINES FROM INFECTIOUS DISEASES

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		High demand for public messaging and coordination stresses communication infrastructure. Misinformation can undermine public trust and compliance.
Energy (Power & Fuel)		Utility operations may be impacted by absenteeism and increased demand for residential energy use.
Food, Hydration, Shelter		Supply chain interruptions affect food availability and distribution. Increased demand for sheltering and sanitation services in vulnerable populations.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Hazardous Materials		Increased generation of medical and biohazard waste requires enhanced handling and disposal protocols.
Health & Medical		Surge in demand for healthcare services strains hospitals, clinics, and long-term care facilities. Shortages of staff, PPE, and isolation space hinder effective response.
Safety & Security		Law enforcement and emergency services face staffing shortages due to illness/quarantine. Continuity of government operations may be disrupted.
Transportation		Reduced workforce and movement restrictions disrupt delivery of goods and access to care. Public transit systems may be limited or suspended.
Water & Wastewater Systems		Workforce shortages due to illness can disrupt operations, maintenance, and water quality monitoring. Wastewater can carry infectious agents shed in human waste, posing risks to workers and communities if not properly treated.

People

Wright County face notable vulnerabilities during a human infectious disease event due to a combination of environmental, healthcare, and socioeconomic factors. Transmission risks are heightened by close human contact, contaminated surfaces, and limited access to sanitation in some areas. Populations most at risk include the elderly, immuno-compromised individuals, and frontline workers. The County's rural nature may limit healthcare surge capacity, making it harder to manage widespread outbreaks. Additionally, risk will vary based on geographical vaccination efforts and vaccination uptake by communities and individuals.

Currently, there have been threats of cuts to some federal funding which could impact funding to rural hospitals which would further increase vulnerability to hospital and healthcare systems but also the subsequent impacts to those seeking medical care. Federal funding cuts can worsen impacts and could increase risk to health ailments from infectious diseases.

Detection and response efforts depend heavily on early surveillance, laboratory testing, and coordinated communication across jurisdictions. However, challenges such as misinformation, public distrust, and uneven preparedness across counties can hinder containment. Socioeconomic barriers, like poverty, limited

transportation, and inadequate housing, further increase vulnerability, making it essential for emergency planners to prioritize outreach, resource distribution, and community. Additionally, insurance, access to healthcare, as well as trust in the medical community can determine risk to population which can increase infection rates, hospitalizations, and mortality. [25] According to the Iowa Health and Human Services, Wright County has a 41.3% of adults who have a BMI of 30.0 or higher and 11.0% live below the poverty rate which may increase risk of disease.

Natural, Cultural, and Historic Resources

Cultural institutions such as museums, historic sites, and art galleries may be closed or operate at reduced capacity during a pandemic. This can lead to decreased access to cultural resources for the public. Cultural organizations often rely on visitor revenue and donations to sustain operations. Reduced visitation and economic uncertainty during a pandemic can strain the financial stability of these institutions, impacting their ability to preserve cultural resources. Cultural resource preservation and restoration projects may be delayed or postponed due to budget constraints and public health restrictions, potentially leading to deterioration of historic buildings and artifacts. Archives, libraries, and repositories of cultural heritage materials may face disruptions in operations, making it difficult to access and preserve historical records and documents.

Structures and Systems

Infectious disease events can significantly impact critical infrastructure and systems, especially in rural and resource-limited areas. Healthcare facilities may face strain due to increased patient loads, limited surge capacity, and potential shortages of personal protective equipment (PPE), isolation space, and trained personnel. Public health systems must rapidly scale up surveillance, testing, and contact tracing, which can overwhelm local capabilities. If the outbreak exceeds the State of Iowa's capacity, IEMA may activate the State Emergency Operations Center to coordinate a broader response. In the case of COVID-19, the pandemic was on a global scale and required the support from the federal government in terms of resources and funds.

Beyond healthcare, infectious disease events can disrupt transportation systems, supply chains, and essential services. For example, absenteeism among workers due to illness or quarantine can affect utilities, emergency services, and food distribution. Communication systems must handle increased demand for public messaging and coordination among agencies. Schools, correctional facilities, and long-term care centers are particularly vulnerable due to close-contact environments. Additionally, environmental systems, such as water and waste management, may be stressed by increased medical waste and sanitation needs. These cascading impacts highlight the importance of integrated planning across public health, emergency management, and infrastructure sectors.

Additionally, infectious disease outbreaks and pandemics can cause million or billions of dollars in losses to the economy. The United States government released the Coronavirus Aid, Relief, and Economic Security Act (CARES Act), which aimed to provide direct financial support to mitigate economic strain. The CARES Act also introduced additional relief programs specifically designed to support lower-income households, addressing the disproportionately severe impact of the pandemic on economically vulnerable people. [26]

Future Development

The population in Wright County is declining and thus there are fewer people to potential fall ill from a human disease. However, population has increased in the cities which may increase risk and transmission of disease as people live closer together than rural areas. Additionally, 20.9 percent of the population is

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[25] World Health Organization. 2020 Oct 13. Impact of COVID-19 on people's livelihoods, their health and our food systems. Whoint. https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people.

[26] Safirta M. 2024 Nov 25. COVID-19 and the Economy: A Comprehensive Analysis – Michigan Journal of Economics. Umichedu. https://sites.lsa.umich.edu/mje/2024/11/25/covid-19-and-the-economy-a-comprehensive-analysis/.

over 65 years old, and those over 65 are more susceptible to health complications as a result of disease. Overall, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years.

Hazard Summary by Jurisdiction

Due to disease spreading more quickly in areas with high density, the cities, and the public-school districts were given a magnitude of 3. The unincorporated county and cities with smaller populations were given a magnitude of 2. The rest of the elements are not varied across jurisdictions. More details can be found in **Table 4.40**.

TABLE 4.40 HUMAN DISEASE HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	2	2	2	4	2.20	Moderate
Belmond	2	2	2	4	2.20	Moderate
Clarion	2	2	2	4	2.20	Moderate
Dows	2	2	2	4	2.20	Moderate
Eagle Grove	2	2	2	4	2.20	Moderate
Galt	2	2	2	4	2.20	Moderate
Goldfield	2	2	2	4	2.20	Moderate
Rowan	2	2	2	4	2.20	Moderate
Woolstock	2	2	2	4	2.20	Moderate
Belmond-Klemme CSD	2	3	2	4	2.50	Moderate
Clarion-Goldfield-Dows CSD	2	3	2	4	2.50	Moderate
Eagle Grove CSD	2	3	2	4	2.50	Moderate

4.5.9 INFRASTRUCTURE FAILURE

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
4	2	4	3	3.30	High

Critical infrastructure involves several different types of facilities and systems including electric power, transportation routes, natural gas and oil pipelines, water and sewer systems, storage networks and internet/telecommunications systems. Failure of utilities or other components of the infrastructure in the planning area can seriously impact public health, functioning of communities and the economy. Disruption of any of these services could result from the majority of the natural, technological, and manmade hazards described in this plan. In addition to a secondary or cascading impact from another primary hazard, utilities and infrastructure can fail as a result of faulty equipment, lack of maintenance, degradation over time, or accidental damage such as damage to buried lines or pipes during excavation.

Communications Failure

Communications failure is the widespread breakdown or disruption of normal communication capabilities. This could include major telephone outages, internet interruption, loss of cellular telephone service, loss of local government radio facilities, long-term interruption of electronic broadcast services, or emergency 911. Law enforcement, fire, emergency medical services, public works, and emergency warning systems are just a few of the vital services which rely on communications systems to effectively protect citizens. In addition, business and industry rely heavily on various modes of communication. Mechanical failure, traffic accidents, power failure, line severance, and weather can all affect communications systems and disrupt service. Disruptions and failures can range from localized and temporary to widespread and long-term.

The types of hazards and impacts to internet and telecommunications infrastructure are very similar to electric power supply. Land line and phone lines often utilize the same poles as electric lines. So, when weather events such as windstorms or winter weather cause lines to break, both electricity and telephone services experience outages. With the increasing utilization of cellular phones, hazard events such as tornados that can damage cellular repeaters can cause outages. In addition, during any hazard event, internet and telecommunications systems can become overwhelmed due to the surge in call and usage volume.

Energy Failure

Energy failure includes interruption of service to electric, petroleum, or natural gas. Disruption of electric power supply can be a cascading impact of several other hazards. Electric power is the type of energy failure that is most often a secondary impact of other hazard events. The most common hazards analyzed in this plan that disrupt power supply are flood, tornado, windstorm, and winter weather as these hazards can cause major damage to power infrastructure. To a lesser extent, extreme temperatures, dam failure, lightning, and terrorism can disrupt power. Extreme heat can disrupt power supply when air conditioning use spikes during heat waves which can cause brownouts. Lightning strikes can damage substations and transformers but is usually isolated to small areas of outage. Many forms of terrorism could impact power supply either by direct damage to infrastructure or through cyber-terrorism targeting power supply networks.

Hazards that can impact natural gas and oil pipelines are earthquake, expansive soils, land subsidence, landslide, and terrorism. All these hazards are not profiled with the exception of terrorism.

Other Utility Failure

Interruption of other utilities such as water and sewer systems can be a devastating, costly impact. The primary hazards that can impact water supply systems are drought, flood, hazardous materials, and

terrorism. Winter storms can also impact water supply if low temperatures cause failure and breakage of water infrastructure. The primary hazard that impacts sewer systems is flood.

Structural Failure / Structure Fire

The collapse (partial or total) of any structure including roads, bridges, towers, and buildings is considered a structural failure. A road, bridge, or building may collapse due to the failure of the structural components or because the structure was overloaded. Natural events such as heavy snow may also cause the roof of a building to collapse (under the weight of snow).

A structural fire is an uncontrolled fire in a populated area that threatens life and property and is beyond normal day-to-day response capability. Structural fires present a far greater threat to life and property and the potential for much larger economic losses. Modern fire codes and fire suppression requirements in new construction and building renovations, coupled with improved fire-fighting equipment, training, and techniques lessen the chance and impact of a major urban fire. Most structural fires occur in residential structures, but the occurrence of a fire in a commercial or industrial facility could affect more people and pose a greater threat to those near the fire or fighting the fire because of the volume or type of the material involved. Less severe structural fires are almost a common occurrence in some communities.

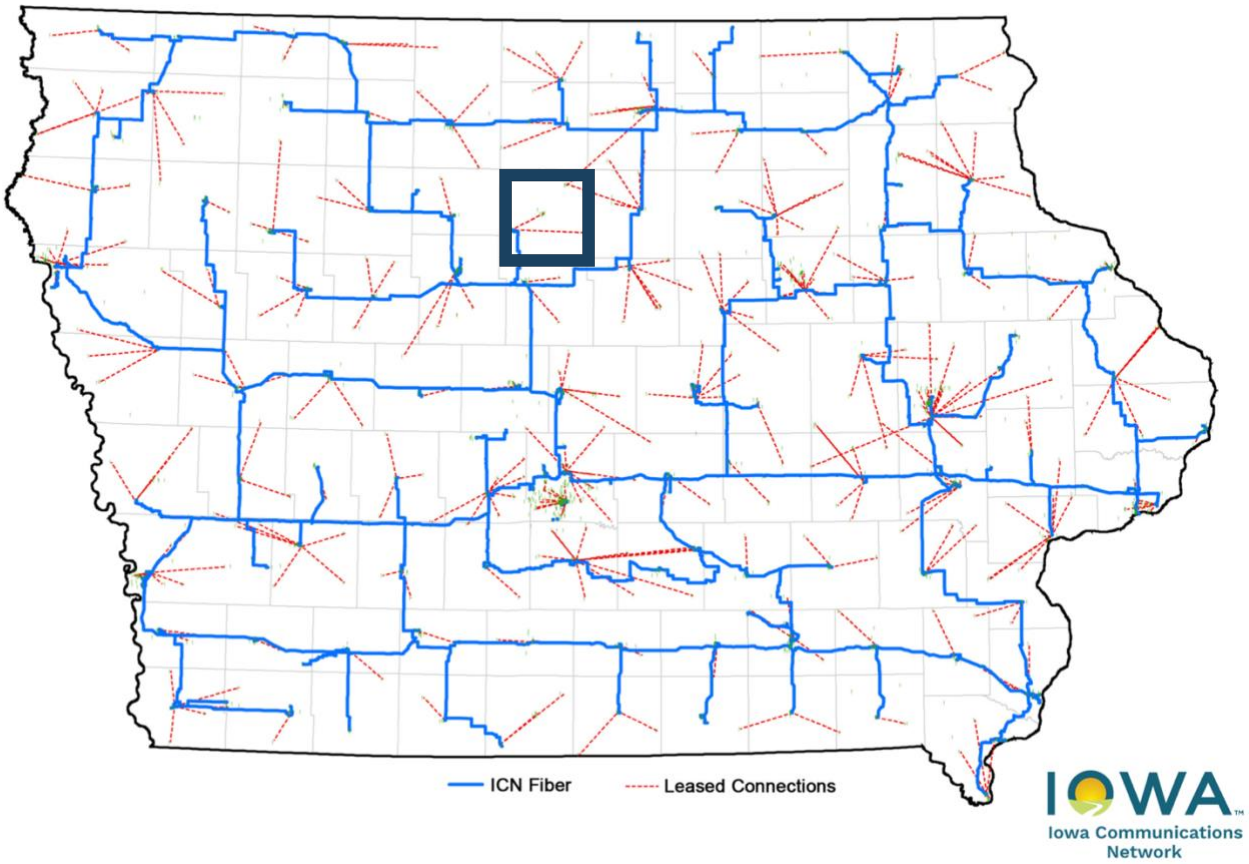
4.5.9.1 Geographic Location/Extent

The entire planning area is at risk to all types of infrastructure failure included in the hazard description section, either from primary failure due to malfunction, degradation, or accidental or intentional damage or as a result of a secondary impact related to another hazard event. Extent of these failures can range from scattered outage to the complete failure of these systems countywide.

Communications

Figure 4.24 shows the Iowa Communications Network (ICN) that administers Iowa's statewide fiber optic telecommunications network. The County outlined in blue is Wright County which has ICN fibers and leased connections.

FIGURE 4.24 MAP OF IOWA COMMUNICATION NETWORK

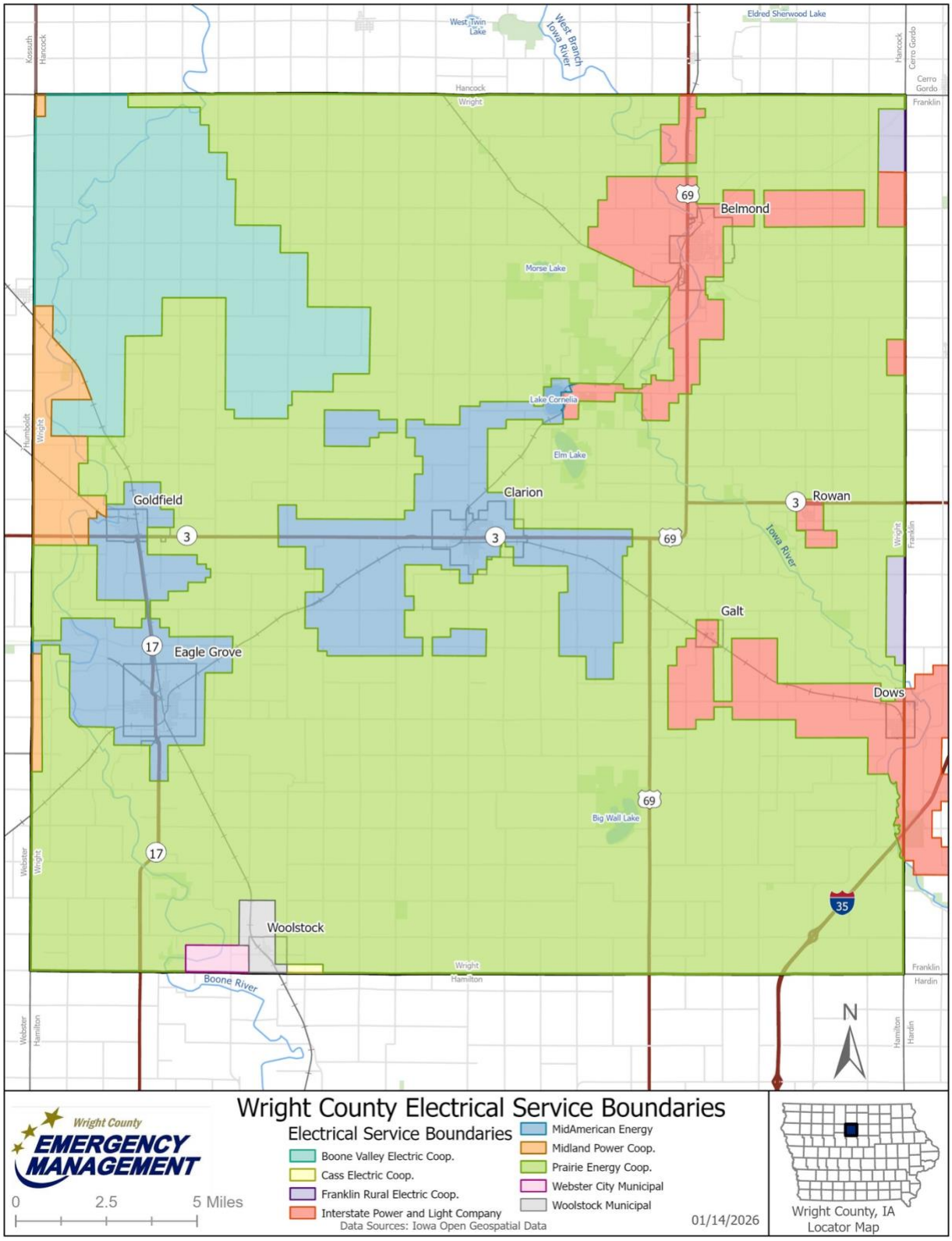


Source: Iowa Communications Network

Energy

Power outages can occur in rural areas with more frequency than in more developed areas. A loss of electric power can also interrupt supply of water from a well. Food in freezers or refrigerators may also be lost. Power outages can cause problems with computers and other devices as well. **Figure 4.25** is the electrical service area map for Wright County. The majority of Wright County is served by Prairie Energy Cooperation.

FIGURE 4.25 ELECTRICAL SERVICE AREAS IN WRIGHT COUNTY



Other Utilities (Water/Sewer)

There are seven Community Public Water Supplies in Wright County, Iowa as follows:[27]

- Belmond Water Supply (serves 2463)
- Clarion Water Supply (serves 2810)
- Dows Water Supply (serves 526)
- Eagle Grove Water Supply (serves 3601)
- Goldfield Water Supply (serves 634)
- Rowan Muni Water Supply (serves 124)
- Woolstock Water Supply (serves 144)

There are 11 permitted wastewater treatment discharge sites in Wright County, Iowa according to the Department of Natural Resources (see **Table 4.41**).

TABLE 4.41 PERMITTED WASTEWATER SITES IN WRIGHT COUNTY

Facility Name	Facility City	Permit Type	Class	Sic Code	Treatment Type
AG Processing Inc.- Energy Center	Eagle Grove	Industrial	Minor	2075	No Treatment
Belmond City of STP	Belmond	Municipal	Minor	4952	Activated Sludge
Centrium Valley Farms, LLP	Dows	Operation	Minor	2015	Land Application
Clarion, City of STP	Clarion	Municipal	Minor	4952	Aerated Lagoon
Corn, LP	Goldfield	Industrial	Minor	2869	No Treatment
Daybreak Foods Vincent Farm	Eagle Grove	Operation	Minor	0252	Aerated Lagoon
Dows City of STP	Dows	Municipal	Minor	4952	Aerated Lagoon
Eagle Grove, City of STP	Eagle Grove	Municipal	Major	4952	Rotating Biological Contactor
Goldfield City of STP	Goldfield	Municipal	Minor	4952	Waste Stabilization Lagoon
Lake Cornella Sanitary District	Clarion	Municipal	Minor	4952	Waste Stabilization Lagoon
Renwick City of STP	Renwick	Municipal	Minor	4952	Waste Stabilization Lagoon

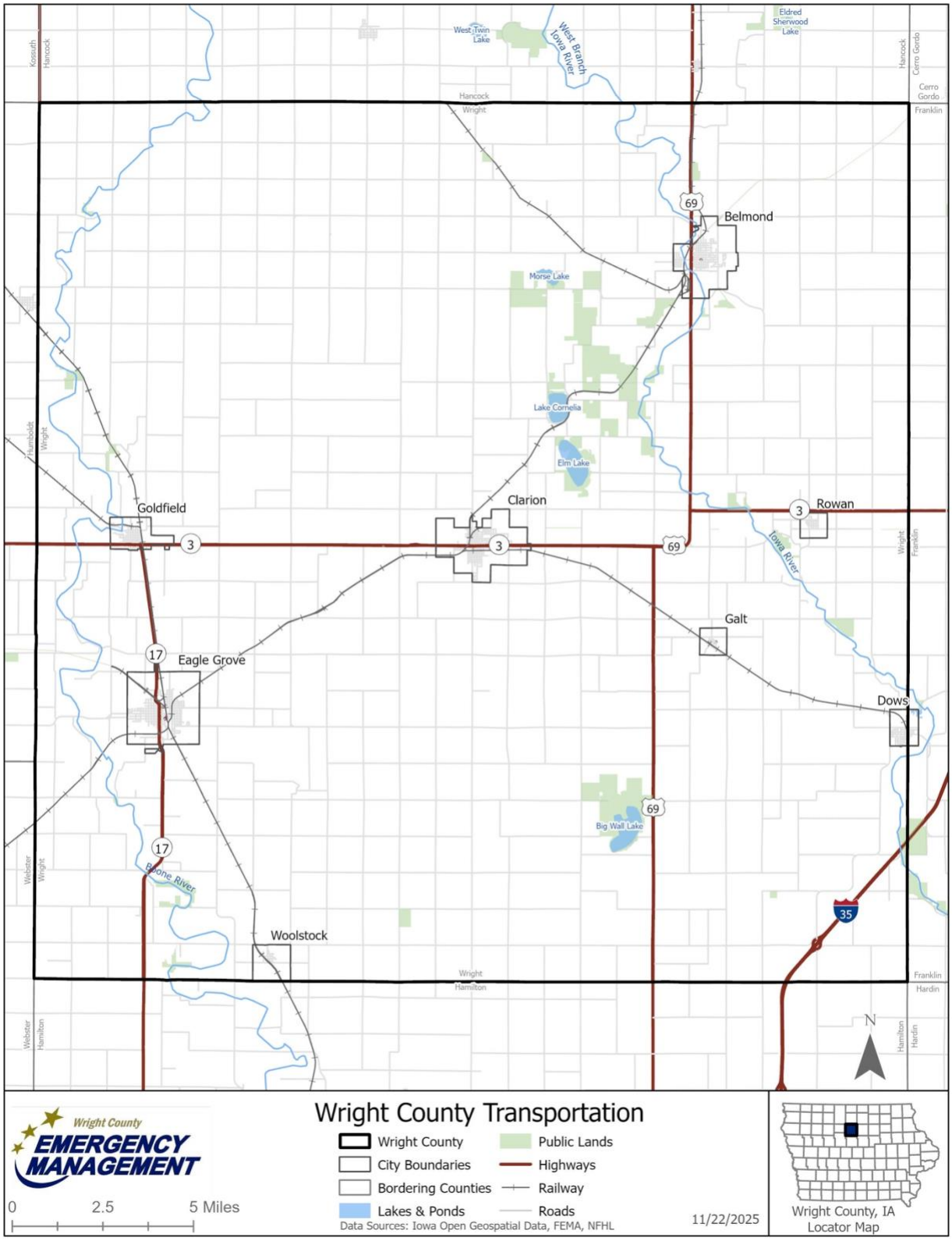
Source: Iowa Department of Natural Resources, http://www.iowadnr.gov/Environmental-Protection/Water-Quality/NPDES-Wastewater-Permitting/Current-NPDES-Permits

Infrastructure/Structures

The Highway map for Wright County is provided in **Figure 4.26**. The major highways that run through the County include Highway 3, 69, 17 and Interstate 35.

[27] Public Water Supply Search - Iowa Drinking Water. 2026. Iowadnrgov. [accessed 2026 Jun 16]. https://programs.iowadnr.gov/iowadrinkingwater/Search/pwsSearch?mapcounty=Ida.

FIGURE 4.26 WRIGHT COUNTY HIGHWAYS



4.5.9.2 Previous Occurrences

As indicated in the Hazard Description Section, Infrastructure Failure often occurs as a secondary impact to other hazard events. For specific descriptions, please see the Previous Occurrences section of the other hazards included in this plan. In addition to failure/impacts as a result of other hazard events, Infrastructure Failure can also occur as a result of lack of maintenance, human error, and age deterioration. There have been no significant, independent infrastructure failures reported in Wright County, outside of outages occurring as usual secondary impacts of other hazards.

4.5.9.3 Probability of Future Occurrences

As discussed in other hazard sections in this plan, infrastructure failure occurs as a secondary or cascading impact from several primary hazards such as winter storm, wind storm, and tornado as well as lack of maintenance and age deterioration and other human-caused incidents such as human error, and various forms of terrorism. Structure fire events also occur annually. Therefore, the HMPC determined the probability of future occurrence of this hazard to be **Highly Likely**.

4.5.9.4 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

Iowans purchase oil, coal, and natural gas from outside sources and therefore are vulnerable to their energy disruptions. However, renewables also provide most of Iowa's electricity. In 2024, about two-thirds of the state's total electricity net generation came from renewable resources, almost all of it from wind. Iowa is the top fuel ethanol-producing state in the nation and has slightly more than one-fourth of the nation's total fuel ethanol production capacity. The state's 42 ethanol plants can produce about 5 billion gallons per year, which is about 28 times greater than the 178 million gallons of ethanol consumed annually in the state[28].

In addition to potential energy failures, communication outages and disruption to water and sewer due to primary or secondary impacts from hazards are commonplace and may affect the entire County. Therefore, infrastructure failure poses a **High** risk to the County.

Critical Facilities

Infrastructure failure can poses a variety of impacts to all community lifelines including communication, energy, and transportation. **Table 4.42** details the impacts that infrastructure failures can pose on all community lifelines.

TABLE 4.42 POTENTIAL VULNERABILITIES OF LIFELINES FROM INFRASTRUCTURE FAILURE

[28] United States - U.S. Energy Information Administration (EIA). 2024. Eiagov. https://www.eia.gov/states/IA/analysis.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		Infrastructure failure can include communication failure which can threatens community and human lives, especially concerning emergency response and services.
Energy (Power & Fuel)		The interruption itself directly impacts this lifeline. Restoring these services swiftly is critical for the functioning of all other community aspects.
Food, Hydration, Shelter		Food and water can be disrupted from infrastructure failure impacting the food supply chain and distribution as well as impacting access to clean drinking water.
Hazardous Materials		Preventing hazardous materials is partially depending on functioning infrastructure. Failure to infrastructure can increase risk of a hazardous materials incident.
Health & Medical		Hospitals and healthcare facilities rely heavily on utilities. Power outages can affect medical equipment, refrigeration of medicines, and comfort of patients. Backup systems are crucial for maintaining healthcare operations during interruptions.
Safety & Security		Utility disruptions can compromise safety systems, street lighting, and security alarms, increasing risks for accidents and crime. Emergency services must adapt to these challenges, ensuring public safety in the absence of regular utilities.
Transportation		Traffic control systems, public transit, and fuel stations rely on utilities. Disruptions can lead to traffic congestions, accidents, and hinder the mobility of residents and emergency responders.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Water & Wastewater Systems		Infrastructure failure can include failure to water and wastewater systems which can pose a significant health risk to the community.

People

Infrastructure failures may disproportionately impact individuals whose health relies on electricity such as individuals with certain medical conditions. Additionally, power outages can leave individuals physically vulnerable to extreme cold and heat events. Older adults, individuals with disabilities, young children, and individuals with certain medical conditions are at elevated risk to injury or even death. Infrastructure failures such as communication and power outages are common and have impacted Wright County residents in the past and is likely to continue to in the future.

Natural, Historic, and Cultural Resources

Infrastructure failures have a limited impact to natural, historic, and cultural resources. Secondary impacts of infrastructure failures such as fires due to ruptured gas pipelines and contamination from wastewater, may pose a greater risk to these resources.

Structures

Since utility and infrastructure failure is generally a secondary or cascading impact of other hazards, it is not possible to quantify estimated potential losses specific to this hazard due to the variables associated with affected population, duration of outages, etc. In some instances, failure of one system can impact others. For example, the loss of electricity may also lead to the loss of internet connectivity which is the greatest concern.

Future Development

Increases in development and population growth would increase the demand for utilities and use of infrastructure as well as the level of impacts when the utilities or infrastructure fail.

As technological advances are made and systems become more and more automated and dependent on power and communications infrastructure, the impacts of infrastructure failure could increase even though population is decreasing slightly. Overall, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years.

Hazard Summary by Jurisdiction

All jurisdictions within the planning area are at risk to infrastructure failure. For more details see **Table 4.43**.

TABLE 4.43 INFRASTRUCTURE FAILURE HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	4	2	4	3	3.30	High
Belmond	4	2	4	3	3.30	High
Clarion	4	2	4	3	3.30	High

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Dows	4	2	4	3	3.30	High
Eagle Grove	4	2	4	3	3.30	High
Galt	4	2	4	3	3.30	High
Goldfield	4	2	4	3	3.30	High
Rowan	4	2	4	3	3.30	High
Woolstock	4	2	4	3	3.30	High
Belmond-Klemme CSD	4	2	4	3	3.30	High
Clarion-Goldfield-Dows CSD	4	2	4	3	3.30	High
Eagle Grove CSD	4	2	4	3	3.30	High

4.5.10 RIVER FLOODING

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
4	3	1	4	3.25	High

Many of the communities in Iowa were settled and developed largely because of their proximity to water resources. A flood is partial or complete inundation of normally dry land areas. Heavy precipitation can cause flooding either in the region of precipitation or in areas downstream.

Heavy accumulations of ice or snow can also cause flooding during the melting stage. These events are complicated by the freeze/thaw cycles characterized by moisture thawing during the day and freezing at night. There are two main types of flooding in the planning area: river flooding and flash flood which includes ice jam flooding. Flash flood is discussed separately in **Section 4.5.5**.

River flooding is defined as the overflow of rivers, streams, drains and lakes due to excessive rainfall, rapid snowmelt or ice melt. The areas adjacent to rivers and stream banks that carry excess floodwater during rapid runoff are called floodplains. A floodplain is defined as the lowland and relatively flat area adjoining a river or stream. The terms "base flood" and "100-year flood" refer to the area in the floodplain that is subject to a one percent or greater chance of flooding in any given year. Floodplains are part of a larger entity called a basin, which is defined as all the land drained by a river and its branches.

Gauges along streams and rain gauges throughout the state provide for an early flood warning system. River flooding usually develops over the course of several hours or even days depending on the basin characteristics and the position of the particular reach of the stream.

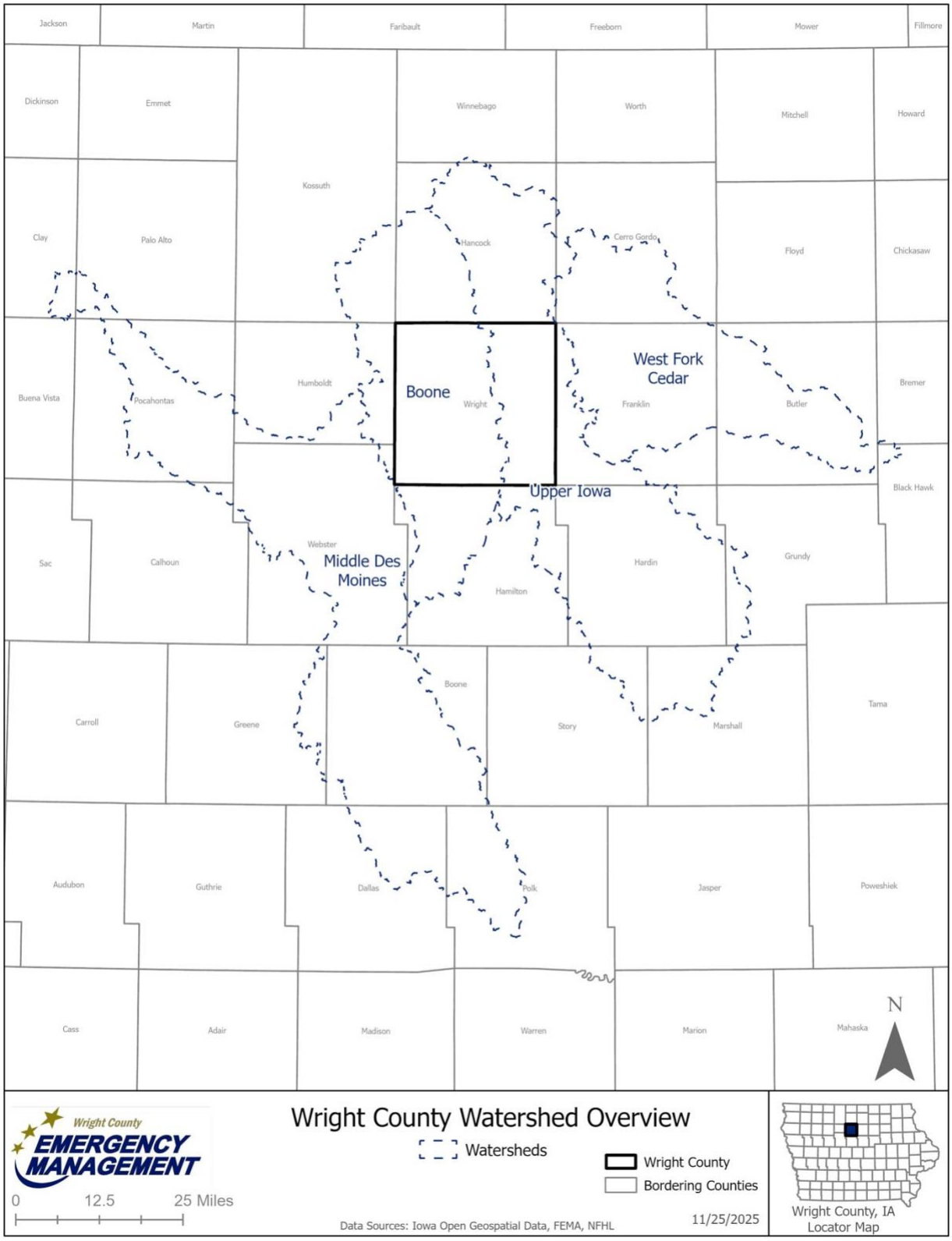
The National Weather Service provides flood forecasts for Iowa. Flood warnings are issued over emergency radio and television messages as well as the NOAA Weather Radio. People in the paths of river floods may have time to take appropriate actions to limit harm to themselves and their property.

4.5.10.1 Geographic Location/Extent

Wright County crosses three HUC-8 watersheds as follows (see **Figure 4.27**):

- 07080204 West Fork Cedar; state(s): IA
- 07080207 Upper Iowa; state(s): IA
- 07100005 Boone; state(s): IA

FIGURE 4.27 WRIGHT COUNTY, IOWA WATERSHEDS

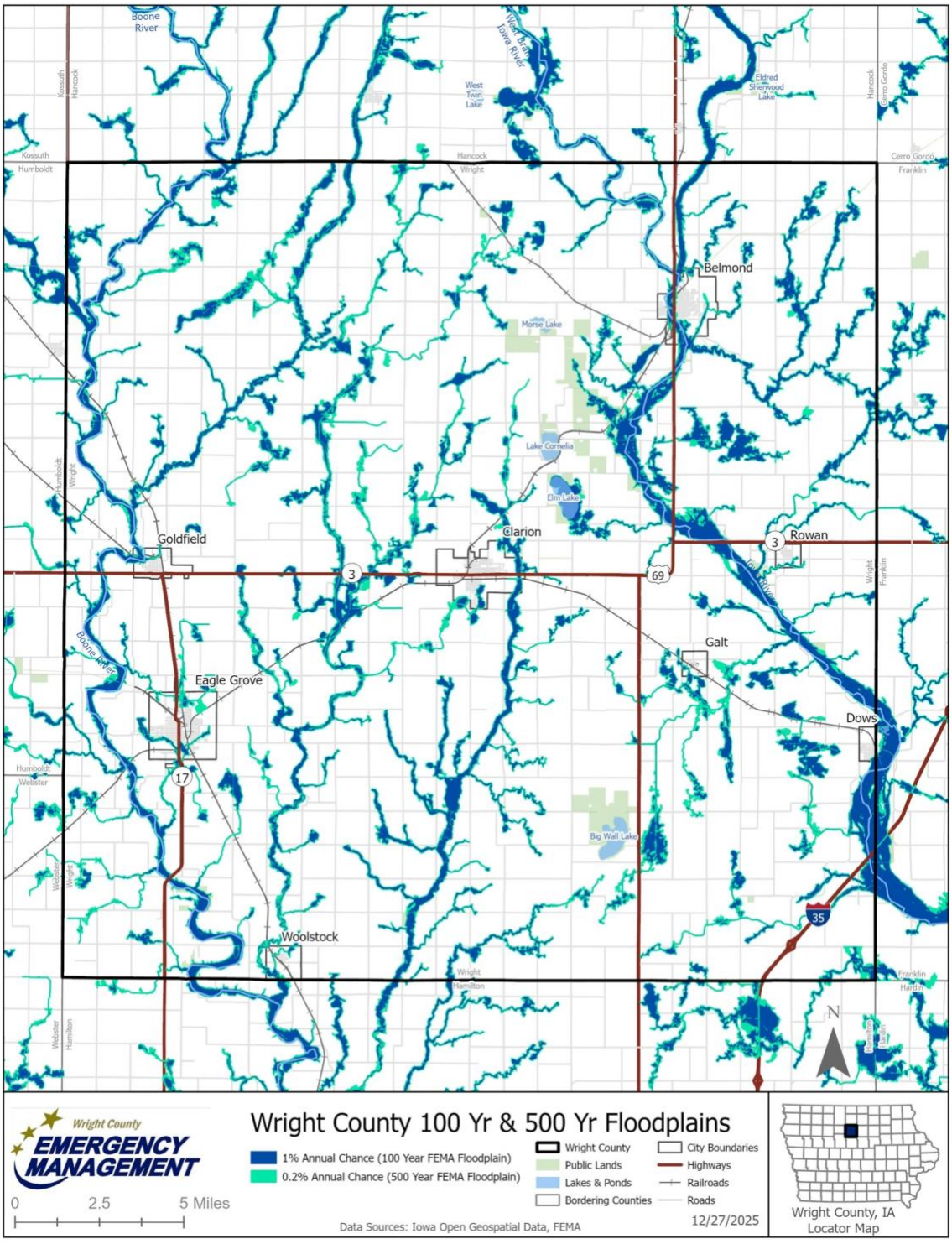


For purposes of this hazard profile and vulnerability analysis, the geographic location and extent for river flooding will be considered as those areas at risk to the 100-year flood (also known as the 1-percent annual chance flood). The 1-percent annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes.

FEMA has identified Special Flood Hazard Areas (SFHA) in the unincorporated county and all incorporated jurisdictions.

Figure 4.28 provides the 1-percent annual chance floodplain for Wright County according to the effective FEMA Flood Insurance Rate Map. The floodplain maps for each of the participating jurisdictions can be found in their respective annex.

FIGURE 4.28 WRIGHT COUNTY 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN



River flooding is among the most significant hazards in the planning area for a variety of reasons. First, the hazard can extend over a relatively large geographic area, threatening a significant number of people and properties. Second, the dangers associated with flooding can quickly become devastating. Just an inch of water can cause tens of thousands of dollars' worth of property damage, and adults can be swept away by as little as six inches of moving water. Furthermore, it only takes a foot of moving water to wash away most cars. The dangers of floodwaters can be deceptive, and it is common for individuals to attempt to drive through water which they perceive as safe. More than half of all flood-related deaths occur as a result of vehicles driving into hazardous floodwater. Third, flooding generally tends to be longer-lasting than many other hazards. It can take days or weeks for floodwaters to recede, and during this time people may be displaced, transportation and utility services will likely be limited, and community activities disrupted.

Based on previous occurrences, river flooding incidents are expected to cause minimal damage to people and property in Wright County and mainly contained around rivers and streams, to damaging crops, closing highways, and flooding properties. Previous flood events have produced rainfall totaling from two to six inches in the County.

4.5.10.2 Previous Occurrences

This section provides information on previous occurrences of river flooding in the planning area.

Disaster Declarations for Flooding in Planning Area

Disaster declarations due to flooding in Wright County are listed in **Table 4.44**. Since 1965, there have been 16 disaster declarations due to flooding.

TABLE 4.44 DISASTER DECLARATIONS DUE TO FLOODING (1965-2024)

DISASTER NUMBER	DECLARATION DATE	TITLE	INCIDENT BEGIN DATE	INCIDENT END DATE
193	4/22/1965	Flooding	4/22/1965	4/22/1965
248	8/4/1968	Heavy Rains & Flooding	8/4/1968	8/4/1968
269	8/14/1969	Heavy Rains & Flooding	8/14/1969	8/14/1969
996	7/9/1993	Severe Storms & Flooding	4/13/1993	10/1/1993
1230	7/2/1998	Severe Storms, Tornadoes and Flooding	6/13/1998	7/15/1998
1518	5/25/2004	Severe Storms, Tornadoes, and Flooding	5/19/2004	6/24/2004
996	7/9/1993	Severe Storms & Flooding	4/13/1993	10/1/1993
1763	5/27/2008	Severe Storms, Tornadoes, and Flooding	5/25/2008	8/13/2008
1930	7/29/2010	Severe Storms, Flooding, and Tornadoes	6/1/2010	8/31/2010
4126	7/2/2013	Severe Storms, Tornadoes, and Flooding	5/19/2013	6/14/2013
4184	7/24/2014	Severe Storms, Tornadoes, Straight-Line Winds, and Flooding	6/14/2014	6/23/2014
4234	7/31/2015	Severe Storms, Tornadoes, Straight-Line Winds, and Flooding	6/20/2015	6/25/2015
4289	10/31/2016	Severe Storms and Flooding	9/21/2016	10/3/2016
4386	8/20/2018	Severe Storms, Tornadoes, Straight-Line Winds, and Flooding	6/6/2018	7/2/2018
4421	3/23/2019	Severe Storms and Flooding	3/12/2019	6/15/2019
4784	5/24/2024	Severe Storms, Tornadoes, and Flooding	5/20/2024	5/31/2024

Previous Flood Events

Information from the NCDC was obtained from 1997 to June 2025 to determine previous occurrences for flash flood in the planning area. During this time period there were 72 reported flood incidents. No deaths or injuries were reported for any of the events. Since 1997 there has been $1,828,570 in property damage and $23,378,039 in crop damage. **Table 4.45** provides a summary of the NCDC data. Additionally, NOAA's National Weather Service has issued 41 Flood Warnings products from January 2000 to January 2026.

TABLE 4.45 NCDC WRIGHT COUNTY, IOWA FLOOD EVENTS SUMMARY, 1997-JUNE 2025

Location	Date	Property Damage	Crop Damage
COUNTYWIDE	3/9/97	$0	$0
COUNTYWIDE	3/19/97	$0	$0
COUNTYWIDE	6/21/97	$0	$0
CLARION	6/20/98	$75000	$10000
CLARION	6/29/98	$50000	$10000
COUNTYWIDE	4/6/99	$7000	$0
COUNTYWIDE	4/22/99	$10000	$0
COUNTYWIDE	5/16/99	$200000	$25000
COUNTYWIDE	5/21/99	$50000	$10000
COUNTYWIDE	6/9/99	$50000	$75000
COUNTYWIDE	6/9/00	$25000	$25000
COUNTYWIDE	6/13/00	$20000	$50000
COUNTYWIDE	7/10/00	$50000	$25000
COUNTYWIDE	3/23/01	$7500	$0
COUNTYWIDE	4/1/01	$5000	$0
COUNTYWIDE	4/7/01	$150000	$0
COUNTYWIDE	5/1/01	$75000	$0
COUNTYWIDE	6/12/01	$25000	$50000
COUNTYWIDE	5/4/03	$5000	$0
COUNTYWIDE	5/9/03	$5000	$0
COUNTYWIDE	6/27/03	$5000	$10000
COUNTYWIDE	7/5/03	$10000	$25000
COUNTYWIDE	5/22/04	$100000	$300000
COUNTYWIDE	5/13/05	$30000	$0
COUNTYWIDE	6/26/05	$74070	$50000
COUNTYWIDE	7/26/05	$10000	$30000
COUNTYWIDE	4/1/06	$5000	$0
FLORENCE	4/25/08	$100000	$0
CLARION	6/11/08	$0	$0

Location	Date	Property Damage	Crop Damage
BELMOND	3/12/10	$50000	$0
FLORENCE	6/12/10	$0	$20000000
HOLMES	6/23/10	$100000	$10000
CLARION	6/25/10	$0	$0
BELMOND	6/26/10	$200000	$2000000
BELMOND	7/1/10	$10000	$25000
BELMOND	7/26/10	$0	$0
GOLDFIELD	4/10/13	$0	$0
BELMOND	5/27/13	$50000	$0
EAGLE GROVE	8/17/15	$0	$0
CLARION	5/23/16	$0	$0
CLARION	5/23/16	$0	$0
BELMOND	5/23/16	$0	$0
CLARION	8/11/16	$0	$0
EAGLE GROVE	8/19/16	$0	$0
SOLBERG	9/21/16	$0	$0
CLARION	9/22/16	$0	$0
CLARION ARPT	9/22/16	$0	$0
CORNELIA	9/23/16	$0	$0
BELMOND	9/23/16	$50,000	$100,000
EAGLE GROVE	8/5/18	$0	$0
CLARION	8/5/18	$0	$0
EAGLE GROVE	8/19/18	$0	$0
PALSVILLE	8/26/18	$0	$0
EAGLE GROVE	9/4/18	$0	$0
CLARION ARPT	9/5/18	$100,000	$250,000
CLARION	9/19/18	$0	$0
DOWS	9/19/18	$0	$0
EAGLE GROVE	9/19/18	$0	$0
BELMOND	9/20/18	$25,000	$50,000
CORNELIA	9/21/18	$100,000	$250,000
CORNELIA	3/15/19	$0	$0
EAGLE GROVE	8/20/19	$0	$0
EAGLE GROVE	7/30/21	$0	$0
CLARION	8/20/21	$0	$0
EAGLE GROVE ARPT	6/21/24	$0	$0
SOLBERG	6/22/24	$0	$0
EAGLE GROVE ARPT	6/22/24	$0	$0

Location	Date	Property Damage	Crop Damage
EAGLE GROVE	7/6/24	$0	$0
EAGLE GROVE	7/7/24	$0	$0
EAGLE GROVE	7/7/24	$0	$0
CLARION	7/7/24	$0	$0
SOLBERG	7/7/24	$0	$0

Additional details are provided below to describe previous events for specific jurisdictions: The following section provides details on selected previous occurrences of flooding within the planning area, as reported by NCDC. First, historical events for the county are described, followed by reported events for each city, where available.

Wright County

April 1, 2006 - Minor flooding took place over a large part of northwest and north central Iowa during the month. In actuality, the far northern sites in the upper reaches of the Des Moines River Basin remained above flood stage through the entire month. A significant rainfall event of 2 to 4 inches over a several day period from late March through the 2nd of April resulted in minor flooding along many of the main stem rivers in the northwest and north central counties. The flooding was limited lowland agricultural areas. Damage was very minor. Much of the flooding had subsided by the middle of the month.

Belmond

July 1, 2010 - Widespread flooding from June continued along several river systems across the state into July. For the most part, rivers crested early and then fell slowly during the first week of the month. There was little new flooding, however most of the flooding during early July was on agricultural land.

September 23, 2016 - A generally stationary boundary remained oriented roughly west to east across the state through the evening and overnight hours. As a result, storms initiated along and north of the boundary and provided multiple rounds of heavy rainfall from roughly Ames northward. Rainfall amounts typically resided within the 2 to 5 inch range with a few reports within the 5 to 5.5 inch range. Given the relatively short duration of the rainfall, flash flooding was reported in a number of areas, again ranging from Ames northward. Iowa DOT reported US Highway 69 closed near Belmond due to flooding. A detour was put in place.

September 20, 2018 - More heavy rainfall was seen across the area, primarily situated over the northern third of the state, as a surface boundary sat across central Iowa and a shortwave moved through the upper level flow. Overall, conditions remained ripe and very much summer-like as opposed to mid-September including precipitable water values were around and in excess of 1.7 inches, moderate to strong low level moisture flow. Over a roughly 24 hour period, a number of sites experienced heavy rainfall in the 3 to 4 inch range, with a few reporting as much as 5+ inches. Fortunately, with widespread precipitation and limited instability, storms remained sub-severe during this portion of the heavy rainfall event. By late afternoon and evening, as the surface low progressed across the area, stronger, more organized convection moved across the area and produced severe winds. The severe wind event will be covered by another entry focused on September 20th.

Clarion

June 20, 1998 - A cold front to the west of Iowa moved into the state during the day. Initially, the airmass was quite capped and thunderstorms had a hard time getting going. Thunderstorms formed on the north edge of the cap over Minnesota, with the tail end of the storms reaching into north central Iowa. There was very little severe weather associated with the storms in Iowa. Heavy rain was the major concern as the

ground was already saturated over a large part of the state. Heavy rain of 3 to 5 inches fell over north central Iowa. Five inches of rain was recorded in Scarville, in Winnebago County. Flash flooding was reported around the county with several roads flooded. The line of thunderstorms became more widespread during the later afternoon hours. Rainfall amounts of 2 to 4 inches in a two hour timeframe were reported over a several county area. The City of Iowa Falls reported 4.33 inches of rainfall in about two hours' time.

Urban flooding was reported over several counties from central into northeast Iowa. The only severe reports were from relatively small hail. Three quarter inch diameter hail fell in Story County at Ames, and north of Lake Mills in Winnebago County.

September 5, 2018 - Wet conditions continued across the state with yet another round of moderate to heavy rainfall on top of already mostly saturated conditions. A shortwave moving through the upper level flow out of the southwest, a surface front situated to the west and northwest of the state, and strong 850 mb flow were the main contributors to showers and storms. In the end, a couple of funnel cloud and brief tornado reports were seen across the most favorable areas in northwest Iowa, followed up by nearly exclusively heavy rainfall and flash flooding reports from southwest Iowa into central Iowa and even parts of northern Iowa. Greatest reports included multiple 3+ inch reports across northern and northwest Iowa and 2-day totals in excess of 6 inches into parts of central Iowa.

Previous Agricultural Impacts

Flooding and excess moisture take a toll on crop production in the planning area. According to the USDA's Risk Management Agency, payments for insured crop losses in the planning area as a result of excess moisture and flood conditions from 2016-2025 totaled $15,276,893. This translates to an annual average of $1.527,689. According to USDA Risk Management Agency's 2024 Iowa Crop Insurance Profile, 91 percent of insurable crops in Iowa were insured. **Table 4.46** summarizes the claims paid by year.

TABLE 4.46 CROP INSURANCE CLAIMS PAID IN WRIGHT COUNTY FOR CROP LOSS AS A RESULT OF EXCESS MOISTURE/PRECIPITATION/RAIN AND FLOOD (2016-2025)

Damage Cause	Sum of Indemnity Amount	Sum of Determined Acres
Excess Moisture/Precipitation/Rain		
2016	$244,093.75	3,374.30
2017	$65,013.00	1,219.37
2018	$4,360,221.23	58,863.65
2019	$1,712,889.61	19,639.80
2020	$9,556.00	218.60
2021	$3,052.00	85.70
2022	$9,478.00	209.88
2023	$29,320.00	706.82
2024	$3,858,253.56	45,374.79
2025	$4,858,336.88	46,172.60
Totals	$15,150,214.03	175,865.51
Flood		
2016	$44,884.23	304.65
2017	$0	0
2018	$39,841.60	213.99

Damage Cause	Sum of Indemnity Amount	Sum of Determined Acres
2019	$6,238.00	21.9
2020	$303.00	11
2021	$890.00	25
2022	$0	0
2023	$0	0
2024	$33,652.56	207.61
2025	$870.57	28.56
Total	$126,679.96	812.71
Grand Total	**$15,276,893.99**	**176,678.21**

Source: USDA Risk Management Agency

4.5.10.3 National Flood Insurance Program (NFIP) Participation

Table 4.47 on the following page provides details on NFIP participation for the communities in the planning area as well as the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction, where applicable. The claims information is for the period from January 1, 1978 to Fall 2025.

Repetitive Loss/Severe Repetitive Loss Properties

Repetitive Loss: Repetitive Loss Properties are those properties with at least two flood insurance payments of $5,000 or more in a 10-year period.

Severe Repetitive Loss (SRL): SRL properties are defined it as "a single family property" (consisting of one-to-four residences) that is covered under flood insurance by the NFIP and has incurred flood-related damage for which four or more separate claims payments have been paid under flood insurance coverage with the amount of each claim payment exceeding $5,000 and with cumulative amounts of such claims payments exceeding $20,000; or for which at least two separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.

According to the Iowa Department of Natural Resources, there are no Repetitive Loss or Severe Repetitive Loss Properties in Wright County.

TABLE 4.47 NFIP PARTICIPATION, CURRENT, HISTORICAL POLICY AND CLAIM STATISTICS

Community Name	NFIP Participant	Curr Eff Map Date	Reg Emer Date	Policies In-force	Total Coverage	Historical Claims	Historical Total Payments
Wright County, Iowa	Yes	2/20/2013-M	3/01/2011	4	$1,349,000.00	0	$0
Belmond	Yes	2/20/2013-M	3/01/2011	6	$1,322,000.00	1	$0
Clarion	Yes	2/20/2013-M	5/8/2013	2	$1,115,000.00	0	$0
Dows	Yes	2/20/2013-M	2/20/2013	1	$105,000.00	0	$0
Eagle Grove	Yes	2/20/2013-M	09/04/2003	1	$350,000	0	$0
Galt	No-Sanctioned 2/20/2014	2/20/2013	N/A	N/A	N/A	0	$0
Goldfield	Yes	2/20/2013-M	2/20/2013	1	$350,000.00	1	$2,369.00
Rowan	No-Sanctioned 11/5/1977	2/20/2013	N/A	N/A	N/A	0	$0
Woolstock	No-Sanctioned 6/25/1977	20/20/2013	N/A	N/A	N/A	0	$0

Source: Participation details from NFIP Community Status Book, 10/4/2017; https://www.fema.gov/national-flood-insurance-program-community-status-book; M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program: Policy and Loss Statistics from BureauNet, http://bsa.nfipstat.fema.gov/reports/reports.html;
**Closed Losses are those flood insurance claims that resulted in payment. Loss statistics are for the period from January 1, 1978 to Fall 2025.*

4.5.10.4 Probability of Future Occurrence

According to NCDC, from 1997-2024 there were 50 unique flood events impacting the County. This translates to about two events per year. Therefore, the probability of future occurrence is **Highly Likely**.

4.5.10.5 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

Based on the estimated building and content losses, crop losses, as well as population and critical facilities, impacted, river flooding poses a **High** risk to the County.

HAZUS Methodology

While there has been a slight decrease in population overall and increase in agricultural production, the HMPC decided to keep the HAZUS analysis completed in the previous plan update as the analysis still provides effective information to anticipate potential impacts and losses from flooding. The 2019 HAZUS analysis is provided for Building and Contents Losses, Estimated Population Displaced, and Critical Facilities.

The 2019 analysis included Level 2 enhancements to both the hazard and inventory inputs to the HAZUS model to enhance the accuracy of flood risk modelling as follows:

- Depth Grids provided by University of Iowa's Iowa Flood Center (IFC)
- Parcel layer provided by Wright County
- Assessor's data provided by Wright County

The Depth Grids provided by the IFC were used as the best available data since older FEMA depth grids are difficult to obtain and using the IFC data complements the efforts that the Iowa Homeland Security and Emergency Management Department is doing for the State Plan. It should be noted that the Iowa Flood Center depth grids are very similar to the effective FEMA products however there are some differences in the detailed areas for the 1-percent annual chance floodplain.

Default HAZUS inventories for structures were replaced with data supplied by Wright County using the parcel layer and additional structure attributes in the Assessor's data. GIS was used to create a centroid or point representing the center of the parcel polygon in the parcel layer to represent the location of the primary structure on each parcel. The structure inventory data set was formatted for use in HAZUS using the HAZUS Comprehensive Data Management System (CDMS) tool. This tool syncs data and attributes fields necessary for HAZUS analysis and imports the enhanced data set into the HAZUS study region.

After the hazard and inventory data was imported into HAZUS, analysis was completed to determine the potential losses as a result of a 1-percent annual chance flood. The results of this analysis are provided in the following sections.

Building/Contents Losses

Table 4.48 provides the summary of potential flood loss estimates and impacted population for the 1-percent annual chance flood by jurisdiction based on the HAZUS Level 2 Analysis.

TABLE 4.48 POTENTIAL FLOOD LOSS ESTIMATES, 1-PERCENT ANNUAL CHANCE FLOOD

Jurisdiction	Property Type	Improved Parcel Counts	Improved Losses	Content Losses	Inventory Losses	Total Losses
Belmond	Agriculture	1	$200	$868	$832	$1,900
	Commercial	6	$28,394	$63,270	$40,834	$132,497
	Residential	5	$90,528	$48,099	$0	$138,627
	Total	**12**	**$119,121**	**$112,237**	**$41,666**	**$273,024**
Clarion	Multi-Residential	1	$55,830	$27,033	$0	$82,863
	Residential	20	$222,871	$117,349	$0	$340,220
	Total	**21**	**$278,700**	**$144,382**	**$0**	**$423,082**
Dows	Agriculture	1	$69	$233	$288	$590
	Commercial	3	$422	$1,192	$1,472	$3,087
	Residential	5	$9,297	$3,782	$0	$13,079
	Total	**9**	**$9,788**	**$5,208**	**$1,760**	**$16,756**
Eagle Grove	Agriculture	2	$26	$158	$110	$294
	Commercial	1	$177	$7,093	$9,375	$16,644
	Multi-Residential	2	$36,601	$18,005	$0	$54,605
	Residential	13	$76,076	$40,735	$0	$116,811
	Total	**18**	**$112,880**	**$65,990**	**$9,485**	**$188,355**
Goldfield	Agriculture	1	$693	$2,443	$2,976	$6,112
	Residential	1	$12,410	$7,000	$0	$19,410
	Total	**2**	**$13,103**	**$9,443**	**$2,976**	**$25,522**
Woolstock	Residential	1	$10,410	$4,103	$0	$14,513
	Total	**1**	**$10,410**	**$4,103**	**$0**	**$14,513**
Unincorporated	Agriculture	43	$8,996	$34,672	$39,452	$83,120
	Commercial	1	$3,299	$14,675	$18,028	$36,001
	Residential	53	$1,155,397	$639,207	$0	$1,794,604
	Total	**97**	**$1,167,692**	**$688,554**	**$57,480**	**$1,913,726**
Grand Total		**160**	**$1,711,695**	**$1,029,917**	**$113,366**	**$2,854,978**

Estimated Population Displaced

To estimate population displaced by a 1-percent annual chance flood, the number of residential structures impacted was multiplied by the average household size for each jurisdiction.

According to the HAZUS Level 2 analysis, a total of 298 residential structures and 687 people would be impacted. **Table 4.49** provides the estimated population impacted for each jurisdiction that would have flood losses.

TABLE 4.49 ESTIMATED DISPLACED POPULATION

Jurisdiction	Residential Structures Impacted	Average Household Size	Estimated Displaced Population
Belmond	5	2.24	11
Clarion	220	2.31	508
Dows	5	2.04	10
Eagle Grove	13	2.46	32
Goldfield	1	2.15	2
Woolstock	1	1.83	2
Unincorporated	53	2.29	121
Total	298	--	687

Source: Hazus Analysis, U.S. Census Bureau, American Community Survey 2012-2016 5-Year Estimates

Agricultural Impacts

Additionally, USDA crop insurance claims for excess moisture/precipitation/rain and flood conditions for the ten-year period (2016-2025) totaled $15,276,893.99. Considering that 91 percent of insurable crops are insured in Iowa (2024 Iowa Crop Insurance Profile, USDA, RMA), the adjusted losses calculate to $16,787,795.59 for all insurable crops for the period. This results in an average annual loss estimate of $1,678,779.56 to insurable crops as a result of excess moisture/precipitation/rain and flood conditions affecting agriculture.

Critical Facilities and Infrastructure at Risk

To analyze critical facilities at risk in the planning area, the inventory of critical and essential facilities and infrastructure in the planning area was compiled from various sources including the 2016 Wright County Multi-Jurisdictional Hazard Mitigation Plan, Wright County, HSIP Freedom 2015 and the Iowa Department of Natural Resources (NRGIS). A comparison was made of the facilities in the critical facilities inventory with the FIRM layer to determine those facilities that would be damaged in the 1-percent and 0.2-percent annual chance flood events. This analysis determined that three facilities would be at risk in the 1-percent annual chance floodplain, as detailed in **Table 4.50** below, and none are at risk in the 0.2-percent annual chance floodplain.

TABLE 4.50 CRITICAL FACILITIES AT RISK TO 1-PERCENT ANNUAL CHANCE FLOOD (NFHL DATA)

Jurisdiction	Facility Type
Belmond	Communication
Belmond	Wastewater Facility
Eagle Grove	Tier II Facility

Natural, Historic, and Cultural Resources

Please reference the flash flood section on potential impacts to natural, historic and cultural resources.

Future Development

Any future development in floodplains would increase risk in those areas. For those communities that participate in the National Flood Insurance Program, enforcement of the floodplain management regulations will ensure mitigation of future construction in those areas. There are three NFIP-sanctioned

communities in Wright County: Galt, Rowan, and Woolstock. These communities have mapped Special Flood Hazard Areas but are not regulating development in these areas. Any new development in these areas will potentially increase risk. Overall, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years.

Hazard Summary by Jurisdiction

To demonstrate how river flooding varies additionally by jurisdiction, all jurisdictions that had any structural improvements in the 1-percent annual chance floodplain received a rating of 4 for probability. Magnitude for the county and incorporated cities was based on the loss ratio estimates. Jurisdictions with a loss ratio of less than 1 percent received a magnitude of negligible (1), a loss ratio between 1 percent and 10 percent received a magnitude of limited (2) and a loss ratio over 10 percent received a magnitude of critical (3). For those jurisdictions with no Special Flood Hazard Areas, all elements indicate Not Applicable (N/A) unless other specific infrastructure has been identified as vulnerable in the floodplain. To determine the rankings for the school districts, the critical facility layer of school buildings was compared against the Flood Insurance Rate Map. This analysis revealed no public k-12 school buildings in the 1-percent or 0.2-percent annual chance floodplains. However, because there are areas of high flood risk within the school districts, flooding is still considered applicable and was assigned a probability of occasional and a magnitude of negligible.

The warning time and duration were considered to be 1 and 4 for all jurisdictions to which the flood hazard applies. For more details see **Table 4.51**.

TABLE 4.51 RIVER FLOODING HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	4	3	1	4	3.25	High
Belmond	4	3	1	4	3.25	High
Clarion	4	3	1	4	3.25	High
Dows	4	2	1	4	2.95	Moderate
Eagle Grove	4	3	1	4	3.25	High
Galt	4	1	1	4	2.65	Moderate
Goldfield	4	3	1	4	3.25	High
Rowan	4	1	1	4	2.65	Moderate
Woolstock	4	3	1	4	3.25	High
Belmond-Klemme CSD	4	1	1	4	2.65	Moderate
Clarion-Goldfield-Dows CSD	4	1	1	4	2.65	Moderate
Eagle Grove CSD	4	1	1	4	2.65	Moderate

4.5.11 SEVERE WINTER STORM

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
4	2	3	4	3.25	High

Severe winter storms are an annual occurrence in Iowa. A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, cold temperatures and drifting snow creating blizzards. The National Weather Service describes different types of winter storm events as follows:

- **Blizzard**—Winds of 35 mph or more with snow and blowing snow reducing visibility to less than ¼ mile for at least three hours.
- **Blowing Snow**—Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls**—Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- **Snow Showers**—Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- **Freezing Rain**—Measurable rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Most freezing-rain events are short lived and occur near sunrise between the months of December and March.
- **Sleet**—Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

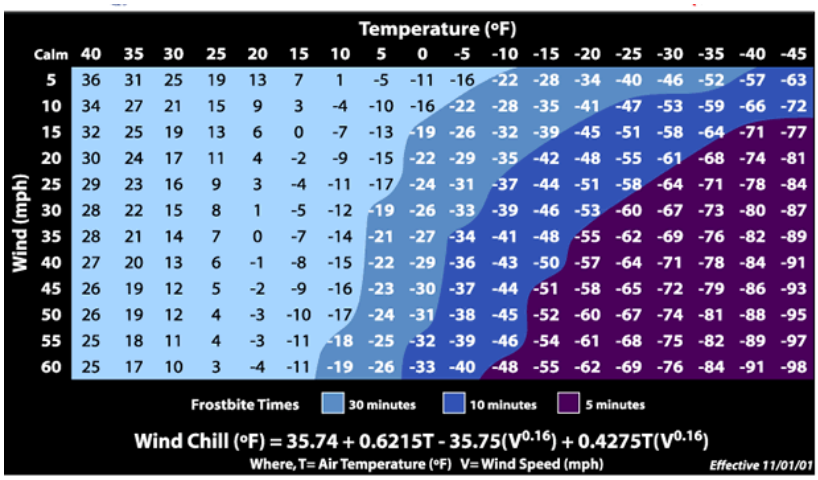
Heavy accumulations of ice, often the result of freezing rain, can bring down trees, utility poles, and communications towers and disrupt communications and power for days. Even small accumulations of ice can be extremely dangerous to motorists and pedestrians.

Severe winter storms include extreme cold, heavy snowfall, ice, and strong winds which can push the wind chill well below zero degrees in the planning area. Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow. Repair and snow removal costs can be significant. Ice buildup can collapse utility lines and communication towers, as well as make transportation difficult and hazardous. Ice can also become a problem on roadways if the air temperature is high enough so that precipitation falls as freezing rain rather than snow.

Extreme cold often accompanies severe winter storms and can lead to hypothermia and frostbite in people who are exposed to the weather without adequate clothing protection. Cold can cause fuel to congeal in storage tanks and supply lines, stopping electric generators. Cold temperatures can also overpower a building's heating system and cause water and sewer pipes to freeze and rupture. When combined with high winds from winter storms, extreme cold becomes extreme wind chill, which is extremely hazardous to health and safety.

Also at risk are those without shelter or who are stranded, or who live in a home that is poorly insulated or without heat. Other impacts of extreme cold include asphyxiation (unconsciousness or death from a lack of oxygen) from toxic fumes from emergency heaters; household fires, which can be caused by fireplaces and emergency heaters; and frozen/burst pipes. Wind can greatly amplify the impact of cold ambient air temperatures. Provided by the National Weather Service, **Figure 4.29** below shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

FIGURE 4.29 WIND CHILL CHART



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

Frostbite Times: 30 minutes; 10 minutes; 5 minutes

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

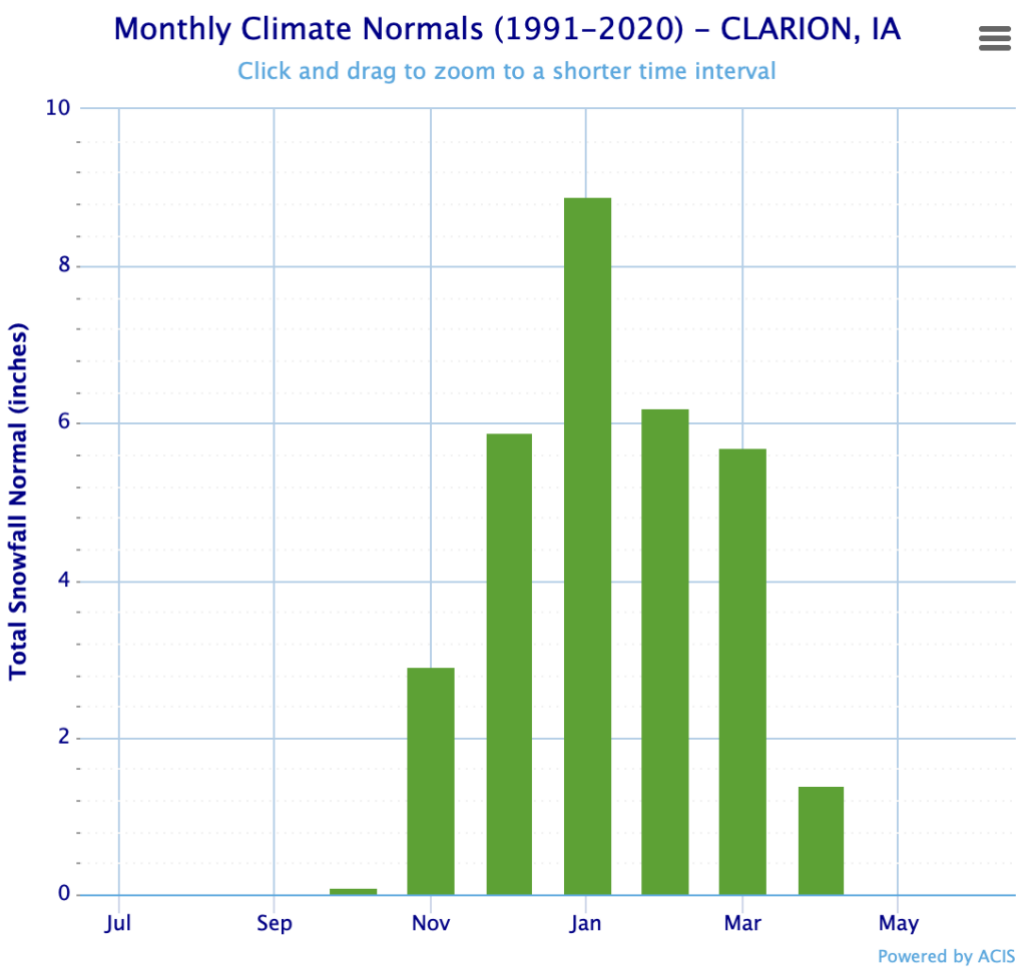
Where, T= Air Temperature (°F) V= Wind Speed (mph) *Effective 11/01/01*

Source: NWS

4.5.11.1 Geographic Location/Extent

The entire state of Iowa is vulnerable to heavy snow, extreme cold temperatures and freezing rain, including all areas of Wright County. Generally, winter storms occur between the months of November and March but can occur as early as October and as late as April. **Figure 4.30** details the average snowfall for the Clarion weather station located in Wright County. The Clarion weather station is used to understand snowfall for the entire County. January has the highest monthly snowfall at about nine inches of snow.

FIGURE 4.30 WRIGHT COUNTY MONTHLY SNOWFALL (1991-2020)



Severe winter storms, including extreme cold, heavy snowfall, ice, and strong winds which can push the wind chill well below zero degrees Fahrenheit, are likely to occur in the planning area and may cause significant crop damage. Wind can greatly amplify the impact of cold ambient air temperatures, making severe winter storm a substantive threat in Wright County.

The National Weather Service developed terms to categorize the severity of winter weather and can vary across the United States depending on the location. For example, a city in the southeast may have a different severity threshold than a city in Massachusetts that experiences snow more frequently. **Table 4.52** describes the difference between a winter weather advisory, winer storm watch, and winter storm warning[29].

TABLE 4.52 NWS WINTER WEATHER PRODUCTS

[29] US. 2024b. NWS Jackson, MS Product Guide--Winter Weather Products. Weathergov. https://www.weather.gov/jan/productguide_winter.

NWS WINTER STORM PRODUCT	DESCRIPTION
Winter Storm Warning	Snow, sleet, or ice expected. Take Action. Confidence is high that a winter storm will produce heavy snow, sleet, or freezing rain and cause significant impacts.
Winter Storm Watch	Snow, sleep, ice possible. Be prepared. Confidence is medium that a winter storm could produce heavy snow, sleet, or freezing rain and cause significant impacts.
Winter Weather Advisory	Wintry weather expected. Exercise caution. Light amounts of wintry precipitation or patchy blowing snow will cause slick conditions and could affect travel if precautions are not taken.

4.5.11.2 Previous Occurrences

Historically, there have been three Presidential Disaster Declarations for Severe Winter Storms that included Wright County since 1965 (See **Section 4.1.1**).

From 1996 through October 2025, the National Climatic Data Center reports the following 124 severe winter weather events:

- 34 - Blizzard
- 9 - Cold/Wind Chill
- 17 - Extreme Cold/Wind Chill
- 18 - Heavy Snow
- 14 – Ice Storm
- 32 – Winter Storm

During this 29-year period, this translates to 4.28 winter storm/cold temperature events each year. The total property damage for these 124 events was $1,827,780. While severe winter weather occurs frequently, it seems that the damage from these events are moderate.

Agricultural Impacts

Winter weather can result in extensive damage to crops, particularly if it occurs after crops have been planted or before they have been harvested. USDA's Risk Management Agency classification of winter weather events is slightly different than those found in the National Climatic Data Center reports, but the information can still be used to develop a general understanding of the losses in Wright County from winter weather. There are three types of winter weather events that the USDA Risk Management Agency lists as having caused crop losses in Wright County over the previous 10 years—these are 1) cold wet weather, 2) freeze, 3) frost. According to the USDA's Risk Management Agency, payments for insured crop losses in the planning area as a result of winter weather from 2016-2025 totaled $188,186.81 (see **Table 4.53**).

TABLE 4.53 CROP INSURANCE CLAIMS PAID IN WRIGHT COUNTY AS A RESULT OF WINTER WEATHER (2016-2025)

Year	Cold Wet Weather		Freeze		Frost	
	Indemnity Amount	Acres affected	Indemnity Amount	Acres affected	Indemnity Amount	Acres affected
2016	$9,269.76	164.71	$695.00	22.50	$2,050.00	19.80
2017	$30,624.00	959.09	$0	0	$0	0

Year	Cold Wet Weather		Freeze		Frost	
	Indemnity Amount	Acres affected	Indemnity Amount	Acres affected	Indemnity Amount	Acres affected
2018	$0	0	$0	0	$0	0
2019	$17,344.05	491.29	$0	0	$0	0
2020	$0	0	$0	0	$0	0
2021	$8,820.00	240.73	$26,322.00	737.99	$67,433.00	1,839.17
2022	$2,171.00	46.00	$0	0	$0	0
2023	$12,982.00	297.48	$0	0	$0	0
2024	$662.00	214.22	$0	0	$0	0
2025	$9,814.00	261.04	$0	0	$0	0
Total	$91,686.81	2,674.56	$27,017.00	760.49	$69,483.00	1,858.97

Source: USDA Risk Management Agency

4.5.11.3 Probability of Future Occurrence

According to NCDC, during the 29-year period from 1996 through 2025, the planning area experienced 124 total blizzards, winter storms, ice storms frost/freeze, and extreme cold events. This translates to an average probability of 4.28 winter weather events per year. Therefore, the probability of future occurrence is **Highly Likely**.

Climate Change Impacts

According to the 2010 Climate Change Impacts on Iowa, Iowa has experienced a long-term upward trend in temperature

- Long-term winter temperatures have increased six times more than summer temperatures.
- Nighttime temperatures have increased more than daytime temperatures since 1970.
- Since 1970, daily minimum temperatures have increased in summer and winter; daily maximum temperatures have risen in winter but declined substantially in summer.

If this trend continues, future occurrences of the extreme cold/wind chill aspects of winter storms should decrease. In addition, higher winter temperatures bring higher probability of rain, rather than snow. As a result, the amount of precipitation falling as snow should decrease. However, there has also been an uptick in more severe storms in general, including winter storms. While general trends may favor decreased snowfall, rare more severe winter storms may occur in the future.

4.5.11.4 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

The entire planning area is vulnerable to the effects of severe winter storms as it poses a **High** risk. Hazardous driving conditions due to snow and ice on highways and bridges lead to many traffic accidents and can impact the response of emergency vehicles. The leading cause of death during winter storms is transportation accidents. About 70 percent of winter-related deaths occur in automobiles due to traffic accidents and about 25 percent are from people caught outside in a storm. Emergency services such as police, fire, and ambulance may be unable to respond due to road conditions.

Emergency needs of remote or isolated residents for food or fuel, as well as for feed, water and shelter for livestock are unable to be met. The probability of utility and infrastructure failure increases during winter storms due to freezing rain accumulation on utility poles and power lines. People, pets, and livestock are also susceptible to frostbite and hypothermia during winter storms. Those at risk are primarily either engaged in outdoor activity (shoveling snow, digging out vehicles, or assisting stranded motorists), or are the elderly. Schools often close during extreme cold or heavy snow conditions to protect the safety of children and bus drivers. Citizens' use of kerosene heaters and other alternative forms of heating may create other hazards such as structural fires and carbon monoxide poisoning.

Critical Facilities

Hospitals, emergency shelters, and water treatment plants may face operational challenges during prolonged outages or freezing conditions. **Table 4.54** describes the potential vulnerabilities of lifelines from severe winter storms within Wright County.

TABLE 4.54 POTENTIAL VULNERABILITIES OF LIFELINES FROM SEVERE WINTER STORMS

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		Weather-related damage to infrastructure disrupts emergency alerts and public information, especially in areas with poor connectivity.
Energy (Power & Fuel)		Ice storms damage power lines, causing extended outages and limiting access to heating fuels.
Food, Hydration, Shelter		Frozen pipes and power loss disrupt water access and heating; vulnerable populations may lose access to safe shelter and food.
Hazardous Materials		Freezing conditions can compromise containment and monitoring systems, increasing risk of spills or exposure.
Health & Medical		Cold-related illnesses rise; outages affect medical equipment and facility operations, especially in rural areas.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Safety & Security		Icy roads and power outages delay emergency response and compromise public safety systems.
Transportation		Untreated roads become hazardous, isolating communities and delaying emergency and supply services.
Water & Wastewater Systems		Frozen pipes and power outages disrupt water supply and wastewater treatment, risking contamination and service loss.

People

Residents who are elderly, disabled, or economically disadvantaged are at heightened risk during winter events due to limited access to reliable heating, transportation, and emergency services. Many homes in rural areas lack adequate insulation or backup power sources, making them susceptible to dangerously low indoor temperatures during prolonged power outages caused by ice storms.

Low-income households may struggle to afford increased heating costs or to repair damage from burst pipes and frozen infrastructure. Individuals who rely on electric-powered medical equipment face life-threatening challenges when outages occur. Additionally, rural isolation can delay emergency response times, leaving residents without timely access to medical care or warming centers. Additionally, warning centers may not be accessible to communities who live in rural areas or communities without access to transportation. Children and school-aged youth are also vulnerable, as school closures can disrupt access to meals and safe environments.

Public health risks increase during extreme cold events, including hypothermia, frostbite, and carbon monoxide poisoning from improper use of space heaters or generators. Language barriers, lack of transportation, and limited communication infrastructure further isolate at-risk groups, emphasizing the need for targeted outreach and inclusive emergency planning [30]. Based on previous occurrences, there have been zero injuries and fatalities due to severe winter storms.

Natural, Cultural, and Historic Resources

Severe winter weather can significantly impact the County's natural, historic, and cultural assets. Ice storms and freezing temperatures often damage forests, wetlands, and wildlife habitats, leading to tree loss, habitat disruption, and increased runoff pollution from de-icing agents. These environmental changes can have lasting effects on local ecosystems and water quality.

[30] Ready. 2017. Snowstorms & Extreme Cold | Ready.gov. Readygov. https://www.ready.gov/winter-weather.

Historic buildings and cultural landmarks are vulnerable to structural damage from ice accumulation, freeze-thaw cycles, and water intrusion. Museums, libraries, and community centers may also face operational disruptions due to power outages or heating failures, putting valuable artifacts and archives at risk. These impacts highlight the need for protective measures and emergency planning to preserve the County's environmental and cultural heritage.

Structures and Systems

Buildings with overhanging tree limbs are more vulnerable to damage during winter storms. Businesses experience loss of income as a result of closure during power outages. In general, heavy winter storms increase wear and tear on roadways though the cost of such damages is difficult to determine. Businesses can experience loss of income as a result of closure during winter storms.

Loss of Use

Overhead power lines and infrastructure are also vulnerable to damages from winter storms, in particular ice accumulation during winter storm events can cause damages to power lines due to the ice weight on the lines and equipment as well as damage caused to lines and equipment from falling trees and tree limbs. Potential losses would include cost of repair or replacement of damaged facilities and lost economic opportunities for businesses. Secondary effects from loss of power could include burst water pipes in homes without electricity during winter storms. Public safety hazards include risk of electrocution from downed power lines. Specific amounts of estimated losses are not available due to the complexity and multiple variables associated with this hazard.

Property Losses

Based on previous occurrences, there have been 124 events causing $1,827,780 damages in the past 29 years. Compared to other hazards severe winter storms cause less in property damage but still poses a risk to structures within the County.

USDA crop insurance claims for cold conditions and snow for the ten-year period of 2016-2025 totaled $188,186.81. The 2024 Iowa Crop Insurance Profile from USDA, RMA shows that 91 percent of crops are insured in Iowa and the adjusted losses calculate to $206,798.69 for the period and $20,679.87 in estimated annualized losses.

Future Development

Future development could potentially increase vulnerability to this hazard by increasing demand on the utilities and increasing the exposure of infrastructure networks during severe winter storms. Overall, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years and decrease overall risk.

Hazard Summary by Jurisdiction

Although crop loss as a result of severe winter storm occurs more in the unincorporated portions of the planning area, the crops losses are not high since corn and soybeans are not in the ground during winter months and only get affected from unusual weather events. The density of vulnerable populations is higher in the cities. Transportation incidents related to winter storm could also impact all jurisdictions. With these vulnerabilities that apply to both urban and rural jurisdictions, the magnitude of this hazard is relatively equal. The factors of probability, warning time, and duration are also equal across the planning area. This hazard does not substantially vary by jurisdiction. For more details see **Table 4.55**.

TABLE 4.55 SEVERE WINTER WEATHER HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	4	2	3	4	3.25	High

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Belmond	4	2	3	4	3.25	High
Clarion	4	2	3	4	3.25	High
Dows	4	2	3	4	3.25	High
Eagle Grove	4	2	3	4	3.25	High
Galt	4	2	3	4	3.25	High
Goldfield	4	2	3	4	3.25	High
Rowan	4	2	3	4	3.25	High
Woolstock	4	2	3	4	3.25	High
Belmond-Klemme CSD	4	2	3	4	3.25	High
Clarion-Goldfield-Dows CSD	4	2	3	4	3.25	High
Eagle Grove CSD	4	2	3	4	3.25	High

4.5.12 TERRORISM

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
1	4	4	4	2.65	Moderate

This hazard encompasses the following sub-hazards: enemy attack, biological terrorism, agro-terrorism, chemical terrorism, conventional terrorism, cyber terrorism, radiological terrorism and public disorder. These hazards can occur anywhere and demonstrate unlawful force, violence, and/or threat against persons or property causing intentional harm for purposes of intimidation, coercion or ransom in violation of the criminal laws of the United States. These actions may cause massive destruction and/or extensive casualties. The threat of terrorism, both international and domestic, is ever present, and an attack can occur when least expected.

The Southern Poverty Law Center reported there were four active hate groups in Iowa:

- Moms for Liberty (Antigovernment, far-right, anti-COVID/LBGTQ+/racially inclusive school curriculum)
- National Alliance (Neo Nazi)
- Asatru Folks Assembly (hate organization)
- Patriot Front (White Nationalist)[31]

Enemy Attack

Enemy attack is an incident that could cause massive destruction and extensive casualties throughout the world. Some areas could experience direct weapons' effects: blast and heat; others could experience indirect weapons' effect. International political and military activities of other nations are closely monitored by the federal government and the State of Iowa would be notified of any escalating military threats.

Biological Agents

The use of biological agents against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom can be described as biological terrorism. Liquid or solid contaminants can be dispersed using sprayers/aerosol generators or by point of line sources such as munitions, covert deposits and moving sprayers. Biological agents vary in the amount of time they pose a threat. They can be a threat for hours to years depending upon the agent and the conditions in which it exists.

Agro-Terrorism

Agro-terrorism consists of acts to intentionally contaminate, ruin, or otherwise make agricultural products unfit or dangerous for consumption or further use. Agriculture is an important industry in Iowa and Wright County. The introduction of a biological agent into the population of 20,500 cattle and calves, or the 57,290 hogs and pigs, or the 141,000 acres of corn in Wright County would be financially devastating and would have a major impact on the food supply of the state and the nation. A major attack involving the nation's food supply could be launched in a rural area that has little capacity to respond. Potential targets for livestock disease introduction would be concentration points, such as the County's licensed feedlots or livestock markets discussed later in the Geographic Location section.

[31] Hate Map. 2025 Jul 15. Southern Poverty Law Center. https://www.splcenter.org/hate-map/?hm_year=2024&hm_state=IA.

Chemical Terrorism

Chemical terrorism involves the use or threat of chemical agents against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom. Effects of chemical contaminants are similar to biological agents. Use of conventional weapons and explosives against persons or property in violation of the criminal laws of the United States for purposes of intimidations, coercion, or ransom is conventional terrorism.

Hazard impacts are instantaneous; additional secondary devices may be used, lengthening the time duration of the hazard until the attack site is determined to be clear. The extent of damage is determined by the type and quantity of explosive.

Cyber Attack

Electronic attack using one computer system, networks, or cellular devices against another in order to intimidate people or disrupt other systems is a cyber-attack. All governments, businesses and citizens that conduct business utilizing computers face these threats. Cyber-security and critical infrastructure protection are among the most important national security issues facing our country today. As such, the Iowa Division of Criminal Investigation has a Cyber Crime Unit tasked with analysis and retrieval of digital information for investigations.

Radiological Terrorism

Radiological terrorism is the use of radiological materials against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom. Radioactive contaminants can be dispersed using sprayers/aerosol generators, or by point of line sources such as munitions, covert deposits and moving sprayers or by the detonation of a nuclear device underground, at the surface, in the air or at high altitude.

Public Disorder

Mass demonstrations, or direct conflict by large groups of citizens, as in marches, protest rallies, riots, and non-peaceful strikes are examples of public disorder. Some types of public disorders include the assembling of people together in a manner to substantially interfere with public peace to constitute a threat, and with use of unlawful force or violence against another person, or causing property damage or attempting to interfere with, disrupting, or destroying the government, political subdivision, or group of people. Marches, protests, and rallies may be used by citizens to express their social and political opinions. Labor strikes and work stoppages are not considered in this hazard unless they escalate into a threat to the community. Vandalism is usually initiated by a small number of individuals and limited to a small target or institution. Most events are within the capacity of local law enforcement.

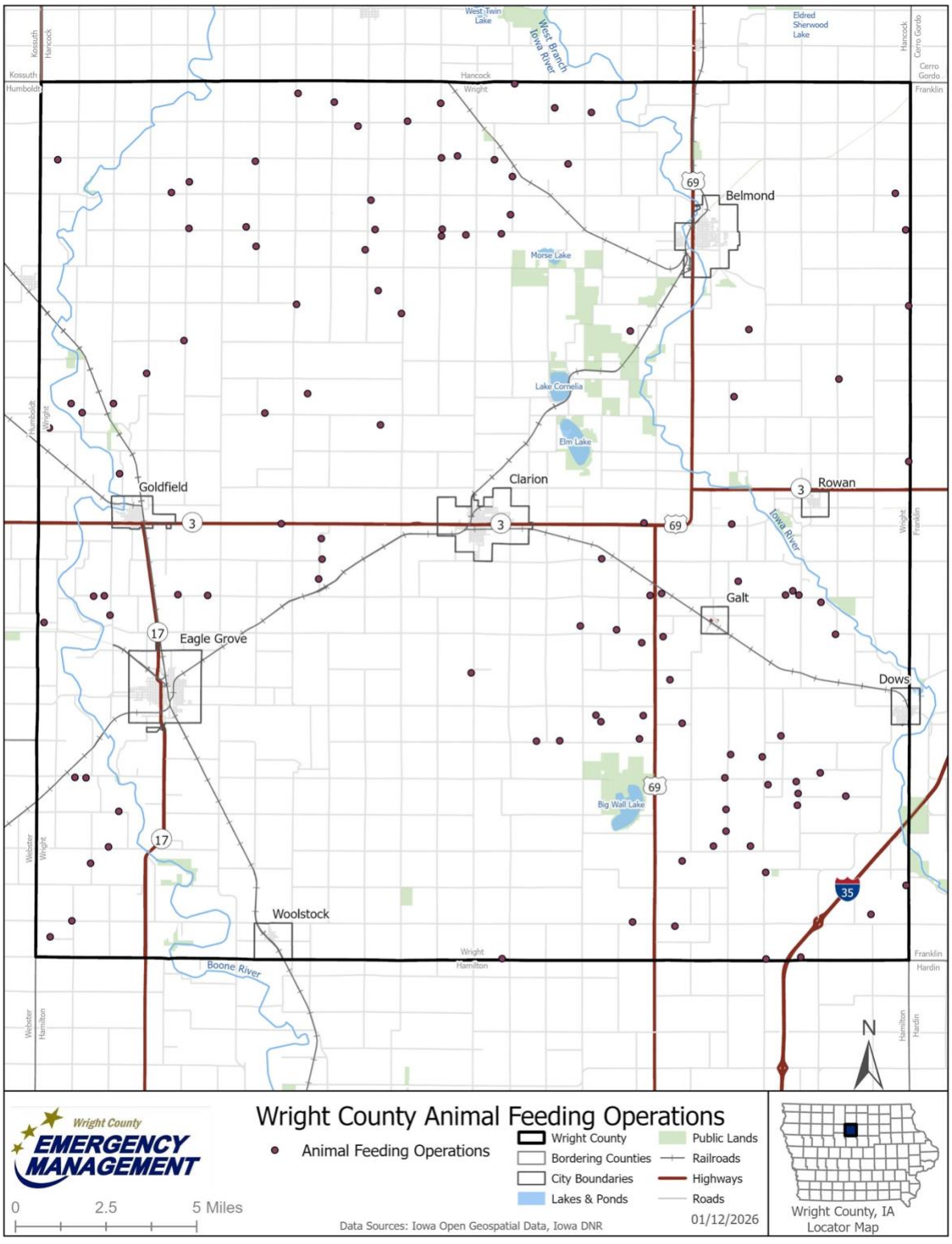
4.5.12.1 Geographic Location/Extent

The entire planning area has a low potential for terrorist activity. However, any venue with a large gathering of people could be a potential target for terrorists. The most likely targets of a conventional terrorism attack in Wright County include public school system facilities the Wright County Courthouse and law enforcement centers within Wright County. The potential extent of impacts of a terrorism event varies by type but can range from minor inconvenience (in the event of minor cyber-attacks) to countywide crippling of infrastructure and a terrorist attack that caused causalities.

In terms of cyber-terrorism, our society is highly networked and interconnected. An attack could be launched from anywhere on earth and could range in impacts from small and localized to a far-reaching global scale. Depending on the attack vector and parameters, a cyber-attack could impact all of Wright County and its associated municipal jurisdictions.

Animal feeding operations and other agricultural operations are potential targets of agro-terrorism. **Figure 4.31** shows the locations of animal feeding operations in Wright County. Additional agricultural assets are discussed in **Section 4.5.2,** Animal/Plant/Crop Disease.

FIGURE 4.31 ANIMAL FEEDING OPERATIONS IN IOWA



Source: Department of Natural Resources

4.5.12.2 Previous Occurrences

There have not been any large-scale enemy attacks or acts of radiological terrorism in Iowa. There have been biological and chemical agent threats, animal rights activists' vandalism and many bomb threats. The following terrorist incidents are described below.

- **2002:** Pipe bombs were found in 18 states including Iowa and six people were injured in the bombings in Iowa and Illinois. The intent of the perpetrator was to create a smiley face across the states with the pipe bombs. The incident required a multi-state coordination and response to capture the perpetrator.
- **2005/2006:** Pipe bombs were used in attempted murder cases in two Iowa cities. This incident was a multi-state extortion campaign executed by a Dubuque, Iowa machinist named John P. Tomkins. Operating under the aliases "The Bishop" and "Tic Toc," Tomkins mailed threatening letters to major investment companies between May 2005 and July 2006. The U.S. Postal Inspection Service led a multi-agency task force that included the FBI.

According to U.S. Department of Justice, Iowa has experienced many hate crimes in the past several years. Hate crimes have decreased from 2021-2023 from 105 to 69 crimes. The majority of hate crimes are motivated by race and ethnicity (56.5%), religion (17.4%), sexual orientation (20.3%), disability (2.9%), gender identity (2.9%)[32]. While not all hate crimes can be defined as terrorism, hate crimes can result in terrorist attacks that focus on political or ideological agendas such as attacks against churches for the religion practiced.

4.5.12.3 Probability of Future Occurrence

While difficult to estimate, the probability of occurrence for a terrorist event is **Unlikely** within the next 10 years in Wright County.

4.5.12.4 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

A terrorism event could occur in either limited area of a jurisdiction or over the entire jurisdiction at once. This hazard has the ability to directly cause substantial structural losses and potentially loss of life. Therefore, terrorism poses a **Medium** risk to the County.

Critical Facilities

Terrorism has the potential disrupt all critical facilities and community lifelines within the County. **Table 4.56** details the potential impacts to community lifelines within Wright County.

[32] Hate Crimes | United States Department of Justice | Hate Crimes | Iowa. 2022 Sep 27. www.justice.gov, https://www.justice.gov/hatecrimes/state-data/iowa.

TABLE 4.56 POTENTIAL VULNERABILITIES OF LIFELINES FROM TERRORISM

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		Acts of terrorism may focus on damaging or disrupting communication infrastructure. Damages or disruptions may pose a risk to public safety and emergency services.
Energy (Power & Fuel)		Acts of terrorism may focus on damaging or disrupting energy sources such as power and fuel. Impacts to energy may create supply chain issues and caused cascading impacts such as increased costs, instability, and in the worse scenario, shortages and outages.
Food, Hydration, Shelter		Acts of terrorism may disrupt supply chains which can impacts food distribution and inflated prices. This can create food insecurity and hardships with paying for food.
Hazardous Materials		Acts of terrorism may target areas with hazard materials which can cause public health and environmental health issues.
Health & Medical		Acts of terrorism can cause immediate causalities and may overwhelm local hospital and emergency services.
Safety & Security		Acts of terrorism intrinsically pose a risk to the safety and security of the community as terrorism directs targets and aims to disrupt a community.
Transportation		Acts of terrorism can directly focus or cause subsequent impacts to transportation by damaging or disruption it. Damage or disruption to transportation can pose a safety risk to the community.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Water & Wastewater Systems		Acts of terrorism may occur through physical damage, toxic chemical releases, cyberattacks. These impacts can harm public health and cause severe environmental degradation.

People

Terrorist attacks can have a physical impact as well as a psychological impact. Terrorist attacks can cause injuries and fatalities, as well as long-term psychological trauma. Depending on the nature of the attack, the broader community can be impacted and disrupt societal and economic functioning. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

Some acts of terrorism are hate-based and therefore individuals and communities from certain religions, nationalities, race, ethnicism, sexuality, and gender are at increased risk of attacks, injury, or even death. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

Secondary effects of terrorism could include public safety hazards, spread of disease, increased morbidity and mortality among the local and distant populations, public panic and long-lasting damage to the environment. Terrorism events are rare occurrences and specific amounts of estimated losses for previous occurrences are not available due to the complexity and multiple variables associated with these types of hazards. In some instances, information about these events is secure and unavailable to the public in order to maintain national security and prevent future attacks.

Natural, Cultural, and Historic Resources

In some cases, terrorist attacks may target certain natural, cultural, or historic resources to erase a community's identity such as museums, monuments, and other cultural sites. Additionally, use of destructive weapons may pollute natural resources and cause environmental degradation and damage the local environments and ecosystems.

Structures and Systems

Potential losses from Terrorism include casualties to people, damage to property, infrastructure, critical facilities, crops, and animals. The degree of impact would be directly related to the type of incident and the target. Potential losses could include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses, loss of human life, injuries to persons, loss of food supplies, disruption of the food supply chain, and immediate damage to the surrounding environment.

As discussed previously, it is difficult to quantify potential losses in terms of the jurisdictions most threatened by CBRNE (chemical, biological, radiological, nuclear, and high yield explosive) attack events due to the many variables and human element.

Future Development

As public events are held at various venues in the County, the potential may exist for these locations to become targets of attack. With human-caused hazards such as this that can have multiple variables involved, increased development is not always a factor in determining risk, although the physical damages of the event may increase with the increased or newly developed areas especially in cities where

population is increasing. Overall, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years.

Hazard Summary by Jurisdiction

The overall rating for any type of terrorism in the County is 2.65 "Moderate". This rating score applies to all jurisdictions in the planning area due to the variables and unknowns involved in terrorism. If a wide scale event occurred in any jurisdiction, it could have devastating consequences. For more details see **Table 4.57**.

TABLE 4.57 TERRORISM HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	1	4	4	4	2.65	Moderate
Belmond	1	4	4	4	2.65	Moderate
Clarion	1	4	4	4	2.65	Moderate
Dows	1	4	4	4	2.65	Moderate
Eagle Grove	1	4	4	4	2.65	Moderate
Galt	1	4	4	4	2.65	Moderate
Goldfield	1	4	4	4	2.65	Moderate
Rowan	1	4	4	4	2.65	Moderate
Woolstock	1	4	4	4	2.65	Moderate
Belmond-Klemme CSD	1	4	4	4	2.65	Moderate
Clarion-Goldfield-Dows CSD	1	4	4	4	2.65	Moderate
Eagle Grove CSD	1	4	4	4	2.65	Moderate

4.5.13 THUNDERSTORM LIGHTNING, AND HAIL

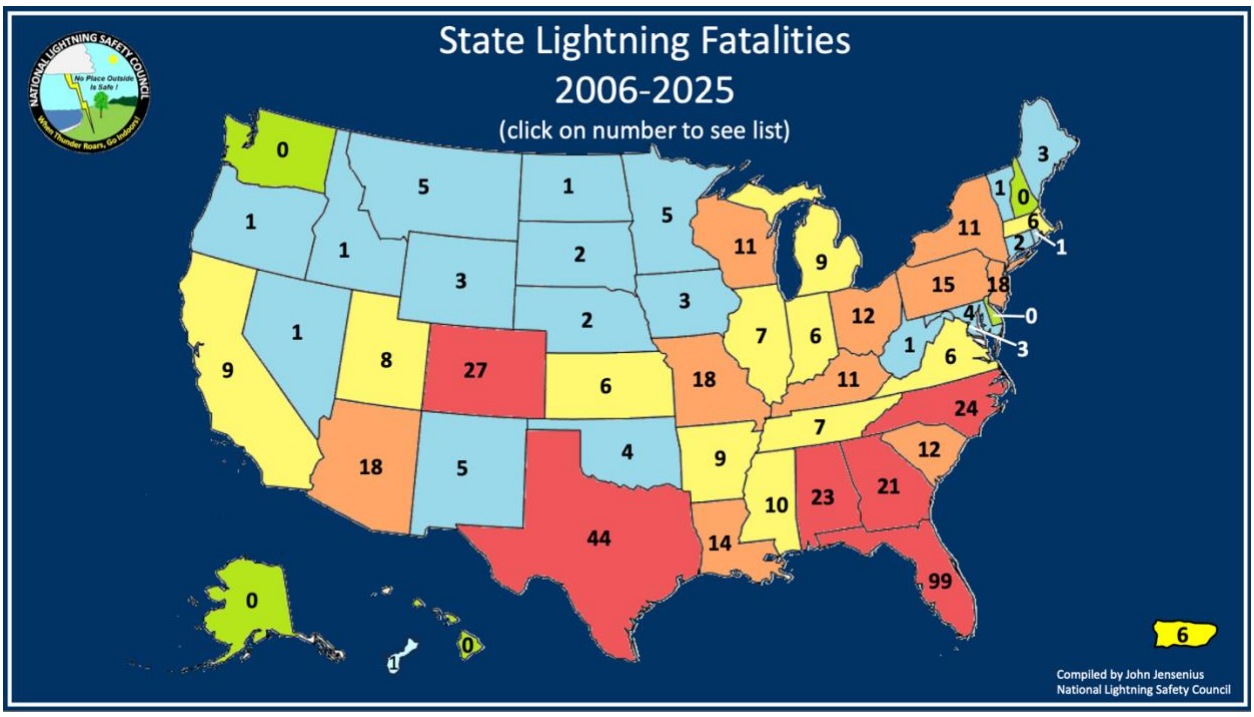
HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
4	2	2	2	2.90	Moderate

A thunderstorm is defined as a storm that contains lightning and thunder which is caused by unstable atmospheric conditions. When the colder upper air sinks and warm moist air rises, storm clouds or 'thunderheads' develop, resulting in thunderstorms. This can occur singularly, in clusters or in lines. Severe thunderstorms most often occur in Iowa in the spring and summer, during the afternoon and evenings, but can occur at any time. Other hazards associated with thunderstorms and lightning include heavy rains causing flash flood and storms winds. Each hazard can be found and further explained in the Flash Flood and Tornado and Windstorms sections.

Lightning

All thunderstorms produce lightning, which often strikes outside of the area where it is raining and is known to fall more than 10 miles away from the rainfall area. Thunder is simply the sound that lightning makes. Lightning is a huge discharge of electricity. When lightning strikes, electricity shoots through the air and causes vibrations creating the sound of thunder. According to the NWS Storm Data, over the last 30 years (1989-2018) the U.S. has averaged 43 reported lightning fatalities per year. Only about 10% of people who are struck by lightning are killed, leaving 90% with various degrees of disability. More recently, from 2009-2018, the U.S. has averaged 27 lightning fatalities. **Figure 4.32** displays the number of deaths that have occurred across the U.S. since 2006 from lightning strikes. Iowa has had three deaths from lightning strikes, none of which occurred in Wright County.

FIGURE 4.32 U.S. STATE LIGHTNING FATALITIES (2006-2025)



Hail

According to the National Oceanic and Atmospheric Administration (NOAA), hail is precipitation that is formed when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere causing them to freeze. The raindrops form into small frozen droplets and then continue to grow as they come into contact with super-cooled water which will freeze on contact with the frozen rain droplet. This frozen rain droplet can continue to grow and form hail. As long as the updraft forces can support or suspend the weight of the hailstone, hail can continue to grow.

At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 mph, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 mph. The largest hailstone recorded in the United States was found in Vivian, South Dakota on July 23, 2010, measuring eight inches in diameter, almost the size of a soccer ball. Soccer-ball-sized hail is the exception, but even pea-sized hail can do damage.

In the United States, hail causes more than $1 billion in damage to property and crops each year. Much of the damage inflicted by hail is to crops. Hailstorms in Iowa cause damage to property, crops, and the environment and kill and injure livestock. Hail has been known to cause injury to humans, occasionally, these injuries can be fatal. **Table 4.58** below describes typical damage impacts of the various sizes of hail.

TABLE 4.58 TORNADO AND STORM RESEARCH ORGANIZATION HAILSTORM INTENSITY SCALE

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5-9	0.2-0.4	Pea	No damage

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Potentially Damaging	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
Significant	16-20	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	21-30	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
Severe	31-40	1.2-1.6	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	41-50	1.6-2.0	Golf ball > Pullet's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	51-60	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	61-75	2.4-3.0	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries
Destructive	76-90	3.0-3.5	Large orange > Soft ball	Severe damage to aircraft bodywork
Super Hailstorms	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
Super Hailstorms	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: Tornado and Storm Research Organization (TORRO), Department of Geography, Oxford Brookes University
Notes: In addition to hail diameter, factors including number and density of hailstones, hail fall speed and surface wind speeds affect severity.

The onset of thunderstorms with lightning and hail is generally rapid. However, advancements in meteorological forecasting allow for some advance warning.

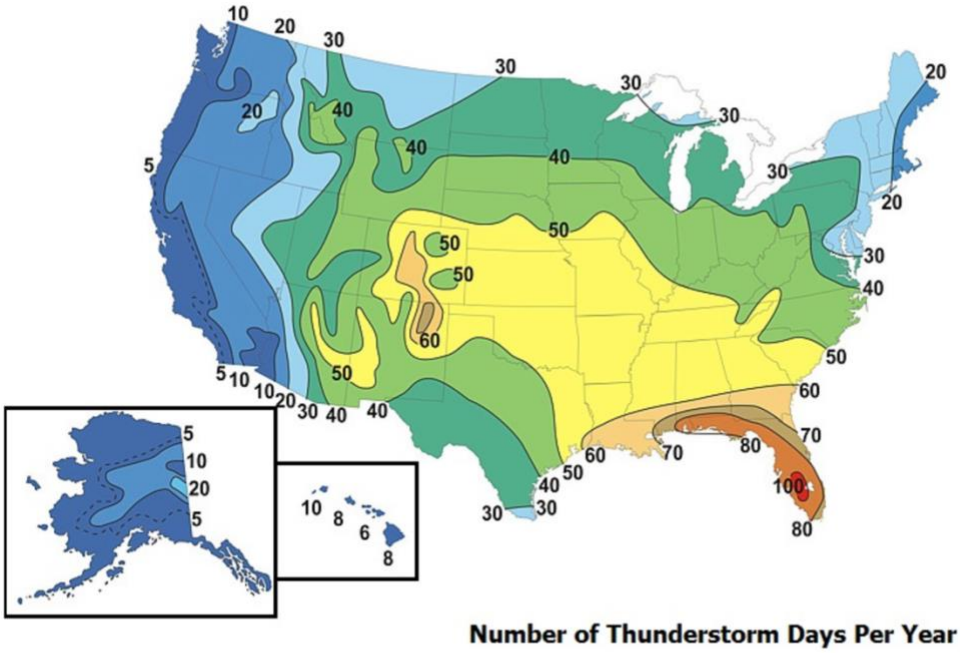
4.5.13.1 Geographic Location/Extent

Thunderstorms and the associated hail and lightning are common in all areas of Wright County and impact the entire County with similar frequency. Although, these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur in more densely developed urban areas as well as croplands. **Figure 4.33** shows that Iowa experiences 40 storms per year in the northwest portion of the state and 60 per year in the southeast portion.

The AEM U.S. Lightning Report, revealed that Illinois and Iowa experienced abnormally vigorous storm seasons, propelling them into the top 10 states for lightning flash density. In 2023, Illinois, previously ranked 17th, and Iowa, previously ranked 21st, saw dramatic increases in lightning activity. These states, typically not associated with such high flash density, joined states like Florida and Louisiana, which consistently lead in this metric each year[33].

FIGURE 4.33 DISTRIBUTION AND FREQUENCY OF THUNDERSTORMS

[33] Patel T. 2025 Jan 2. AEM Releases 2024 U.S. Lightning Report - AEM. AEM. [accessed 2026 Jun 16]. https://aem.eco/aem-releases-2024-lightning-report/.



The map showing the average number of "thunderstorm days" per year shows that thunderstorms are most frequent along the Gulf Coast in the Southeast U.S. (especially in Florida). A relative maximum also exists over the central Rocky Mountains.

Credit: Adapted from the National Weather Service

https://courses.ems.psu.edu/meteo3/l8_p2.html

Extent

Severe thunderstorms of all levels of severity are possible in Wright County. Severe thunderstorms will typically affect an area for less than 60 minutes, although the storm system may exist for much longer than this. Severe thunderstorms are most common in the late spring and early summer months, but it is possible for them to occur at any point in the year as long as conditions are favorable. Severe thunderstorms can produce heavy rain which may lead to flash flooding, lightning, hail and can cause significant property damage. In rare instances, hail and lightning can result in injuries and death. According to the National Weather Service, lightning causes an average of 55-60 fatalities and 400 injuries annually. There are no documented instances of lightning-related fatalities in Wright County. However, there has been one injury due to lightning in the County.

4.5.13.2 Previous Occurrences

Since 1965, Wright County has been included in 13 presidential disaster declarations that included severe storms/weather. Some of the damages that resulted in the declarations were from tornadoes and flooding that accompanied the severe weather. Please see **Section 4.1.1** for more information on presidential disaster declarations.

The NCDC reported 233 total thunderstorm events for the Wright County planning area from 1965 through October 2025 (see **Table 4.59**). There have been 65 events in Wright County, 32 in Belmond, 45 in Clarion, 22 in Dows, 42 in Eagle Grove, 3 in Galt, 12 in Goldfield, 5 in Rowan, and 7 in Woolstock.

TABLE 4.59 THUNDERSTORM SUMMARY FOR WRIGHT COUNTY (1965-2025)

Hazard type	Total Events	Events with Reported Damage	Property Damage	Injuries	Fatalities
Hail	96	64	$695,000	0	0
Lightning	2	2	$22,000	1	0
Thunderstorm Wind	135	81	$1,450,000	0	0
Totals	233	147	$2,167,000	1	0

Source: NCDC

Hail

Table 4.60 shows the number of hail events 0.75 inches and larger by the size of the hail.

TABLE 4.60 HAIL EVENTS SUMMARIZED BY HAIL SIZE

Hail Size (inches)	# of Events 1965-2025
3.00 or greater	2
2.00 to 2.99	6
1.50 to 1.99	30
1.00 to 1.49	28
0.75 to 0.99	28
Grand Total	**94**

Source: NCDC

Thunderstorm Winds

Information concerning tornadoes and windstorms, separate from thunderstorms, can be found in **Section 4.5.13**.

The National Weather Service (NWS) will issue a Severe Thunderstorm Warning whenever a thunderstorm is forecasted to produce wind gusts to 58 miles per hour (50 knots) or greater and/or hail size one inch (quarter-size) diameter which can produce significant damage. Since 2000, there have been 679 Severe Thunderstorm products issued by the National Weather Service (NWS).

Although NCDC provides estimates of crop losses, crop insurance payment statistics are considered a more accurate resource for this data. According to the USDA Risk Management Agency, insured crop losses in Wright County as a result of hail from 2016 to 2025 totaled $2,021,989.99 (see **Table 4.61**) and $618,743.20 from windstorms. The USDA Risk Management Agency groups crop losses from lightning into

another category that includes snow and other phenomena. Therefore, it is not possible to determine the crop losses resulting specifically from lightning, but for planning purposes, it should be assumed that losses from lightning have occurred.

TABLE 4.61 CROP INSURANCE CLAIMS PAID IN WRIGHT COUNTY FROM HAILSTORMS AND WINDSTORMS, 2016-2025

	Hail		Wind/Excess Wind	
Year	Indemnity Amount	Acres Affected	Indemnity Amount	Acres Affected
2016	$34,285.00	556.60	$196,358.00	2,815.55
2017	$40,220.00	557.84	$0	0
2018	$122,499.90	2,352.17	$109,845.30	728.57
2019	$0	0	$19,769.15	279.19
2020	$626.00	47.26	$161,578.75	1,365.63
2021	$5,341.00	150.00	$76.001.00	501.71
2022	$11,212,80	260.83	$0	0
2023	$0	0	$24,655.00	591.44
2024	$1,179,077.83	4,948.09	$1,059.00	3.15
2025	$628,727.46	5,763.87	$29,477.00	358.41
Total	$2,021,989.99	14,636.65	$618,743.20	6,643.64

Source: USDA Risk Management Agency

4.5.13.3 Probability of Future Occurrence

NCDC reported that damaging lightning events occurred twice from 1965 through 2025. Since lightning accompanies thunderstorms, it can be assumed that lightning occurs more often than damages are reported. These rates of occurrence are expected to continue in the future.

Based on NCDC data, there have been 96 damaging hail events and 135 damaging thunderstorm wind events. This translates to an annual average of 1.5 and 2.3 damaging events per year, respectively. Based on this history, damaging hail and thunderstorm wind occur in the planning area multiple times each year making the probability for damaging events **Highly Likely** in any given year.

Climate Change Impacts

According to the 2010 Climate Change Impacts on Iowa report, growing evidence points to stronger summer storm systems in the Midwest. Studies have not been done to conclusively say that severe storms, including hail, lightning, and strong winds, are increasing. However, with summer temperatures becoming warmer and humidity levels increasing, an increase in the likelihood of these hazards is plausible.

4.5.13.4 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

In general, most assets in the County are vulnerable to thunderstorms, winds, lightning and hail including people, crops, vehicles, and built structures, due to both their widespread potential impact and range of potential severity. Although this hazard results in high annual losses, private property insurance and crop insurance cover the majority of losses. Considering insurance coverage as a recovery capability and

therefore mitigation of devastating impacts to the economy, the overall impact on jurisdictions is reduced; therefore thunderstorms pose a **Medium** risk to the County.

Critical Facilities

Essential infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during severe storm events. In rural areas such as Wright County, this vulnerability is compounded by limited system redundancy and constrained emergency response capabilities, making recovery slower and impacts more severe. **Table 4.62** describes the potential vulnerabilities of lifelines from thunderstorms within Wright County.

TABLE 4.62 POTENTIAL VULNERABILITIES OF LIFELINES FROM THUNDERSTORMS

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		Storms can disrupt cell towers and fiber lines, limiting emergency coordination and public alerts, especially in areas with minimal redundancy.
Energy (Power & Fuel)		High winds and lightning can damage power lines and substations, causing widespread outages. Aging infrastructure and limited backup systems increase risk.
Food, Hydration, Shelter		Severe storms can interrupt food supply chains, contaminate water sources, and overwhelm shelter capacity. Vulnerable populations may face barriers to accessing these essential services.
Hazardous Materials		Severe storms may trigger chemical spills or releases from industrial sites, transportation routes, or storage facilities. These incidents pose risks to public health and the environment and require coordinated response from IEMA and other agencies.
Health & Medical		Storms can overwhelm healthcare facilities with injuries and disrupt access to medical care. The Iowa Department of Health and Human Services coordinates emergency medical services, Strategic National Stockpile distribution, and health alerts to maintain continuity of care during disasters.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Safety & Security		Law enforcement and public safety operations may be disrupted by damaged facilities, blocked access routes, and communication failures.
Transportation		Roads and bridges are vulnerable to flooding, erosion, and debris, which can block emergency access and delay recovery.
Water & Wastewater Systems		Flooding and power loss can disable treatment facilities, leading to unsafe or unavailable water—especially in rural areas with outdated systems.

People

Severe storms pose significant vulnerability to people, especially in Iowa, where atmospheric conditions frequently support the development of hazardous weather. This vulnerability stems from both direct physical threats and indirect social and economic impacts. There have not been any fatalities in Wright County from lightning strikes. However, there has been one injury in the County due to lightning.

Severe storms can produce high winds, hail, lightning, and flash flooding, all of which can cause injury or death. High winds may turn debris into projectiles, damage homes, and disrupt transportation. Lightning strikes can lead to fatalities, fires, and power outages. Hail can injure individuals caught outdoors and damage vehicles and roofs. Flash flooding, often associated with intense rainfall, can trap people in vehicles or homes and lead to drowning, especially in low-lying or poorly drained areas.

Populations with limited access to safe housing, emergency services, or reliable communication systems are especially at risk. Vulnerable populations, such as the elderly, individuals with disabilities, and low-income households, may face greater challenges in preparing for, responding to, and recovering from storm events. Severe storms can also disrupt local economies by damaging infrastructure, halting business operations, and increasing public spending on emergency response and recovery.

In Wright County, where rural and underserved communities are common, these vulnerabilities are amplified. Limited infrastructure and emergency resources can delay response times and increase the long-term impact of storm events on residents.

Natural, Cultural, and Historic Resources

Severe storms can significantly impact natural, historic, and cultural resources within Wright County. Natural areas such as wetlands, forests, and river systems are vulnerable to erosion, flooding, and contamination from stormwater runoff. However, these ecosystems also serve as natural buffers that help absorb rainfall and reduce flood risk, but when damaged, they lose their protective function and biodiversity suffers.

Historic and cultural resources-including landmarks, cemeteries, monuments, and archaeological sites are also at risk. Many of these structures are older and not built to withstand high winds or flooding. Storms can cause irreversible damage to fragile materials, displace artifacts, and erode land around culturally significant sites. If historic and cultural assets are located in low-lying or rural areas, the lack of protective infrastructure and documentation further increases their vulnerability. Preserving these resources requires proactive planning, including inventorying sites, integrating them into hazard mitigation strategies, and ensuring emergency response plans account for their protection.

Structures

Most lightning damages occur to electronic equipment located inside buildings. But structural damage can also occur when a lightning strike causes a building fire. In addition, lightning strikes can cause damages to crops if fields light on fire. Communication equipment and warning transmitters and receivers can also be knocked out by lightning strikes. Thunderstorm winds and hail can cause damage to property, vehicles, trees, and crops.

According to previous occurrences, there has been over $3,000,000 in property damages within Wright County since 1965. It is expected that severe thunderstorms will continue to cause significant damage to structures in the future.

Future Development

Any additional future development will result in more property being vulnerable to damages from severe thunderstorms, lightning, and hail. To minimize vulnerability, protective measures could be implemented such as wind-resistant construction, lightning rods, surge protection, and use of materials less prone to hail/wind damage. Overall, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years.

Hazard Summary by Jurisdiction

The following hazard summary table shows that this hazard does not vary significantly by jurisdiction. Although structural property damages are higher in the urban areas, the rural areas have higher damages to agriculture. For more details see **Table 4.63**.

TABLE 4.63 THUNDERSTORM, LIGHTNING, AND HAIL HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	4	2	2	2	2.90	Moderate
Belmond	4	2	2	2	2.90	Moderate
Clarion	4	2	2	2	2.90	Moderate
Dows	4	2	2	2	2.90	Moderate
Eagle Grove	4	2	2	2	2.90	Moderate
Galt	4	2	2	2	2.90	Moderate
Goldfield	4	2	2	2	2.90	Moderate
Rowan	4	2	2	2	2.90	Moderate
Woolstock	4	2	2	2	2.90	Moderate
Belmond-Klemme CSD	4	2	2	2	2.90	Moderate
Clarion-Goldfield-Dows CSD	4	2	2	2	2.90	Moderate
Eagle Grove CSD	4	2	2	2	2.90	Moderate

4.5.14 TORNADO/WINDSTORM

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
4	4	3	1	3.55	High

Tornado

The NWS defines a tornado as "a violently rotating column of air extending from a thunderstorm to the ground." It is usually spawned by a thunderstorm and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. Often, vortices remain suspended in the atmosphere as funnel clouds. When the lower tip of a vortex touches the ground, it becomes a tornado and a force of destruction.

Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour, and damage paths can be more than one mile wide and 50 miles long. Tornadoes have been known to lift and move objects weighing more than 300 tons a distance of 30 feet, toss homes more than 300 feet from their foundations, and siphon millions of tons of water from bodies of water. Tornadoes also generate a tremendous amount of flying debris or "missiles," which often become airborne shrapnel that causes additional damage. If wind speeds are high enough, missiles can be thrown at a building with enough force to penetrate windows, roofs, and walls. However, the less extensive damage is much more common.

Windstorm

Windstorms for purposes of this plan refer to other non-tornadic damaging winds of thunderstorms including downbursts, microbursts, and straight-line winds. Downbursts are localized currents of air blasting down from a thunderstorm, which induce an outward burst of damaging wind on or near the ground. Microbursts are minimized downbursts covering an area of less than 2.5 miles across. They include a strong wind shear (a rapid change in the direction of wind over a short distance) near the surface. Microbursts may or may not include precipitation and can produce winds at speeds of more than 150 miles per hour. Straight-line winds are generally any thunderstorm wind that is not associated with rotation. It is these winds, which can exceed 100 mph, which represent the most common type of severe weather and are responsible for most wind damage related to thunderstorms.

Since thunderstorms do not have narrow tracks like tornadoes, the associated wind damage can be extensive and affect entire (and multiple) counties. Objects like trees, barns, outbuildings, high-profile vehicles, and power lines/poles can be toppled or destroyed, and roofs, windows, and homes can be damaged as wind speeds increase.

Strong winds can occur year-round in Iowa. These winds typically develop with strong pressure gradients and gusty frontal passages. The closer and stronger two systems are, (one high pressure, one low pressure) the stronger the pressure gradient, and therefore, the stronger the winds are. Objects such as trees, barns, outbuildings, high-profile vehicles, and power line/poles can be toppled or destroyed, and roofs, windows, and homes can be damaged as wind speeds increase. Downbursts can be particularly dangerous to aviation.

The NWS can issue High Wind Watch, High Wind Warning, and Wind Advisory to the public. The following are the definitions of these issuances:

- **High Wind Watch**—This is issued when there is the potential of high wind speeds developing that may pose a hazard or is life-threatening.

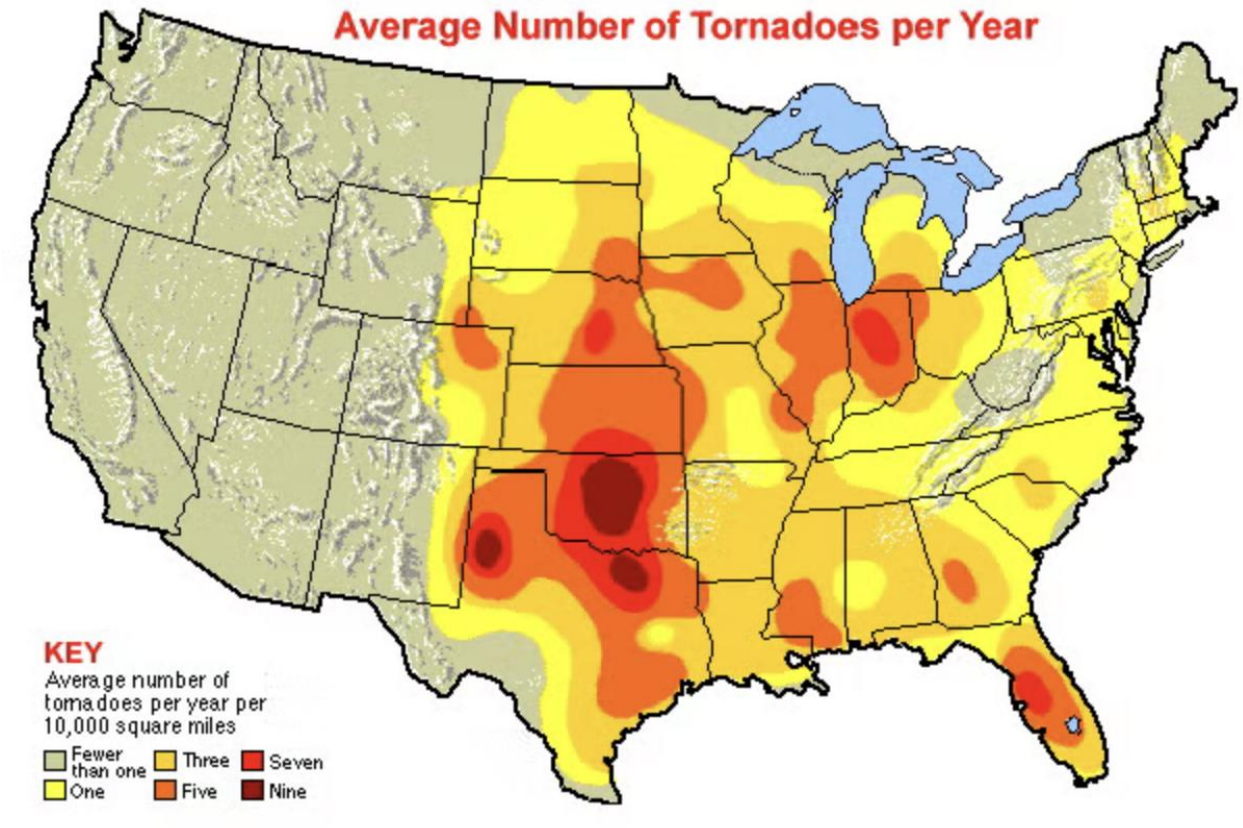
- **High Wind Warning**—The 1-minute surface winds of 35 knots (40 mph) or greater lasting for one hour or longer, or winds gusting to 50 knots (58 mph) or greater, regardless of duration, that are either expected or observed over land.
- **High Wind Advisory**—This is issued when high wind speeds may pose a hazard. Sustained winds 25 to 39 mph and/or gusts to 57 mph.

4.5.14.1 Geographic Location/Extent

Tornado

Iowa is located in a part of the United States where tornadoes are a common occurrence. Tornadoes can occur anywhere throughout the County. Most tornadoes occur in May and June but can occur during any month. Mid-afternoon until around sunset is the peak time of day for tornado activity. **Figure 4.34** displays the average number of tornadoes occur per year across the United States. Wright County experiences about five tornadoes per year.

FIGURE 4.34 AVERAGE NUMBER OF TORNADOES PER YEAR



Source: UCAR Center for Science Education

Tornadoes are classified according to the EF-Scale. The EF-Scale (see **Table 4.64**) attempts to rank tornadoes according to wind speed based on the damage caused. This update to the original F-scale was implemented in the U.S. on February 1, 2007.

TABLE 4.64 FUJITA AND ENHANCED FUJITA SCALES

FUJITA SCALE		ENHANCED FUJITA SCALE	
Fujita (F) Rating	**Peak 3 Second Gust (mph)**	**Enhanced Fujita (EF) Rating**	**Peak 3 Second Gust (mph)**
0	45-78	**0**	65-85
1	79-117	**1**	86-110
2	118-161	**2**	111-135
3	162-209	**3**	136-165
4	210-261	**4**	166-200
5	262-317	**5**	Over 200

Source: NOAA

The wind speeds for the EF-scale and damage descriptions are based on information on the NOAA Storm Prediction Center as listed in **Table 4.65**. The damage descriptions are summaries. For the actual EF scale, it is necessary to look up the damage indicator (type of structure damaged) and refer to the degrees of damage associated with that indicator.

TABLE 4.65 ENHANCED FUJITA SCALE WITH POTENTIAL DAMAGE

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 levelled; cars thrown and small missiles generated.
EF5	>200	<0.1%	Explosive. Strong frame houses levelled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 ft.; steel reinforced concrete structure badly damaged; high rise buildings have significant structural deformation; incredible phenomena will occur.

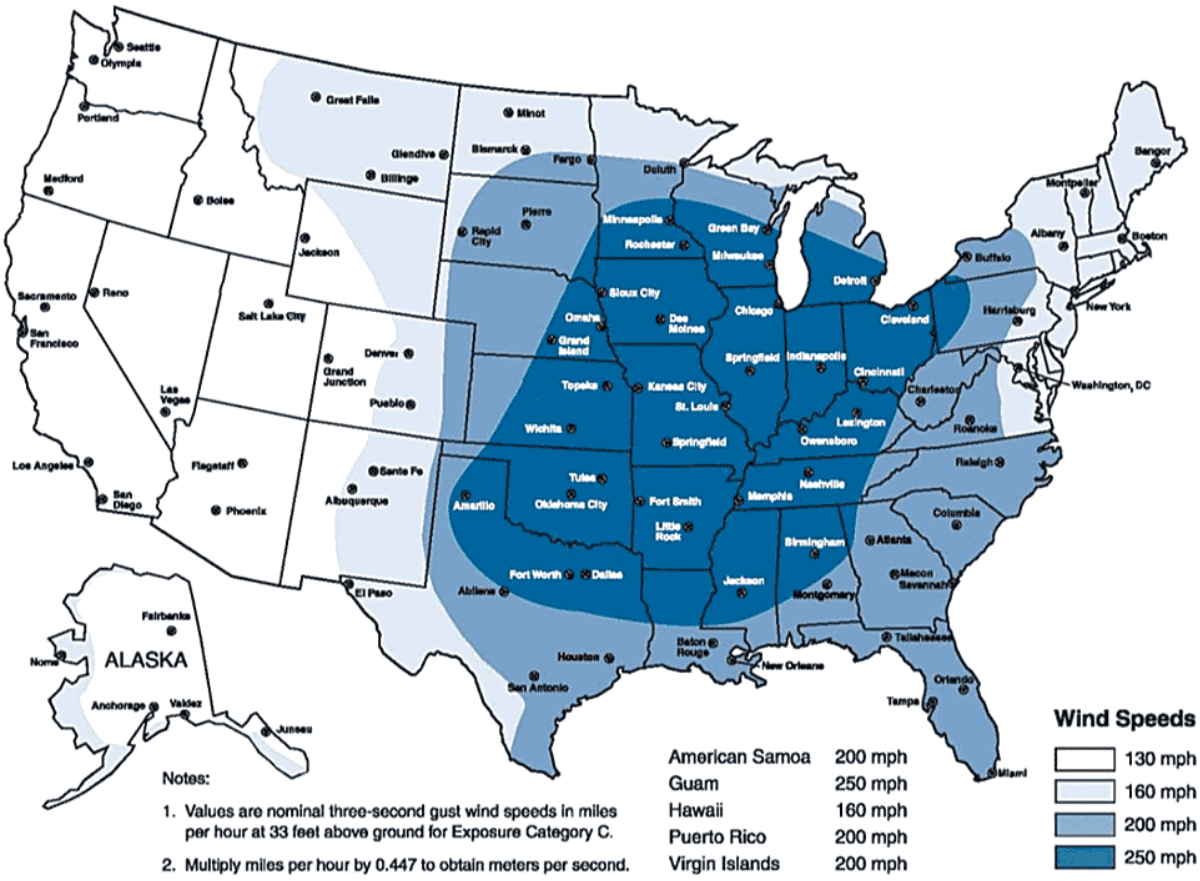
Source: NOAA Storm Prediction Center

Tornadoes of all levels of severity, through EF5, are possible anywhere in Wright County.

Windstorm

All of Wright County is susceptible to high wind events. The County is located in Wind Zone IV, which is susceptible to winds up to 250 mph. All of the participating jurisdictions are vulnerable to this hazard. **Figure 4.35** shows the wind zones for the United States based on maximum wind speeds; the entire State of Iowa is located within wind zone IV the highest inland category.

FIGURE 4.35 WIND ZONES IN THE UNITED STATES



Source: FEMA

The advancement in weather forecasting has provided for the ability to predict severe weather that is likely to produce tornadoes days in advance. Tornado watches can be delivered to those in the path of these storms several hours in advance. Lead time for actual tornado warnings is about 30 minutes. Tornadoes have been known to change paths very rapidly, thus limiting the time in which to take shelter. Tornadoes may not be visible on the ground if they occur after sundown or due to blowing dust or driving rain and hail.

4.5.14.2 Previous Occurrences

Tornadoes

According to NOAA statistics Wright County had 37 recorded tornado events from 1950 to December 2025. Of these, one was an F5; one was an EF3; three were an F2; twelve were an F1/EF1; and 20 were and F0/EF0 or not rated. These tornadoes caused six fatalities, 172 injuries, and over $26 million in property damages. **Table 4.66** summarizes these events.

TABLE 4.66 RECORDED TORNADOES IN WRIGHT COUNTY, 1950-2025

Date	Magnitude	Deaths	Injuries	Property Damages	Crop Damages	Length	Width
4/26/1964	F2	0	0	$25,000	$0	4.7	300

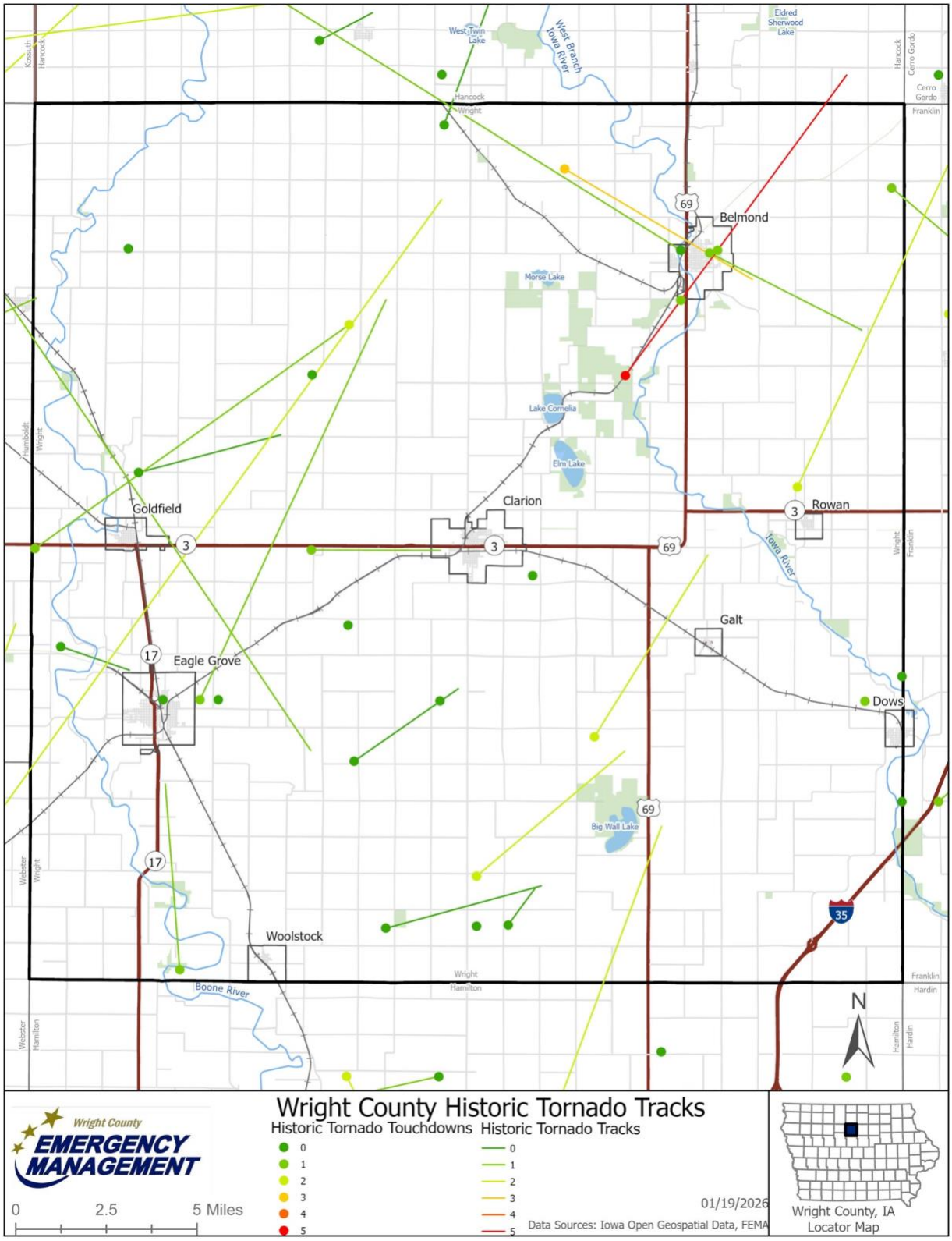
Date	Magnitude	Deaths	Injuries	Property Damages	Crop Damages	Length	Width
10/14/1966	F5	6	172	$25,000,000	$0	9.7	1000
6/24/1968	F1	0	0	$2,500	$0	0.3	100
9/12/1972	F1	0	0	$25,000	$0	0	100
9/26/1973	F2	0	0	$25,000	$0	1	100
5/30/1974	F0	0	0	$250	$0	0	33
6/15/1978	NR	0	0	$0	$0	0.5	10
6/28/1979	F1	0	0	$250,000	$0	12.6	300
7/13/1979	F1	0	0	$25,000	$0	0.8	60
6/16/1984	F1	0	0	$25,000	$0	7	77
6/12/1990	F0	0	0	$25,000	$0	0.4	17
6/29/1990	F0	0	0	$2,500	$0	0.2	20
6/29/1990	F1	0	0	$2,500	$0	3	40
5/17/1991	F2	0	0	$25,000	$0	2.5	60
5/17/1991	F0	0	0	$2,500	$0	0.3	20
6/18/1994	F0	0	0	$500	$50	0.5	25
5/15/1998	F1	0	0	$50,000	$500	11	60
6/6/1999	F0	0	0	$0	$0	0.1	20
6/6/1999	F0	0	0	$0	$0	0.1	20
6/8/1999	F0	0	0	$0	$0	0.2	25
5/21/2004	F0	0	0	$0	$0	0.2	25
3/30/2005	F1	0	0	$30,000	$0	0.5	50
6/21/2007	EF0	0	0	$0	$2,000	0.1	30
6/22/2010	EF0	0	0	$0	$5,000	2	50
6/12/2013	EF3	0	0	$500,000	$5,000	6.2	200
6/12/2013	EF1	0	0	$20,000	$5,000	5	125
6/12/2013	EF0	0	0	$0	$0	1.13	50
6/16/2014	EF0	0	0	$2,000	$1,000	0.4	100
8/31/2014	EF0	0	0	$25,000	$7,000	5.86	170
7/19/2018	EF0	0	0	$0	$500	3.5	80
7/19/2018	EF0	0	0	$0	$700	4.43	80
7/19/2018	EF0	0	0	$0	$100	1.28	60
5/26/2020	EF1	0	0	$70,000	$0	5.14	250
8/20/2021	EF0	0	0	$0	$1,000	4.05	190
12/15/2021	EF2	0	0	$150,000	$0	5.91	70
12/15/2021	EF1	0	0	$5,000	$0	6.48	80
12/15/2021	EFU	0	0	$0	$0	0.62	50
4/7/2024	EF1	0	0	$20,000	$0	0.48	70

Date	Magnitude	Deaths	Injuries	Property Damages	Crop Damages	Length	Width
TOTAL	**-**	**6**	**172**	**$26,307,750**	**$27,850**	**-**	**-**

Source: NOAA

The strongest tornado in Wright County's history is the October 14, 1966 F5 tornado that struck Belmond, killing six and injuring 172. The community was preparing to celebrate homecoming the day that the destructive tornado occurred. **Figure 4.36** displays the historic tornado events in the County. Most tornadoes are an EF2 or lower with the rare exception of an EF5 tornado that occurred, running from southwest of Belmond through the northeastern portion of the County.

FIGURE 4.36 HISTORIC TORNADO EVENTS IN WRIGHT COUNTY



Wright County has been included in eight Presidential Disaster Declarations that involved tornadoes since 1965. See **Section 4.1.1** in the Hazard Identification Section for additional details.

Windstorms

According to the NCDC database, there were 49 high wind events in Wright County from 1996 to October 2025. During this time period, there were no reported deaths or injuries. There was an estimated $1,395,210 in property damages. Based on previous occurrences, there were 19 events in 2010 and 11 in 2014, which were the highest number of high wind events in Wright County since 1996. The most damaging high wind event occurred in 1998, causing $300,000 in damages.

4.5.14.3 Probability of Future Occurrence

NOAA reported 37 tornadoes in Wright County in a 75-year time period, which calculates to approximately 50-percent chance of a tornado in any given year. Therefore, it is a high probability that some portion of Wright County will experience tornado activity in any given year.

According to NCDC, there were 49 separate high wind events from 1996 to October 2025 (29 year period) in Wright County. Based on this data there is over a 100-percent annual probability of high wind events in any given year. Therefore, the probability of future occurrence is **Highly Likely**.

Climate Change Impacts

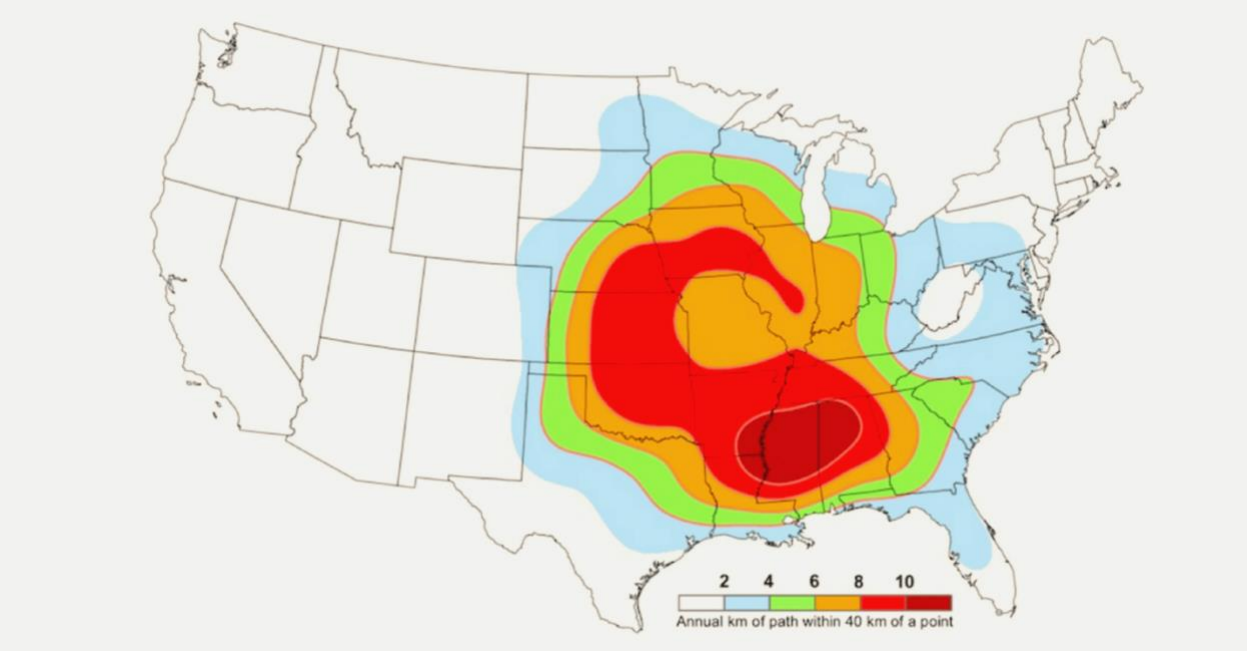
According to the 2010 Climate Change Impacts on Iowa report, growing evidence points to stronger summer storm systems in the Midwest. Studies have not been done to conclusively say that severe storms, including tornadoes, are increasing. However, with summer temperatures becoming warmer and humidity levels increasing, an increase in the likelihood of tornadic activity is plausible.

4.5.14.4 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

All critical facilities within Wright County are vulnerable to tornados, due to both their widespread potential impact and range of potential severity. Wright County is located just outside a region of the U.S. with high frequency of dangerous and destructive tornadoes and is referred to as “Tornado Alley”. **Figure 4.37** s based on areas where dangerous tornadoes are most likely to take place.

FIGURE 4.37 TORNADO ALLEY IN THE U.S.



Source: https://survive-a-storm.com/blog/modern-tornado-alley/

Light frame structures, such as mobile homes, outbuildings and sheds are considered especially vulnerable to damage from tornadoes. Populations most at risk from tornadoes include people living in mobile homes, campgrounds, and other dwellings without secure foundations or basements. People in automobiles are also very vulnerable to twisters. Due to the potential for damaging tornadoes in the planning area tornadoes and windstorms pose a **High** risk to the County.

Critical Facilities

Essential infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during tornadoes. In rural areas such as Wright County, this vulnerability is compounded by limited system redundancy and constrained emergency response capabilities, making recovery slower and impacts more severe. Tornadoes can disrupt critical infrastructure such as communications and energy due to high winds and debris. **Table 4.67** describes the potential vulnerabilities of lifelines from tornadoes within Wright County.

TABLE 4.67 POTENTIAL VULNERABILITIES OF LIFELINES FROM TORNADOES

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		Cell towers, internet infrastructure, and emergency broadcast systems can be damaged, limiting public warnings and coordination.
Energy (Power & Fuel)		Tornadoes frequently down power lines and damage substations, causing widespread outages. Fuel stations may be destroyed or inaccessible.
Food, Hydration, Shelter		Tornadoes disrupt food supply chains, contaminate water systems, and destroy homes, leading to mass displacement and shelter needs.
Hazardous Materials		Tornadoes can damage industrial facilities, leading to chemical spills, fires, or air/water contamination.
Health & Medical		Hospitals and clinics may be damaged or inaccessible, leading to delays in medical care. There's often a surge in trauma cases and mental health needs.
Safety & Security		Tornadoes destroy police stations, fire departments, and emergency operation centers, delaying law enforcement, fire response, and search and rescue operations.
Transportation		Roads, bridges, railways, and airports may be blocked or destroyed, delaying emergency response and supply delivery.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Water & Wastewater Systems		Water treatment plants and wastewater systems may be compromised, leading to boil water advisories and sanitation issues.

People

Populations residing in structures not designed as storm shelters are inherently vulnerable to tornado hazards. This risk is especially elevated for individuals living in mobile homes, which statistically account for a disproportionate number of tornado-related fatalities and injuries due to their limited structural resilience. According to FEMA's Community Resilience Index, Wright County has seven mobile home parks that are vulnerable to thunderstorms and high winds. The elderly (65 and older), young (less than 18 years old), and the physically and mentally handicapped are most vulnerable because of the lack of mobility to escape the path of destruction. People who may not understand tornado watches and warnings due to language barriers are also at risk. Based on previous occurrences, tornadoes have caused 172 injuries and six deaths within the County.

Natural, Cultural, and Historic Resources

Tornadoes can have significant impacts on natural, historic, and cultural resources throughout Wright County. Natural resources such as forests, wetlands, and wildlife habitats may be damaged or destroyed by high winds, flying debris, and uprooted vegetation. These impacts can lead to long-term ecological disruption, erosion, and loss of biodiversity.

Historic and cultural resources, including landmarks, heritage buildings, cemeteries, and tribal sites, are particularly vulnerable due to their age, structural fragility, and irreplaceable value. Tornadoes may cause partial or total destruction of these assets, resulting in the loss of community identity, historical continuity, and tourism value. Recovery and preservation efforts for these resources are often costly and time-consuming, underscoring the importance of proactive mitigation measures such as documentation, structural reinforcement, and protective zoning.

Structures and Systems

Tornadoes pose a significant threat to structures and systems across Wright County. Tornadoes have caused widespread damage to homes, businesses, farms, and public infrastructure. Hundreds of residential structures have been destroyed or severely damaged, and critical facilities like schools, fire stations, and police departments are often left inoperable due to roof failures, debris impacts, and power outages. Transportation routes are frequently blocked, delaying emergency response and recovery efforts. Additionally, agricultural operations are also at high risk, with crop damage and livestock losses posing economic challenges. Based on previous occurrences, there have been several EF1 and EF2 tornadoes within the County. Since the 1950's tornadoes have caused over $26 million in damages.

Overhead power lines and infrastructure are also vulnerable to damages from windstorms. Potential losses would include cost of repair or replacement of damaged facilities and lost economic opportunities for businesses. Public safety hazards include risk of electrocution from downed power lines. Specific amounts of estimated losses are not available due to the complexity and multiple variables associated with this hazard.

Crop Losses

Table 4.68 lists the crop loss estimates due to tornadoes in Wright County from 2016-2025. Crop insurance payments for wind damage are discussed in **Section 4.5.15,** Thunderstorm, Lightning and Hail.

TABLE 4.68 CROP LOSSES IN WRIGHT COUNTY DUE TO TORNADOES 2016-2025

YEAR	INDENMNITY AMOUNT	ACRES AFFECTED
2016	$0	0
2017	$0	0
2018	$0	0
2019	$0	0
2020	$0	0
2021	$19,089.00	39.65
2022	$0	0
2023	$0	0
2024	$0	0
2025	$0	0
Total	**$19,089.00**	**39.65**

Future Development

Public buildings such as schools, government offices, as well as other buildings with a high occupancy and mobile home parks should consider inclusion of a tornado saferoom to shelter occupants in the event of a tornado.

Windstorms are primarily a public safety and economic concern, and the planning area is located in a region with very high frequency of occurrence. Windstorm can cause damage to structures and power lines which in turn create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered.

Although windstorms occur frequently in the planning area and damages to property occur, much of the damage is generally covered by private insurance. This results in less impact to individuals and the community since recovery is facilitated by insurance.

Overall, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years.

Climate Change Impacts

According to the 2010 Climate Change Impacts on Iowa report, growing evidence points to stronger summer storm systems in the Midwest. Studies have not been done to conclusively say that severe storms, including tornadoes, are increasing. However, with summer temperatures becoming warmer and humidity levels increasing, an increase in the likelihood of tornadic activity is plausible.

Hazard Summary by Jurisdiction

The magnitude was rated as a level 4 for all the participating jurisdictions, as they are all vulnerable to tornado and windstorm damage. The factors of probability, warning time, and duration are also equal

across the planning area. This hazard does not substantially vary by jurisdiction. For more detail see **Table 4.69**.

TABLE 4.69 TORNADO AND WINDSTORM HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	4	4	3	1	3.55	High
Belmond	4	4	3	1	3.55	High
Clarion	4	4	3	1	3.55	High
Dows	4	4	3	1	3.55	High
Eagle Grove	4	4	3	1	3.55	High
Galt	4	4	3	1	3.55	High
Goldfield	4	4	3	1	3.55	High
Rowan	4	4	3	1	3.55	High
Woolstock	4	4	3	1	3.55	High
Belmond-Klemme CSD	4	4	3	1	3.55	High
Clarion-Goldfield-Dows CSD	4	4	3	1	3.55	High
Eagle Grove CSD	4	4	3	1	3.55	High

4.5.15 TRANSPORTATION INCIDENT

HAZARD SCORE CALCULATION					
Probability	**Magnitude/Severity**	**Warning Time**	**Duration**	**Weighted Score**	**Level**
4	4	4	1	3.70	High

This hazard encompasses accidents or failures of the following: air transportation, highway transportation, and rail transportation. The transportation incidents can involve any mode of transportation that directly threatens life, and which results in property damage and/or death(s)/injury(s) and/or adversely impact a community's capabilities to provide emergency services. Incidents involving buses and other high occupancy vehicles could trigger a response that exceeds the normal day-to-day capabilities of response agencies.

Air Transportation

An air transportation incident may involve a military, commercial or private aircraft. Air transportation is playing a more prominent role in transportation as a whole. Airplanes and helicopters are used to transport passengers for business and recreation as well as thousands of tons of cargo. A variety of circumstances can result in an air transportation incident including mechanical failure, pilot error, enemy attack, terrorism, weather conditions, and on-board fire.

Highway Transportation

Highway transportation incidents are very complex. Contributing factors can include a roadway's design and/or pavement conditions (e.g. rain, snow and ice), a vehicle's mechanical condition (e.g. tires, brakes, lights), a driver's behavior (e.g. speeding, inattentiveness and seat belt usage), the driver's condition (e.g.

alcohol use, age-related conditions, physical impairment) and driver inattention by using a wireless device. In fact, the driver's behavior and condition factors are one of the primary causes of crashes.

Railway Transportation

A railway transportation incident is a train accident that directly threatens life and/or property or adversely impacts a community's capabilities to provide emergency services. Railway incidents may include derailments, collisions and highway/rail crossing accidents. Train incidents can result from a variety of causes; human error, mechanical failure, faulty signals, and/or problems with the track. Results of an incident can range from minor "track hops" to catastrophic hazardous material incidents and even human/animal casualties. With so many miles of track in Iowa, vehicles must cross the railroad tracks at numerous at-grade crossings.

4.5.15.1 Geographic Location/Extent

The section below describes the geographic location for each of the types of transportation incidents for highways, rail, and air. The extent of transportation incidents can range from reoccurring car crashes with minimal property damage to airplane crashes and rail incidents that causes injuries, fatalities, and millions of dollars and property damage.

Highways/Roads

Numerous major US and state highways run through Wright County. Interstate 35 runs northeast-southwest in the south-eastern corner of the County. State Highway 69 runs north-south through Belmond, in addition to Highway 17 which runs through Eagle Grove. Highway 3 runs east-west in the middle of the County through Goldfield, Clarion, and Rowan.

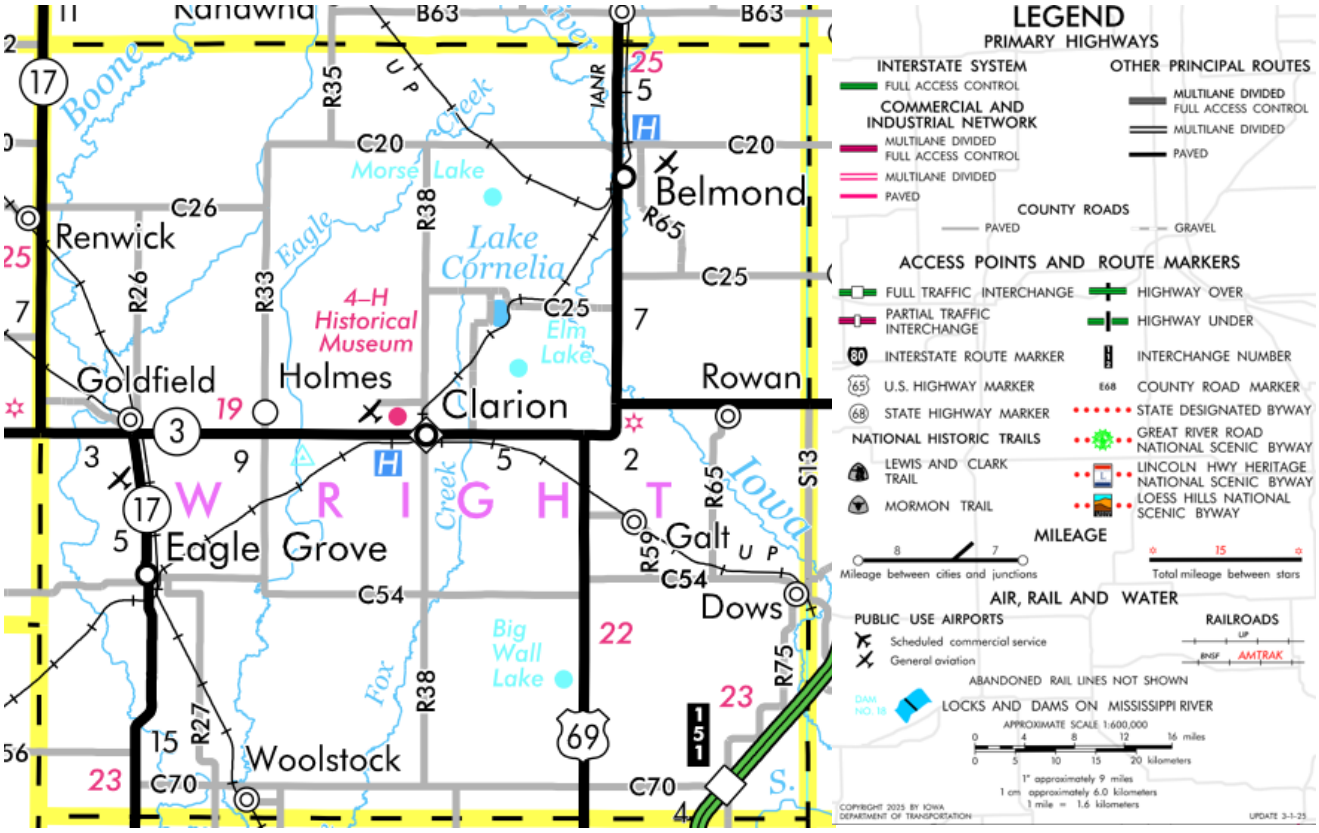
Numerous paved county roads connect all of the incorporated cities and unincorporated towns throughout the County. **Figure 4.19** in the Infrastructure Failure section shows the major highways in Wright County. According to the Iowa Department of Transportation, the total daily traffic in Wright County is 98,201and the total daily truck traffic is 16,567 [34].

Rail Transport

Union Pacific Railroad (UP) operates in Wright County with a line running northeast-southwest through Belmond, Clarion, and Eagle Gove. There are two additional smaller lines; one out of Clarion that runs southeast through Galt and Dows, and another line that runs northwest through Olaf, just south of Belmond. There is a rail line that has a higher gross volume, traveling through Goldfield, Eagle Grove, and Woolstock, with a few spur lines. **Figure 4.38** shows the railroads that operate in Wright County.

[34] Iowa Department of Transportation Map. 2026. Arcgiscom. [accessed 2026 Jun 16]. http://iowadot.maps.arcgis.com/apps/MapSeries/index.html?appid=db6cb43313354a4f8550508.

FIGURE 4.38 RAILROAD LINES IN WRIGHT COUNTY



Source: Iowa Department of Transportation, https://iowadot.gov/media/2102/download?inline

Air Transport

The Des Moines International Airport in Polk County or Fort Dodge Regional Airport are the primary commercial airports that service Wright County. There are three publicly owned airports in Wright County, including Belmond Municipal Airport, Clarion Municipal Airport, and Eagle Grove Municipal Airport. The Iowa Aviation System Plan identifies Belmond Municipal Airport, as well as Eagle Grove Municipal Airport, as Local Service airports, having runways less than 3,000 feet or only turf. Clarion Municipal Airport is categorized as a Basic Service Airport, having runways 3,000 feet or greater in length.

4.5.15.2 Previous Occurrences

Table 4.70 provides details of 18 air transportation incidents in (or near) Wright County from 1967 to 2024 (57 years) from the National Transportation Safety Board (NTSB). Based on previous occurrences, there have been three fatalities and one minor injury.

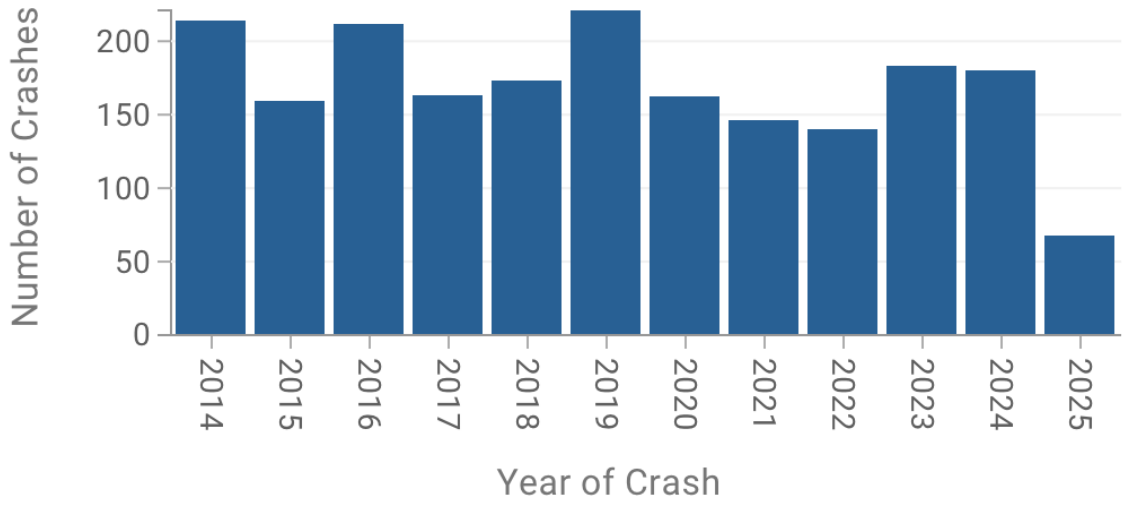
TABLE 4.70 WRIGHT COUNTY AIRCRAFT INCIDENTS/ACCIDENTS (1967-2024)

Event Date	Location	Injury Severity	Aircraft Damage	Make	Broad Phase of Flight
2/26/2014	Clarion	Minor (1)	Substantial	Cessena	Landing
07/03/2017	Eagle Grove	None	Substantial	Columbia Aircraft MFG	Landing
10/21/2010	Clarion, IA	Fatal (1)	Destroyed	Beech	Not Reported
08/20/1992	Dows, IA	Non-Fatal	Substantial	Hiller	Maneuvering
01/14/1989	Clarion, IA	Non-Fatal	Substantial	Cessna	Cruise
06/21/1983	Dows, IA	Non-Fatal	Substantial	Cessna	Takeoff
09/05/1981	Eagle Grove, IA	Non-Fatal	Destroyed	Cessna	Not Reported
07/10/1978	Eagle Grove, IA	Fatal (2)	Not Reported	Skylark	Not Reported
05/28/1978	Goldfield, IA	Non-Fatal	Not Reported	Grumman	Not Reported
03/06/1977	Belmond, IA	Non-Fatal	Not Reported	Cessna	Not Reported
02/17/1977	Clarion, IA	Non-Fatal	Not Reported	Cessna	Not Reported
04/04/1976	Eagle Grove, IA	Non-Fatal	Not Reported	Piper	Not Reported
03/17/1976	Dows, IA	Non-Fatal	Not Reported	Bell	Not Reported
08/29/1972	Eagle Grove, IA	Non-Fatal	Not Reported	Piper	Not Reported
01/06/1972	Belmond, IA	Non-Fatal	Not Reported	Cessna	Not Reported
10/05/1969	Dows, IA	Non-Fatal	Not Reported	Beech	Not Reported
07/10/1969	Eagle Grove, IA	Non-Fatal	Not Reported	Piper	Not Reported
09/04/1968	Eagle Grove, IA	Non-Fatal	Not Reported	Cessna	Not Reported

Source: http://www.ntsb.gov/_layouts/ntsb.aviation/index.aspx.

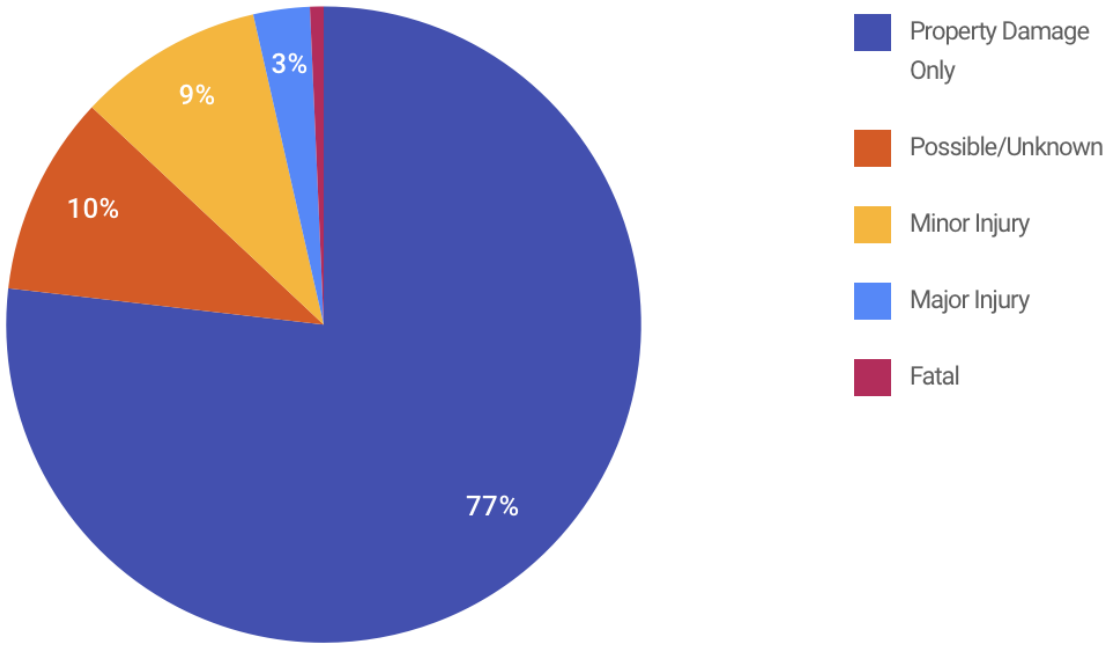
The Iowa Department of Transportation's Office of Traffic and Safety maintains traffic crash statistics and location maps by county and cities in Iowa. **Figure 4.39** through **Figure 4.41** displays the number of crashes per year, severity of crashes, and property damages per year from 2014 to 2025. 2019 had the highest number of crashes, and 2022 had the highest cost of property damage at over $1.5 million, and most of the crashes were property damage only.

FIGURE 4.39 WRIGHT COUNTY CRASHES BY YEAR (2014-2025)



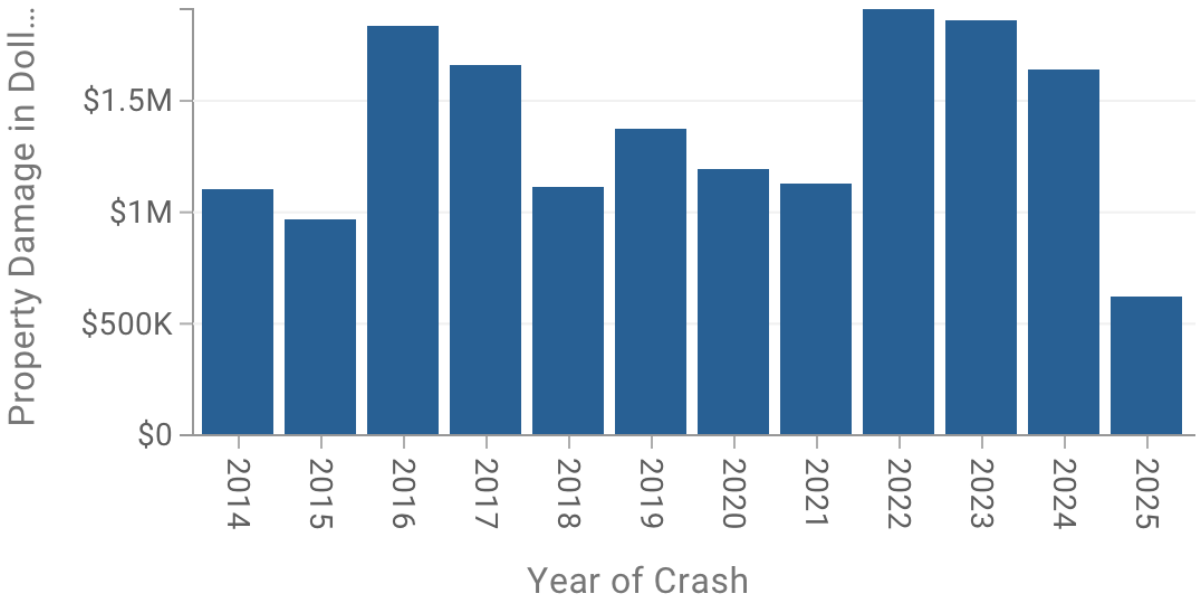
Source: Iowa Department of Transportation

FIGURE 4.40 WRIGHT COUNTY SEVERITY OF CRASHES (2014-2025)



Source: Iowa Department of Transportation

FIGURE 4.41 WRIGHT COUNTY PROPERTY DAMAGE BY YEAR (2014-2025)



Source: Iowa Department of Transportation

Table 4.71 provides details of 31 train-vehicle accidents in Wright County since 1975 from the Des Moines Register News Data Central. There have been two fatalities from train vehicle accidents and 13 injuries.

TABLE 4.71 TRAIN VEHICLE ACCIDENTS IN WRIGHT COUNTY SINCE 1975

Railroad	Year	City	Highway	Total Killed	Total Injured
CNW	1975		Allan's Crossing MP	0	1
CNW	1975	Eagle Grove	SW 10th Street	0	0
CNW	1975		Cornelia Blacktop	0	2
CNW	1975	Eagle Grove	2nd Street South	0	1
CNW	1975		Allen Crossing	0	0
CNW	1975	Eagle Grove	2nd Street North	0	0
CNW	1975		Gravel Crossing	0	0
RI	1976		County L 26	0	2
CNW	1976	Eagle Grove	Broadway Crossing	0	0
CNW	1976	Eagle Grove	Broadway Street	0	0
CNW	1976	Eagle Grove	Broadway	0	0
CNW	1977	Eagle Grove	Broadway Street	0	0
RI	1977		Highway 3	1	0

Railroad	Year	City	Highway	Total Killed	Total Injured
CNW	1977	Eagle Grove	Highway 17	0	0
CNW	1975		Allan's Crossing MP	0	1
CNW	1975	Eagle Grove	SW 10th Street	0	0
CNW	1975		Cornelia Blacktop	0	2
CNW	1975	Eagle Grove	2nd Street South	0	1
CNW	1975		Allen Crossing	0	0
CNW	1975	Eagle Grove	2nd Street North	0	0
CNW	1975		Gravel Crossing	0	0
RI	1976		County L 26	0	2
CNW	1976	Eagle Grove	Broadway Crossing	0	0
CNW	1976	Eagle Grove	Broadway Street	0	0
CNW	1976	Eagle Grove	Broadway	0	0
CNW	1977	Eagle Grove	Broadway Street	0	0
RI	1977		Highway 3	1	0
CNW	1977	Eagle Grove	Highway 17	0	0
UP	2008	Goldfield	Iowa Highway 3	0	0
UP	2008		Hancock Avenue	0	1
UP	2009	Eagle Grove	Private	0	0

4.5.15.3 Probability of Future Occurrence

A major transportation incident can occur at any time, even though traffic engineering, inspection of traffic facilities and land use management of areas adjacent to roads and highways have increased, incidents continue to occur. The combination of cars and trucks, farm equipment, wildlife, unpredictable weather conditions, potential mechanical problems and human error always leaves the potential for a transportation accident. Therefore, the probability of future occurrences of transportation incidents is **Highly Likely**.

4.5.15.4 Vulnerability Assessment

In order to understand how vulnerable the County is to the profiled hazards, an assessment was conducted for people, structures and systems, natural, cultural, and historic resources, and critical facilities. The following section details and discusses how vulnerable each category is based on hazard and community characteristics.

Transportation incidents can almost always be expected to occur in specific areas, on or near airports, roadways or other transportation infrastructure. The exception is air transportation incidents, which can occur anywhere. However, it is difficult to predict the magnitude of any specific event because these types of events are accidental and the circumstances surrounding these events will impact the extent of damage or injuries that occur. The number of urban and rural highway/roadway transportation accidents from 2014 to 2025 was a total of 2,019 crashes and 14 fatalities. Transportation incidents have resulted in one of the most deaths historically in the County compared to other hazards. Due to the potential for fatalities to occur, transportation incidents pose a **High** risk to the County.

Critical Facilities

Essential infrastructure, including power grids, water treatment plants, and communication networks, and transportation infrastructure itself, is highly susceptible to disruption from transportation incidents. In rural areas such as Wright County, this vulnerability is compounded by limited system redundancy and constrained emergency response capabilities, making recovery slower and impacts more severe. Transportation incidents can disrupt other critical infrastructure such as communications and energy due to damages. **Table 4.72** describes the potential vulnerabilities of lifelines from transportation incidents within Wright County.

TABLE 4.72 POTENTIAL VULNERABILITIES OF LIFELINES FROM TRANSPORTATION INCIDENTS

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Communications		Damage to cell towers or fiber-optic lines may disrupt emergency communications. Overloaded networks can delay 911 calls and coordination among responders.
Energy (Power & Fuel)		Power outages may result from damaged substations or downed lines. Fuel supply interruptions could affect emergency generators and transportation fleets.
Food, Hydration, Shelter		Blocked roads may delay delivery of food and water supplies.
Hazardous Materials		Spills or leaks from transport vehicles can contaminate soil, air, and water. Evacuation zones may be required, affecting residential and commercial areas.
Health & Medical		Hospitals and clinics may be overwhelmed by casualties or lose access to utilities. Delays in EMS transport due to road blockages can affect patient outcomes.

LIFELINE	FEMA ICON	DESCRIPTION OF IMPACT
Safety & Security		Law enforcement and fire services may face delayed response times. Damaged facilities may reduce operational capacity and increase public safety risks.
Transportation		Road and rail closures can disrupt emergency access, supply chains, and public transit. Long-term infrastructure damage may require costly repairs and rerouting.
Water & Wastewater Systems		Accidents near pipelines or treatment plants may cause service interruptions or contamination. Delayed access for utility crews can prolong outages and increase health risks.

People

Transportation-related incidents involving passenger vehicles, aircraft, or rail systems pose significant risks to public safety and infrastructure. These events can result in a spectrum of consequences, from minor property damage to mass casualty incidents. The likelihood and severity of such accidents are influenced by factors including traffic volume, infrastructure condition, weather, and human error. Based on the reported previous occurrences, there have been over a dozen fatalities from all types of transportation incidents. There are likely more fatalities that were not captured during the identified time periods, especially due to highway and road incidents.

Natural, Cultural, and Historic Resources

Transportation accidents, whether involving vehicles, rail, or hazardous material spills, can pose serious threats to natural, cultural, and historical resources in Wright County. These incidents may result in direct physical damage, environmental contamination, or long-term degradation of sites that hold historical or cultural significance.

Structures and Systems

Wright County is a largely rural area with pockets of densely populated cities. The County has several critical infrastructure and public services located near major transportation corridors. A transportation accident, such as a vehicular collision, rail incident, or hazardous material spill, could have significant consequences for the County's structures and systems.

Based on previous occurrences, transportation incidents have caused nearly $1,000,000 or more in damages a year since 2014. The year with the highest property damages from transportation incidents was 2022.

Future Development

Overall, Wright County has seen a decrease in population which may result in slowed or stagnant development over the next several years. Since the population in Wright County is declining, and volume

of traffic on the county roads, highways and interstates may decrease as well. With less traffic, transportation accidents may likely become less frequent.

Hazard Summary by Jurisdiction

All jurisdictions within the planning area are at risk to some kind of transportation incident. For more details see **Table 4.73**.

TABLE 4.73 TRANSPORTATION INCIDENTS HAZARD SUMMARY BY JURISDICTION

JURISDICTION	PROBABILITY	MAGNITUDE	WARNING TIME	DURATION	SCORE	LEVEL
Wright County	4	4	4	1	3.70	High
Belmond	4	4	4	1	3.70	High
Clarion	4	4	4	1	3.70	High
Dows	4	4	4	1	3.70	High
Eagle Grove	4	4	4	1	3.70	High
Galt	4	4	4	1	3.70	High
Goldfield	4	4	4	1	3.70	High
Rowan	4	4	4	1	3.70	High
Woolstock	4	4	4	1	3.70	High
Belmond-Klemme CSD	4	4	4	1	3.70	High
Clarion-Goldfield-Dows CSD	4	4	4	1	3.70	High
Eagle Grove CSD	4	4	4	1	3.70	High

4.6 HAZARD ANALYSIS SUMMARY

Table 4.74 provides a tabular summary of the hazard ranking for each jurisdiction in the planning area.

TABLE 4.74 HAZARD RANKING SUMMARY BY JURISDICTION

Jurisdiction	Animal/Crop/Plant Disease	Drought	Extreme Heat	Flash Flood	Grass or Wildland Fire	Hazardous Materials	Human Disease	Infrastructure Failure	River Flooding	Severe Winter Storm	Terrorism	Thunderstorm/Lightning/Hail	Tornado/Windstorm	Transportation Incident
Wright County	M	H	M	M	M	M	M	H	H	H	M	M	H	H
Belmond	M	H	M	M	M	H	M	H	H	H	M	M	H	H
Clarion	M	H	M	M	L	H	M	H	H	H	M	M	H	H
Dows	M	H	M	L	L	H	M	H	M	H	M	M	H	H
Eagle Grove	M	H	M	M	M	H	M	H	H	H	M	M	H	H
Galt	M	H	M	L	L	M	M	H	H	H	M	M	H	H
Goldfield	M	H	M	M	L	M	M	H	H	H	M	M	H	H
Rowan	M	H	M	M	L	M	M	H	M	H	M	M	H	H
Woolstock	M	H	M	L	L	L	M	H	H	H	M	M	H	H
Belmond-Klemme CSD	L	H	M	L	L	L	M	H	M	H	M	M	H	H
Clarion-Goldfield-Dows CSD	L	H	M	L	L	L	M	H	M	H	M	M	H	H
Eagle Grove CSD	L	H	M	L	L	L	M	H	M	H	M	M	H	H

5. MITIGATION STRATEGY

This section presents the mitigation strategy updated by the Hazard Mitigation Planning Committee (HMPC) based on the updated risk assessment. The mitigation strategy was developed through a collaborative group process and consists of updated general goal statements to guide the jurisdictions in efforts to lessen disaster impacts, as well as specific mitigation actions that can be put in place to directly reduce vulnerability to hazards and losses.

5.1 GOALS

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

This planning effort is an update to an existing hazard mitigation plan. Therefore, the goals from the *2019 Wright County Hazard Mitigation Plan* were reviewed to determine if they are still valid. The HMPC participated in a facilitated discussion to review and update the plan goals. To ensure that the goals are comprehensive and support State goals, the *State Hazard Mitigation Plan* goals were reviewed as well. The HMPC also reviewed common categories of mitigation goals from other plans.

The planning committee determined that all four previous goals from the previous plan remain valid. No changes were made to the plan goals. The validated plan goals for the Wright County Hazard Mitigation Plan are below:

- **Goal 1:** Increase capabilities within Wright County entities to mitigate the effects of hazards by enhancing existing or designing and adopting new policies that will reduce damaging effects of hazards.
- **Goal 2**: Protect the most vulnerable populations, buildings, and critical facilities within Wright County through the implementation of cost effective and technically feasible mitigation projects.
- **Goal 3**: Improve the level of responder, government, business and citizen awareness and preparedness for disasters.
- **Goal 4**: Develop programs to assure that response agencies, governments, educational institutions, and local businesses are able to operate during times of disaster.

5.2 IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS

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

Each jurisdiction was provided a list of their previous mitigation actions to update as needed based on their goals, priorities, the risk assessment and capability assessment. Since the last plan update, 15 Countywide Mitigation Actions were identified that apply to all participating jurisdictions for each of the profiled hazards. Jurisdictional representatives were instructed to review their previous mitigation actions and the newly identified 15 Countywide Mitigation Actions. The jurisdictions were encouraged to be comprehensive and include all appropriate actions to work toward becoming more disaster resistant.

For detailed information on countywide and jurisdictional mitigation actions, see each jurisdictional annex.

5.3 PRIORITIZATION

In efforts to simplify the prioritization method, a new method was developed to replace the STAPLEE method used in the last plan update. All existing and new mitigation actions were assessed using the new prioritization method.

The recommended path forward for prioritizing mitigation actions was to assign high, medium, or low priority based on whether the action saves lives, prevents property damage, or reduces the need for response. Each jurisdiction was instructed to provide a prioritization for each mitigation action. The definitions for low, medium, and high prioritization are provided below.

High Priority (H)

- Saves lives, AND either reduces property damage or reduces the need for response actions.

Medium Priority (M)

- Saves lives, but does not reduce property damage or the need for response actions OR
- Does not save lives but reduces property damage and reduces the need for response actions.

Low Priority (L)

- Does not save lives or reduce need for response actions, but reduces property damage OR
- Does not save lives or reduce property damage but reduces the need for response actions.

5.4 IMPLEMENTATION OF MITIGATION ACTIONS

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include an action strategy describing how the actions identified in paragraph (c)(2)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefits review of the proposed projects and their associated costs.

The mitigation actions included in this plan do not represent a commitment by participating communities to take on every listed action. Rather, this is a list of potential actions that they may wish to pursue, depending on the availability of funding. When determining how to use available hazard mitigation funding, or identifying (during annual plan reviews) which actions to pursue in the coming year, the HMPC will consider the following factors when identifying priority actions:

- The benefit-cost ratio (BCR) of proposed projects.
- BCR is a measure of the return on investment the community can expect to receive, and one of the most important factors in determining whether or not to implement an action.
- Communities may opt to conduct a full benefit-cost analysis, or may consider the relative costs and benefits qualitatively, depending on the availability of detailed project cost information.
- Degree to which the project impacts or protects life safety.
- Degree to which the project reduces the need for response actions.
- Size of the population who would benefit from the action.
- Benefit to the County's economy overall.
- Useful life of project, taking into consideration the expected impacts of climate change.
- Benefits to underserved communities.
- Other non-monetary benefits not specified here.

A summary of mitigation actions for Wright County is provided in **Table 5.1**. In addition to the Wright County actions provided and the actions specific to other jurisdictions considered in their individual annexes, **Table 5.2** provides a list of Countywide Actions shared across all participating jurisdictions. Due to a relative lack of municipal capacity to take on mitigation projects individually, the communities participating in this plan are likely to share resources and work together to reduce hazard related risk across the County. Many of these Countywide Actions list Wright County EMA as the responsible office, but they would be undertaken with support from all participating jurisdictions, reflecting the ongoing local commitment to joint action and mutual aid that is a key part of their emergency management ethos.

The Action ID for each existing and new action has been updated. New actions were assigned the next sequential Action ID for each jurisdiction. No mitigation actions have been deleted since the previous plan update.

TABLE 5.1 UPDATED 2026 WRIGHT COUNTY MITIGATION ACTIONS

Action ID	Issue/Background	Hazards Addressed	2026 Status	Responsible Office	Supporting Partners	Potential Funding Sources	Cost Estimate	Timeline	Priority
Wright County – 1	Continue pipeline safety training and support One Call to ensure pipeline and utility locations are known before digging.	Grass/Wildland Fire, Infrastructure Failure, Transportation Incident	Continue In-Progress	County EMA	Engineer, BOS, Sheriff	General Funds, In-Kind, Private Non-Profit	Little or no cost	Ongoing	H
Wright County – 2	Purchase additional generators for courthouse and essential county services.	Infrastructure Failure	Continue In-Progress	BOS	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds, In-Kind	$50,000 to $100,000	2-3 yrs	H
Wright County – 3	Continue supporting and promoting Code Red and utilize the system to warn citizens of hazards.	All Hazards	Continue In-Progress	EMA	BOS, Public Health	General Funds, In-Kind, Private Non-Profit	Less than $10,000	Ongoing	H
Wright County - 4	When roads, ditches, etc., are reconstructed evaluate the condition of the drainage tile.	Flash Flood, Infrastructure Failure, River Flooding, Transportation Incident	Continue In-Progress	Engineer	BOS	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$50,000 to $100,000	Ongoing	M
Wright County - 5	Build a tornado shelter at Big Wall Lake for campers (enough for 400-500 people).	Thunderstorm/ Lightning/Hail, Tornado/Winds torm	Continue In-Progress	Conservation	BOS, County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds, In-Kind	$500,000 to $1,000,000	More than 5 years	H
Wright County - 6	Install metal detectors at the courthouse to limit the possibility of bringing in firearms and explosive devices.	Terrorism	Continue In-Progress	Sheriff, County EMA	BOS, Buildings & Grounds, Clerk of Court	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$100,000 to $500,000	More than 5 years	H

Action ID	Issue/Background	Hazards Addressed	2026 Status	Responsible Office	Supporting Partners	Potential Funding Sources	Cost Estimate	Timeline	Priority
Wright County - 7	Continue compliance with National Flood Insurance Program	Flash Flood, River Flooding	Continue in-Progress	Planning & Zoning	BOS	FEMA HMA Grant (HMGP, BRIC, or FMA)	Little or no cost	Ongoing	H

TABLE 5.2. 2026 COUNTYWIDE MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA - 1	Encourage residents to purchase weather radios to stay informed on emergency information.	All Hazards	Continue In-Progress	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	1 year	M
CWA - 2	Increase coordination with regional and state agencies for early warning and monitoring of animal, plant, and crop disease	Animal/plant/crop disease	New	Environmental Health	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), USDA	Little or no cost	Ongoing	H
CWA - 3	Educate residents on water saving techniques and water conservation	Drought	New	County EMA , Participating Jurisdictions	Public Media	General Funds	Little or No Cost	1 year	L
CWA – 4	Promote tree planting in areas with low vegetation to increase shade coverage.	Extreme Heat	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	Ongoing	M
CWA – 5	Improve drainage infrastructure in areas where flash flooding frequently occurs.	Flash Flood	New	County EMA	Participating Jurisdictions	General Funds	$100,000 to $500,000	Ongoing	H
CWA – 6	Promote defensible landscape for homes, businesses and entities within WUI areas.	Grass and Wildland Fire	New	County EMA	Participating Jurisdictions	General Funds	Little to No Cost	Ongoing	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 7	Promote wetland restoration to reduce flooding impacts across the County.	River Flooding	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$100,000 to $500,000	Ongoing	H
CWA – 8	Promote snow safety to residents on how to prevent pipe breaks in their homes (e.g., insulating outdoor faucets, drip warm water from an indoor faucet) and what to do if a pipe breaks.	Severe Winter Storm	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	Little to No Cost	Ongoing	H
CWA – 9	Conduct Countywide trainings to practice responding to hazardous materials.	Hazardous Materials	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA -10	Promote flu clinics across the County	Human Disease	New	County EMA , Participating Jurisdictions	County Public Health	CDC Grants, General Funds	$10,000 to $50,000	Ongoing	M
CWA – 11	Promote Tree Trimming across the County to prevent fallen trees on infrastructure.	Infrastructure Failure	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	2-3 years	M
CWA – 12	Conduct Countywide trainings to practice responding to terrorist incidents.	Terrorism	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 13	Conduct Countywide trainings to practice responding to transportation incidents.	Transportation Incident	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA - 14	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Thunderstorm/Lightning/Hail	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M
CWA – 15	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Tornado/Windstorm	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M

6. PLAN IMPLEMENTATION AND MAINTENANCE

This chapter provides an overview of the overall strategy for plan maintenance and outlines the method and schedule for monitoring, updating and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

6.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

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

6.1.1 HAZARD MITIGATION PLANNING COMMITTEE (HMPC)

With adoption of this plan, the HMPC will continue to be tasked with plan monitoring, evaluation and maintenance. The participating jurisdictions and agencies, led by the Wright County Emergency Management Coordinator, agree to:

- Meet annually to review the Hazard Mitigation Plan;
- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high priority, low- or no-cost recommended actions;
- Maintain vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Report on plan progress and recommended changes to the Wright County Board of Supervisors and governing bodies of participating jurisdictions; and
- Inform and solicit input from the public.

The HMPC is an advisory body and can only make recommendations to county, city, town, or district officials. Its primary duty is to see the plan successfully carried out and to report to the community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, hearing stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information in areas accessible to the public.

6.1.2 PLAN MONITORING PROCESS

The plan will be monitored annually during the five-year cycle. Wright County Emergency Management will coordinate with the HMPC to conduct an annual review of the mitigation action plan and request status updates from participating jurisdictions and planning partners. At a minimum, the annual monitoring process will review:

- Progress made toward implementing mitigation actions;
- Changes in the status, priority, timeline, lead agency, or funding source for each mitigation action;
- New hazard events or impacts that occurred during the previous year;
- Changes in land use, development, infrastructure, critical facilities, or population that may affect hazard vulnerability;
- New plans, policies, programs, grant opportunities, or local capabilities that may support mitigation implementation;
- Any issues or barriers challenging implementation of the mitigation strategy.

Mitigation action status will be tracked using categories such as completed, in progress, ongoing capability, delayed, deferred, or removed. The annual monitoring process may be completed through planning team meetings, email coordination, jurisdiction questionnaires, progress reports, or other documentation methods determined appropriate by the HMPC.

The HMPC agrees to meet annually to monitor progress, discuss recent hazard events and changes in development that impact vulnerability, and update the mitigation strategy. The Wright County Emergency Management Coordinator will be responsible for initiating the plan reviews.

6.1.3 PLAN EVALUATION PROCESS

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or;
- Increased vulnerability as a result of new development (and/or annexation).

Plan evaluation also includes assessing whether the plan currently covers all hazards applicable to the County, whether the mitigation strategy and goals are still relevant and suited for the participating jurisdictions, and whether the mitigation actions are still considered effective. To best evaluate the mitigation strategy during plan review and update, the participating jurisdictions will utilize the following process:

- A representative from the responsible office identified in each started mitigation action will be responsible for tracking and reporting the action status on an annual basis to the jurisdictional HMPC member and providing input on any completion details or whether the action still meets the defined objectives and is likely to be successful in reducing vulnerabilities.
- If the action does not meet identified objectives, the jurisdictional HMPC member will determine what additional measures may be implemented, and an assigned individual will be responsible for defining action scope, implementing the action, monitoring success of the action, and making any required modifications to the plan.
- As part of the annual review process, the Wright County Emergency Management Coordinator will provide the updated Mitigation Strategy with the current status of each mitigation action to the County Board of Supervisors and County Department Heads as well as all Mayors, City Clerks, and School District Superintendents requesting that the mitigation strategy be incorporated, where appropriate in other planning mechanisms.

Changes will be made to the plan to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation.

6.1.4 PLAN UPDATE PROCESS

In coordination with the other participating jurisdictions, a five-year written update of the plan will be submitted to the Iowa Homeland Security and Emergency Management Department and FEMA Region VII per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. The next plan update will:

- Follow a planning process aligned with the one outlined in Chapter 1 of this plan;
- Be supported by the HMPC;
- Consider changes in vulnerability due to action implementation;
- Document changes in vulnerability where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new capabilities or changes in capabilities;
- Incorporate new data or studies on hazards and risks;
- Incorporate growth and development-related changes to inventories and;
- Incorporate new action recommendations or changes in action prioritization.

The HMPC aims to start planning for the next update 1-2 years before the plan expires in order to complete the plan update before the five-year expiration. The goal is to maintain eligibility to FEMA Hazard Mitigation Assistance grants.

6.2 INCORPORATION INTO EXISTING PLANNING MECHANISMS

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

Many of the small jurisdictions in Wright County do not have standard formal planning mechanisms such as a Comprehensive Plan or Capital Improvement Plan through which formal integration of mitigation actions can be documented. As a result, activities that occur in these small communities are developed through annual budget planning, regular City Council Meetings and other community forums rather than a formal planning process. Planning mechanisms that do exist to some degree within the participating jurisdictions include:

- Comprehensive Plans
- Various ordinances of participating jurisdictions, including floodplain management ordinances in NFIP-participating communities
- Wright County Emergency Operations Plan
- Capital Improvement Plans

For a detailed summary of planning mechanisms and other mitigation-related capabilities, see Chapter 3.

Where possible, plan participants will use existing plans and/or programs to implement hazard mitigation actions. After the annual review of the Hazard Mitigation Plan, the Wright County Emergency Management Coordinator will provide the updated Mitigation Strategy with the current status of each mitigation action to the County Board of Supervisors and County Department Heads as well as all Mayors, City Clerks, and School District Superintendents. They will consider this updated information, and the hazard mitigation principles, vulnerability information and mitigation actions in the plan in the update of any existing community planning during the following year to leverage activities that have co-benefits, reduce risk and increase resilience.

Table 6.1 Provides additional details on each jurisdiction regarding how the 2019 Hazard Mitigation Plan was integrated into existing planning mechanisms as well as the strategy going forward to integrate this plan update into existing planning mechanisms in the future.

TABLE 6.1 INTEGRATION OF PREVIOUS PLAN AND STRATEGIES TO INTEGRATE PLAN UPDATE

Jurisdiction	Incorporation of 2019 Plan into Existing Planning Mechanisms	Integration Process for Plan Update
Unincorporated Wright County	Plan was integrated with secondary road construction plan, COOP plan, and Health Department plans.	Plan will be incorporated with budgeting plans and in seeking grants for larger projects; will be integrated with comprehensive plan, capital improvement plan, infrastructure plan, annual budgeting and planning, environmental health plan, preparedness plan annual reviews, and COOP plan.
Belmond	Plan was consulted in planning of CIP projects and use of funding.	Plan will be integrated with Comprehensive Plan, which needs to be updated soon, and with CIP and operating budgets, which are reviewed annually.
Clarion	Plan was tied to necessary sanitary sewer and storm sewer improvements funded by CDBG.	Plan will be integrated with CIP and infrastructure improvements.
Dows	No integration.	Will be reviewed on future updates and tied to sewer updates; will be integrated with infrastructure plan.
Eagle Grove	Plan was incorporated into Comprehensive Plan and new plan for capital improvements.	Plan will continue to be integrated with the Comprehensive Plan and will be incorporated into the Capital Improvement Plan / Pavement Plan and the Utility Board's infrastructure plan.
Galt	N/A; did not participate in previous plan.	There are no standing planning mechanisms at the municipal level into which this plan could be integrated, but it will be consulted where relevant to budgeting decisions.
Goldfield	No integration.	Plan will be incorporated into the comprehensive plan, the capital improvement plan, and the infrastructure plan.
Rowan	No integration.	Mitigation will be incorporated into infrastructure actions.
Woolstock	No integration.	There are no standing planning mechanisms at the municipal level into which this plan could be integrated, but it will be consulted where relevant to budgeting decisions.
Clarion-Goldfield-Woolstock CSD	No integration: plan objections compete for funding with other facility needs.	Plan implementation will be integrated with Wright County and the City of Clarion and will be incorporated into school infrastructure plan and school emergency plan.
Eagle Grove CSD	Plan incorporated into plans for new addition by informing construction techniques.	Incorporated into plans for construction and renovations and integrated into the school infrastructure plan.
Belmond-Klemme CSD	No integration.	There are no standing planning mechanisms at the municipal level into which this plan could be integrated, but it will be consulted where relevant to budgeting decisions.

6.3 CONTINUED PUBLIC INVOLVEMENT

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

The public will be invited to attend annual review meetings and/or provide comment on annual status reports. The County will publish a press release after each annual review indicating the committee has met and providing a summary of mitigation action status updates and highlights of specific completed mitigation actions, as applicable.

The update process also provides an opportunity to publicize success stories from the plan's implementation and seek additional public comment. When the HMPC reconvenes for the update, it will coordinate with all stakeholders participating in the planning process, including those who joined the HMPC after the initial effort, to update and revise the plan. Public notice will be posted through available website postings and social media outlets; the public will be invited to provide comments regarding HMPC activities throughout the process.



WRIGHT
COUNTY
IOWA

1.INTRODUCTION AND PLANNING PROCESS

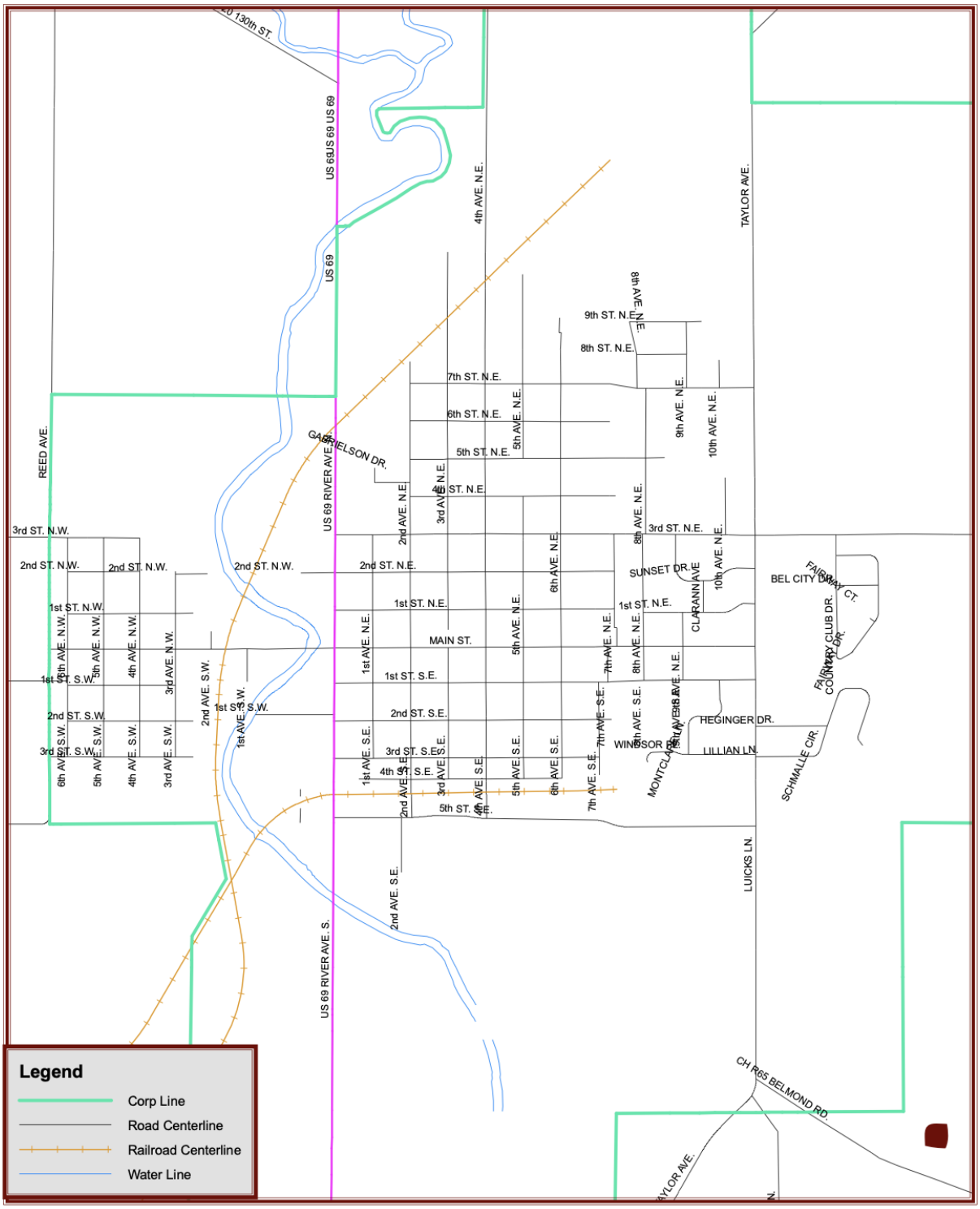
This annex provides more detailed information about the City of Belmond. This annex includes the following:

- A more localized community profile, including more detailed mapping, population and demographic information, and critical facilities information
- City-level Hazard Identification and Risk Assessment (HIRA) information, including some more localized hazard maps and conclusions related to hazard risk and how it varies across the planning area
- A localized vulnerability assessment, including the likely impact of profiled hazards on critical facilities
- A detailed capability assessment, describing resource and tools available to the City and to participate in hazard mitigation and reduce hazard risk
- A mitigation strategy, describing a variety of actions the City may opt to take to reduce the risk associated with profiled hazards over the useful life of this plan

2. COMMUNITY PROFILE

The City of Belmond was incorporated in 1881 and is located in northeastern Wright County, Iowa. Like many communities in Wright County, Belmond is a relatively rural and agriculturally connected community. The community's roadways primarily adhere to a grid pattern, and Highway 69 passes through the community along the Iowa River. **Figure 1** displays a map of the City of Belmond.

FIGURE 1. CITY OF BELMOND



2.1 POPULATION AND DEMOGRAPHICS

In order to properly plan and prepare a jurisdiction for future emergencies and disasters, it is important to know the community's characteristics and demographics. Over the past several decades the City's population has increased. **Table 1** shows the population trends over time for the City of Belmond. The population increase also means that, in general, there are more individuals exposed to hazards within the community, slightly increasing its overall vulnerability. **Table 2** shows the demographic data. The median household income for the City is $56,528 and 17.6% of the population live below the poverty level. For comparison, the County's poverty level is at 11% and the U.S. at about 10.6% as of 2024.

TABLE 1. POPULATION TRENDS

JURISDICTION	2010 CENSUS POPULATION	2016 POPULATION ESTIMATE	2023 CENSUS POPULATION	% CHANGE 2010-2023
Belmond	2,376	2,324	2,678	12.7%

Source: U.S. Census Bureau: 2010 Decennial Census, 2016 Population Estimates, 2020 Decennial Census, 2023 American Community Survey

TABLE 2. DEMOGRAPHIC DATA

JURISDICTION	POPULATION 18 YEARS AND OVER	UNEMPLOYMENT RATE (2025)[1]	MEDIAN HOUSEHOLD INCOME	PERCENT BELOW POVERTY LEVEL
Belmond	1,846	-	$56,528	17.6%

Source: U.S. Census, 2023 American Community Survey, 5-year Estimates

The median age in Belmond is 38.2 years old and about 16.2% of the population speak a language other than English at home which is greater than the State of Iowa at 9.7%. Other languages spoken at home include Spanish and other Indo-European languages. About 30% of the population have a bachelor's degree which is slightly lower than the State of Iowa at 32%.

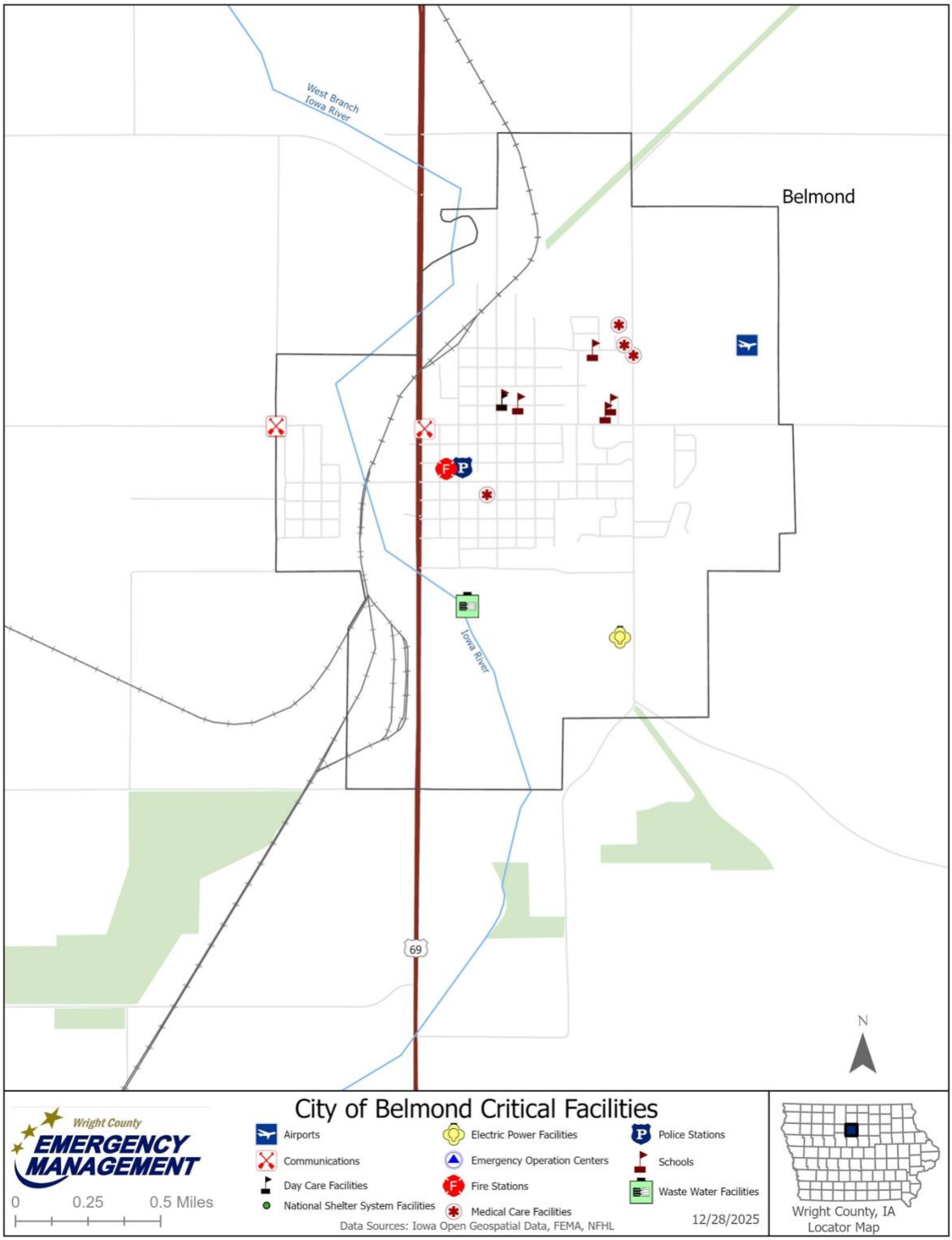
There are 1,165 housing units within the City, 1,057 of which are occupied. Additionally, 10% of the population has a disability which is slightly lower than the State of Iowa at 12.9%.

2.2 CRITICAL FACILITIES

Critical facilities are the systems and structures that are essential to a jurisdiction's continued functioning, the failure of which would cause significant disruption. **Figure 2** displays the critical facilities within Belmond. There are 16 critical facilities within Belmond.

[1] https://fred.stlouisfed.org/series/IAWRIG7URN

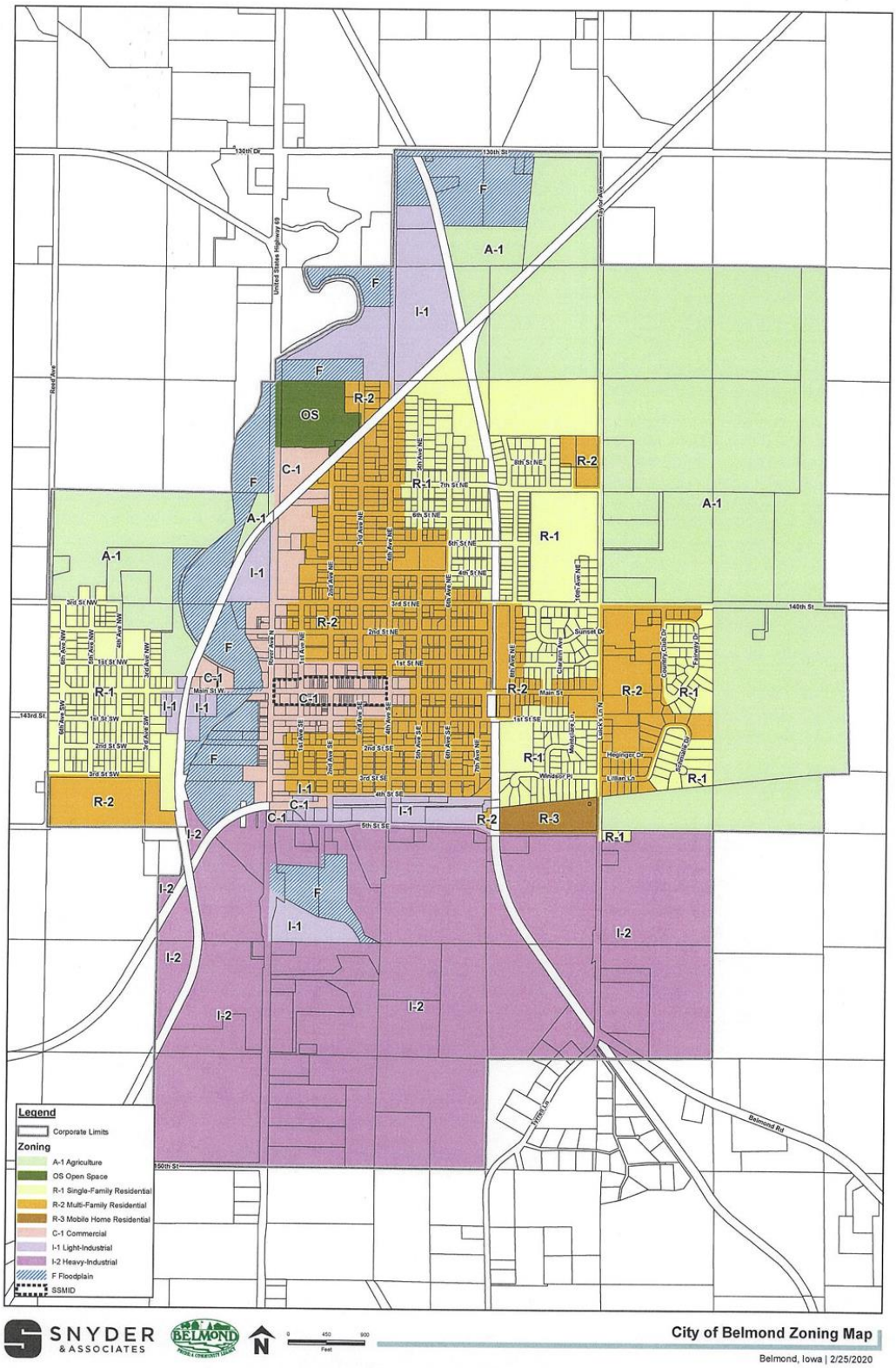
FIGURE 2. BELMOND CRITICAL FACILITIES



2.3 LAND USE AND DEVELOPMENT

The City of Belmond contains a variety of land uses, including industrial, agricultural, and residential areas. Residential land uses are generally concentrated in the central portion of the community, while industrial and agricultural uses are generally located near the outer edges of the jurisdiction. According to the U.S. Census Bureau, the number of housing units in Belmond decreased by approximately 7.5% between 2010 and 2023, and no significant commercial, industrial, or agricultural developments have been reported. These trends indicate that the community's vulnerability derived from building exposure may have slightly decreased since the previous plan update, primarily due to fewer structures being exposed to hazards. **Figure 3** shows the land use map for the City of Belmond.

FIGURE 3. BELMOND LAND USE MAP



The City of Belmond is one of several cities within Wright County that has access to major highways including U.S. Highway 69 and Interstate 35 only 15 miles to the east. As mentioned prior, Belmond has a municipal airport which includes a 330-foot turf runway and hangar facility.

The City of Belmond has the Belmond Growth Alliance (BGA), which collects Belmond's data pertaining to the investment of industrial sites and/or purchase of existing buildings. BGA is a committee of community leaders who work to improve the business climate in Belmond. Additionally, Belmond houses several industries including Printing Service Inc. which provides nationwide printing. Other industries provide goods and servicessuch as implements, fertilizer, and chemical products[2].

2.4 NATURAL, HISTORIC, AND CULTURAL RESOURCES

The City of Belmond has several natural, historic, and cultural resources. These resources include[3]:

- Jenison-Meacham Memorial Arts Center and Farmstead
- Belmond Historical Museum
- Iowa River Players Theater
- Luick Memorial Swimming pool
- The New Lyric Theater
- Talbot Belmond Public Library
- Wright County Dr. District Fair
- Ball Field Park
- Belmond Bark Park
- City Park
- Crown Point Park
- Franklin Grove Heritage Trail
- El Mar Park
- Iowa River RV Park
- Pool Park[4]

[2] https://belmondiowa.com/businesses/business-development/business-industry/
[3] https://belmondiowa.com/community/tourism/attractions/
[4] https://belmondiowa.com/community/tourism/recreation/parks/

3. CAPABILITY ASSESSMENT

The capability assessment evaluates a jurisdiction's ability to implement a comprehensive mitigation strategy and identifies opportunities to establish or strengthen mitigation policies, programs, and projects. More generalized information about the goals of the capability assessment, including the process and methodology, is presented in the Capability Assessment portion of the base plan.

This section articulates specific information about the capabilities of Belmond which include the following:

- Planning mechanisms
- Regulatory tools and programs
- Staff and technical capabilities
- Fiscal and other mechanisms
- Floodplain management and regulation

3.1 PLANNING MECHANISMS

Table 3 describes the planning mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Belmond has a Capital Improvement Plan (CIP), Comprehensive Plan, Critical Facilities Plan, Emergency Operations Plan (EOP), County Hazard Mitigation Plan, and Land Use Plan. In order to increase this capability, the City may seek to implement additional plans such as a Debris Management Plan, Continuity of Operations Plan, and Disaster Recovery Plan. These plan can support the City in planning to remove debris, continue City operations, and recovering from disasters in the future.

TABLE 3. PLANNING MECHANISMS

PLANNING MECHANISMS	CITY OF BELMOND
Capital Improvement Plan (CIP)	12/5/2016
Comprehensive Plan	Jul-02
Community Wildfire Protection Plan (CWPP)	no
Comprehensive Emergency Management Plan (CEMP)	no
Critical Facilities Plan	2/1/2016
General Plan	No
Continuity of Operations Plan (COOP)	No
Debris Management Plan	No
Disaster Recovery Plan	No
Economic Development Plan	No
Emergency Operations Plan (EOP)	Yes - 2/1/2016
Environmental Impact Report (EIR)	No
Evacuation Plan	No

PLANNING MECHANISMS	CITY OF BELMOND
Flood Response Plan	No
Floodplain Management Plan/Flood Mitigation Plan	No
Hazard Mitigation Plan	Yes
Historic Preservation Plan	No
Land Use Plan	Yes-Jul-02
Natural Resource Protection Plan (NRPP)	No
Open Space Management Plan	No
Transportation Plan	No
Threat Hazard Identification and Risk Assessment (THIRA)	No
Watershed Plan	No

3.2 REGULATORY TOOLS AND PROGRAMS

Table 4 describes the regulatory tools and programs that the jurisdiction has in place to support hazard mitigation. Currently, the City of Belmond has adopted the 1997 Unified Building Code and floodplain management and ordinances as well as other stormwater management and subdivision regulations and ordinances. In order to increase this capability, the City may seek to update their building codes and explore community programs such as a Community Emergency Response Team (CERT).

TABLE 4. REGULATORY TOOLS AND PROGRAMS

REGUALTORY TOOLS AND PROGRAMS	CITY OF BELMOND
Building Codes	UBC 1997
Citizen Corps – Community Emergency Response Team (CERT)	No
Community Rating System (CRS Program of the NFIP)	No
Emergency Management Accreditation Program (EMAP)	No
Fire Code	No
Firewise Community	No
Floodplain Management/Flood Damage Prevention Ordinance	Yes
Land Use/Development Planning	Yes
National Flood Insurance Program (NFIP)	Yes

REGUALTORY TOOLS AND PROGRAMS	CITY OF BELMOND
Post Disaster Redevelopment/Reconstruction Plan/Ordinance	No
Storm Ready	No - Low NOAA Reception In Belmond
Stormwater Management Plan/Ordinance	Yes
Subdivision Regulations/Ordinance	Yes
Unified Development Ordinance	No
Zoning Ordinance	Yes

3.3 STAFF AND TECHNICAL CAPABILITIES

Table 5 describes the staff and technical capabilities that the jurisdiction has in place to support hazard mitigation. Currently, the City of Belmond has an Emergency Manager and a Floodplain Manager. In order to increase this capability, the City may seek to increase the number of specialized staff to support hazard mitigation.

TABLE 5. STAFF AND TECHNICAL CAPABILITIES

STAFF AND TECHNICAL CAPABILITES	CITY OF BELMOND
Emergency Manager	Yes
Engineers or professional trained in construction practices related to buildings and/or infrastructure	No
Environmental Justice Specialists	No
Fiscal Management or Procurement Specialists	No
Floodplain Manager	Yes
Housing Specialist(s)	No
Land Surveyors	No
Land Use/Management/Development Planning	No
Planners or engineers with an understanding of natural and/or human caused hazards	No
Recreation/Green Space Specialist(s)	No
Resource Development Staff or Grant Writing	No
Scientists familiar with the hazards of the community	No
Staff experienced with Geographic Information Systems (GIS) or HAZUS	No

STAFF AND TECHNICAL CAPABILITES	CITY OF BELMOND
Staff with education or expertise to assess the community's vulnerability to hazards	No
Transportation Manager/Traffic Engineer	No

3.4 FISCAL AND OTHER MECHANISMS

Table 6 describes the fiscal and other mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Belmond implements several fees and bonds to generate funds. These funds can be critical to funding community operations and future mitigation projects. To improve this capability, the City may look to continue to diversity funding mechanisms and apply for grants such as the HSGP, IIJA, and USDA grants.

TABLE 6. FISCAL AND OTHER MECHANISMS

FISCAL AND OTHER MECHANISMS	CITY OF BELMOND
Capital Improvement Programming	Yes
Community Development Block Grants (CDBG)	Yes
Development Impact Fees	No
FEMA Hazard Mitigation Assistance Grants (HMPG, FMA, PDM)	No
Gas/Electric Utility Fees	Yes
General Obligation, Revenue, and/or Special Tax Bonds	Yes
Homeland Security Grants (HSGP)	No
Infrastructure Investment and Jobs Act (IIJA)	No
Infrastructure State Revolving Fund Loan	No
Partnering Agreements or Intergovernmental Agreements	No
Sewer/Water Fees	Yes
Special Purpose Tax (or taxing districts)	No
Stormwater Utility Fees	No
USDA Grants	No
USDA Rural Development Agency Grants	No
US Economic Development Administration Grants	No

3.5 FLOODPLAIN MANAGEMENT AND REGULATION

Table 7 describes the National Floodplain Insurance Program (NFIP) Capability for the City of Belmond. Currently, the City participates in the NFIP and has adopted and enforces floodplain management regulations and ordinances.

TABLE 7. FLOODPLAIN MANAGEMENT AND REGULATION

NFIP CAPABILITIES	CITY OF BELMOND
Has your community adopted a floodplain management ordinance that meets NFIP minimum criteria?	Yes
Has your community adopted the latest effective Flood Insurance Rate Map (FIRM)?	Yes – 03/01/2011
Do you regulate/permit development in the Special Food Hazard Area (SFHA)?	Yes
Which position or agency is in charge of NFIP compliance for your community?	Wright County Planning and Zoning Administrator
How do you implement the substantial improvement/substantial damage provisions of your floodplain management ordinance?	Through development review and permitting

4. HAZARD IDENTIFICATION AND RISK ASSESSMENT

The Hazard Identification and Risk Assessment (HIRA) process, described in more detail in the HIRA section of the base plan, involves identifying potential hazards, evaluating their likelihood and potential consequences, and estimating and describing the level of risk these hazards present to a community.

As described in the "HIRA Methodology" section of the base plan, participants in this plan update reconsidered the relative risk posed by the profiled hazards by conducting a hazard ranking process. **Table 8** below provides a summary of how those hazards were ranked in the City of Belmond. Each of the 14 natural and manmade hazards discussed in this section are described in more detail in the HIRA section of the base plan. This section aims to provide more detailed, local-level information, mapping, and conclusions for these hazards wherever relevant.

TABLE 8. BELMOND HAZARD RANKING

JURISDICTION	ANIMAL/CROP/PLANT DISEASE	DROUGHT	EXTREME HEAT	FLASH FLOOD	GRASS OR WILDLAND FIRE	HAZARDOUS MATERIALS	HUMAN DISEASE	INFRASTRUCTURE FAILURE	RIVER FLOODING	SEVERE WINTER STORM	TERRORISM	THUNDERSTORM/LIGHTNING/HAIL	TORNADO/WINDSTORM	TRANSPORTATION INCIDENT
Belmond	M	H	M	M	M	H	M	H	H	H	M	M	H	H

4.1 ANIMAL/PLANT/CROP DISEASE

For detailed information on animal, plant, and crop disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.1.1 LOCATION AND EXTENT

All of Wright County is subject to animal/livestock incidents and agricultural infestations, which include the City of Belmond. For more information on the location and extent of animal, plant, and crop disease, please refer to the base plan.

4.1.2 PREVIOUS OCCURRENCES

There are no previous occurrences that have been reported to impact the City of Belmond specifically. For more information on previous occurrences in Wright County, please refer to the base plan.

4.1.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for animal/plant/crop/disease in Belmond is **Unlikely**.

4.1.4 VULNERABILITY ASSESSMENT

Within Belmond, animal/plant/crop disease poses a **Medium** risk due to limited previous occurrences and impact to the City yet potential to cause economic instability. This section provides further contextualization for the anticipated vulnerability of Belmond to animal/plant/crop disease. Belmond's vulnerability to plant, animal, and crop disease does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for animal, plant, and crop disease, please refer to the base plan.

4.1.4.1 Critical Facilities

Animal, plant, and crop diseases have limited impact on critical facilities due to the hazard directly impacting animals, plants, and crops and related industries.

4.1.4.2 Cultural, Historic, and Natural Resources

In regard to natural resources, sensitive crops are those that are more susceptible to stress from environmental factors such as weather and crop diseases. There are several areas within Wright County that have sensitive crops and would be more vulnerable to disease. There are three sensitive crop locations within the City of Belmond. For more information reference **Figure 4.4** in the base plan. There are limited impacts to cultural and historic resources.

4.1.4.3 People

Animal, plant, and crop diseases can impact the population through food supply chain disruptions, increased food prices, local employment, and potential health impacts from zoonotic diseases such Highly Pathogenic Avian Influenza (HPAI).

4.1.4.4 Structures and Systems

Buildings, infrastructure, and critical facilities are not vulnerable to this hazard. Its impacts are primarily economic and environmental, rather than structural effects.

4.1.4.5 Changes in Development

Overall, population in the City of Belmond has increased in recent years. It is difficult to quantify what impacts a slight population change could have on animal/plant/crop diseases; on the one hand, an increase in people may mean that there is a slightly higher chance that human activity accidentally contaminates animal/plant/crop populations. On the other hand, communities that become more populated tend to support a more diverse economy, and the economic damage resulting from an animal/plant/crop disease outbreak may be lower than in communities that are heavily dependent on livestock and agriculture. Based on current trends, future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.2 DROUGHT

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.2.1 LOCATION AND EXTENT

All of Wright County is subject to drought as drought normally is more of a widespread hazard and not isolated. For more information on the location and extent of drought, please refer to the base plan.

4.2.2 PREVIOUS OCCURRENCES

According to the National Drought Mitigation Center's Drought Impact Reporter, during the period from January 2007 through January 2026, nine were reported to affect Wright County. Impacts of recent drought periods in Iowa that affected Wright County are provided below. Unless otherwise indicated, these impacts are from the National Climatic Data Center. For more information on previous occurrences in Wright County, please refer to the base plan.

4.2.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for drought in Belmond is **Highly Likely**.

4.2.4 VULNERABILITY ASSESSMENT

Within Belmond, drought poses a **High** risk due to potential impacts, largely to public health, agriculture, and the local economy. This section provides further contextualization for the anticipated vulnerability of Belmond to drought. Belmond's vulnerability to drought does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for drought, please refer to the base plan.

4.2.4.1 Critical Facilities

All critical facilities in Belmond may be impacted by drought and more so by water shortages during extreme drought conditions.

4.2.4.2 Cultural, Historic, and Natural Resources

All natural resources within the City can experience stressed vegetation, tree mortality, soil compaction, erosion and loss of habitat or shade due to drought. Areas associated with agricultural use are vulnerable to drought conditions if irrigation is unavailable--this could result in a decrease in crop production or a decrease in available grazing area for livestock. Where irrigation is possible, owners may be faced with higher costs due to greater water usage. Drought may also erode cultural and historic resources within Belmond as well.

4.2.4.3 People

All people residing in Belmond may be impacted by Drought. Drought presents hazards to public health when drinking water production cannot keep up with demand. Additionally, water scarcity caused by a drought can lead to increased water rates and create financial hardship, especially for individuals and families living below poverty. In Belmond, 17.6% of the population lives below the poverty line. Additionally, the elderly and young children may be at greater risk of experiencing adverse health effects resulting from reduced water quality.

4.2.4.4 Structures and Systems

Drought has minimal effect on houses and buildings. In severe prolonged droughts, structures could be impacted through cracks in foundation which can comprise the integrity and safety of the building. Additional impacts on structures could include shifting foundations and dried vegetation which can execrate urban fire and wildfire risk.

4.2.4.5 Changes in Development

Overall, population in the City of Belmond has increased since the previous hazard mitigation plan. This may increase vulnerability to droughts if the community's water production is unable to adequately meet the needs of more people. Increased demand may also strain the local water infrastructure in severe drought conditions.

4.3 EXTREME HEAT

For detailed information on extreme heat in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.3.1 LOCATION AND EXTENT

All of Wright County is subject to extreme heat as it is normally more of a widespread hazard and not isolated. For more information on the location and extent of extreme heat, please refer to the base plan.

4.3.2 PREVIOUS OCCURRENCES

The following summarizes the National Weather Service Advisories, Watches, and Warnings for Heat or Excessive Heat in Wright County from 2000 to 2025 (25 years of data). For more information on previous occurrences in Wright County, please refer to the base plan.

- 46 Heat Advisories
- 2 Extreme Heat Watches
- 8 Excessive Heat Watches
- 7 Excessive Warnings

4.3.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for extreme heat in Belmond is **Likely**. For more information on the vulnerability assessment for extreme heat, please refer to the base plan.

4.3.4 VULNERABILITY ASSESSMENT

Within Belmond, extreme heat poses a **Medium** risk due to high likelihood of future occurrence and magnitude. Belmond's vulnerability to extreme heat does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for extreme heat, please refer to the base plan.

4.3.4.1 Critical Facilities

All critical facilities may be at risk of impact depending on severity of extreme heat events. Extreme heat can significantly affect all critical facilities by compromising the structural integrity and operational reliability of critical facilities and infrastructure. Water scarcity may also directly reduce the ability of hospitals and care facilities to deliver critical services. During extreme heat events, it is likely that food, hydration, and health and medical lifelines would be disrupted.

4.3.4.2 Cultural, Historic, and Natural Resources

Prolonged high temperatures and hot conditions can stress ecosystems, reduce biodiversity, and increase the risk of wildfires, especially in forested and agricultural areas. These changes threaten native species and disrupt ecological balance, which in turn affects the natural heritage in Belmond. Some historic buildings were built before the invention of central air conditioning and may lack proper cooling, posing risk to its inhabitants. Cultural traditions and outdoor events may be disrupted due to unsafe heat conditions, reducing community engagement and tourism.

4.3.4.3 People

All people residing in Belmond may be at risk, although certain populations may be more vulnerable to the effects of extreme heat. Those at greatest risk for heat-related illness and deaths include people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. Wright

County's population over 65 years is higher than both the national and state average, at 20.9 percent. Young children may also be more susceptible to extreme heat, and parents and childcare providers should always ensure young children are never left in hot, enclosed spaces.

4.3.4.4 Structures and Systems

All structures and systems may be at risk of impacts depending on the severity of extreme heat events. Materials can crack, warp, deform, and generally lose strength when hot enough. Extreme heat can also put strain on electricity infrastructure, which can be overloaded during peak use of electricity to power air conditioning during extreme heat events. Increased electricity use can increase rates and cause financial hardships, especially for individuals and families experiencing poverty. In Belmond, 17.6% of the population lives in poverty according to the US Census Bureau.

4.3.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years, corresponding to an overall increase in vulnerability across the community. As a community's population increases, there are naturally more individuals who may be exposed to extreme heat and may need medical attention. Additionally, more people will utilize air conditioning during hot periods, which may increase electricity usage and strain the local infrastructure.

4.4 FLASH FLOOD

For detailed information on flash flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.4.1 LOCATION AND EXTENT

Wright County includes two major tributaries of the Mississippi River, including the Boone River and the upper portion of the Iowa River. The Boone Watershed intercepts the entire western and central portion of Wright County and is an area of gently flat to rolling hills. For more information on the location and extent of flash flood, please refer to the base plan.

4.4.2 PREVIOUS OCCURRENCES

There are no reported flash flood events that have occurred in Belmond. For more information on previous occurrences within Wright County, please refer to the base plan. It is important to note that flash flooding can be highly localized and affect areas as small as a single low intersection, and minor flash flooding events can be underreported.

4.4.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for flash flood in Belmond is **Highly Likely**. While there are no reported previous occurrences in the City, there have been several flash flood events that occurred Countywide and may have impacted the City. Due to the frequency of flash flood events in the County, the City of Belmond shares the same probability as the County.

4.4.4 VULNERABILITY ASSESSMENT

Within Belmond, flash floods pose a **Medium** risk due to a highly likely probability of occurrences and moderate damage to property and crops. Belmond's vulnerability to flash flooding does not vary significantly from the risk of the county as a whole. For more information on the countywide vulnerability assessment for flash flooding, please refer to the base plan.

4.4.4.1 Critical Facilities

Critical facilities in low lying areas may be at risk of impact from flash flood events. Critical facilities, such as hospitals, emergency operations centers, fire stations, schools, nursing homes, and water treatment plants, face varying levels of risk from flash flood events depending on their location, structural resilience, and operational readiness.

4.4.4.2 Cultural, Historic, and Natural Resources

Cultural, historic, and natural resources in low lying areas may be at risk of impact from flash flood events. Flooding can cause significant damage to Wright County's natural, historic, and cultural assets. Natural areas such as wetlands, forests, and waterways may experience erosion, pollution, and habitat loss, reducing their ecological value and ability to buffer future flood events. These changes can also affect recreational and conservation areas. Historic buildings and cultural landmarks are at risk of structural damage, deterioration, and loss of historically significant materials. Flooding may also disrupt cultural traditions tied to specific locations or community spaces.

4.4.4.3 People

Flooding presents a serious risk to residents across Wright County. People residing in low lying areas and near rivers and creeks are at the greatest risk of impact from flash flood events. Demographics that are

most at risk include older adults, low-income families, and individuals without access to flood insurance, lack of accessible emergency alert and notifications, or reliable transportation.

4.4.4.4 Structures and Systems

Structures and systems in low lying areas are at the greatest risk of impact from flash flood events. Flash flooding can quickly flood any low-lying structures and systems that are inundated. These damages can cause costly repairs for state, county, and city road/bridge maintenance departments. When sewer back-up occurs, this can result in costly clean-up for home and business owners, and they also present a health hazard.

4.4.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years which may increase across Belmond as a whole. While no new development is foreseen, and development in low-lying areas would also increase the community's risk to flash flooding.

4.5 GRASS OR WILDLAND FIRE

For detailed information on grass or wildland fire in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

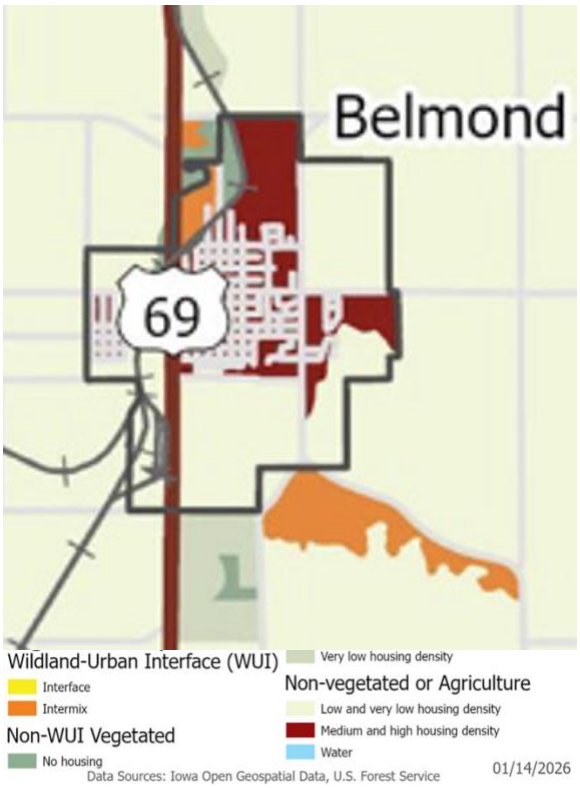
4.5.1 LOCATION AND EXTENT

Wildland/Grass fires are most likely to occur in the Wildland Urban Interface (WUI). This is the area where houses meet or intermingle with undeveloped wildland vegetation. Within the WUI, there are two specific areas identified:

- Interface
- Intermix

The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. **Figure 4** shows the WUI areas near Belmond. On the map, the orange represents Intermix areas and the yellow represents Interface areas. The red indicates medium and high housing density that is unrelated to wildfire risk. For more information on the location and extent of grass or wildland fire, please refer to the base plan.

FIGURE 4. BELMOND WUI AREAS



4.5.2 PREVIOUS OCCURRENCES

According to the National Fire Incident Reporting System (NFIRS), there has been one fire incident in Wright County since 2017, which occurred southwest of Belmond. For more information on previous occurrences within Wright County, please refer to the base plan.

4.5.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for grass or wildland fire in Belmond is **Possible**.

4.5.4 VULNERABILITY ASSESSMENT

Within Belmond, grass or wildland fire pose a **Medium** risk due to prevalence of WUI areas and limited previous occurrences. This section provides further contextualization for the anticipated vulnerability of Belmond to grass or wildland fire. Belmond's vulnerability to grass or wildland fire does not vary significantly from the risk of the county as a whole. For more vulnerability information regarding grass or wildland fires in Wright County, please refer to the base plan.

4.5.4.1 Critical Facilities

There are no critical facilities that fall within the WUI areas (Intermix or Interface) within Belmond.

4.5.4.2 Cultural, Historic, and Natural Resources

Wildfire and Wildland-Urban Interface (WUI) areas can pose a risk to the County's natural, historic, and cultural resources. Wildfires can degrade ecosystems by destroying native vegetation, fragmenting wildlife habitats, and increasing soil erosion and water pollution. Smoke and airborne pollutants also impact air quality, affecting both environmental and human health. Culturally and historically significant sites, such as cemeteries and historic buildings, are vulnerable to direct fire damage and indirect impacts from suppression efforts and post-fire erosion.

4.5.4.3 People

Populations across Wright County face varying degrees of vulnerability to WUI fires, depending on factors such as proximity to wildland areas, housing density, socioeconomic conditions, and access to emergency services. In urbanizing areas, the expansion of housing into fire-prone zones increases the number of people and structures exposed to wildfire hazards.

4.5.4.4 Structures and Systems

Structure and systems in WUI areas may be at risk of impact from grass and wildland fires. Wildfires can cause extensive damage to crops, the environment, and occasionally residential or business facilities. Homes built in rural areas are more vulnerable since they are in closer proximity to wildland where fires may start, and rural properties are typically further away from emergency services.

4.5.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years which may increase communitywide risk as more people in the City are potentially exposed to wildfires.

4.6 HAZARDOUS MATERIALS

For detailed information on hazardous materials in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.6.1 LOCATION AND EXTENT

Fixed Hazardous Materials Incident

According to the Iowa Department of Natural Resources, there are 44 sites in Wright County that because of the volume or toxicity of the materials on site were designated as Tier II Facilities under the Superfund Amendments and Reauthorization Act. Within Belmond there are seven Tier II facilities. For more information on the location and extent of hazardous materials, please refer to the base plan.

Transportation Hazardous Materials Incident

The transport of hazardous materials in Wright County can occur via trucks on the highways/roads and airplanes carrying hazardous cargo. Hazardous materials can be transported on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. In Belmond, Highway 69 runs through the City and is at risk of hazardous transportation materials incident.

Rail Transport

Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Gove.

Air Freight

There are three airports in Wright County: Belmond, Clarion, and Eagle Grove. Hazardous materials incidents can occur within these three airports across the County. Crashes involving planes can lead to contamination if aviation fuel, pesticides, herbicides, and other potentially hazardous materials are dispersed.

Pipeline Incident

There are no major pipelines that run directly through the City of Belmond, however there are pipelines located nearby, and ruptures could potentially impact the residents of the City.

4.6.2 PREVIOUS OCCURRENCES

From 2017 to 2024, there have been 22 hazardous materials spills reported to the Environmental Protection Agency (EPA) within Belmond. There are no other types of hazardous materials incidents that have been reported to have occurred in Belmond. For more information on previous occurrences within Wright County, please refer to the base plan.

4.6.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for hazardous materials in Belmond is **Highly Likely**.

4.6.4 VULNERABILITY ASSESSMENT

Within Belmond, hazardous materials pose a **Medium** risk due to the number of previous occurrences and number of Tier II facilities in the City. This section provides further contextualization for the anticipated vulnerability of Belmond to hazardous materials. Belmond's vulnerability to hazardous materials is higher than the risk of the county as a whole due to the higher concentration of assets and people. For more

information on Wright County's vulnerability assessment for hazardous materials, please refer to the base plan.

4.6.4.1 Critical Facilities

Facilities located near major transportation corridors or industrial zones are at higher risk of exposure to chemical spills, fires, or airborne toxins. These incidents can disrupt operations, damage infrastructure, and endanger occupants, especially in facilities that house vulnerable populations like the elderly or children. Additionally, facilities without proper ventilation systems, backup power, or shelter-in-place protocols are more susceptible to contamination and operational failure during a HazMat event. All 16 critical facilities are near either transportation corridors or Tier II facilities within Belmond.

4.6.4.2 Cultural, Historic, and Natural Resources

Hazardous material (HazMat) incidents pose significant risks to natural, historic, and cultural resources across Wright County. These resources include wetlands, rivers, forests, historic buildings, archaeological sites, and culturally significant landmarks. A chemical spill or airborne release can contaminate soil and water, damage ecosystems, and degrade the physical integrity of historic structures. Natural resources such as wildlife habitats and water bodies are particularly vulnerable to long-term environmental damage, which can disrupt biodiversity and recreational use. Historic and cultural sites may suffer irreversible harm if exposed to corrosive or toxic substances, especially if they lack protective infrastructure or are located near transportation corridors or industrial zones.

4.6.4.3 People

Communities near major transportation routes, such as highways and rail lines, are at higher risk due to the frequent movement of hazardous substances. Industrial zones and agricultural areas with chemical storage facilities also present elevated risks of fixed-site incidents. These events can lead to chemical spills, fires, or airborne releases that threaten public health and safety.

Vulnerability is especially high among populations with limited mobility, such as the elderly, individuals with disabilities, and residents of schools, hospitals, and correctional facilities. These groups may face challenges during evacuation or shelter-in-place orders. Additionally, low-income communities may struggle with access to protective equipment, transportation, and timely information, further increasing their vulnerability.

4.6.4.4 Structures and Systems

Due to data limitations, there is no definitive information on how much damage previous hazardous materials events have caused. It is difficult to determine the potential losses to existing development because of the variable nature of a hazardous materials spill. For example, a spill of a toxic airborne chemical in a populated area could have greater potential for loss of life. By contrast a spill of a very small amount of a chemical in a remote rural area would be much less costly and possibly limited to remediation of soil.

4.6.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years, which may increase overall risk in Belmond due to the greater number of people potentially exposed to hazardous materials.

4.7 HUMAN DISEASE

For detailed information on human disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.7.1 LOCATION AND EXTENT

Pandemics and epidemics do not affect a single geographic location; Wright County is equally vulnerable. Transmission can occur anywhere people interact, but locations with higher numbers of individuals create more opportunities for disease to spread. For more information on the location and extent of human disease, please refer to the base plan.

4.7.2 PREVIOUS OCCURRENCES

Pandemics and epidemics have had recurring and widespread effects on the County and across the world. While some events have been global in scale and others more localized, each has highlighted the vulnerability of the community to infectious disease and underscored the importance of preparedness and coordinated response. Since 1918, there have been six major epidemics or pandemics that are widely recognized by both the CDC and WHO, in addition to the COVID-19 pandemic. For more information on previous occurrences within Wright County, please refer to the base plan.

4.7.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for human disease in Belmond is **Possible**.

4.7.4 VULNERABILITY ASSESSMENT

Within Belmond, human disease poses a **Medium** risk due to low probability yet high risk to significantly impact the City. This section provides further contextualization for the anticipated vulnerability of Belmond to human disease. Belmond's vulnerability to human disease does not differ significantly from the risk of the county as a whole. For more information on Wright County's vulnerability assessment for human disease, please refer to the base plan.

4.7.4.1 Critical Facilities

Infectious disease outbreaks can significantly disrupt the operation of critical facilities in Wright County. Healthcare facilities, including hospitals, clinics, and long-term care centers, are particularly vulnerable due to increased patient loads, limited surge capacity, and potential shortages of staff and medical supplies. These facilities must maintain continuity of operations while implementing infection control measures, such as isolation protocols and PPE usage. Other essential facilities, such as emergency operations centers, law enforcement agencies, schools, and correctional institutions, may experience staffing shortages due to illness or quarantine, which can impair their ability to deliver vital services.

4.7.4.2 Cultural, Historic, and Natural Resources

Cultural institutions such as museums, historic sites, and art galleries may be closed or operate at reduced capacity during a pandemic. This can lead to decreased access to cultural resources for the public. Cultural organizations often rely on visitor revenue and donations to sustain operations. Reduced visitation and economic uncertainty during a pandemic can strain the financial stability of these institutions, impacting their ability to preserve cultural resources.

4.7.4.3 People

Wright County face several vulnerabilities during a human infectious disease event due to a combination of environmental, healthcare, and socioeconomic factors. Transmission risks are heightened by close human contact, contaminated surfaces, and limited access to sanitation in some areas. Populations most at risk include the elderly, immuno-compromised individuals, and frontline workers.

The County's rural nature may limit healthcare surge capacity, making it harder to manage widespread outbreaks. Risk will vary based on geographical vaccination efforts and vaccination uptake by communities and individuals. Additionally, insurance, access to healthcare, as well as trust in the medical community can determine risk to population which can increase infection rates, hospitalizations, and mortality. [5] Additionally, due to the high percentage of induvial living in poverty, Belmond may be more at risk to health impacts from human disease.

4.7.4.4 Structures and Systems

Infectious disease events can significantly impact critical infrastructure and systems, especially in rural and resource-limited areas. Healthcare facilities may face strain due to increased patient loads, limited surge capacity, and potential shortages of personal protective equipment (PPE), isolation space, and trained personnel.

4.7.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years. With more people, the risk of transmission and the number of people which may become sick are both increased, corresponding to an overall increase in vulnerability across Belmond.

[5] https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems

4.8 INFRASTRUCTURE FAILURE

For detailed information on infrastructure failure in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.8.1 LOCATION AND EXTENT

The entire planning area is at risk to all types of infrastructure failure included in the hazard description section, either from primary failure due to malfunction, degradation, or accidental or intentional damage or as a result of a secondary impact related to another hazard event. Belmond has a wastewater site within the City and may be at increased risk of failure. For more information on the location and extent of infrastructure failure, please refer to the base plan.

4.8.2 PREVIOUS OCCURRENCES

Infrastructure Failure often occurs as a secondary impact to other hazard events. For specific descriptions, please see the Previous Occurrences section of the other hazards included in the base plan. In addition to failure/impacts as a result of other hazard events, Infrastructure Failure can also occur as a result of lack of maintenance, human error, and age deterioration. There have been no significant infrastructure failures reported in Belmond.

4.8.3 PROBABILITY OF FUTURE OCCURRENCES

While there have been no significant infrastructure failures reported previously, many minor infrastructure failures, such as road closures, downed power lines, loss of cellular signal, and others, go unreported. Therefore, the HMPC considers the probability of future occurrences for infrastructure failure in Belmond is **Highly Likely**.

4.8.4 VULNERABILITY ASSESSMENT

Within Belmond, infrastructure failure poses a **High** risk due to a high likelihood of future occurrence and the potential for high magnitude. This section provides further contextualization for the anticipated vulnerability of Belmond to infrastructure failure. Belmond's vulnerability to infrastructure failure does not vary significantly from countywide risk. For more information on Wright County's vulnerability assessment for infrastructure failure, please refer to the base plan.

4.8.4.1 Critical Facilities

All critical facilities within Belmond may be at risk of impacts such as damage and disruption to services from infrastructure failure.

4.8.4.2 Cultural, Historic, and Natural Resources

Infrastructure failures have a limited impact to natural, historic, and cultural resources. Secondary impacts of infrastructure failures such as fires due to ruptured gas pipelines and contamination from wastewater, may pose a greater risk to these natural resources.

4.8.4.3 People

Infrastructure failure may impact all people within Belmond due to the range of infrastructure failures such as transportation, sewer, water, energy, and communications. Certain populations may be at increased risk, including, older adults, individuals medically dependent on electricity, and those with certain medical conditions.

4.8.4.4 Structures and Systems

Since utility/infrastructure failure is generally a secondary or cascading impact of other hazards, it is not possible to quantify estimated potential losses specific to this hazard due to the variables associated with affected population, duration of outages, etc. In some instances, failure of one system can impact others. For example, the loss of electricity may also lead to the loss of internet connectivity, which is the primary concern.

4.8.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years, resulting in an overall increase in the community's vulnerability to infrastructure failures.

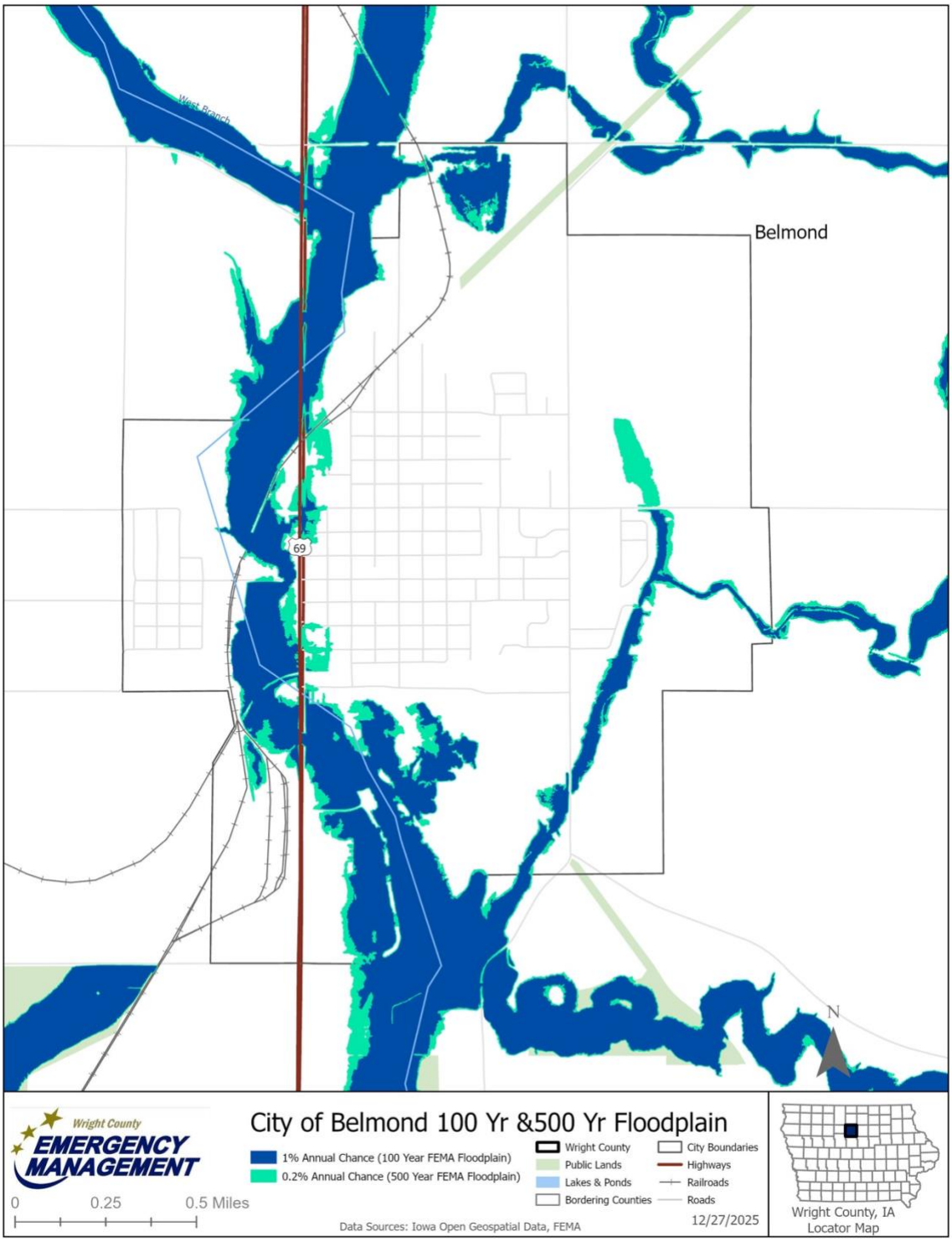
4.9 RIVER FLOODING

For detailed information on river flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.9.1 LOCATION AND EXTENT

Belmond has both 100-year floodplains and 500-year floodplains that run throughout the City, but mainly center around Highway 69 and the South, southeastern part of the City. **Figure 5** displays both the 100-year and 500-year floodplains within Belmond. For more information on the location and extent of river flooding, please refer to the base plan.

FIGURE 5. CITY OF BELMOND 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN



4.9.2 PREVIOUS OCCURRENCES

There have been eight flood events that occurred in Belmond and have caused $385,000 in property damage and $2,175,000 in crop damage. **Table 9** details the flood events in Belmond since 1997. The majority of the flood events occurred in 2010 and in 2016. For more information on previous occurrences in Wright County, please refer to the base plan.

TABLE 9. NCDC WRIGHT COUNTY, IOWA FLOOD EVENTS SUMMARY, 1997-JUNE 2025

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
BELMOND	3/12/10	50,000	0
BELMOND	6/26/10	200,000	2,000,000
BELMOND	7/1/10	10,000	25,000
BELMOND	7/26/10	0	0
BELMOND	5/27/13	50,000	0
BELMOND	5/23/16	0	0
BELMOND	9/23/16	50,000	100,000
BELMOND	9/20/18	25,000	50,000

July 1, 2010 - Widespread flooding from June continued along several river systems across the state into July. For the most part, rivers crested early and then fell slowly during the first week of the month. There was little new flooding, however most of the flooding during early July was on agricultural land.

September 23, 2016 - A generally stationary boundary remained oriented roughly west to east across the state through the evening and overnight hours. As a result, storms initiated along and north of the boundary and provided multiple rounds of heavy rainfall from roughly Ames northward. Rainfall amounts typically resided within the 2 to 5 inch range with a few reports within the 5 to 5.5 inch range. Given the relatively short duration of the rainfall, flash flooding was reported in a number of areas, again ranging from Ames northward. Iowa DOT reported that US Highway 69 closed near Belmond due to flooding. Detour in place.

September 20, 2018 - More heavy rainfall was seen across the area, primarily situated over the northern third of the state, as a surface boundary sat across central Iowa and a shortwave moved through the upper level flow. Overall, conditions remained ripe and very much summer-like as opposed to mid-September including precipitable water values were around and in excess of 1.7 inches, moderate to strong low level moisture flow. Over a roughly 24 hour period, a number of sites experienced heavy rainfall in the 3 to 4 inch range, with a few reporting as much as 5+ inches. Fortunately, with widespread precipitation and limited instability, storms remained sub-severe during this portion of the heavy rainfall event. By late afternoon and evening, as the surface low progressed across the area, stronger, more organized convection moved across the area and produced severe winds. The severe wind event will be covered by another entry focused on September 20th.

National Flood Insurance Program (NFIP) Participation

According to the Iowa Department of Natural Resources, there are no Repetitive Loss or Severe Repetitive Loss Properties in Wright County. **Table 10** provides details on NFIP participation for Belmond as well as the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction, where applicable. The claims information is for the period from January 1, 1978 to Fall 2025.

TABLE 10. NFIP PARTICIPATION, CURRENT, HISTORICAL POLICY AND CLAIM STATISTICS

COMMUNITY NAME	NFIP PARTICIPANT	CURR EFF MAP DATE	REG EMER DATE	POLICIES IN-FORCE	TOTAL COVERAGE	HISTORICAL CLAIMS	HISTORICAL TOTAL PAYMENTS
Belmond	Yes	2/20/2013-M	3/01/2011	6	$1,322,000.00	1	$0

Source: Participation details from NFIP Community Status Book, 10/4/2017; https://www.fema.gov/national-flood-insurance-program-community-status-book; M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program: Policy and Loss Statistics from BureauNet, http://bsa.nfipstat.fema.gov/reports/reports.html;
**Closed Losses are those flood insurance claims that resulted in payment. Loss statistics are for the period from January 1, 1978 to Fall 2025.*

4.9.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for river flooding in Belmond is **Highly Likely**.

4.9.4 VULNERABILITY ASSESSMENT

Within Belmond, river flooding poses a **High** risk due to high likelihood of future occurrence and the magnitude. Belmond's vulnerability to river flooding does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for river flooding across the entire county, please refer to the base plan.

4.9.4.1 Critical Facilities

To analyze critical facilities at risk in the planning area, the inventory of critical and essential facilities and infrastructure in the planning area was compiled from various sources including the 2019 Wright County Multi-Jurisdictional Hazard Mitigation Plan, Wright County, HSIP Freedom 2015 and the Iowa Department of Natural Resources (NRGIS). A comparison was made of the facilities in the critical facilities inventory with the FIRM layer to determine those facilities that would be damaged in the 1-percent and 0.2-percent annual chance flood events. This analysis determined that four facilities would be at risk in the 1-percent annual chance floodplain, as detailed in **Table 11** below, and none are at risk in the 0.2-percent annual chance floodplain.

TABLE 11. CRITICAL FACILITIES AT RISK TO 1-PERCENT ANNUAL CHANCE FLOOD (NFHL DATA)

NJURISDICTION	FACILITY TYPE
Belmond	Communications
Belmond	Waste Water Treatment

4.9.4.2 Cultural, Historic, and Natural Resources

The impacts of flooding on cultural, historic, and natural resources are comparable to those of flash flooding. Please refer to the flash flood section on potential impacts to natural, historic and cultural resources.

4.9.4.3 People

To estimate population displaced by a 1-percent annual chance flood, the number of residential structures impacted was multiplied by the average household size for each jurisdiction. According to the analysis, there would be a total of 5 residential structures impacted, and an estimated 11 people displaced. **Table 12** provides the estimated structures and population impacted.

TABLE 12. ESTIMATED DISPLACED POPULATION

JURISDICTION	RESIDENTIAL STRUCTURES IMPACTED	AVERAGE HOUSEHOLD SIZE	ESTIMATED DISPLACED POPULATION
Belmond	5	2.24	11

4.9.4.4 Structures and Systems

The potential losses to existing development will be provided for the following categories of losses:

- Building/Contents Losses
- Estimated Population Displaced
- Agricultural Impacts
- Critical Facilities and Infrastructure at Risk

Table 13 provides the summary of potential flood loss estimates and impacted population for the 1-percent annual chance flood by jurisdiction based analysis of available data.

TABLE 13. POTENTIAL FLOOD LOSS ESTIMATES, 1-PERCENT ANNUAL CHANCE FLOOD

JURISDICTION	PROPERTY TYPE	IMPROVED PARCEL COUNTS	IMPROVED LOSSES	CONTENT LOSSES	INVENTORY LOSSES	TOTAL LOSSES
Belmond	Agriculture	1	$200	$868	$832	$1,900
	Commercial	6	$28,394	$63,270	$40,834	$132,497
	Residential	5	$90,528	$48,099	$0	$138,627
	Total	**12**	**$119,121**	**$112,237**	**$41,666**	**$273,024**

4.9.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years which may increase the community's vulnerability to flood events. There are no plans for development which would increase or decrease the community's vulnerability.

4.10 SEVERE WINTER STORM

For detailed information on severe winter storms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.10.1 LOCATION AND EXTENT

The entire state of Iowa is vulnerable to heavy snow, extreme cold temperatures and freezing rain. Generally, winter storms occur between the months of November and March but can occur as early as October and as late as April. January has the highest monthly snowfall at about 9 inches of snow. For more information on the location and extent of severe winter storms, please refer to the base plan.

4.10.2 PREVIOUS OCCURRENCES

Due to the large scale of winter weather, all winter weather in Wright County is likely to have impacted Belmond. From 1996 through October 2025, the National Climatic Data Center reports the following 124 severe winter weather events in Wright County:

- 34 - Blizzard
- 9 - Cold/Wind Chill
- 17 - Extreme Cold/Wind Chill
- 18 - Heavy Snow
- 14 – Ice Storm
- 32 – Winter Storm

For more information on previous occurrences in Wright County, please refer to the base plan.

4.10.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for severe winter storms in Belmond is **Highly Likely**.

4.10.4 VULNERABILITY ASSESSMENT

Within Belmond, severe winter storms pose a **High** risk due to the high likelihood of occurrence and magnitude. Belmond's vulnerability to severe winter storms does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for severe winter storms, please refer to the base plan.

4.10.4.1 Critical Facilities

All critical facilities within Belmond may be at risk of impacts and disruption to services due to extreme cold temperatures and high snowfall. Hospitals, emergency shelters, and water treatment plants may face operational challenges during prolonged outages or freezing conditions.

4.10.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources may be at risk to impact from severe winter weather. Severe winter weather can significantly impact the community's natural, historic, and cultural assets. Ice storms and freezing temperatures often damage forests, wetlands, and wildlife habitats, leading to tree loss, habitat disruption, and increased runoff pollution from de-icing agents. These environmental changes can have lasting effects on local ecosystems and water quality. Historic buildings and cultural landmarks are vulnerable to structural damage from ice accumulation, freeze-thaw cycles, and water intrusion.

4.10.4.3 People

All people residing in Belmond may be at risk of impact from severe winter storms from extreme cold temperatures and high snowfall. Residents who are elderly, disabled, or economically disadvantaged are at heightened risk during winter events due to limited access to reliable heating, transportation, and emergency services. Older homes may lack adequate insulation or backup power sources, making them susceptible to dangerously low indoor temperatures during prolonged power outages caused by ice storms.

Low-income households may struggle to afford increased heating costs or to repair damage from burst pipes and frozen infrastructure. Within Belmond, over 17% of individuals live in poverty. Individuals who rely on electric-powered medical equipment face life-threatening challenges when outages occur. Additionally, rural isolation can delay emergency response times, leaving residents without timely access to medical care or warming centers.

4.10.4.4 Structures and Systems

Structures and systems can be damaged or impaired by loss of electricity from overhead power line damage. The loss of electricity can then lead to burst water pipes as ice begins to accumulate. While winter storms typically occur between harvest and planting, unusually late or early events can cause significant damage to crops.

4.10.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years, corresponding to an overall increase in vulnerability.

4.11 TERRORISM

For detailed information on terrorism in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.11.1 LOCATION AND EXTENT

The entire planning area has a low potential for terrorist activity. However, there are areas with increased risk such as large events, schools, religious organizations, and government facilities. For more information on the location and extent of terrorism, please refer to the base plan.

4.11.2 PREVIOUS OCCURRENCES

There have not been any large-scale enemy attacks or acts of radiological terrorism in Iowa. There have been biological and chemical agent threats, animal rights activists' vandalism and bomb threats. For more information on previous occurrences in Wright County, please refer to the base plan.

4.11.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for terrorism in Belmond is **Unlikely**.

4.11.4 VULNERABILITY ASSESSMENT

Within Belmond, terrorism poses a **Medium** risk due to limited previous occurrences and the potential magnitude for such events. This section provides further contextualization for the anticipated vulnerability. Belmond's vulnerability to terrorism does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for terrorism, please refer to the base plan.

4.11.4.1 Critical Facilities

Essentially all critical facilities are at risk of damage or disruption of services from terrorism. Terrorism can disrupt and damage critical facilities such as physical damage which can cause public safety and public health concerns. There are no previous occurrences of terrorism impacting critical facilities in Belmond.

4.11.4.2 Cultural, Historic, and Natural Resources

In some cases, terrorist attacks may target certain natural, cultural, or historic resources to erase a community's identity such as museums, monuments, and other cultural sites. Additionally, use of destructive weapons may pollute natural resources and cause environmental degradation and damage the local environment and ecosystems.

4.11.4.3 People

Terrorist attacks can have a physical impact as well as a psychological impact. Terrorist attacks can cause injuries and fatalities, as well as long-term psychological trauma. Depending on the nature of the attack, the broader community can be impacted and disrupt societal and economic functioning. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

Some acts of terrorism are hate-based and therefore individuals and communities from certain religions, nationalities, race, ethnicism, sexuality, and gender are at increased risk of attacks, injury, or even death. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

4.11.4.4 Structures and Systems

Potential losses could include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses, loss of human life, injuries to persons, loss of food supplies, disruption of the food supply chain, and immediate damage to the surrounding environment.

4.11.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years. Broadly, this could translate to increased vulnerability, as there are more individuals who may be affected by a potential attack.

4.12 THUNDERSTORM/LIGHTNING/HAIL

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.12.1 LOCATION AND EXTENT

Thunderstorms, including the associated hail and lightning, impact all Wright County communities. Although these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. For more information on the location and extent of thunderstorms, lightning, and hail, please refer to the base plan.

4.12.2 PREVIOUS OCCURRENCES

The NCDC reported 233 total thunderstorm events for the Wright County planning area from 1965 through October 2025. 32 of those thunderstorm events occurred in Belmond. For more information on previous occurrences in Wright County, please reference the base plan.

4.12.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for thunderstorm/lightning/hail in Belmond is **Highly Likely**.

4.12.4 VULNERABILITY ASSESSMENT

Within Belmond, thunderstorm/lightning/hail pose a **Medium** risk due to a high likelihood of future occurrences. Belmond's vulnerability to thunderstorms, lightning, and hail do not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for thunderstorm/lightning/hail across Wright County, please refer to the base plan.

4.12.4.1 Critical Facilities

All critical facilities are at risk of impact from thunderstorms, lightning, and hail. Essential infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during severe storm events. In rural areas, this vulnerability is compounded by limited resources and constrained emergency response capabilities, potentially slowing response and recovery operations.

4.12.4.2 Cultural, Historic, and Natural Resources

Severe storms can significantly impact natural, historic, and cultural resources within Wright County. Natural areas such as wetlands, forests, and river systems are vulnerable to erosion, flooding, and contamination from stormwater runoff. However, these ecosystems also serve as natural buffers that help absorb rainfall and reduce flood risk, but when damaged, they lose their protective function and biodiversity suffers.

Historic and cultural resources-including landmarks, cemeteries, monuments, and archaeological sites are also at risk. Many of these structures are older and not built to withstand high winds or flooding. Storms can cause irreversible damage to fragile materials, displace artifacts, and erode land around culturally significant sites.

4.12.4.3 People

All people residing in Belmond may be at risk of impact from thunderstorms, lightning, and hail. Severe storms pose significant vulnerability to people, especially in Iowa, where atmospheric conditions frequently

support the development of hazardous weather. This vulnerability stems from both direct physical threats and indirect social and economic impacts.

Populations with limited access to safe housing, emergency services, or reliable communication systems are especially at risk. Vulnerable populations, such as the elderly, individuals with disabilities, and low-income households, may face greater challenges in preparing for, responding to, and recovering from storm events.

4.12.4.4 Structures and Systems

All structures and systems may be at risk of impact from thunderstorms, lightning, and hail. Most lightning damages occur to electronic equipment located inside buildings. Structural damage can also occur when a lightning strike causes a building fire. In addition, hail and lightning strikes can cause damage to crops. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes. There have not been any fatalities in Wright County from lightning strikes.

4.12.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years, which may increase risk. There is no notable development that is anticipated to significantly alter the community's vulnerability to severe thunderstorms.

4.13 TORNADO/WINDSTORM

For detailed information on tornadoes/windstorms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.13.1 LOCATION AND EXTENT

Iowa is located in a part of the United States where tornadoes are a relatively common occurrence. Most tornadoes occur in May and June but can occur during any month. Also, mid-afternoon until sunset is the peak time of day for tornado activity. Tornadoes can occur anywhere throughout the County, including Belmond, and all of Wright County and Belmond is susceptible to high wind events. The County is located in Wind Zone IV, which is susceptible to winds up to 250 mph. For more information on the location and extent of tornadoes and windstorms, please refer to the base plan.

4.13.2 PREVIOUS OCCURRENCES

The strongest tornado in Wright County's history is the October 14, 1966 tornado that struck Belmond, killing six and injuring 172. The community was preparing to celebrate homecoming the day that this destructive tornado occurred.

According to the NCDC database, there were 49 high wind events in Wright County from 1996 to October 2025. During this time period, there were no reported deaths or injuries. There was an estimated $1,395,210 in property damages. For more information on previous occurrences in Wright County, please refer to the base plan.

4.13.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for tornado/windstorm in Belmond is **Highly Likely**.

4.13.4 VULNERABILITY ASSESSMENT

Within Belmond, tornado/windstorm pose a **High** risk due to probability or future occurrences and magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Belmond to tornado/windstorm. Belmond's vulnerability to tornadoes and windstorms do not vary significantly from the risk across the county. For more information on the vulnerability assessment for tornadoes/windstorms, please refer to the base plan.

4.13.4.1 Critical Facilities

All critical facilities are vulnerable to tornadoes and high wind events. Critical infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during tornadoes. Tornadoes can disrupt or damage critical infrastructure due to the physical forces generated by high winds and debris impacts. Additionally, emergency operations may temporarily be interrupted due to the immediate risk during a tornado.

4.13.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources are at risk of impact and damage from tornadoes and high wind events. Natural resources such as forests, wetlands, and wildlife habitats may be damaged or destroyed by high winds, flying debris, and uprooted vegetation. Historic and cultural resources, including landmarks, heritage buildings, cemeteries, and tribal sites, are particularly vulnerable due to their age, structural fragility, and irreplaceable value. Tornadoes may cause partial or total destruction of these assets, resulting in the loss of community identity, historical continuity, and tourism value.

4.13.4.3 People

All individuals residing in Belmond are at risk of tornadoes and high winds. Populations residing in structures not designed as storm shelters are inherently more vulnerable to tornado hazards. This risk is especially elevated for individuals living in mobile homes, which statistically account for a disproportionate number of tornado-related fatalities and injuries due to their limited structural resilience. Populations that have disabilities, lack internet or cellular connections, the elderly, and young children may be at a greater risk as these populations may not receive or notice a tornado warning, or they may have difficulty quickly seeking shelter.

4.13.4.4 Structures and Systems

All structures and systems are at risk of impact, damage, and disruption to systems. Tornadoes have caused widespread damage to homes, businesses, farms, and public infrastructure. Hundreds of residential structures have been destroyed or severely damaged, and critical facilities like schools, fire stations, and police departments are often left inoperable due to roof failures, debris impacts, and power outages.

4.13.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years, which may increase risk to people. Although there are currently no major development plans, future increases in the number of buildings could also increase the communities vulnerability, particularly if these structures are unreinforced or constructed with lightweight materials.

4.14 TRANSPORTATION INCIDENT

For detailed information on transportation incidents in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Belmond for all profiled hazards.

4.14.1 LOCATION AND EXTENT

The transport of hazardous materials in Wright County can occur via trucks on the highways/roads and airplanes carrying hazardous cargo. Hazardous materials can be transported on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. In Belmond, Highway 69 runs through the City and is at risk of hazardous transportation materials incident. For more information on the location and extent of transportation incidents, please refer to the base plan.

Rail Transport

Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Gove.

Air Freight

There are three airports in Wright County; Belmond, Clarion, and Eagle Grove. Hazardous materials incidents can occur within these three airports across the County.

4.14.2 PREVIOUS OCCURRENCES

Table 14 provides details of two air transportation incidents in Belmond from 1967 to 2024 (57 years) from the National Transportation Safety Board (NTSB). There have been no reported rail or other transportation incidents in Belmond. For more information on previous occurrences in Wright County, please refer to the base plan.

TABLE 14. WRIGHT COUNTY AIRCRAFT INCIDENTS/ACCIDENTS (1967-2024)

EVENT DATE	LOCATION	INJURY SEVERITY	AIRCRAFT DAMAGE	MAKE	BROAD PHASE OF FLIGHT
03/06/1977	Belmond, IA	Non-Fatal	Not Reported	Cessna	Not Reported
01/06/1972	Belmond, IA	Non-Fatal	Not Reported	Cessna	Not Reported

Source: http://www.ntsb.gov/_layouts/ntsb.aviation/index.aspx.

4.14.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for transportation incident in Belmond is **Highly Likely**.

4.14.4 VULNERABILITY ASSESSMENT

Within Belmond, transportation incidents pose a **High** risk due to the number of transportation modalities and incidents that have occurred in the City. Belmond's vulnerability to transportation incidents do not vary significantly from the risk of the county as a whole. For more information on the County's overall vulnerability assessment for transportation incidents, please refer to the base plan.

4.14.4.1 Critical Facilities

All critical facilities are essentially at risk of damage or disruption due to transportation incidents. These can range from minor disruptions to catastrophic damage.

4.14.4.2 Cultural, Historic, and Natural Resources

Transportation accidents, whether involving cars/trucks, trains, or aircrafts, can damage natural, cultural, and historical resources in Wright County. These incidents may result in direct physical damage, environmental contamination, or long-term degradation of sites that hold historical or cultural significance.

4.14.4.3 People

Transportation-related incidents involving passenger vehicles, aircraft, or rail systems pose significant risks to public safety and infrastructure. These events can result in a spectrum of consequences, from minor property damage to mass casualty incidents. The likelihood and severity of such accidents are influenced by factors including traffic volume, infrastructure condition, weather, and human error. Based on previous occurrences in the City, there have been no reported injuries or fatalities.

4.14.4.4 Structures and Systems

All structures and systems are at risk of damage and disruption. The community has several critical facilities located near major transportation corridors. A transportation accident, such as a vehicular collision, rail incident, or aircraft crash could have significant consequences for the community's structures and systems.

4.14.4.5 Changes in Development

Overall, population in the City of Belmond has increased over the past several years, which may increase risk to people as more people are utilizing the roadways and may be affected by transportation incidents.

5. MITIGATION STRATEGY

The Mitigation Strategy section of the base plan provides an overall blueprint for all participating jurisdictions in Wright County to become less vulnerable to its identified hazards and the findings and conclusions of the Capability and Risk Assessments. As established in the base plan, the overall goals of the Wright County mitigation strategy are consistent across all participating municipalities.

This section provides community-specific strategies for Belmond, including the status of actions that were included in the previous plan and actions to be considered or pursued over the next five years. As noted in the base plan, the participants are not committing to undertaking every action suggested in this list but rather are proposing an extensive list of *potential* actions that they may wish to pursue, depending on the availability of funding. **Table 15** details the mitigation actions identified for the City of Belmond and **Table 16** details the mitigation actions identified for the entire County, known as Countywide Actions.

TABLE 15. UPDATED 2026 BELMOND MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Belmond - 1	Continue participating in the NFIP, and continue to update and enforce the floodplain ordinance	Flash Flood, River Flooding	Continue In-Progress	Zoning Administrator	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds	Little or no cost	More than 5 years	H
Belmond - 2	Continue to facilitate and coordinate the emergency management coalition.	River Flooding; Flash Flood; Wildland Fire; Thunderstorm/ Lightning/Hail; Severe Winter Storm; Drought; Extreme Heat; Tornado/. Windstorm	Continue In-Progress	City Manager, Fire Department	Sheriff, County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds	Little or no cost	More than 5 years	H
Belmond - 3	Promote Code Red.	River Flooding; Flash Flood; Wildland Fire; Thunderstorm/ Lightning/Hail; Severe Winter Storm; Drought; Extreme Heat; Tornado/Windstorm	Continue In-Progress	City Manager and Fire Department	Sheriff, County EMA	General Funds	Little or no cost	More than 5 years	H
Belmond - 4	Promote general hazard public education and awareness to City residents.	River Flooding; Flash Flood; Wildland Fire; Thunderstorm/ Lightning/Hail; Severe Winter Storm; Drought;	Continue In-Progress	City Manager	Sheriff County EMA, Fire Department	General Funds	Little or no cost	More than 5 years	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
		Extreme Heat; Tornado/Winds torm							
Belmond - 5	Coordinate with Alliant Energy to mitigate energy disruption.	Infrastructure Failure	Continue In-Progress	City Manager	Alliant Energy	General Funds; FEMA HMA Grant (HMGP, BRIC, or FMA)	$10,000 to $50,000	More than 5 years	H
Belmond - 6	Coordinate with NWS to get NOAA radios to function properly throughout Belmond.	River Flooding; Flash Flood; Wildland Fire; Thunderstorm/ Lightning/Hail; Severe Winter Storm; Drought; Extreme Heat; Tornado/Winds torm	Continue Not Started	City Manager	County EMA, NWS	General Funds	Less than $10,000	1 year	M
Belmond - 7	Continue to analyze flood risk to the City.	River flood; Flash Flood	Continue In-Progress	City Manager	County EMA	General Funds; FEMA HMA Grant (HMGP, BRIC, or FMA)	$500,000 to $1,000,000	Ongoing	L
Belmond - 8	Install Severe Weather Safe Rooms in the City.	Tornado/Winds torm; Thunderstorm/ Lightning/Hail	Continue Not Started	City Manager	County EMA	General Funds; FEMA HMA Grant (HMGP, BRIC, or FMA)	$500,000 to $1,000,000	3-5 years	H
Belmond - 9	Map all utility lines that run through the City.	Infrastructure failure	Continue In-Progress	City Manager	County EMA	General Funds	$10,000 to $50,000	2-3 years	L

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Belmond-10	Map all utility lines within the City	Infrastructure Failure	Continue In-Progress	City Manager, Clerk	County EMA	General Funds	$10,000 to $50,000	Ongoing	M
Belmond - 11	Install backup generators for City Hall and the Ambulance Garage.	Extreme Heat, Flash Flood, Infrastructure Failure, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado/Windstorm	Continue Not Started	City Manager, Clerk	Hospital	General Funds	$10,000 to $50,000	2-3 years	M
Belmond - 12	Install shelters for vulnerable populations during extreme weather events.	Extreme Heat, Flash Flood, Infrastructure Failure, River Flooding, Severe Winter Storm, Terrorism, Thunderstorm/ Lightning/Hail, Tornado/Windstorm	Continue Not Started	City Manager, Clerk	Wright County Public Health, local churches, American Red Cross, Salvation Army, etc.	General Funds, In-Kind	Little or No Cost	1 year	H

TABLE 16. 2026 COUNTYWIDE ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA - 1	Encourage residents to purchase weather radios to stay informed on emergency information.	All Hazards	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	1 year	M
CWA - 2	Increase coordination with regional and state agencies for early warning and monitoring of animal, plant, and crop disease	Animal/plant/crop disease	New	Environmental Health	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), USDA	Little or no cost	Ongoing	L
CWA - 3	Educate residents on water saving techniques and water conservation	Drought	New	County EMA , Participating Jurisdictions	Public Media	General Funds	Little or No Cost	1 year	M
CWA – 4	Promote tree planting in areas with low vegetation to increase shade coverage.	Extreme Heat	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	Ongoing	M
CWA – 5	Improve drainage infrastructure in areas where flash flooding frequently occurs.	Flash Flood	New	County EMA	Participating Jurisdictions	General Funds	$100,000 to $500,000	Ongoing	H
CWA – 6	Promote defensible landscape for homes, businesses and entities within WUI areas.	Grass and Wildland Fire	New	County EMA	Participating Jurisdictions	General Funds	Little to No Cost	Ongoing	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 7	Promote wetland restoration to reduce flooding impacts across the County.	River Flooding	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$100,000 to $500,000	Ongoing	M
CWA – 8	Promote snow safety to residents on how to prevent pipe breaks in their homes (e.g., insulating outdoor faucets, drip warm water from an indoor faucet) and what to do if a pipe breaks.	Severe Winter Storm	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	Little to No Cost	Ongoing	M
CWA – 9	Conduct Countywide trainings to practice responding to hazardous materials incidents.	Hazardous Materials	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA -10	Promote flu clinics across the County	Human Disease	New	County EMA , Participating Jurisdictions	County Public Health	CDC Grants, General Funds	$10,000 to $50,000	Ongoing	H
CWA – 11	Promote Tree Trimming across the County to prevent fallen trees on infrastructure.	Infrastructure Failure	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	2-3 years	M
CWA – 12	Conduct Countywide trainings to practice responding to terrorist incidents.	Terrorism	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 13	Conduct Countywide trainings to practice responding to transportation incidents.	Transportation Incident	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA - 14	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Thunderstorm/Lightning/Hail	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M
CWA – 15	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Tornado/Windstorm	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M

1.INTRODUCTION AND PLANNING PROCESS

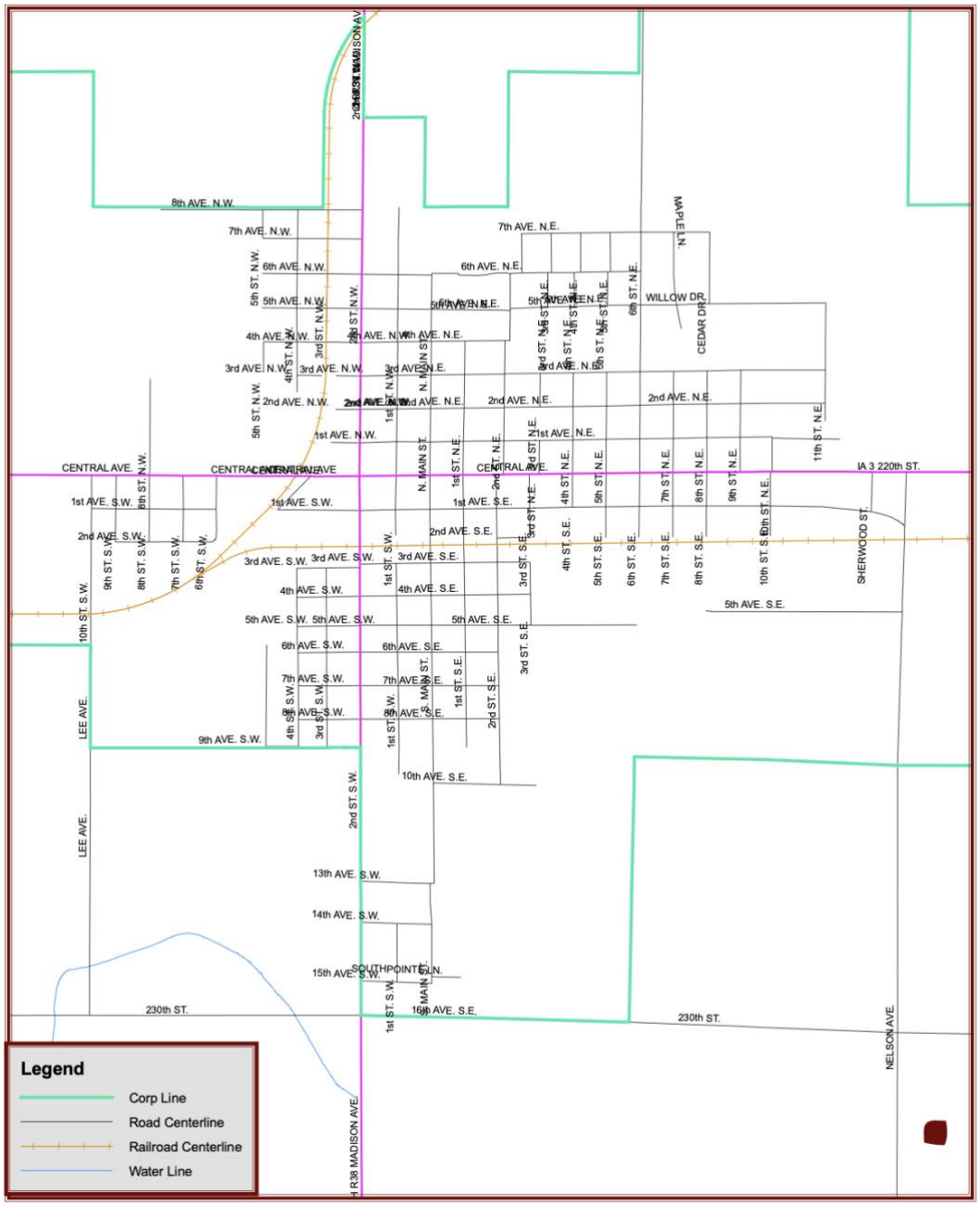
This annex provides more detailed information about the City of Clarion. This annex includes the following:

- A more localized community profile, including more detailed mapping, population and demographic information, and critical facilities information
- City-level Hazard Identification and Risk Assessment (HIRA) information, including some more localized hazard maps and conclusions related to hazard risk and how it varies across the planning area
- A localized vulnerability assessment, including the likely impact of profiled hazards on critical facilities
- A detailed capability assessment, describing resource and tools available to the City and to participate in hazard mitigation and reduce hazard risk
- A mitigation strategy, describing a variety of actions the City may opt to take to reduce the risk associated with profiled hazards over the useful life of this plan

2. COMMUNITY PROFILE

The City of Clarion is located within Wright County, Iowa is an agricultural driven community. The City was founded in the 1900s and features the 4-H Clover Monument. **Figure 1** displays the map of the City of Clarion.

FIGURE 1. CITY OF CLARION



2.1 POPULATION AND DEMOGRAPHICS

In order to properly plan and prepare a jurisdiction for future emergencies and disasters, it is important to know the community's characteristics and demographics. Over the past several decades the City's population has decreased. **Table 1** shows the population trends over time for the City of Clarion. The population decrease is similar to Wright County. The decrease in population also means that, in general, there are fewer individuals exposed to hazards within the community, slightly reducing the community's overall vulnerability to different hazards. **Table 2** shows the demographic data. The median household income for the City is $64,625 and 14.3% of the population live below the poverty level. For comparison, the County's poverty level is at 11% and the U.S. at about 10.6% as of 2024.

TABLE 1. POPULATION TRENDS

JURISDICTION	2010 CENSUS POPULATION	2016 POPULATION ESTIMATE	2023 CENSUS POPULATION	% CHANGE 2010-2023
Clarion	2,850	2,765	2,775	-2.63%

Source: U.S. Census Bureau: 2010 Decennial Census, 2016 Population Estimates, 2020 Decennial, 2023 American Community Survey.

TABLE 2. DEMOGRAPHIC DATA

JURISDICTION	POPULATION 18 YEARS AND OVER	UNEMPLOYMENT RATE (2025)[1]	MEDIAN HOUSEHOLD INCOME	PERCENT BELOW POVERTY LEVEL
Clarion	2,196	-	$64,625	14.3%

Source: U.S. Census, 2023 American Community Survey, 5-year Estimates

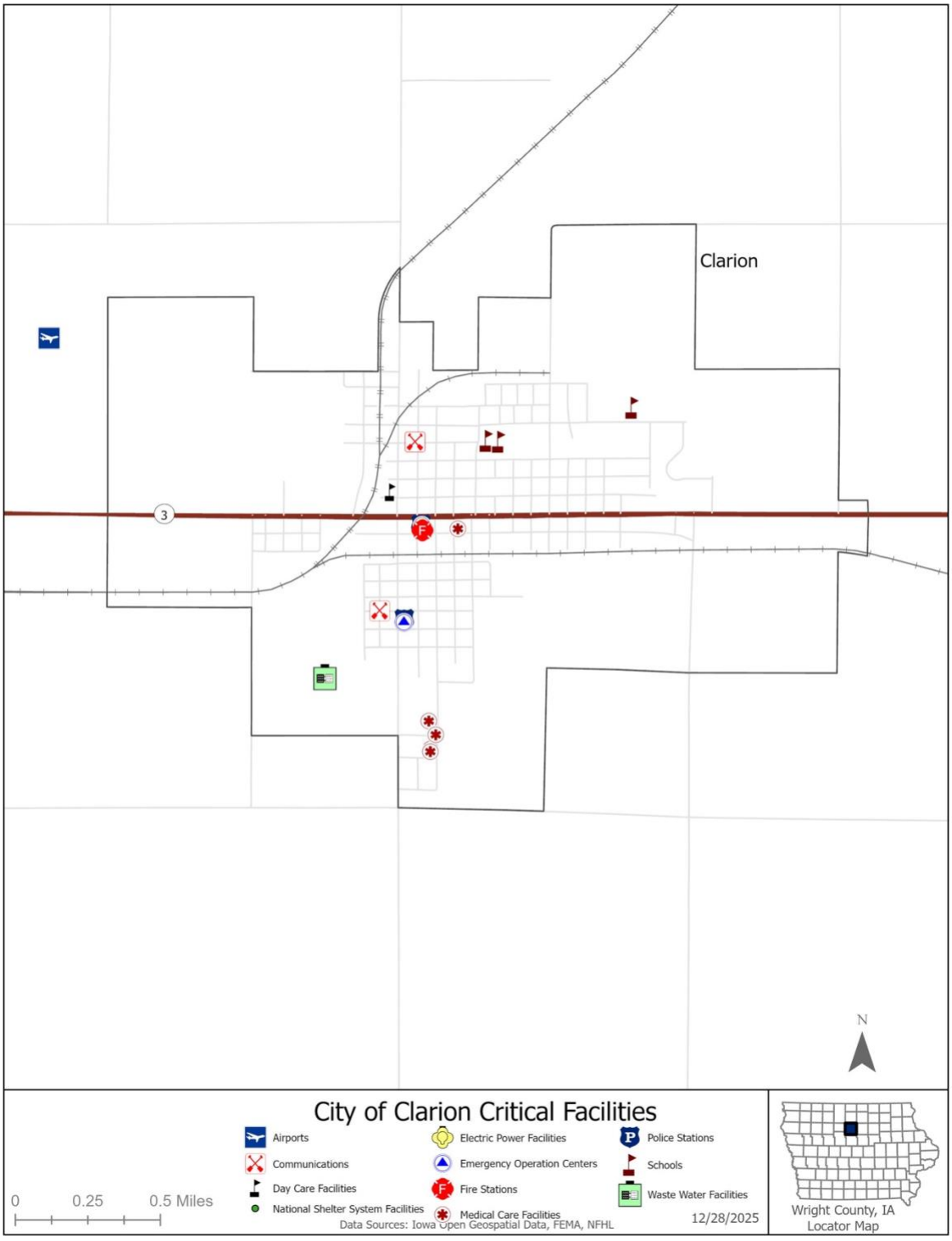
The median age in Clarion is 41.2 years old and about 16.6% of the population speak a language other than English at home which is greater than the State of Iowa at 9.7%. Other languages spoken at home include Spanish and other Indo-European languages. About 26.4% of the population have a bachelor's degree which is lower than the State of Iowa at 32%. There are 1,512 housing units within the City, 1,319 of which are occupied. Additionally, 14% of the population has a disability which is slightly higher than the State of Iowa at 12.9%.

[1] https://fred.stlouisfed.org/series/IAWRIG7URN

2.2 CRITICAL FACILITIES

Critical facilities are the systems and structures that are essential to a jurisdiction's continued functioning, the failure of which would cause significant disruption. **Figure 2** displays the critical facilities within Clarion. There are 15 critical facilities within Clarion.

FIGURE 2. CLARION CRITICAL FACILITIES



2.3 LAND USE AND DEVELOPMENT

The City of Clarion contains a variety of land uses within its jurisdiction. The Clarion Development Alliance advocates for development and new businesses to support the local economy and improve the quality of life for residents and visitors of the City. The Alliance is a nine-person board and represents the local business community. The number of housing units in Clarion has remained nearly the same since 2010, with data from the US Census Bureau showing a less than 1% decrease in housing units between 2010 and 2023. Additionally, no significant commercial, industrial, or agricultural developments have been reported, and these trends indicate that the community's vulnerability related to building exposure has largely remained unchanged since the last plan update.

2.4 NATURAL, HISTORIC, AND CULTURAL RESOURCES

The City of Clarion has several natural, historic, and cultural resources. These resources include:

- Burlington, Cedar Rapids and Northern Railroad Passenger Station
- Cornelia Lake Bridge
- Wrought County Courthouse[2]
- Hanson park
- East Park
- Gazebo park
- Clarion City Park
- Lion's Family Park

[2] https://www.nps.gov/subjects/nationalregister/database-research.htm#table

3. CAPABILITY ASSESSMENT

The capability assessment evaluates a jurisdiction's ability to implement a comprehensive mitigation strategy and identifies opportunities to establish or strengthen mitigation policies, programs, and projects. More generalized information about the goals of the capability assessment, including the process and methodology, is presented in the Capability Assessment portion of the base plan.

This section articulates specific information about the capabilities of Clarion which include the following:

- Planning mechanisms
- Regulatory tools and programs
- Staff and technical capabilities
- Fiscal and other mechanisms
- Floodplain management and regulation

3.1 PLANNING MECHANISMS

Table 3 describes the planning mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Clarion has a Capital Improvement Plan (CIP), Comprehensive Plan, County Hazard Mitigation Plan, and Emergency Operations Plan (EOP). In order to increase this capability, the City may seek to implement additional plans such as a Debris Management Plan and Continuity of Operations Plan. These plans can support the City in planning to remove debris and continue City operations in the future.

TABLE 3. PLANNING MECHANISMS CAPABILITY

PLANNING MECHANISMS	CITY OF CLARION
Capital Improvement Plan (CIP)	Yes-May-17
Comprehensive Plan	Yes-Jun-02
Community Wildfire Protection Plan (CWPP)	No
Comprehensive Emergency Management Plan (CEMP)	No
Critical Facilities Plan	No
General Plan	No
Continuity of Operations Plan (COOP)	No
Debris Management Plan	No
Disaster Recovery Plan	Yes
Economic Development Plan	Yes - Clarion Economic Development Corp.
Emergency Operations Plan (EOP)	Yes
Environmental Impact Report (EIR)	No
Evacuation Plan	No
Flood Response Plan	No
Floodplain Management Plan/Flood Mitigation Plan	No
Hazard Mitigation Plan	Yes
Historic Preservation Plan	No
Land Use Plan	No
Natural Resource Protection Plan (NRPP)	No
Open Space Management Plan	No
Transportation Plan	No
Threat Hazard Identification and Risk Assessment (THIRA)	No
Watershed Plan	No

3.2 REGULATORY TOOLS AND PROGRAMS

Table 4 describes the regulatory tools and programs that the jurisdiction has in place to support hazard mitigation. Currently, the City of Clarion participates in the NFIP and has adopted floodplain management and ordinances as well as other stormwater management and subdivision regulations and ordinances. In order to increase this capability, the City may seek to update their building codes and engage with community programs such as a Community Emergency Response Team (CERT).

TABLE 4. REGULATORY TOOLS AND PROGRAMS CAPABILITY

REGUALTORY TOOLS AND PROGRAMS	CITY OF CLARION
Building Codes	Sudas
Citizen Corps – Community Emergency Response Team (CERT)	No
Community Rating System (CRS Program of the NFIP)	No
Emergency Management Accreditation Program (EMAP)	No
Fire Code	No
Firewise Community	No
Floodplain Management/Flood Damage Prevention Ordinance	Yes
Land Use/Development Planning	Yes
National Flood Insurance Program (NFIP)	Yes
Post Disaster Redevelopment/Reconstruction Plan/Ordinance	No
Storm Ready	No
Stormwater Management Plan/Ordinance	Yes
Subdivision Regulations/Ordinance	Yes
Unified Development Ordinance	No
Zoning Ordinance	Yes

3.3 STAFF AND TECHNICAL CAPABILITIES

Table 5 below describes the staff and technical capabilities that the jurisdiction has in place to support hazard mitigation. Currently, the City of Clarion has a limited number of staff that directly support hazard mitigation. In order to increase this capability, the City may seek to increase the number of specialized staff to support hazard mitigation. Many of the technical capabilities Clarion has are provided through the contract with ISG.

TABLE 5. STAFF AND TECHNICAL CAPABILITIES

STAFF AND TECHNICAL CAPABILITES	CITY OF CLARION
Emergency Manager	No
Engineers or professional trained in construction practices related to buildings and/or infrastructure	Yes - Contracted With ISG
Environmental Justice Specialists	No
Fiscal Management or Procurement Specialists	No
Floodplain Manager	Yes, Wright County Planning and Zoning Administrator
Housing Specialist(s)	No
Land Surveyors	No
Land Use/Management/Development Planning	Yes - Contracted With ISG
Planners or engineers with an understanding of natural and/or human caused hazards	Yes
Recreation/Green Space Specialist(s)	No
Resource Development Staff or Grant Writing	No
Scientists familiar with the hazards of the community	No
Staff experienced with Geographic Information Systems (GIS) or HAZUS	Yes - Contracted With ISG
Staff with education or expertise to assess the community's vulnerability to hazards	No
Transportation Manager/Traffic Engineer	No

3.4 FISCAL AND OTHER MECHANISMS

Table 6 describes the fiscal and other mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Clarion has implemented several fees and bonds to generate funds. These funds can be critical to funding community operations and future mitigation projects. To improve this capability, the City may look to continue to diversity funding mechanisms and apply for grants such as the HSGP, IIJA, and USDA grants.

TABLE 6. FISCAL AND OTHER MECHANISMS

FISCAL AND OTHER MECHANISMS	CITY OF CLARION
Capital Improvement Programming	Yes
Community Development Block Grants (CDBG)	Yes
Development Impact Fees	Yes
FEMA Hazard Mitigation Assistance Grants (HMPG, FMA, PDM)	No
Gas/Electric Utility Fees	Yes
General Obligation, Revenue, and/or Special Tax Bonds	Yes
Homeland Security Grants (HSGP)	No
Infrastructure Investment and Jobs Act (IIJA)	No
Infrastructure State Revolving Fund Loan	No
Partnering Agreements or Intergovernmental Agreements	No
Sewer/Water Fees	Yes
Special Purpose Tax (or taxing districts)	No
Stormwater Utility Fees	No
USDA Grants	No
USDA Rural Development Agency Grants	No
US Economic Development Administration Grants	No

3.5 FLOODPLAIN MANAGEMENT AND REGULATION

Table 7 describes the National Floodplain Insurance Program (NFIP) Capability for the City of Clarion. Currently, the City participates in the NFIP, and it has adopted and enforces floodplain management regulations and ordinances.

TABLE 7. FLOODPLAIN MANAGEMENT AND REGULATION

NFIP CAPABILITIES	CITY OF CLARION
Has your community adopted a floodplain management ordinance that meets NFIP minimum criteria?	Yes
Has your community adopted the latest effective Flood Insurance Rate Map (FIRM)?	Yes – 2/20/2013
Do you regulate/permit development in the Special Food Hazard Area (SFHA)?	Yes
Which position or agency is in charge of NFIP compliance for your community?	Wright County Planning and Zoning Administrator
How do you implement the substantial improvement/substantial damage provisions of your floodplain management ordinance?	Yes, through development review and permitting

4. HAZARD IDENTIFICATION AND RISK ASSESSMENT

The Hazard Identification and Risk Assessment (HIRA) process, described in more detail in the HIRA section of the base plan, involves identifying potential hazards, evaluating their likelihood and potential consequences, and estimating and describing the level of risk these hazards present to a community.

As described in the "HIRA Methodology" section of the base plan, participants in this plan update reconsidered the relative risk posed by the profiled hazards by conducting a hazard ranking process. **Table 8** below provides a summary of how those hazards were ranked in the City of Clarion. Each of the 14 natural and manmade hazards discussed in this section are described in more detail in the HIRA section of the base plan. This section endeavors to provide more detailed, local-level information, mapping, and conclusions for these hazards wherever relevant.

TABLE 8. CLARION HAZARD RANKING

JURISDICTION	ANIMAL/CROP/PLANT DISEASE	DROUGHT	EXTREME HEAT	FLASH FLOOD	GRASS OR WILDLAND FIRE	HAZARDOUS MATERIALS	HUMAN DISEASE	INFRASTRUCTURE FAILURE	RIVER FLOODING	SEVERE WINTER STORM	TERRORISM	THUNDERSTORM/LIGHTNING/HAIL	TORNADO/WINDSTORM	TRANSPORTATION INCIDENT
Clarion	M	H	M	M	L	H	M	H	H	H	M	M	H	H

4.1 ANIMAL/PLANT/CROP DISEASE

For detailed information on animal, plant, and crop disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.1.1 LOCATION AND EXTENT

All of Wright County is subject to animal/livestock disease and agricultural infestations, which include the City of Clarion. For more information on the location and extent of animal, plant, and crop disease, please refer to the base plan.

4.1.2 PREVIOUS OCCURRENCES

There are no previous occurrences that have been reported to impact the City of Clarion specifically. For more information on previous occurrences in Wright County, please refer to the base plan.

4.1.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for animal/plant/crop/disease in Clarion is **unlikely**.

4.1.4 VULNERABILITY ASSESSMENT

Within Clarion, animal/plant/crop disease poses a **Medium** risk due to due to potential impacts, largely to public health, agriculture, and the local economy. Clarion's vulnerability to plant, animal, and crop disease does not vary significantly from the risk of the county as a whole. For more information on Wright County's overall vulnerability assessment for animal/plant/crop disease, please refer to the base plan.

4.1.4.1 Critical Facilities

Animal, plant, and crop diseases have limited impact on critical facilities due to the hazard directly impacting animals, plants, and crops and related industries.

4.1.4.2 Cultural, Historic, and Natural Resources

In regard to natural resources, sensitive crops are those that are more susceptible to stress from environmental factors such as weather and crop diseases. There are several areas within Wright County that have sensitive crops and would be more vulnerable to disease. There are three sensitive crop locations within the City of Clarion. For more information reference **Figure 4.4** in the base plan. There are limited impacts to cultural and historic resources.

4.1.4.3 People

Animal, plant, and crop diseases can impact the population through food supply chain disruptions, increased food prices, local employment, and potential health impacts from zoonotic diseases such Highly Pathogenic Avian Influenza (HPAI).

4.1.4.4 Structures and Systems

Buildings, infrastructure, and critical facilities are not vulnerable to this hazard. Its impacts are primarily economic and environmental, rather than structural effects.

4.1.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years. Future development is not expected to significantly impact the planning area's vulnerability to this hazard. However, according to the 2022 USDA Census, Wright County has increased farm acreage and sales. If crop production and numbers of animals/livestock increases, the amount vulnerable to infestation also increases.

4.2 DROUGHT

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.2.1 LOCATION AND EXTENT

All of Wright County is subject to extreme heat as it is normally more of a widespread hazard and not isolated. For more information on the location and extent of extreme heat, please refer to the base plan.

4.2.2 PREVIOUS OCCURRENCES

The following summarizes the National Weather Service Advisories, Watches, and Warnings for Heat or Excessive Heat in Wright County from 2000 to 2025 (25 years of data). For more information on previous occurrences in Wright County, please refer to the base plan.

- 46 Heat Advisories
- 2 Extreme Heat Watches
- 8 Excessive Heat Watches
- 7 Excessive Warnings

4.2.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for drought in Clarion is **Highly likely**. For more information on the vulnerability assessment for drought, please refer to the base plan.

4.2.4 VULNERABILITY ASSESSMENT

Within Clarion, drought poses a **High** risk due to potential impacts, largely to public health, agriculture, and the local economy. This section provides further contextualization for the anticipated vulnerability of Clarion to drought. Clarion's vulnerability to drought does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for drought, please refer to the base plan.

4.2.4.1 Critical Facilities

All critical facilities in Clarion may be impacted by drought and more so by water shortages during extreme drought conditions.

4.2.4.2 Cultural, Historic, and Natural Resources

All natural resources within the City can experience stressed vegetation, tree mortality, soil compaction, erosion and loss of habitat or shade due to drought. Areas associated with agricultural use are vulnerable to drought conditions if irrigation is unavailable--this could result in a decrease in crop production or a decrease in available grazing area for livestock. Where irrigation is possible, owners may be faced with higher costs due to greater water usage. Drought may also erode cultural and historic resources within Clarion as well.

4.2.4.3 People

All people residing in Clarion may be impacted by Drought. Drought presents hazards to public health in extreme cases, where drinking water production cannot keep up with demand. Increased water demand may increase water rates and create financial hardship, especially for individuals and families experiencing poverty. In Clarion, 14.3% live below poverty. Additionally, the elderly and young children may be at greater risk of experiencing adverse health effects resulting from reduced water quality.

4.2.4.4 Structures and Systems

Drought has minimal effect on houses and buildings. In severe prolonged droughts, structures could be impacted through cracks in foundation which can comprise the integrity and safety of the building. Additional impacts on structures could include shifting foundations and dried vegetation which can execrate urban fire and wildfire risk.

4.2.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years which may decrease risk to drought, particularly if the overall water demand and strain on the local water infrastructure is reduced.

4.3 EXTREME HEAT

For detailed information on extreme heat in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.3.1 LOCATION AND EXTENT

All of Wright County is subject to extreme heat as it is normally more of a widespread hazard and not isolated to a single jurisdiction. For more information on the location and extent of extreme heat, please refer to the base plan.

4.3.2 PREVIOUS OCCURRENCES

The following summarizes the National Weather Service Advisories, Watches, and Warnings for Heat or Excessive Heat in Wright County from 2000 to 2025 (25 years of data). For more information on previous occurrences in Wright County, please refer to the base plan.

- 46 Heat Advisories
- 2 Extreme Heat Watches
- 8 Excessive Heat Watches
- 7 Excessive Warnings

4.3.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for extreme heat in Clarion is **Likely**.

4.3.4 VULNERABILITY ASSESSMENT

Within Clarion, extreme heat poses a **Medium** risk due to a high likelihood of probability and magnitude. This section provides further contextualization for the anticipated vulnerability of Clarion to extreme heat. Clarion's vulnerability to extreme heat does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for extreme heat, please refer to the base plan.

4.3.4.1 Critical Facilities

All critical facilities may be at risk of impact depending on severity of extreme heat events. Extreme heat can significantly affect all critical facilities by compromising the structural integrity and operational reliability of critical facilities and infrastructure. Water scarcity may also directly reduce the ability of hospitals and care facilities to deliver critical services. During extreme heat events, it is likely that food, hydration, and health and medical lifelines would be disrupted.

4.3.4.2 Cultural, Historic, and Natural Resources

Prolonged high temperatures and hot conditions can stress ecosystems, reduce biodiversity, and increase the risk of wildfires, especially in forested and agricultural areas. These changes threaten native species and disrupt ecological balance, which in turn affects the natural heritage in Clarion. some historic buildings were built before the invention of central air conditioning and may lack proper cooling, posing risk to its inhabitants. Cultural traditions and outdoor events may be disrupted due to unsafe heat conditions, reducing community engagement and tourism.

4.3.4.3 People

All people residing in Clarion may be at risk, although certain populations may be more vulnerable to the effects of extreme heat. Those at greatest risk for heat-related illness and deaths include people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. Wright County's population over 65 years is higher than both the national and state average, at 20.9 percent.

Young children may also be more susceptible to extreme heat, and parents and childcare providers should always ensure young children are never left in hot, enclosed spaces.

4.3.4.4 Structures and Systems

All structures and systems may be at risk of impacts depending on the severity of extreme heat events. Extreme heat can also cause a strain on electricity delivery infrastructure which can be overloaded during peak use of electricity to power air conditioning during extreme heat events. Increased electricity use can increase rates and cause financial hardships, especially for individuals and families experiencing poverty. In Clarion, 14.3% live in poverty.

4.3.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years which may decrease risk to extreme heat as there are fewer individuals exposed to the hazard. Additionally, there are no known development plans that are expected to alter the community's vulnerability to extreme heat.

4.4 FLASH FLOOD

For detailed information on flash floods in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.4.1 LOCATION AND EXTENT

Wright County includes two major tributaries of the Mississippi River, including the Boone River and the upper portion of the Iowa River. The Boone Watershed intercepts the entire western and central portion of Wright County and is an area of gently flat to rolling hills. Neither of these rivers pass through Clarion, although flash flooding can still impact low-lying areas. For more information on the location and extent of flash flooding, please refer to the base plan.

4.4.2 PREVIOUS OCCURRENCES

There have been seven flash flood events in Clarion that have caused $210,000 in property damage and $260,000 in crop damage. **Table 9** details the previous occurrences in Clarion. For more information on previous occurrences within Wright County, please refer to the base plan.

TABLE 9. NCDC WRIGHT COUNTY, IOWA FLASH FLOOD EVENTS SUMMARY, 1997-JUNE 2025

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
CLARION	6/22/07	$100,000	$250,000
CLARION ARPT	5/6/08	$25,000	$0
CLARION ARPT	6/8/08	$20,000	$0
CLARION	6/23/10	$50,000	$10,000
CLARION	7/23/10	$15,000	$0
CLARION ARPT	7/7/24	$0	$0
CLARION	7/7/24	$0	$0

Source: NCDC

4.4.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for flash flood in Clarion is **Highly Likely**.

4.4.4 VULNERABILITY ASSESSMENT

Within Clarion, flash flooding poses a **Medium** risk due to a high likelihood of probability and magnitude. This section provides further contextualization for the anticipated vulnerability of Clarion to flash flood. Clarion's vulnerability to flash flooding does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for flash flood, please refer to the base plan.

4.4.4.1 Critical Facilities

Critical facilities in low lying areas are at the greatest risk of impact from flash flood events. Hospitals, emergency operations centers, fire stations, schools, nursing homes, and water treatment plants, face varying levels of risk from flash flood events depending on their location, structural resilience, and operational readiness.

4.4.4.2 Cultural, Historic, and Natural Resources

Cultural, historic, and natural resources in low lying areas may be at risk of impact from flash flood events. Flooding can cause significant damage to Wright County's natural, historic, and cultural assets. Natural areas such as wetlands, forests, and waterways may experience erosion, pollution, and habitat loss, reducing their ecological value and ability to buffer future flood events. These changes can also affect recreational and conservation areas. Historic buildings and cultural landmarks are at risk of structural damage, deterioration, and loss of historically significant materials. Flooding may also disrupt cultural traditions tied to specific locations or community spaces.

4.4.4.3 People

Flash flooding presents a serious risk to residents across Wright County, particularly in low-lying areas with a history of flood events. Demographics most at risk include older adults, low-income families, and individuals without access to flood insurance, lack of accessible emergency alert and notifications, or reliable transportation.

4.4.4.4 Structures and Systems

Structures and systems in low lying areas have the greatest risk of impacts from flash flood events. Flash flooding can quickly inundate structures and systems that are located in areas where water pools or cannot quickly disperse. Structural damages can cause costly repairs for state, county, and city road/bridge maintenance departments. When sewer back-ups occur, this can result in costly clean-up for home and business owners, and it can present a health hazard to residents.

4.4.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years, and this results in a decreased vulnerability due to fewer individuals exposed to the hazard.

4.5 GRASS OR WILDLAND FIRE

For detailed information on grass or wildland fire in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.5.1 LOCATION AND EXTENT

Wildland/Grass fires are most likely to occur in the Wildland Urban Interface (WUI). This is the area where houses meet or intermingle with undeveloped wildland vegetation. Within the WUI, there are two specific areas identified:

- Interface
- Intermix

The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. **Figure 3** shows the WUI areas within Clarion. On the map, the orange represents Intermix areas and the yellow represents Interface areas. The red indicates medium and high housing density that is unrelated to wildfire risk. For more information on the location and extent of grass or wildland fire, please refer to the base plan.

FIGURE 3. CLARION WUI AREAS



4.5.2 PREVIOUS OCCURRENCES

Based on previous occurrences, the probability of future occurrences for grass or wildland fire in Clarion is **Possible.**

4.5.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for grass or wildland fire in Clarion is **Medium.**

4.5.4 VULNERABILITY ASSESSMENT

Within Clarion, grass or wildland fire pose a **Low** risk due to due to prevalence of WUI areas and limited previous occurrences. This section provides further contextualization for the anticipated vulnerability of Clarion to grass or wildland fire. Clarion's vulnerability to grass or wildland fire is slightly lower than the risk across the entire county because there are no documented critical facilities in WUI areas. For more information about the county's overall vulnerability to grass or wildland fire, please refer to the base plan.

4.5.4.1 Critical Facilities

There are no critical facilities in Clarion that are within the WUI areas (Interface or Intermix). While rare, it is plausible that critical facilities elsewhere may be affected by fires that burn through WUI areas. These facilities include emergency operations centers, fire stations, hospitals, schools, water treatment plants, power substations, and communication infrastructure.

4.5.4.2 Cultural, Historic, and Natural Resources

Wildfire and Wildland-Urban Interface (WUI) areas can pose a risk to the community's natural, historic, and cultural resources. Wildfires can degrade ecosystems by destroying native vegetation, fragmenting wildlife habitats, and increasing soil erosion and water pollution. Smoke and airborne pollutants also impact air quality, affecting both environmental and human health. Culturally and historically significant sites, such as cemeteries and historic buildings, are vulnerable to direct fire damage and indirect impacts from suppression efforts and post-fire erosion.

4.5.4.3 People

Populations across the City of Clarion face varying degrees of vulnerability to WUI fires, depending on factors such as proximity to wildland areas, housing density, socioeconomic conditions, and access to emergency services. In urbanizing areas, the expansion of housing into fire-prone zones increases the number of people and structures exposed to wildfire hazards. Populations with allergies, medical conditions, the elderly, and young children may be more sensitive to toxic smoke that is produced as a result of wildfires.

4.5.4.4 Structures and Systems

Structure and systems in WUI areas may be at risk of impact from grass and wildland fires. Wildfires can cause extensive damage to crops, the environment, and occasionally residential or business facilities. Homes built in rural areas are more vulnerable since they are in closer proximity to wildland where these fires may originate, and they tend to be further away from emergency services.

4.5.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years which may decrease the community's risk. There are no known residential, commercial, or industrial developments that are anticipated to significantly alter the community's vulnerability to wildfire.

4.6 HAZARDOUS MATERIALS

For detailed information on hazardous materials in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.6.1 LOCATION AND EXTENT

Fixed Hazardous Materials Incident

According to the Iowa Department of Natural Resources, there are 44 sites in Wright County that because of the volume or toxicity of the materials on site were designated as Tier II Facilities under the Superfund Amendments and Reauthorization Act. Within Clarion there are nine Tier II facilities. For more information on the location and extent of hazardous materials, please refer to the base plan.

Transportation Hazardous Materials Incident

The transport of hazardous materials in Wright County can occur via trucks on the highways/roads and airplanes carrying hazardous cargo. Hazardous materials can be transported on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. In Clarion, Iowa Highway 3 runs through the City and may be a route where the risk of hazardous materials transportation incidents occur.

Rail Transport

Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Gove.

Air Freight

There are three airports in Wright County; Belmond, Clarion, and Eagle Grove. Hazardous materials incidents can occur within these three airports and across the County in the event of an aircraft crash.

Pipeline Incident

There are no major pipeline that runs through the City of Clarion. However there are pipelines located nearby and could impact residents of the City if ruptured.

4.6.2 PREVIOUS OCCURRENCES

There have been no hazardous materials incidents that have been reported to have occurred in Clarion. For more information on previous occurrences within Wright County, please refer to the base plan.

4.6.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for hazardous materials in Clarion is **Highly Likely**.

4.6.4 VULNERABILITY ASSESSMENT

Within Clarion, hazardous materials pose a **Medium** risk due to the various types of hazardous materials within the City and the magnitude. This section provides further contextualization for the anticipated vulnerability of Clarion to hazardous materials. Clarion's vulnerability to hazardous materials is higher from the risk of the county as a whole due to the higher concentration of people at risk. For more information about the county's overall vulnerability assessment for hazardous materials, please refer to the base plan.

4.6.4.1 Critical Facilities

Critical facilities located near major transportation corridors or industrial zones are at higher risk of exposure to chemical spills, fires, or airborne toxins. These incidents can disrupt operations, damage infrastructure, and endanger occupants. Additionally, facilities without proper ventilation systems, backup power, or shelter-in-place protocols are more susceptible to contamination and operational failure during a HazMat event.

4.6.4.2 Cultural, Historic, and Natural Resources

Hazardous materials pose significant risks to natural, historic, and cultural resources across Wright County. These resources include wetlands, rivers, forests, historic buildings, archaeological sites, and culturally significant landmarks. A chemical spill or airborne release can contaminate soil and water, damage ecosystems, and degrade the physical integrity of historic structures. Natural resources such as wildlife habitats and water bodies are particularly vulnerable to long-term environmental damage, which can disrupt biodiversity and recreational use. Historic and cultural sites may suffer irreversible harm if exposed to corrosive or toxic substances, especially if they lack protective infrastructure or are located near transportation corridors or industrial zones.

4.6.4.3 People

Communities near major transportation routes, such as highways and rail lines, are at higher risk due to the frequent movement of hazardous substances. Industrial zones and agricultural areas with chemical storage facilities also present elevated risks of fixed-site incidents. These events can lead to chemical spills, fires, or airborne releases that threaten public health and safety.

Vulnerability is especially high among populations with limited mobility, such as the elderly, individuals with disabilities, and residents of schools, hospitals, and correctional facilities. These groups may face challenges during evacuation or shelter-in-place orders.

Additionally, low-income communities may struggle with access to protective equipment, transportation, and timely information, further increasing their vulnerability.

4.6.4.4 Structures and Systems

It is difficult to determine the potential losses to existing development because of the variable nature of a hazardous materials spill. For example, a spill of a toxic airborne chemical in a populated area could have greater potential for loss of life. By contrast a spill of a very small amount of a chemical in a remote rural area would be much less costly and possibly limited to remediation of soil.

4.6.4.5 Changes in Development

The population of the City of Clarion has decreased over the past several years, and this may decrease the community's overall vulnerability.

4.7 HUMAN DISEASE

For detailed information on human disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.7.1 LOCATION AND EXTENT

Pandemics and epidemics do not affect a single geographic location; Wright County is equally vulnerable. Transmission can occur anywhere people interact, but locations with higher numbers of individuals create more opportunities for disease to spread. For more information on the location and extent of human disease, please refer to the base plan.

4.7.2 PREVIOUS OCCURRENCES

Pandemics and epidemics have had recurring and widespread effects on the County and across the world. While some events have been global in scale and others more localized, each has highlighted the vulnerability of the community to infectious disease and underscored the importance of preparedness and coordinated response. Since 1918, there have been six major epidemics or pandemics that are widely recognized by both the CDC and WHO, in addition to the COVID-19 pandemic. For more information on previous occurrences within Wright County, please refer to the base plan.

4.7.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for human disease in Clarion is **Possible**.

4.7.4 VULNERABILITY ASSESSMENT

Within Clarion, human disease poses a **Medium** risk due to low probability yet high risk to significantly impact the City. This section provides further contextualization for the anticipated vulnerability of Clarion to human disease. Clarion's vulnerability to human disease does not vary significantly from the risk of the county as a whole. For more information about the county's the vulnerability assessment for human disease, please refer to the base plan.

4.7.4.1 Critical Facilities

Infectious disease outbreaks can significantly disrupt the operation of critical facilities in Clarion. Healthcare facilities, including hospitals, clinics, and long-term care centers, are particularly vulnerable due to increased patient loads, limited surge capacity, and potential shortages of staff and medical supplies. These facilities must maintain continuity of operations while implementing infection control measures, such as isolation protocols and PPE usage.

Other essential facilities, such as emergency operations centers, law enforcement agencies, schools, and correctional institutions, may experience staffing shortages due to illness or quarantine, which can impair their ability to deliver vital services.

4.7.4.2 Cultural, Historic, and Natural Resources

Cultural institutions such as museums, historic sites, and art galleries may be closed or operate at reduced capacity during a pandemic. This can lead to decreased access to cultural resources for the public. Cultural organizations often rely on visitor revenue and donations to sustain operations. Reduced visitation and economic uncertainty during a pandemic can strain the financial stability of these institutions, impacting their ability to preserve cultural resources.

4.7.4.3 People

The community's rural nature may limit healthcare surge capacity, making it harder to manage widespread outbreaks. At the same time, it could take longer for a wider pandemic to initially affect Clarion. Risk will vary based on geographical vaccination efforts and vaccination uptake by communities and individuals. Transmission risks are heightened by close human contact, contaminated surfaces, and limited access to sanitation in some areas. Populations most at risk include the elderly, immuno-compromised individuals, and frontline workers. Additionally, insurance, access to healthcare, as well as trust in the medical community can determine risk to population which can increase infection rates, hospitalizations, and mortality. [3] Additionally, due to the high percentage of induvial living in poverty, Clarion may be more at risk to health impacts from human disease.

4.7.4.4 Structures and Systems

Infectious diseases can impact critical infrastructure and systems, especially in rural and resource-limited areas. Healthcare facilities may face strain due to increased patient loads, limited surge capacity, and potential shortages of personal protective equipment (PPE), isolation space, and trained personnel.

4.7.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years, corresponding to a reduced vulnerability to human diseases.

[3] https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems

4.8 INFRASTRUCTURE FAILURE

For detailed information on infrastructure failure in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.8.1 LOCATION AND EXTENT

The entire planning area, including Clarion, is at risk to all types of infrastructure failure included in the hazard description section, either from primary failure due to malfunction, degradation, or accidental or intentional damage or as a result of a secondary impact related to another hazard event. For more information on the location and extent of infrastructure failure, please refer to the base plan.

4.8.2 PREVIOUS OCCURRENCES

Infrastructure failure often occurs as a secondary impact to other hazard events. For specific descriptions, please see the Previous Occurrences section of the other hazards included in this plan. In addition to failure/impacts as a result of other hazard events, Infrastructure failure can also occur as a result of lack of maintenance, human error, and age deterioration. There have been no significant infrastructure failures reported in Clarion.

4.8.3 PROBABILITY OF FUTURE OCCURRENCES

While there have been no significant infrastructure failures reported previously, many minor infrastructure failures, such as road closures, downed power lines, loss of cellular signal, and others, go unreported. Therefore, the HMPC considers the probability of future occurrences for infrastructure failure in Clarion to be **Highly Likely**.

4.8.4 VULNERABILITY ASSESSMENT

Within Clarion, infrastructure failure poses a **High** risk due to a high likelihood of future occurrence and high magnitude. This section provides further contextualization for the anticipated vulnerability of Clarion to infrastructure failure. Clarion's vulnerability to infrastructure failure does not vary significantly from the risk of the county as a whole. For more information about the county's vulnerability assessment for infrastructure failure, please refer to the base plan.

4.8.4.1 Critical Facilities

All critical facilities within Clarion may be all risk of impacts such as damage and disruption to services from infrastructure failure. Additionally, major infrastructure failures affecting electricity, water, and wastewater services may simultaneously impact multiple critical facilities.

4.8.4.2 Cultural, Historic, and Natural Resources

Infrastructure failures have a limited impact to natural, historic, and cultural resources. Secondary impacts of infrastructure failures such as fires due to ruptured gas pipelines and contamination from wastewater, may pose a greater risk to these resources.

4.8.4.3 People

Infrastructure failures may impact all people within Clarion due to the range of infrastructure failures such as transportation, sewer, water, energy, and communications. Certain populations may be at increased risk. These populations include groups such as older adults, individuals medically dependent on electricity and those with certain medical conditions.

4.8.4.4 Structures and Systems

Infrastructure failures are typically a secondary or cascading impact of other hazards. It is not possible to fully quantify estimated potential losses specific to this hazard due to the variables associated with

affected populations, duration of outages, etc. In some instances, failure of one system can impact others. For example, the loss of electricity may also lead to the loss of internet connectivity.

4.8.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years. The overall vulnerability can be considered lower due to the population decrease because there are fewer individuals who would be affected by the hazard.

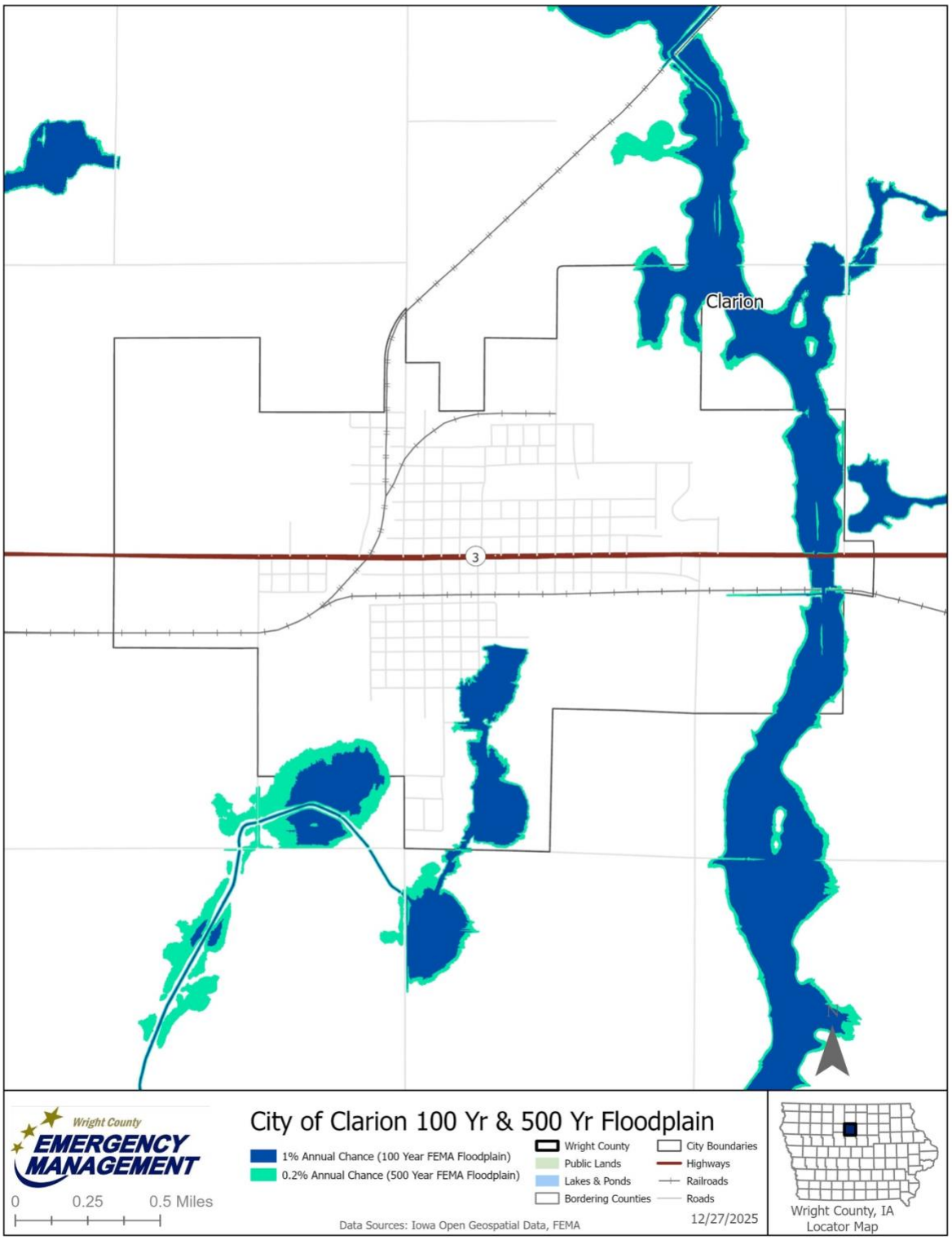
4.9 RIVER FLOODING

For detailed information on river flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.9.1 LOCATION AND EXTENT

Clarion has both 100-year floodplains and 500-year floodplains that run throughout the City, but mainly center around the eastern and southern part of the City. **Figure 4** displays both the 100-year and 500-year floodplains within Clarion. For more information on the location and extent of river flooding, please refer to the base plan.

FIGURE 4. CITY OF CLARION 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN



4.9.2 PREVIOUS OCCURRENCES

There have been 14 flood events that occurred in Clarion and have caused $225,000 in property damage and $270,000 in crop damage. **Table 10** details the flooding events in Clarion since 1997. The majority of the flood events occurred in 2016. For more information on previous occurrences in Wright County, please refer to the base plan.

TABLE 10. NCDC WRIGHT COUNTY, IOWA FLOOD EVENTS SUMMARY, 1997-JUNE 2025

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
CLARION	6/20/98	75,000	10,000
CLARION	6/29/98	50,000	10,000
CLARION	6/11/08	0	0
CLARION	6/25/10	0	0
CLARION	5/23/16	0	0
CLARION	5/23/16	0	0
CLARION	8/11/16	0	0
CLARION	9/22/16	0	0
CLARION ARPT	9/22/16	0	0
CLARION	8/5/18	0	0
CLARION ARPT	9/5/18	100,000	250,000
CLARION	9/19/18	0	0
CLARION	8/20/21	0	0
CLARION	7/7/24	0	0

June 20, 1998 - A cold front to the west of Iowa moved into the state during the day. Initially, the airmass was quite capped and thunderstorms had a hard time getting going. Thunderstorms formed on the north edge of the cap over Minnesota, with the tail end of the storms reaching into north central Iowa. There was very little severe weather associated with the storms in Iowa. Heavy rain was the major concern as the ground was already saturated over a large part of the state. Heavy rain of 3 to 5 inches fell over north central Iowa. Five inches of rain was recorded in Scarville, in Winnebago County. Flash flooding was reported around the county with several roads flooded. The line of thunderstorms became more widespread during the later afternoon hours. Rainfall amounts of 2 to 4 inches in a two hour timeframe were reported over a several county area. The city of Iowa Falls reported 4.33 inches of rainfall in about two hours' time.

Urban flooding was reported over several counties from central into northeast Iowa. The only severe reports were from relatively small hail. Three quarter inch diameter hail fell in Story County at Ames, and north of Lake Mills in Winnebago County.

National Flood Insurance Program (NFIP) Participation

According to the Iowa Department of Natural Resources, there are no Repetitive Loss or Severe Repetitive Loss Properties in Wright County. **Table 11** provides details on NFIP participation for Clarion as well as the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction, where applicable. The claims information is for the period from January 1, 1978 to Fall 2025.

TABLE 11. NFIP PARTICIPATION, CURRENT, HISTORICAL POLICY AND CLAIM STATISTICS

COMMUNITY NAME	NFIP PARTICIPANT	CURR EFF MAP DATE	REG EMER DATE	POLICIES IN-FORCE	TOTAL COVERAGE	HISTORICAL CLAIMS	HISTORICAL TOTAL PAYMENTS
Clarion	Yes	2/20/2013-M	5/8/2013	2	$1,115,000.00	0	$0

Source: Participation details from NFIP Community Status Book, 10/4/2017; https://www.fema.gov/national-flood-insurance-program-community-status-book; M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program: Policy and Loss Statistics from BureauNet, http://bsa.nfipstat.fema.gov/reports/reports.html;
**Closed Losses are those flood insurance claims that resulted in payment. Loss statistics are for the period from January 1, 1978 to Fall 2025.*

4.9.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for river flooding in Clarion is **Highly Likely**.

4.9.4 VULNERABILITY ASSESSMENT

Within Clarion, river flooding pose a **High** risk due to high likelihood of future occurrence and the magnitude. This section provides further contextualization for the anticipated vulnerability of Clarion to river flooding. Clarion's vulnerability to river flooding does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for river flooding, please refer to the base plan.

4.9.4.1 Critical Facilities

No critical facilities are within the 100-year floodplain within Clarion.

4.9.4.2 Cultural, Historic, and Natural Resources

Please refer to the flash flood section on potential impacts to natural, historic and cultural resources.

4.9.4.3 People

To estimate population displaced by a 1-percent annual chance flood, the number of residential structures impacted was multiplied by the average household size for each jurisdiction.

According to the analysis, there approximately 220 residential structures would be impacted. **Table 12** provides the estimated structures and population impacted.

TABLE 12. ESTIMATED DISPLACED POPULATION

JURISDICTION	RESIDENTIAL STRUCTURES IMPACTED	AVERAGE HOUSEHOLD SIZE	ESTIMATED DISPLACED POPULATION
Clarion	220	2.31	508

4.9.4.4 Structures and Systems

The potential losses to existing development will be provided for the following categories of losses:

Building/Contents Losses
Estimated Population Displaced
Agricultural Impacts
Critical Facilities and Infrastructure at Risk

Table 13. provides the summary of potential flood loss estimates and impacted population for the 1-percent annual chance flood.

TABLE 13. POTENTIAL FLOOD LOSS ESTIMATES, 1-PERCENT ANNUAL CHANCE FLOOD

JURISDICTION	PROPERTY TYPE	IMPROVED PARCEL COUNTS	IMPROVED LOSSES	CONTENT LOSSES	INVENTORY LOSSES	TOTAL LOSSES
Clarion	Multi-Residential	1	$55,830	$27,033	$0	$82,863
	Residential	20	$222,871	$117,349	$0	$340,220
	Total	**21**	**$278,700**	**$144,382**	**$0**	**$423,082**

4.9.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years which may decrease risk to people as less people reside in the City.

4.10 SEVERE WINTER STORM

For detailed information on severe winter storms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.10.1 LOCATION AND EXTENT

The entire state of Iowa is vulnerable to heavy snow, extreme cold temperatures and freezing rain. Generally, winter storms occur between the months of November and March but can occur as early as October and as late as April. January has the highest monthly snowfall at about 9 inches of snow. For more information on the location and extent of severe winter storms, please refer to the base plan.

4.10.2 PREVIOUS OCCURRENCES

Due to the large scale of winter weather, all winter weather in Wright County is likely to have impacted clarion. From 1996 through October 2025, the National Climatic Data Center reports the following 124 severe winter weather events in Wright County:

- 34 - Blizzard
- 9 - Cold/Wind Chill
- 17 - Extreme Cold/Wind Chill
- 18 - Heavy Snow
- 14 – Ice Storm
- 32 – Winter Storm

For more information on previous occurrences in Wright County, please refer to the base plan.

4.10.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for severe winter storms in Clarion is **Highly Likely**.

4.10.4 VULNERABILITY ASSESSMENT

Within Clarion, severe winter storms pose a **High** risk due the high likelihood of occurrence and magnitude. This section provides further contextualization for the anticipated vulnerability of Clarion to severe winter weather. Clarion's vulnerability to severe winter storms does not vary significantly from the risk of the county as a whole. For more information about severe winter storms across Wright County, please refer to the base plan.

4.10.4.1 Critical Facilities

All critical facilities within Clarion may be at risk of impacts and disruption to services due to extreme cold temperatures and high snowfall. Hospitals, emergency shelters, and water treatment plants may face operational challenges during prolonged outages or freezing conditions.

4.10.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources may be at risk to impact from severe winter weather. Severe winter weather can significantly impact the County's natural, historic, and cultural assets. Ice storms and freezing temperatures often damage forests, wetlands, and wildlife habitats, leading to tree loss, habitat disruption, and increased runoff pollution from de-icing agents. These environmental changes can have lasting effects on local ecosystems and water quality. Historic buildings and cultural landmarks are vulnerable to structural damage from ice accumulation, freeze-thaw cycles, and water intrusion.

4.10.4.3 People

All people residing in Clarion may be at risk of impact from severe winter storms from extreme cold temperatures and high snowfall. Residents who are elderly, disabled, or economically disadvantaged are at heightened risk during winter events due to limited access to reliable heating, transportation, and emergency services. Older homes may lack adequate insulation or backup power sources, making them susceptible to dangerously low indoor temperatures during prolonged power outages caused by ice storms.

Low-income households may struggle to afford increased heating costs or to repair damage from burst pipes and frozen infrastructure. Within Clarion, over 14% of individuals live in poverty. Individuals who rely on electric-powered medical equipment face life-threatening challenges when outages occur. Additionally, rural isolation can delay emergency response times, leaving residents without timely access to medical care or warming centers.

4.10.4.4 Structures and Systems

Structures and systems can be damaged or disrupted by loss of electricity from overhead power line damages, and the resulting drop in temperatures can lead to burst water pipes. While winter storms typically occur between harvest and planting, unusually late or early events can cause significant damage to crops.

4.10.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years. With fewer exposed residents, the vulnerability of the community to severe winter storms slightly decreases.

4.11 TERRORISM

For detailed information on terrorism in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.11.1 LOCATION AND EXTENT

The entire planning area has a low potential for terrorist activity. However, there are areas with increased risk such as large events, schools, religious organizations, and government facilities. For more information on the location and extent of terrorism, please refer to the base plan.

4.11.2 PREVIOUS OCCURRENCES

There have not been any large-scale enemy attacks or acts of radiological terrorism in Iowa. There have been biological and chemical agent threats, animal rights activists' vandalism, and bomb threats. For more information on previous occurrences in Wright County, please refer to the base plan.

4.11.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for terrorism in Clarion is **Unlikely**.

4.11.4 VULNERABILITY ASSESSMENT

Within Clarion, terrorism poses a **Medium** risk due to limited previous occurrences and the potential magnitude for such events. This section provides further contextualization for the anticipated vulnerability of Clarion to terrorism. Clarion's vulnerability to terrorism does not vary significantly from the risk of the county as a whole. For more information on the County's vulnerability assessment for terrorism, please refer to the base plan.

4.11.4.1 Critical Facilities

All critical facilities are at risk of damage or disruption of services from terrorism. Attacks can disrupt and damage critical facilities by causing physical damage, interfering with operations, or injuring workers. This can lead to potentially serious public safety and health concerns.

4.11.4.2 Cultural, Historic, and Natural Resources

In some cases, terrorist attacks may target certain natural, cultural, or historic resources to erase a community's identity such as museums, monuments, and other cultural sites. Additionally, use of destructive weapons may pollute natural resources and cause environmental degradation and damage the local environmental and ecosystems.

4.11.4.3 People

Terrorist attacks can have a physical impact as well as a psychological impact. Terrorist attacks can cause injuries and fatalities, as well as long-term psychological trauma. Depending on the nature of the attack, the broader community can be impacted and disrupt societal and economic functioning. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

Some acts of terrorism are hate-based and therefore individuals and communities from certain religions, nationalities, race, ethnicism, sexuality, and gender are at increased risk of attacks, injury, or even death. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

4.11.4.4 Structures and Systems

Potential losses could include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses, loss of services and functions, disruption of supply chains, and immediate damage to the surrounding environment.

4.11.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years, meaning there are fewer individuals exposed to this hazard.

4.12 THUNDERSTORM/LIGHTNING/HAIL

For detailed information on thunderstorms, lightning, and hail in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.12.1 LOCATION AND EXTENT

Thunderstorms, and the associated hail and lightning, can impact the entire county, including Clarion. Although these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. In addition, structural damage is more likely to occur in developed, urban areas. For more information on the location and extent of thunderstorms, lightning, and hail, please refer to the base plan.

4.12.2 PREVIOUS OCCURRENCES

The NCDC reported 233 total thunderstorm events for the Wright County planning area from 1965 through October 2025. 45 of those thunderstorm events occurred in Clarion. For more information on previous occurrences in Wright County, overall, please reference the base plan.

4.12.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for thunderstorms/lightning/hail in Clarion is **Highly Likely**.

4.12.4 VULNERABILITY ASSESSMENT

Within Clarion, thunderstorm/lightning/hail pose a **Medium** risk due to a high likelihood of future occurrences. This section provides further contextualization for the anticipated vulnerability of Clarion to thunderstorm/lightning/hail. Clarion's vulnerability does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for thunderstorm/lightning/hail, please refer to the base plan.

4.12.4.1 Critical Facilities

All critical facilities are at risk of impact from thunderstorms, lightning, and hail. Critical infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is susceptible to damage or disruption during severe storm events. In rural areas such as Wright County, this vulnerability is compounded by limited system redundancy and constrained emergency response capabilities, potentially delaying response and recovery operations.

4.12.4.2 Cultural, Historic, and Natural Resources

Severe storms can significantly impact natural, historic, and cultural resources within Wright County. Natural areas such as wetlands, forests, and river systems are vulnerable to erosion, flooding, and contamination from stormwater runoff. However, these ecosystems also serve as natural buffers that help absorb rainfall and reduce flood risk, but when damaged, they lose their protective function and biodiversity suffers.

Historic and cultural resources-including landmarks, cemeteries, monuments, and archaeological sites are also at risk. Many of these structures are older and not built to withstand high winds or flooding. Storms can cause irreversible damage to fragile materials, displace artifacts, and erode land around culturally significant sites.

4.12.4.3 People

All people residing in Clarion are vulnerable to thunderstorms, lightning, and hail. This vulnerability stems from both direct physical threats and indirect social and economic impacts. Populations with limited access

to safe housing, emergency services, or reliable communication systems are especially at risk. Other vulnerable populations, such as the elderly, individuals with disabilities, and low-income households, may face greater challenges in preparing for, responding to, and recovering from storm events.

4.12.4.4 Structures and Systems

All structures and systems are at risk of impact from thunderstorms, lightning, and hail. Lightning can damage exteriors as well as electronic equipment located inside buildings. Structural damage can also occur when a lightning strike causes a building fire. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes. In addition, lightning strikes and hail can cause significant damage to crops. Hail and high wind can also cause physical damage to building exteriors, vehicles, powerlines, and other infrastructure.

4.12.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years which may decrease vulnerability as fewer individuals are exposed to the hazard. Currently, there are no planned residential, commercial, or industrial developments which are anticipated to significantly alter the community's vulnerability.

4.13 TORNADO/WINDSTORM

For detailed information on tornadoes and windstorms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.13.1 LOCATION AND EXTENT

Iowa is located in a region of the United States where tornadoes are common. Although tornadoes most often occur in May and June, they can occur during any month, with activity typically peaking from mid-afternoon to around sunset. Tornadoes can occur anywhere in the County, including Clarion. For more information on the location and extent of tornadoes and windstorms, please refer to the base plan. Additionally, all of Wright County and Clarion is susceptible to high wind events. The County is located in Wind Zone IV, which is susceptible to winds up to 250 mph.

4.13.2 PREVIOUS OCCURRENCES

According to the NCDC database, Wright County experienced 49 high wind events between 1996 and October 2025, with no reported deaths or injuries and an estimated $1,395,210 in property damage. For more information on previous occurrences in Wright County, please refer to the base plan.

4.13.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for tornado/windstorm in Clarion is **Highly Likely**.

4.13.4 VULNERABILITY ASSESSMENT

Within Clarion, tornado/windstorm pose a **High** risk due to probability or future occurrences and magnitude. This section provides further contextualization for the anticipated vulnerability of Clarion to tornadoes and windstorms. Clarion's vulnerability to tornadoes and windstorms does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for tornadoes/windstorms, please refer to the base plan.

4.13.4.1 Critical Facilities

All critical facilities are vulnerable to damage and service disruption from tornadoes and high wind events. Critical infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, can be destroyed or disrupted by the physical force of tornadoes and high winds, as well as related debris impacts.

4.13.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources are at risk of impact and damage from tornadoes and high wind events. Natural resources such as forests, wetlands, and wildlife habitats may be damaged or destroyed by high winds, flying debris, and uprooted vegetation. Historic and cultural resources, including landmarks, heritage buildings, cemeteries, and tribal sites, are particularly vulnerable due to their age, structural fragility, and irreplaceable value. Tornadoes may cause partial or total destruction of these assets, resulting in the loss of community identity, historical continuity, and tourism value.

4.13.4.3 People

All Clarion residents are at risk from tornadoes and high winds. The risk is greater for people in structures not designed as storm shelters, particularly mobile homes, which account for a disproportionate share of tornado-related fatalities and injuries because of their limited structural resilience.

4.13.4.4 Structures and Systems

All structures and systems are at risk of impact, damage, and disruption due to tornadoes and windstorms. Tornadoes have caused widespread damage to homes, businesses, farms, and public infrastructure. Hundreds of residential structures have been destroyed or severely damaged, and critical facilities like schools, fire stations, and police departments are often left inoperable due to roof failures, debris impacts, and power outages.

4.13.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years which may decrease vulnerability. Additionally, there are no planned developments which are expected to notably alter the community's vulnerability.

4.14 TRANSPORTATION INCIDENT

For detailed information on transportation incidents in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.14.1 LOCATION AND EXTENT

Transportation incidents can occur throughout Wright County, including on highways and roads, railways, and as a result of aircraft crashes. These incidents may disrupt travel, delay emergency response, damage infrastructure, or create secondary hazards such as hazardous materials releases. Because Clarion is served by key transportation routes and nearby aviation and rail facilities, transportation incidents remain a relevant local concern.

Road Transport

Key transportation routes in Wright County include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. In Clarion, Highway 3 runs through the City and may present a risk for transportation-related hazardous materials incidents. For more information on the location and extent of transportation incidents, please refer to the base plan.

Rail Transport

Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Grove.

Air Freight

There are three airports in Wright County; Belmond, Clarion, and Eagle Grove. Air incidents can occur at these three airports, as well as anywhere across the county in the event of an aircraft crash.

4.14.2 PREVIOUS OCCURRENCES

Table 15 provides details of four air transportation incidents in Clarion from 1967 to 2024 (57 years) from the National Transportation Safety Board (NTSB).

TABLE 15. WRIGHT COUNTY AIRCRAFT INCIDENTS/ACCIDENTS (1967-2024)

EVENT DATE	LOCATION	INJURY SEVERITY	AIRCRAFT DAMAGE	MAKE	BROAD PHASE OF FLIGHT
2/26/2014	Clarion	Minor (1)	Substantial	Cessna	Landing
10/21/2010	Clarion, IA	Fatal (1)	Destroyed	Beech	Not Reported
01/14/1989	Clarion, IA	Non-Fatal	Substantial	Cessna	Cruise
02/17/1977	Clarion, IA	Non-Fatal	Not Reported	Cessna	Not Reported

Source: http://www.ntsb.gov/_layouts/ntsb.aviation/index.aspx.

4.14.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for transportation incidents in Clarion is **Highly Likely**.

4.14.4 VULNERABILITY ASSESSMENT

Within Clarion, transportation incidents pose a **High** risk due to the number of transportation modalities and incidents that have occurred in the City. This section provides further contextualization for the

anticipated vulnerability of Clarion to transportation incident. Clarion's vulnerability to transportation incidents does not vary significantly from the risk of the county as a whole. For more information on the County's overall vulnerability assessment for transportation incidents, please refer to the base plan.

4.14.4.1 Critical Facilities

All critical facilities are essentially at risk of damage or disruption due to transportation incidents. Transportation incidents can result in physical damage to critical facilities, disrupt operations, or injure workers.

4.14.4.2 Cultural, Historic, and Natural Resources

Transportation accidents, whether involving vehicles, rail, or aircraft, can threaten natural, cultural, and historical resources in Wright County. These incidents may result in direct physical damage, environmental contamination, or long-term degradation of sites that hold historical or cultural significance.

4.14.4.3 People

Transportation-related incidents involving passenger vehicles, rail systems, or aircrafts pose significant risks to public safety and infrastructure. These events can result in a spectrum of consequences, from minor property damage to mass casualty incidents. The likelihood and severity of such accidents are influenced by factors including traffic volume, infrastructure condition, weather, and human error.

4.14.4.4 Structures and Systems

All structures and systems are essentially at risk of damage and disruption due to the nearby transportation infrastructure. The County has several critical facilities and public services located near major transportation corridors. A transportation accident, such as a vehicular collision, rail incident, or aircraft crash, could have significant consequences for the County's structures and systems.

4.14.4.5 Changes in Development

Overall, population in the City of Clarion has decreased over the past several years, corresponding to a decrease in vulnerability, as there are fewer individuals exposed to transportation incidents. Additionally, there is no planned development that would significantly expand transportation infrastructure or add structures in close proximity to major highways, railways, or airports.

5. MITIGATION STRATEGY

The Mitigation Strategy section of the base plan provides an overall blueprint for all participating jurisdictions in Wright County to become less vulnerable to its identified hazards and the findings and conclusions of the Capability and Risk Assessments. As established in the base plan, the overall goals of the Wright County mitigation strategy are consistent across all participating municipalities.

This section provides community-specific strategies for Clarion, including the status of actions that were included in the previous plan and actions to be considered or pursued over the next five years. As noted in the base plan, the participants are not committing to undertaking every action suggested in this list but rather are proposing an extensive list of *potential* actions that they may wish to pursue, depending on the availability of funding. **Table 16** details the mitigation actions identified for the City of Clarion and **Table 17** details the mitigation actions identified for the entire County, known as Countywide Actions.

TABLE 16. UPDATED 2026 CLARION MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Clarion - 1	Purchase a new tanker truck to have enough water available for those areas where water hookups are not available.	Grass/Wildland Fire	Continue In-Progress	Fire Department	County EMA	General Funds; in-kind donations	$100,000 to $500,000	3-5 years	M
Clarion - 2	Continue public education & establish a power point on fire safety programs to help citizens be aware of fire issues and what they can do to reduce the risk of a fire.	Grass/Wildland Fire	Continue In-Progress	Fire Department	County EMA	General Funds	Less than $10,000	1 year	M
Clarion - 3	Get funding to establish a property inspection program to identify issues which can be addressed in order to reduce the number of properties with structural failure issues.	Infrastructure failure	Continue In-Progress	City Administrator	County EMA	General Funds; in-kind match	Less than $10,000	3-5 years	H
Clarion - 4	Map where all hazardous materials are located within the city & have laptop computer for location of hazardous materials (to be put on fire truck).	Hazardous Materials	Continue Not Started	City Administrator	Fire Department	General Funds	Less than $10,000	2-3 years	M
Clarion - 5	Communicating with county health to get a list of people who might need help & setup fan distribution program & Window A/C units for	Extreme Heat	Continue Not Started	City Administrator	County EMA	General Funds	Less than $10,000	3-5 years	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
	people that need them.								
Clarion - 6	Construct a tornado shelter to be open to the public to use in case of tornados and when other storms lead to power outage.	Tornado; Thunderstorm/ Lightning/Hail	Continue Not Started	City Administrator	County EMA	General Funds; FEMA HMA Grant (HMGP, BRIC, or FMA)	$500,000 to $1,000,000	3-5 years	H
Clarion - 7	Geo-coding cities addresses (located at driveway of home) & GPS Units.	All Hazards	Continue Not Started	City Administrator	County EMA	Local funds	$10,000 to $50,000	3-5 years	H
Clarion - 8	Continue participating in the NFIP and continue to update and enforce the floodplain ordinance.	River Flooding	Continue In-Progress	Floodplain manager	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds	Less than $10,000	3-5 years	H
Clarion - 9	Promote a public education and awareness program for hazards.	All Hazards	Continue In-Progress	Police, Ambulance, Fire, Public Works, City Administrator	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds in-kind donations	$10,000-50,000	3-5 years	H
Clarion - 10	Coordinate targeted law enforcement during transportation incidents.	Transportation Incident	Continue In-Progress	City of Clarion, Police Department	County EMA	General funds	Little or No Cost	1 year	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Clarion - 11	Implement a storm sewer backup prevention program.	Flash Flood	Continue In-Progress	City of Clarion, Public Works	County EMA	General Funds	Less than $10,000	1 year	H
Clarion - 12	Install a mobile generator for the City during hazardous events.	All Hazards	Continue In-Progress	City Administrator	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds, Private/Non-profit	$10,000 to $50,000	2-3 years	H

TABLE 17. 2026 COUNTYWIDE MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA - 1	Encourage residents to purchase weather radios to stay informed on emergency information.	All Hazards	Continue In-Progress	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	1 year	M
CWA - 2	Increase coordination with regional and state agencies for early warning and monitoring of animal, plant, and crop disease	Animal/plant/crop disease	New	Environmental Health	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), USDA	Little or no cost	Ongoing	H
CWA - 3	Educate residents on water saving techniques and water conservation	Drought	New	County EMA , Participating Jurisdictions	Public Media	General Funds	Little or No Cost	1 year	L
CWA – 4	Promote tree planting in areas with low vegetation to increase shade coverage.	Extreme Heat	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	Ongoing	M
CWA – 5	Improve drainage infrastructure in areas where flash flooding frequently occurs.	Flash Flood	New	County EMA	Participating Jurisdictions	General Funds	$100,000 to $500,000	Ongoing	H
CWA – 6	Promote defensible landscape for homes, businesses and entities within WUI areas.	Grass and Wildland Fire	New	County EMA	Participating Jurisdictions	General Funds	Little to No Cost	Ongoing	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 7	Promote wetland restoration to reduce flooding impacts across the County.	River Flooding	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$100,000 to $500,000	Ongoing	H
CWA – 8	Promote snow safety to residents on how to prevent pipe breaks in their homes (e.g., insulating outdoor faucets, drip warm water from an indoor faucet) and what to do if a pipe breaks.	Severe Winter Storm	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	Little to No Cost	Ongoing	H
CWA – 9	Conduct Countywide trainings to practice responding to hazardous materials incidents.	Hazardous Materials	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA -10	Promote flu clinics across the County	Human Disease	New	County EMA , Participating Jurisdictions	County Public Health	CDC Grants, General Funds	$10,000 to $50,000	Ongoing	M
CWA – 11	Promote Tree Trimming across the County to prevent fallen trees on infrastructure.	Infrastructure Failure	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	2-3 years	M
CWA – 12	Conduct Countywide trainings to practice responding to terrorist incidents.	Terrorism	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 13	Conduct Countywide trainings to practice responding to transportation incidents.	Transportation Incident	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA - 14	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Thunderstorm/Lightning/Hail	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M
CWA – 15	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Tornado/Windstorm	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M

1.INTRODUCTION AND PLANNING PROCESS

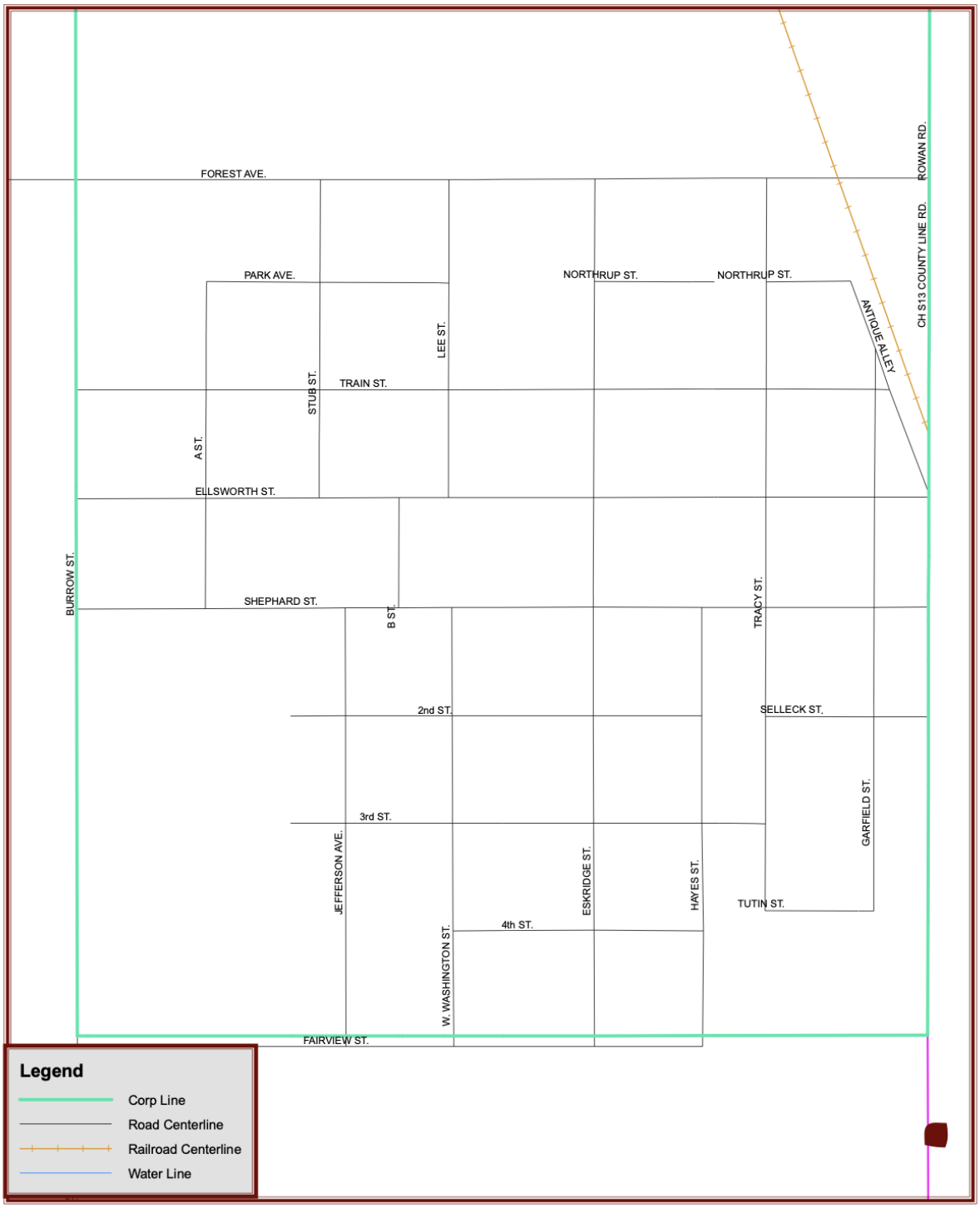
This annex provides more detailed information about the City of Dows. This annex includes the following:

- A more localized community profile, including more detailed mapping, population and demographic information, and critical facilities information
- City-level Hazard Identification and Risk Assessment (HIRA) information, including some more localized hazard maps and conclusions related to hazard risk and how it varies across the planning area
- A localized vulnerability assessment, including the likely impact of profiled hazards on critical facilities
- A detailed capability assessment, describing resource and tools available to the City and to participate in hazard mitigation and reduce hazard risk
- A mitigation strategy, describing a variety of actions the City may opt to take to reduce the risk associated with profiled hazards over the useful life of this plan

2. COMMUNITY PROFILE

The City of Dows is a small community located within Franklin and Wright County, and it was incorporated in 1892. The community is named after Colonel William Greene Dows. Like many communities in the Midwest, Dows got its start as the railroad was constructed. Today, Dows' economy is closely tied to agriculture and agricultural services. The community encompasses .80 square miles, and it is home to several historical sites. **Figure 1** displays the City of Dows.

FIGURE 1. CITY OF DOWS



2.1 POPULATION AND DEMOGRAPHICS

In order to properly plan and prepare a jurisdiction for future emergencies and disasters, it is important to know the community's characteristics and demographics. Over the past several decades the City's population has slightly increased. **Table 1** shows the population trends over time for the City of Dows. The increase in population also means that, in general, there are more individuals exposed to hazards within the community, slightly increasing its overall vulnerability. **Table 2** shows the demographic data. The median household income for the City is $58,750 and 7.2% of the population live below the poverty level. For comparison, the County's poverty level is at 11% and the U.S. at about 10.6% as of 2024.

TABLE 1. POPULATION TRENDS

JURISDICTION	2010 CENSUS POPULATION	2016 POPULATION ESTIMATE	2023 CENSUS POPULATION	% CHANGE 2010-2023
Dows	538	511	544	1.1%

*Source: U.S. Census Bureau: 2010 Decennial Census, 2016 Population Estimates, 2020 Decennial, 2023 American Community Survey, 5-year Estimates. *portions of this city extend into adjacent county – the population total is for the entire corporate limits including portion in adjacent county.*

TABLE 2. DEMOGRAPHIC DATA

JURISDICTION	POPULATION 18 YEARS AND OVER	UNEMPLOYMENT RATE (2025)[1]	MEDIAN HOUSEHOLD INCOME	PERCENT BELOW POVERTY LEVEL
Dows	394	-	$78,000	7.2%

*Source: U.S. Census, 2023 American Community Survey, 5-year Estimates. *portions of this city extend into adjacent county – the population total is for the entire corporate limits including portion in adjacent county.*

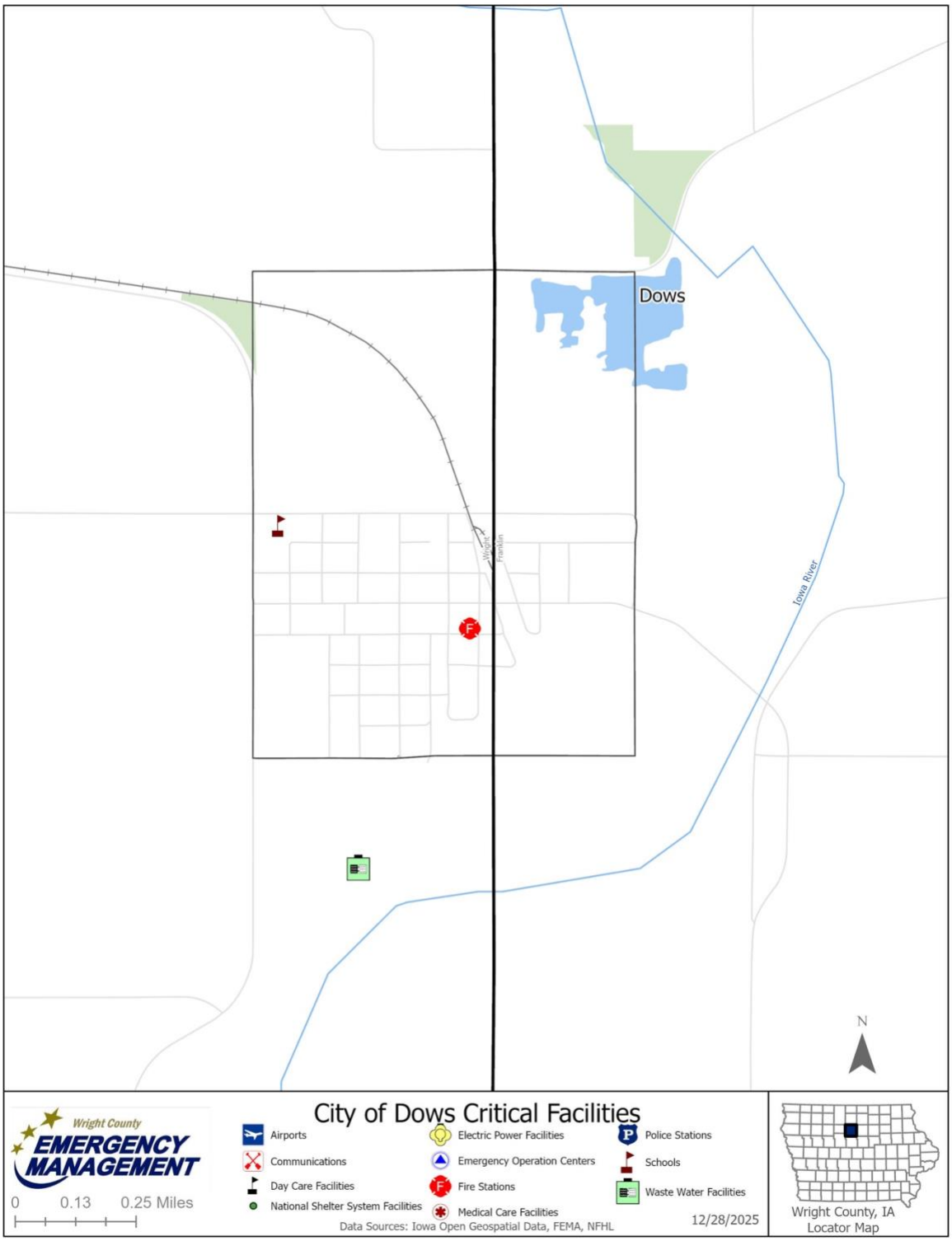
The median age in Dows is 37.3 years old and about 2.2% of the population speak a language other than English at home which is greater than the State of Iowa at 9.7%. Other languages spoken at home include Spanish. About 16.2% of the population have a bachelor's degree which is lower than the State of Iowa at 32%. There are 222 housing units within the City, 198 of which are occupied. Additionally, 17.8% of the population has a disability which is higher than the State of Iowa at 12.9%.

[1] https://fred.stlouisfed.org/series/IAWRIG7URN

2.2 CRITICAL FACILITIES

Critical facilities are the systems and structures that are essential to a jurisdiction's continued functioning, the failure of which would cause significant disruption. **Figure 2** displays the critical facilities within Dows. There are two critical facilities within Dows and one outside of City limits.

FIGURE 2. CRITICAL FACILITIES MAP



2.3 LAND USE AND DEVELOPMENT

The City of Dows has limited land use as it is a small community with a population of a couple of hundred people. Currently, development is limited in the City of Dows. The number of housing units in Dows has decreased significantly since 2010. According to the US Census Bureau, Dows recorded a 22.95% decrease in the number of housing units between 2010 and 2023, and no significant commercial, industrial, or agricultural developments have been reported. These trends indicate that the community's vulnerability related to building exposure has largely decreased since the previous plan due to fewer homes being exposed to hazards.

2.4 NATURAL, HISTORIC, AND CULTURAL RESOURCES

The City of Dows has several natural, historic, and cultural resources. These resources include:

- Burlington, Cedar Rapids & Northern Passenger Depot-Dows
- Fillmore Block
- Quasdorf Blacksmith and Wagon Shop[2]

[2] https://www.nps.gov/subjects/nationalregister/database-research.htm#table

3. CAPABILITY ASSESSMENT

The capability assessment evaluates a jurisdiction's ability to implement a comprehensive mitigation strategy and identifies opportunities to establish or strengthen mitigation policies, programs, and projects. More generalized information about the goals of the capability assessment, including the process and methodology, is presented in the Capability Assessment portion of the base plan.

This section articulates specific information about the capabilities of Dows which include the following:

- Planning mechanisms
- Regulatory tools and programs
- Staff and technical capabilities
- Fiscal and other mechanisms
- Floodplain management and regulation

3.1 PLANNING MECHANISMS

Table 3 describes the planning mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Dows has an Emergency Operations Plan (EOP) and the County Hazard Mitigation Plan. In order to increase this capability, the City may seek to implement additional plans such as a Debris Management Plan, Continuity of Operations Plan, and Disaster Recovery Plan. These plans can support the City in planning to remove debris, continue City operations, and recovering from disasters in the future.

TABLE 3. PLANNING MECHANISMS

PLANNING MECHANISMS	CITY OF DOWS
Capital Improvement Plan (CIP)	No
Comprehensive Plan	No
Community Wildfire Protection Plan (CWPP)	No
Comprehensive Emergency Management Plan (CEMP)	No
Critical Facilities Plan	No
General Plan	No
Continuity of Operations Plan (COOP)	No
Debris Management Plan	No
Disaster Recovery Plan	No
Economic Development Plan	No
Emergency Operations Plan (EOP)	Yes - 2006
Environmental Impact Report (EIR)	No
Evacuation Plan	No

PLANNING MECHANISMS	CITY OF DOWS
Flood Response Plan	No
Floodplain Management Plan/Flood Mitigation Plan	No
Hazard Mitigation Plan	Yes
Historic Preservation Plan	No
Land Use Plan	No
Natural Resource Protection Plan (NRPP)	No
Open Space Management Plan	No
Transportation Plan	No
Threat Hazard Identification and Risk Assessment (THIRA)	No
Watershed Plan	No

3.2 REGULATORY TOOLS AND PROGRAMS

Table 4 describes the regulatory tools and programs that the jurisdiction has in place to support hazard mitigation. Currently, the City of Dows has adopted the State of Iowa Building Code and adopted local Floodplain management and ordinances as well as other stormwater management and subdivision regulations and ordinances. In order to increase this capability the City may seek to update their building codes and engage with community programs such as the Community Emergency Response Team (CERT).

TABLE 4. REGULATORY TOOLS AND PROGRAMS

REGUALTORY TOOLS AND PROGRAMS	CITY OF DOWS
Building Codes	State
Citizen Corps – Community Emergency Response Team (CERT)	No
Community Rating System (CRS Program of the NFIP)	No
Emergency Management Accreditation Program (EMAP)	No
Fire Code	No
Firewise Community	No
Floodplain Management/Flood Damage Prevention Ordinance	Yes
Land Use/Development Planning	No
National Flood Insurance Program (NFIP)	Yes

REGUALTORY TOOLS AND PROGRAMS	CITY OF DOWS
Post Disaster Redevelopment/Reconstruction Plan/Ordinance	No
Storm Ready	No
Stormwater Management Plan/Ordinance	No
Subdivision Regulations/Ordinance	No
Unified Development Ordinance	No
Zoning Ordinance	2015

3.3 STAFF AND TECHNICAL CAPABILITIES

Table 5 describes the staff and technical capabilities that the jurisdiction has in place to support hazard mitigation. Currently, the City of Dows has a Floodplain Manager. In order to increase this capability, the City may seek to increase the number of specialized staff to support hazard mitigation such as an Emergency Manager or other staff with planning and hazard mitigation expertise.

TABLE 5. STAFF AND TECHNICAL CAPABILITIES

STAFF AND TECHNICAL CAPABILITES	CITY OF DOWS
Emergency Manager	No
Engineers or professional trained in construction practices related to buildings and/or infrastructure	No
Environmental Justice Specialists	No
Fiscal Management or Procurement Specialists	No
Floodplain Manager	Yes, Wright County Planning and Zoning Administrator with support from City Clerk
Housing Specialist(s)	No
Land Surveyors	No
Land Use/Management/Development Planning	No
Planners or engineers with an understanding of natural and/or human caused hazards	No
Recreation/Green Space Specialist(s)	No
Resource Development Staff or Grant Writing	No
Scientists familiar with the hazards of the community	no
Staff experienced with Geographic Information Systems (GIS) or HAZUS	No

STAFF AND TECHNICAL CAPABILITES	CITY OF DOWS
Staff with education or expertise to assess the community's vulnerability to hazards	No
Transportation Manager/Traffic Engineer	No

3.4 FISCAL AND OTHER MECHANISMS

Table 6 describes the fiscal and other mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Dows implements several fees and bonds to generate funds. These funds can be critical to funding daily operations and potential mitigation projects. To improve this capability, the City may look to continue to diversity funding mechanisms and apply for grants such as the HSGP, IIJA, and USDA grants.

TABLE 6. FISCAL AND OTHER MECHANISMS

FISCAL AND OTHER MECHANISMS	CITY OF DOWS
Capital Improvement Programming	Yes
Community Development Block Grants (CDBG)	Yes
Development Impact Fees	No
FEMA Hazard Mitigation Assistance Grants (HMPG, FMA,PDM)	No
Gas/Electric Utility Fees	Yes
General Obligation, Revenue, and/or Special Tax Bonds	Yes
Homeland Security Grants (HSGP)	No
Infrastructure Investment and Jobs Act (IIJA)	No
Infrastructure State Revolving Fund Loan	No
Partnering Agreements or Intergovernmental Agreements	No
Sewer/Water Fees	Yes
Special Purpose Tax (or taxing districts)	No
Stormwater Utility Fees	No
USDA Grants	No
USDA Rural Development Agency Grants	No
US Economic Development Administration Grants	No

3.5 FLOODPLAIN MANAGEMENT AND REGULATION

Table 7 describes the National Floodplain Insurance Program (NFIP) Capability for the City of Dows. Currently, the City participates in the NFIP, and it has adopted and enforces floodplain management regulations and ordinances.

TABLE 7. FLOODPLAIN MANAGEMENT AND REGULATION

NFIP CAPABILITIES	CITY OF DOWS
Has your community adopted a floodplain management ordinance that meets NFIP minimum criteria?	Yes
Has your community adopted the latest effective Flood Insurance Rate Map (FIRM)?	Yes – 2/20/2013
Do you regulate/permit development in the Special Food Hazard Area (SFHA)?	Yes
Which position or agency is in charge of NFIP compliance for your community?	Wright County Planning and Zoning Administrator
How do you implement the substantial improvement/substantial damage provisions of your floodplain management ordinance?	Through development review and permitting

4. HAZARD IDENTIFICATION AND RISK ASSESSMENT

The Hazard Identification and Risk Assessment (HIRA) process, described in more detail in the HIRA section of the base plan, involves identifying potential hazards, evaluating their likelihood and potential consequences, and estimating and describing the level of risk these hazards present to a community.

As described in the "HIRA Methodology" section of the base plan, participants in this plan update reconsidered the relative risk posed by the profiled hazards by conducting a hazard ranking process. **Table 8** below provides a summary of how those hazards were ranked in the City of Dows. Each of the 14 natural and manmade hazards discussed in this section are described in more detail in the HIRA section of the base plan. This section endeavors to provide more detailed, local-level information, mapping, and conclusions for these hazards wherever relevant.

TABLE 8. DOWS HAZARD RANKING

JURISDICTION	ANIMAL/CROP/PLANT DISEASE	DROUGHT	EXTREME HEAT	FLASH FLOOD	GRASS OR WILDLAND FIRE	HAZARDOUS MATERIALS	HUMAN DISEASE	INFRASTRUCTURE FAILURE	RIVER FLOODING	SEVERE WINTER STORM	TERRORISM	THUNDERSTORM/LIGHTNING/HAIL	TORNADO/WINDSTORM	TRANSPORTATION INCIDENT
Dows	M	H	M	L	L	H	M	H	M	H	M	M	H	H

4.1 ANIMAL/PLANT/CROP DISEASE

For detailed information on animal, plant, and crop disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.1.1 LOCATION AND EXTENT

All of Wright County is subject to animal/livestock incidents and agricultural infestations, which include the City of Dows. For more information on the location and extent of animal, plant, and crop disease, please refer to the base plan.

4.1.2 PREVIOUS OCCURRENCES

There are no previous occurrences that have been reported to have impacted the City of Dows, specifically. For more information on previous occurrences in Wright County, please refer to the base plan.

4.1.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for animal/plant/crop/disease in Dows is **Unlikely**.

4.1.4 VULNERABILITY ASSESSMENT

Within Dows, animal/plant/crop disease poses a **Medium** risk due to limited previous occurrences and the anticipated impact to the City. This section provides further contextualization for the anticipated vulnerability of Dows to animal/plant/crop disease. Dow's vulnerability to plant, animal, and crop disease does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for animal/plant/crop disease, please refer to the base plan.

4.1.4.1 Critical Facilities

Animal, plant, and crop diseases have limited impact on critical facilities due to the hazard directly impacting animals, plants, and crops and related industries.

4.1.4.2 Cultural, Historic, and Natural Resources

Sensitive crops are those that are more susceptible to stress from environmental factors such as weather and crop diseases.

4.1.4.3 People

Animal, plant, and crop diseases can impact the population through food supply chain disruptions, increased food prices, local employment, and potential health impacts from zoonotic diseases such Highly Pathogenic Avian Influenza (HPAI).

4.1.4.4 Structures and Systems

Buildings, infrastructure, and critical facilities are not vulnerable to this hazard. Its impacts are primarily economic and environmental, rather than structural effects.

4.1.4.5 Changes in Development

Overall, population in the City of Dows has slightly increased over the past several years. This increase is small enough that its impact on overall vulnerability is minimal. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.2 DROUGHT

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Clarion for all profiled hazards.

4.2.1 LOCATION AND EXTENT

All of Wright County is subject to drought as drought normally is more of a widespread hazard and not isolated. For more information on the location and extent of drought, please refer to the base plan.

4.2.2 PREVIOUS OCCURRENCES

According to the National Drought Mitigation Center's Drought Impact Reporter, during the period from January 2007 through January 2026, nine were reported to affect Wright County. Impacts of recent drought periods in Iowa that affected Wright County are provided below. Unless otherwise indicated, these impacts are from the National Climatic Data Center. For more information on previous occurrences in Wright County, please refer to the base plan.

4.2.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for drought in Dows is **Highly Likely**.

4.2.4 VULNERABILITY ASSESSMENT

Within Dows, drought poses a **High** risk due to potential impacts, largely to public health, agriculture, and the local economy. This section provides further contextualization for the anticipated vulnerability Dows to drought. Dow's vulnerability to drought does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for drought, please refer to the base plan.

4.2.4.1 Critical Facilities

All critical facilities in Dows may be impacted by drought and water shortages. Critical facilities such as water and wastewater facilities, hospitals, fires stations, and more may struggle to operate normally if water is scarce. Additionally, droughts may cause soil cracking and erosion that can damage structures.

4.2.4.2 Cultural, Historic, and Natural Resources

All natural resources within the City may experience stress, tree mortality, soil compaction, erosion and loss of habitat or shade due to drought. Drought may also erode cultural and historic resources within Dows as well.

4.2.4.3 People

All people residing in Dows may be impacted by Drought. In extreme cases, droughts can create health hazards when drinking water production cannot keep up with demand. Increased water demand may also increase water rates and create financial hardship, especially for individuals and families living below poverty. In Dows, 7.2% live below poverty. Additionally, the elderly and young children may be at greater risk of experiencing adverse health effects resulting from reduced water quality.

4.2.4.4 Structures and Systems

In severe prolonged droughts, structures could be impacted through cracks in foundation which can comprise the integrity and safety of the building.

4.2.4.5 Changes in Development

Overall, population in the City of Dows has increased slightly over the past several years, although this change is small enough where it is not considered to appreciably alter the community's vulnerability. Additionally, there is no anticipated development which would affect Dows' overall vulnerability to drought and water shortage. A potential development that could have an impact would be increased use of irrigation by surrounding agricultural—if increased irrigation significantly reduces water availability for people living in town, that could increase the community's vulnerability to future droughts and water shortages.

4.3 EXTREME HEAT

For detailed information on extreme heat in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.3.1 LOCATION AND EXTENT

All of Wright County is subject to extreme heat as it is normally more of a widespread hazard and not isolated. For more information on the location and extent of extreme heat, please refer to the base plan.

4.3.2 PREVIOUS OCCURRENCES

The following summarizes the National Weather Service Advisories, Watches, and Warnings for Heat or Excessive Heat in Wright County from 2000 to 2025 (25 years of data). For more information on previous occurrences in Wright County, please refer to the base plan.

- 46 Heat Advisories
- 2 Extreme Heat Watches
- 8 Excessive Heat Watches
- 7 Excessive Warnings

4.3.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for extreme heat in Dows is **Likely**.

4.3.4 VULNERABILITY ASSESSMENT

Within Dows, extreme heat poses a **Medium** risk, primarily due to the high likelihood of future occurrence and magnitude. This section provides further contextualization for the anticipated vulnerability of Dows to extreme heat. Dow's vulnerability to extreme heat does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for extreme heat, please refer to the base plan.

4.3.4.1 Critical Facilities

All critical facilities may be at risk of impact depending on severity of extreme heat events. Extreme heat can significantly affect all critical facilities by compromising the structural integrity and operational reliability of critical facilities and infrastructure. During extreme heat events, it is likely that food, hydration, and shelter, as well as health and medical lifelines would be disrupted.

4.3.4.2 Cultural, Historic, and Natural Resources

Prolonged high temperatures and hot conditions can stress ecosystems, reduce biodiversity, and increase the risk of wildfires, especially in forested and agricultural areas. These changes threaten native species and disrupt ecological balance, which in turn affects the natural heritage in Dows. Some historic buildings were built before the invention of central air conditioning and may lack proper cooling, posing risk to its inhabitants. Cultural traditions and outdoor events may be disrupted due to unsafe heat conditions, reducing community engagement and tourism.

4.3.4.3 People

All people residing in Dows may be at risk of impact, especially heat-related illnesses depending on the severity of extreme heat events. Those at greatest risk for heat-related illness and deaths include people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. Wright County's population over 65 years is higher than the national and state average at 20.9 percent.

4.3.4.4 Structures and Systems

All structures and systems may be at risk of impacts depending on the severity of extreme heat events. Extreme heat can also cause a strain on electricity delivery infrastructure which can be overloaded during peak use of electricity to power air conditioning during extreme heat events. Increased electricity use can increase rates and cause financial hardships, especially for individuals and families living under poverty. In Dows, 7.2% live in poverty.

4.3.4.5 Changes in Development

Overall, population in the City of Dows has increased slightly over the past several years, but this increase is less than one percent and not expected to significantly affect the community's overall vulnerability. Additionally, there is no anticipated development that would affect Dows' vulnerability to extreme heat.

4.4 FLASH FLOOD

For detailed information on flash flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.4.1 LOCATION AND EXTENT

Wright County includes two major tributaries of the Mississippi River, including the Boone River and the upper portion of the Iowa River. The Boone Watershed intercepts the entire western and central portion of Wright County and is an area of gently flat to rolling hills. For more information on the location and extent of flash flood, please refer to the base plan.

4.4.2 PREVIOUS OCCURRENCES

There are no reported flash flood events that have occurred in Dows. For more information on previous occurrences within Wrigth County, please refer to the base plan.

4.4.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for flash flood in Dows is **Possible**.

4.4.4 VULNERABILITY ASSESSMENT

Within Dows, flash flooding poses a **Medium** risk due to a highly likely probability of occurrences and moderate damages to property and crops. This section provides further contextualization for the anticipated vulnerability of Dows to flash flood. Dows' vulnerability to flash flooding is lower than the risk of the county as a whole due given its location away from major rivers or ponds. For more information on the county's vulnerability assessment for flash flooding, please refer to the base plan.

4.4.4.1 Critical Facilities

Critical facilities in low lying areas may be at risk of impact from flash flood events. Critical facilities, such as hospitals, emergency operations centers, fire stations, schools, nursing homes, and water treatment plants, face varying levels of risk from flash flood events depending on their location, structural resilience, and operational readiness.

4.4.4.2 Cultural, Historic, and Natural Resources

Cultural, historic, and natural resources in low lying areas may be at risk of impact from flash flood events. Flooding can cause significant damage to Wright County's natural, historic, and cultural assets. Natural areas such as wetlands, forests, and waterways may experience erosion, pollution, and habitat loss, reducing their ecological value and ability to buffer future flood events. These changes can also affect recreational and conservation areas. Historic buildings and cultural landmarks are at risk of structural damage, deterioration, and loss of historically significant materials. Flooding may also disrupt cultural traditions tied to specific locations or community spaces.

4.4.4.3 People

People residing in low lying areas are at the most risk to flash flooding. Flooding presents a serious risk to residents across Wright County, particularly in low-lying areas with a history of flood events. Populations most at risk include older adults, low-income families, and individuals without access to flood insurance, lack of accessible emergency alert and notifications, or reliable transportation.

4.4.4.4 Structures and Systems

Structures and systems in low lying areas are at the greatest risk of flash flooding. Flash flooding can quickly inundate any low lying structures and systems. Damage to public infrastructure can be costly for the state, county, and city road/bridge maintenance departments to repair. Flooding in private residences and businesses can also require expensive repairs, especially if not covered by insurance.

4.4.4.5 Changes in Development

Overall, population in the City of Dows has increased slightly over the past several years, although the increase is less than one percent and not anticipated to noticeably affect the community's vulnerability. Additionally, there are no known developments that are anticipated to affect Dows' vulnerability to flash flooding.

4.5 GRASS OR WILDLAND FIRE

For detailed information on grass and wildland fire in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

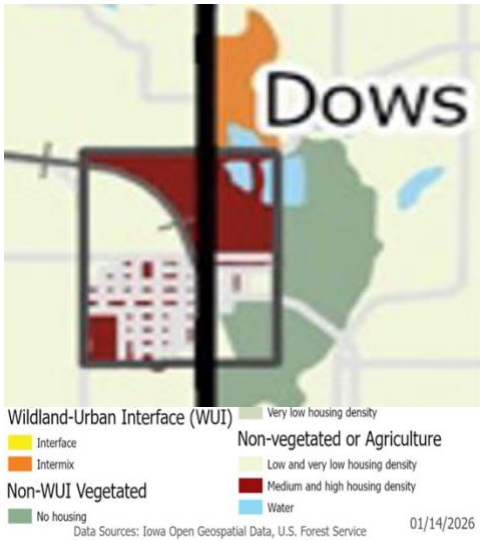
4.5.1 LOCATION AND EXTENT

Wildland/Grass fires are most likely to occur in the Wildland Urban Interface (WUI). This is the area where houses meet or intermingle with undeveloped wildland vegetation. Within the WUI, there are two specific areas identified:

- Interface
- Intermix

The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. **Figure 3** shows the WUI areas within Dows. On the map, the orange represents Intermix areas and the yellow represents Interface areas. The red indicates medium and high housing density that is unrelated to wildfire risk. For more information on the location and extent of grass or wildland fire, please refer to the base plan.

FIGURE 3. DOWS WUI AREAS



4.5.2 PREVIOUS OCCURRENCES

According to the National Fire Incident Reporting System (NFIRS), there has been one fire incident in Wright County since 2017. For more information on previous occurrences within Wright County, please refer to the base plan.

4.5.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for grass or wildland fire in Dows is **Possible**.

4.5.4 VULNERABILITY ASSESSMENT

Within Dows, grass or wildland fire pose a **Low** risk due to limited previous occurrences. This section provides further contextualization for the anticipated vulnerability of Dows to grass or wildland fire. Dow's vulnerability to grass and wildland fire is lower than the risk to the county as a whole. For more information on the county's vulnerability assessment for grass or wildland fires, please refer to the base plan.

4.5.4.1 Critical Facilities

There are no critical facilities in Dows that are within the WUI areas (Interface or Intermix). Critical facilities across the County may be vulnerable to disruption or damage from WUI fires, particularly those located near forested or undeveloped areas. These facilities include emergency operations centers, fire stations, hospitals, schools, water treatment plants, power substations, and communication infrastructure.

4.5.4.2 Cultural, Historic, and Natural Resources

Wildfire and Wildland-Urban Interface (WUI) areas can pose a risk to the County's natural, historic, and cultural resources. Wildfires can degrade ecosystems by destroying native vegetation, fragmenting wildlife habitats, and increasing soil erosion and water pollution. Smoke and airborne pollutants also impact air quality, affecting both environmental and human health. Culturally and historically significant sites, such as cemeteries and historic buildings, are vulnerable to direct fire damage and indirect impacts from suppression efforts and post-fire erosion.

4.5.4.3 People

Populations across Wright County face varying degrees of vulnerability to WUI fires, depending on factors such as proximity to wildland areas, housing density, socioeconomic conditions, and access to emergency services. In urbanizing areas, the expansion of housing into fire-prone zones increases the number of people and structures exposed to wildfire hazards.

4.5.4.4 Structures and Systems

Structure and systems in WUI areas may be at risk of impact from grass and wildland fires. Wildfires can be responsible for extensive damage to crops, the environment and occasionally residential or business facilities. Homes built in rural areas are more vulnerable since they are in closer proximity to wildland that may burn, and they tend to be farther away from emergency services.

4.5.4.5 Changes in Development

Overall, population in the City of Dows has increased over the past several years. However, this increase is less than one percent and not anticipated to significantly affect overall vulnerability. There are currently no plans for development in WUI areas or other locations which could affect Dows' vulnerability to grass or wildland fires.

4.6 HAZARDOUS MATERIALS

For detailed information on hazardous materials in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.6.1 LOCATION AND EXTENT

Fixed Hazardous Materials Incident

According to the Iowa Department of Natural Resources, there are 44 sites in Wright County that because of the volume or toxicity of the materials on site were designated as Tier II Facilities under the Superfund Amendments and Reauthorization Act. Within Dows there are seven Tier II facilities. For more information on the location and extent of hazardous materials, please refer to the base plan.

Transportation Hazardous Materials Incident

The transport of hazardous materials in Wright County can occur via trucks on the highways/roads and airplanes carrying hazardous cargo. Hazardous materials can be transported on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. There are no major highways within Dows.

Rail Transport

There is one railroad that runs through Dows.

Air Freight

There are no airports within Dows.

Pipeline Incident

There are no pipelines that run through the City of Dows, however there are pipelines located nearby that may impact residents of the City if ruptured.

4.6.2 PREVIOUS OCCURRENCES

There have been no previously documented hazardous materials spills in Dows. For more information on previous occurrences within Wright County, please refer to the base plan.

4.6.3 PROBABILITY OF FUTURE OCCURRENCES

While there are no previously documented occurrences of hazardous materials incidents in Dows, these events are sometimes underreported, and hazardous materials are surprisingly common. Household cleaners, fuel, and pesticides are just a few substances that can be hazardous to humans, and human error when handling these substances can never be fully eliminated. Therefore, the HMPC assesses that the probability of future occurrences for hazardous materials incidents in Dows is **Highly Likely**.

4.6.4 VULNERABILITY ASSESSMENT

Within Dows, hazardous materials pose a **High** risk due to high likelihood of future occurrences and magnitude. This section provides further contextualization for the anticipated vulnerability of Dows to hazardous materials. For more information on the vulnerability assessment for hazardous materials, please refer to the base plan.

4.6.4.1 Critical Facilities

Critical facilities located near major transportation corridors or industrial zones are at higher risk of exposure to chemical spills, fires, or airborne toxins. These incidents can disrupt operations, damage infrastructure, and endanger occupants, especially in facilities that house vulnerable populations like the elderly or children. Additionally, facilities without proper ventilation systems, backup power, or shelter-in-place protocols are more susceptible to contamination and operational failure during a release.

4.6.4.2 Cultural, Historic, and Natural Resources

Hazardous material incidents pose significant risks to natural, historic, and cultural resources across Wright County. These resources include wetlands, rivers, forests, historic buildings, archaeological sites, and culturally significant landmarks. A chemical spill or airborne release can contaminate soil and water, damage ecosystems, and degrade the physical integrity of historic structures. Natural resources such as wildlife habitats and water bodies are particularly vulnerable to long-term environmental damage, which can disrupt biodiversity and recreational use. Historic and cultural sites may suffer irreversible harm if exposed to corrosive or toxic substances, especially if they lack protective infrastructure or are located near transportation corridors or industrial zones.

4.6.4.3 People

Communities near major transportation routes, such as highways and rail lines, are at higher risk due to the frequent movement of hazardous substances. Industrial zones and agricultural areas with chemical storage facilities also present elevated risks of fixed-site incidents. These events can lead to chemical spills, fires, or airborne releases that threaten public health and safety.

Vulnerability is especially high among populations with limited mobility, such as the elderly, individuals with disabilities, and residents of schools, hospitals, and correctional facilities. These groups may face challenges during evacuation or shelter-in-place orders.

Additionally, low-income communities may struggle with access to protective equipment, transportation, and timely information, further increasing their vulnerability. There have not been any reported injuries or fatalities in Dows from hazardous materials incidents.

4.6.4.4 Structures and Systems

It is difficult to determine the potential losses to existing development because of the variable nature of a hazardous materials spill. For example, a spill of a toxic airborne chemical in a populated area could have greater potential for loss of life. By contrast a spill of a very small amount of a chemical in a remote rural area would be much less costly and possibly limited to remediation of soil. There have not been any reported property damage or crop damage in Dows from hazardous materials incidents.

4.6.4.5 Changes in Development

Overall, population in the City of Dows has increased over the past several years, but this increase is less than one percent and not anticipated to significantly affect the community's overall vulnerability. Additionally, there is no anticipated development which would increase or decrease Dows' vulnerability.

4.7 HUMAN DISEASE

For detailed information on human diesase in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.7.1 LOCATION AND EXTENT

Pandemics and epidemics do not affect a single geographic location; Wright County is equally vulnerable. Transmission can occur anywhere people interact, but locations with higher numbers of individuals create more opportunities for disease to spread. For more information on the location and extent of human disease, please refer to the base plan.

4.7.2 PREVIOUS OCCURRENCES

Pandemics and epidemics have had recurring and widespread effects on the County and across the world. While some events have been global in scale and others more localized, each has highlighted the vulnerability of the community to infectious disease and underscored the importance of preparedness and coordinated response. Since 1918, there have been six major epidemics or pandemics that are widely recognized by both the CDC and WHO, in addition to the COVID-19 pandemic. For more information on previous occurrences within Wright County, please refer to the base plan.

4.7.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for human disease in Dows is **Possible**.

4.7.4 VULNERABILITY ASSESSMENT

Within Dows, human disease poses a **Medium** risk due to low probability yet high risk to significantly impact the City. This section provides further contextualization for the anticipated vulnerability of Dows to human disease. For more information on the county's vulnerability assessment for human disease, please refer to the base plan.

4.7.4.1 Critical Facilities

Infectious disease outbreaks can significantly disrupt the operation of critical facilities in Wright County. Healthcare facilities, including hospitals, clinics, and long-term care centers, are particularly vulnerable due to increased patient loads, limited surge capacity, and potential shortages of staff and medical supplies. These facilities must maintain continuity of operations while implementing infection control measures, such as isolation protocols and PPE usage.

Other essential facilities, such as emergency operations centers, law enforcement agencies, schools, and correctional institutions, may experience staffing shortages due to illness or quarantine, which can impair their ability to deliver vital services.

4.7.4.2 Cultural, Historic, and Natural Resources

Cultural institutions such as museums, historic sites, and art galleries may be closed or operate at reduced capacity during a pandemic. This can lead to decreased access to cultural resources for the public. Cultural organizations often rely on visitor revenue and donations to sustain operations. Reduced visitation and economic uncertainty during a pandemic can strain the financial stability of these institutions, impacting their ability to preserve cultural resources.

4.7.4.3 People

Wright County face notable vulnerabilities during a human infectious disease event due to a combination of environmental, healthcare, and socioeconomic factors. Transmission risks are heightened by close human contact, contaminated surfaces, and limited access to sanitation in some areas. Populations most at risk include the elderly, immuno-compromised individuals, and frontline workers.

The County's rural nature may limit healthcare surge capacity, making it harder to manage widespread outbreaks. Risk will vary based on geographical vaccination efforts and vaccination uptake by communities and individuals. Additionally, insurance, access to healthcare, as well as trust in the medical community can determine risk to population which can increase infection rates, hospitalizations, and mortality. [3] Additionally, due to the high percentage of induvial living in poverty, Dows may be more at risk to health impacts from human disease.

4.7.4.4 Structures and Systems

Infectious diseases can impact critical infrastructure and systems, especially in rural and resource-limited areas. Healthcare facilities may face strain due to increased patient loads, limited surge capacity, and potential shortages of personal protective equipment (PPE), isolation space, and trained personnel.

4.7.4.5 Changes in Development

Overall, population in the City of Dows has increased over the past several years. An increase in population could correspond to an overall increase in vulnerability, although the population growth is relatively minor. There are no plans for future development which are anticipated to alter Dows' vulnerability to human diseases.

[3] https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems

4.8 INFRASTRUCTURE FAILURE

For detailed information on infrastructure failure in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.8.1 LOCATION AND EXTENT

The entire planning area is at risk to all types of infrastructure failure included in the hazard description section, either from primary failure due to malfunction, degradation, or accidental or intentional damage or as a result of a secondary impact related to another hazard event. For more information on the location and extent of infrastructure failure, please refer to the base plan.

4.8.2 PREVIOUS OCCURRENCES

Infrastructure failures often occur as a secondary impact to other hazard events. For specific descriptions, please see the Previous Occurrences section of the other hazards included in this plan. Infrastructure failures can also occur as a result of lack of maintenance, human error, and age deterioration. There have been no significant infrastructure failures reported in Wright County.

4.8.3 PROBABILITY OF FUTURE OCCURRENCES

While there have been no significant infrastructure failures reported previously, many minor infrastructure failures, such as road closures, downed power lines, loss of cellular signal, and others, go unreported. Therefore, the HMPC considers the probability of future occurrences for infrastructure failure in Dows to be **Highly Likely.**

4.8.4 VULNERABILITY ASSESSMENT

Within Dows, infrastructure failure poses a **High** risk due to a high likelihood of future occurrence and high magnitude. This section provides further contextualization for the anticipated vulnerability of Dows to infrastructure failure. Dow's vulnerability to infrastructure failure does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for infrastructure failure, please refer to the base plan.

4.8.4.1 Critical Facilities

All critical facilities within Dows may be all risk of impacts such as damage and disruption to services from infrastructure failure.

4.8.4.2 Cultural, Historic, and Natural Resources

Infrastructure failures have a limited impact to natural, historic, and cultural resources. Secondary impacts of infrastructure failures such as fires due to ruptured gas pipelines and contamination from wastewater, may pose a greater risk to these resources.

4.8.4.3 People

Infrastructure failures may impact all people within Dows due to the range of infrastructure failures such as transportation, sewer, water, energy, and communications. Certain population may be at increased risk such as older adults, individuals medically dependent on electricity, and those with certain medical conditions.

4.8.4.4 Structures and Systems

Since infrastructure failures are generally a secondary or cascading impact of other hazards, it is not possible to fully quantify estimated potential losses specific to this hazard due to the variables associated

with affected population, duration of outages, etc. In some instances, failure of one system can impact others. For example, the loss of electricity may also lead to the loss of internet connectivity.

4.8.4.5 Changes in Development

Overall, population in the City of Dows has increased, although this increase is minor and not anticipated to noticeably impact Dows' vulnerability to infrastructure failure. Additionally, there are no plans for development which would increase or decrease the community's vulnerability.

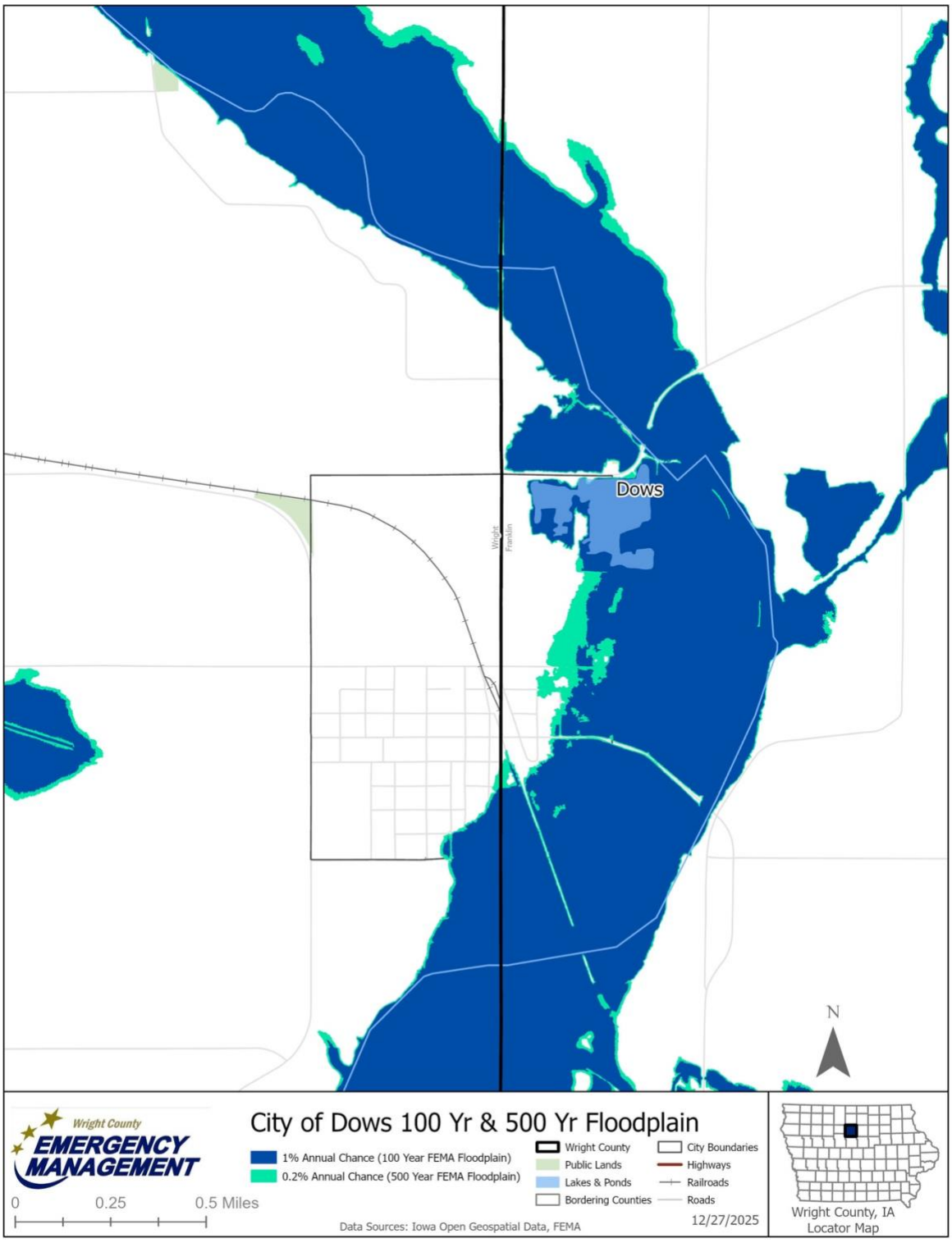
4.9 RIVER FLOODING

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.9.1 LOCATION AND EXTENT

Dows has both 100-year floodplains and 500-year floodplains that run throughout the City but mainly center around the eastern part of the City. **Figure 4** displays both the 100-year and 500-year floodplains within Dows. For more information on the location and extent of river flooding, please refer to the base plan.

FIGURE 4. CITY OF DOWS 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN



4.9.2 PREVIOUS OCCURRENCES

There has one event that occurred in Dows. There was no reported property damage and crop damage. **Table 9** details the flood events in Dows since 1997. The majority of the flood events occurred in 2010 and in 2016. For more information on previous occurrences in Wright County, please refer to the base plan.

TABLE 9. NCDC WRIGHT COUNTY, IOWA FLOOD EVENTS SUMMARY, 1997-JUNE 2025

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
DOWS	9/19/18	0	0

National Flood Insurance Program (NFIP) Participation

According to the Iowa Department of Natural Resources, there are no Repetitive Loss or Severe Repetitive Loss Properties in Wright County. **Table 10** provides details on NFIP participation for Dows as well as the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction, where applicable. The claims information is for the period from January 1, 1978 to Fall 2025

TABLE 10. NFIP PARTICIPATION, CURRENT, HISTORICAL POLICY AND CLAIM STATISTICS

COMMUNITY NAME	NFIP PARTICIPANT	CURR EFF MAP DATE	REG EMER DATE	POLICIES IN-FORCE	TOTAL COVERAGE	HISTORICAL CLAIMS	HISTORICAL TOTAL PAYMENTS
Dows	Yes	2/20/2013-M	2/20/2013	1	$105,000.00	0	$0

Source: Participation details from NFIP Community Status Book, 10/4/2017; https://www.fema.gov/national-flood-insurance-program-community-status-book; M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program: Policy and Loss Statistics from BureauNet, http://bsa.nfipstat.fema.gov/reports/reports.html;
**Closed Losses are those flood insurance claims that resulted in payment. Loss statistics are for the period from January 1, 1978 to Fall 2025.*

4.9.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for river flooding in Dows is **Highly Likely.**

4.9.4 VULNERABILITY ASSESSMENT

Within Dows, river flooding poses a **High** risk due to high likelihood of future occurrence and the magnitude. This section provides further contextualization for the anticipated vulnerability of Dows to river flooding. Dows' vulnerability to river flooding is lower from the risk of the county as a whole due to limited previous occurrences. For more information on the county's vulnerability assessment for river flooding, please refer to the base plan.

4.9.4.1 Critical Facilities

To analyze critical facilities at risk in the planning area, the inventory of critical and essential facilities and infrastructure in the planning area was compiled from various sources including the 2013 Wright County Multi-Jurisdictional Hazard Mitigation Plan, Wright County, HSIP Freedom 2015 and the Iowa Department of Natural Resources (NRGIS). A comparison was made of the 176 facilities in the critical facilities inventory with the FIRM layer to determine those facilities that would be damaged in the 1-percent and

0.2-percent annual chance flood events. This analysis determined that four facilities would be at risk in the 1-percent annual chance floodplain.

There are no critical facilities within the 100-year or 500-year floodplain within Dows.

4.9.4.2 Cultural, Historic, and Natural Resources

Please refer to the flash flood section on potential impacts to natural, historic and cultural resources.

4.9.4.3 People

To estimate population displaced by a 1-percent annual chance flood, the number of residential structures impacted was multiplied by the average household size for each jurisdiction. According to the analysis, there would be a total of 5 residential structures impacted and 10 potentially people displaced. **Table 11** provides the estimated structures and population which would be impcated.

TABLE 11. ESTIMATED DISPLACED POPULATION

JURISDICTION	RESIDENTIAL STRUCTURES IMPACTED	AVERAGE HOUSEHOLD SIZE	ESTIMATED DISPLACED POPULATION
Dows	5	2.04	10

4.9.4.4 Structures and Systems

The potential losses to existing development will be provided for the following categories of losses:

- Building/Contents Losses
- Estimated Population Displaced
- Agricultural Impacts
- Critical Facilities and Infrastructure at Risk

Table 12. provides the summary of potential flood loss estimates and impacted population for the 1-percent annual chance flood by jurisdiction based on the HAZUS Level 2 Analysis.

TABLE 12. POTENTIAL FLOOD LOSS ESTIMATES, 1-PERCENT ANNUAL CHANCE FLOOD

JURISDICTION	PROPERTY TYPE	IMPROVED PARCEL COUNTS	IMPROVED LOSSES	CONTENT LOSSES	INVENTORY LOSSES	TOTAL LOSSES
Dows	Agriculture	1	$69	$233	$288	$590
	Commercial	3	$422	$1,192	$1,472	$3,087
	Residential	5	$9,297	$3,782	$0	$13,079
	Total	**9**	**$9,788**	**$5,208**	**$1,760**	**$16,756**

4.9.4.5 Changes in Development

Overall, population in the City of Dows has increased over the past several years, but this increase is minor and not anticipated to affect overall vulnerability. There are no plans for development which would increase or decrease Dows' vulnerability to flooding.

4.10 SEVERE WINTER STORM

For detailed information on severe winter storms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.10.1 LOCATION AND EXTENT

The entire state of Iowa is vulnerable to heavy snow, extreme cold temperatures and freezing rain. Generally, winter storms occur between the months of November and March but can occur as early as October and as late as April. January has the highest monthly snowfall at about 9 inches of snow. For more information on the location and extent of severe winter storms, please refer to the base plan.

4.10.2 PREVIOUS OCCURRENCES

Due to the large scale of winter weather, all winter weather in Wright County is likely to have impacted clarion. From 1996 through October 2025, the National Climatic Data Center reports the following 124 severe winter weather events in Wright County:

- 34 - Blizzard
- 9 - Cold/Wind Chill
- 17 - Extreme Cold/Wind Chill
- 18 - Heavy Snow
- 14 – Ice Storm
- 32 – Winter Storm

For more information on previous occurrences in Wright County, please refer to the base plan.

4.10.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for severe winter storms in Dows is **Highly Likely**.

4.10.4 VULNERABILITY ASSESSMENT

Within Dows, severe winter storms pose a **High** risk due to the high likelihood of occurrence and magnitude. This section provides further contextualization for the anticipated vulnerability of Dows to severe winter storms. Dow's vulnerability to severe winter storms does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for severe winter storms, please refer to the base plan.

4.10.4.1 Critical Facilities

All critical facilities within Dows may be at risk of impacts and disruption to services due to extreme cold temperatures and high snowfall. Hospitals, emergency shelters, and water treatment plants may face operational challenges during prolonged outages or freezing conditions.

4.10.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources may be at risk to impact from severe winter weather. Severe winter weather can significantly impact the County's natural, historic, and cultural assets. Ice storms and freezing temperatures often damage forests, wetlands, and wildlife habitats, leading to tree loss, habitat disruption, and increased runoff pollution from de-icing agents. These environmental changes can have lasting effects on local ecosystems and water quality. Historic buildings and cultural landmarks are vulnerable to structural damage from ice accumulation, freeze-thaw cycles, and water intrusion.

4.10.4.3 People

All people residing in Dows may be vulnerable to severe winter storms. Residents who are elderly, disabled, or economically disadvantaged are at heightened risk during winter events due to limited access to reliable heating, transportation, and emergency services. Many homes in rural areas lack adequate insulation or backup power sources, making them susceptible to dangerously low indoor temperatures during prolonged power outages caused by ice storms.

Low-income households may struggle to afford increased heating costs or to repair damage from burst pipes and frozen infrastructure. Within Dows, over 7.2% of individuals live in poverty. Individuals who rely on electric-powered medical equipment face life-threatening challenges when outages occur. Additionally, rural isolation can delay emergency response times, leaving residents without timely access to medical care or warming centers.

4.10.4.4 Structures and Systems

Structures and systems can be damaged or impaired by loss of electricity from overhead power line damages, which can lead to bursting water pipes. Additionally, winter storms damages crops if they occur before harvest or after planting.

4.10.4.5 Changes in Development

Overall, population in the City of Dows has increased over the past several years, but this increase is minor and not anticipated to affect overall vulnerability. There are no plans for development which would increase or decrease Dows' vulnerability to winter storms.

4.11 TERRORISM

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.11.1 LOCATION AND EXTENT

The entire planning area has a low potential for terrorist activity. However, there are areas with increased risk such as large events, schools, religious organizations, and government facilities. For more information on the location and extent of terrorism, please refer to the base plan.

4.11.2 PREVIOUS OCCURRENCES

There have not been any large-scale enemy attacks or acts of radiological terrorism in Iowa. There have been biological and chemical agent threats, animal rights activists' vandalism and many bomb threats. For more information on previous occurrences in Wright County, please refer to the base plan.

4.11.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for terrorism in Dows is **Unlikely**.

4.11.4 VULNERABILITY ASSESSMENT

Within Dows, terrorism pose a **Medium** risk due to limited previous occurrences and the potential magnitude for such events. This section provides further contextualization for the anticipated vulnerability of Dows to terrorism. Dow's vulnerability to terrorism does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for severe winter storms, please refer to the base plan.

4.11.4.1 Critical Facilities

Essentially all critical facilities are at risk of damage or disruption of services from terrorism. Terrorism can disrupt and damage critical facilities such as physical damage which can cause public safety and public health concerns. There are no previous occurrences of terrorism impacting critical facilities in Dows.

4.11.4.2 Cultural, Historic, and Natural Resources

In some cases, terrorist attacks may target certain natural, cultural, or historic resources to erase a community's identity such as museums, monuments, and other cultural sites. Additionally, use of destructive weapons may pollute natural resources and cause environmental degradation and damage the local environmental and ecosystems.

4.11.4.3 People

Terrorist attacks can have a physical impact as well as a psychological impact. Terrorist attacks can cause injuries and fatalities, as well as long-term psychological trauma. Depending on the nature of the attack, the broader community can be impacted and disrupt societal and economic functioning. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

Some acts of terrorism are hate-based and therefore individuals and communities from certain religions, nationalities, race, ethnicism, sexuality, and gender are at increased risk of attacks, injury, or even death. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

4.11.4.4 Structures and Systems

Potential losses could include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses, loss of human life, injuries to persons, loss of food supplies, disruption of the food supply chain, and immediate damage to the surrounding environment.

4.11.4.5 Changes in Development

Overall, population in the City of Dows has increased over the past several years, but this increase is minor and not expected to alter vulnerability. There are no plans for development which would increase or decrease Dows' vulnerability.

4.12 THUNDERSTORM/LIGHTNING/HAIL

For detailed information on thunderstorms, lightning, and hail in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.12.1 LOCATION AND EXTENT

Thunderstorms, lightning, and hail can impact the entire County. Although these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. Iowa experiences 40 storms per year in the northwest portion of the state and 60 per year in the southeast portion. For more information on the location and extent of thunderstorms, lightning, and hail, please refer to the base plan.

4.12.2 PREVIOUS OCCURRENCES

The NCDC reported 233 total thunderstorm events for the Wright County planning area from 1965 through October 2025. Seven of those thunderstorm events occurred in Dows. For more information on previous occurrences in Wright County, please refer to the base plan.

4.12.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for thunderstorm/lightning/hail in Dows is **Highly Likely**.

4.12.4 VULNERABILITY ASSESSMENT

Within Dows, thunderstorm/lightning/hail pose a **Medium** risk due to a high likelihood of future occurrences. This section provides further contextualization for the anticipated vulnerability of Dows to thunderstorm/lightning/hail. Dow's vulnerability to thunderstorm/lightning/hail does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for thunderstorm/lightning/hail, please refer to the base plan.

4.12.4.1 Critical Facilities

All critical facilities are at risk of impact from thunderstorms, lightning, and hail. Critical infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during severe storm events. In rural areas such as Wright County, this vulnerability is compounded by limited system redundancy and constrained emergency response capabilities, making recovery slower and impacts more severe.

4.12.4.2 Cultural, Historic, and Natural Resources

Severe storms can significantly impact natural, historic, and cultural resources within Wright County. Natural areas such as wetlands, forests, and river systems are vulnerable to erosion, flooding, and contamination from stormwater runoff. However, these ecosystems also serve as natural buffers that help absorb rainfall and reduce flood risk, but when damaged, they lose their protective function and biodiversity suffers.

Historic and cultural resources-including landmarks, cemeteries, monuments, and archaeological sites are also at risk. Many of these structures are older and not built to withstand high winds or flooding. Storms can cause irreversible damage to fragile materials, displace artifacts, and erode land around culturally significant sites.

4.12.4.3 People

All people residing in Dows are vulnerable to impacts from thunderstorms, lightning, and hail. Populations with limited access to safe housing, emergency services, or reliable communication systems are especially at risk. Other vulnerable populations, such as the elderly, individuals with disabilities, and low-income households, may face greater challenges in preparing for, responding to, and recovering from storm events.

4.12.4.4 Structures and Systems

All structures and systems may be at risk of impact from thunderstorms, lightning, and hail. Hail and lightning can cause structural damage, and lightning strikes can also damage electronic devices within buildings. Hail and lightning can significantly damage crops. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes.

4.12.4.5 Changes in Development

Overall, population in the City of Dows has increased over the past several years, although this increase has been minor and is not expected to increase or decrease Dows' overall vulnerability. Additionally, there are no planned developments which would alter the community's vulnerability to thunderstorms, lightning, and hail.

4.13 TORNADO/WINDSTORM

For detailed information on tornadoes and windstorms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.13.1 LOCATION AND EXTENT

Iowa is located in a region of the United States where tornadoes occur regularly. Although tornadoes are most common in May and June, they can occur during any month of the year. Tornado activity is also most likely from mid-afternoon through around sunset. Tornadoes can occur anywhere in Wright County, including the City of Dows. Additionally, All of Wright County and Dows is susceptible to high wind events. The County is located in Wind Zone IV, which is susceptible to winds up to 250 mph. Additional information on the location and extent of tornadoes and windstorms is provided in the base plan

4.13.2 PREVIOUS OCCURRENCES

There are no reported previous occurrences of tornadoes directly striking Dows, although there have been 37 tornadoes and 49 windstorms reported elsewhere in the county. For more information on previous occurrences in Wright County, please refer to the base plan.

4.13.3 PROBABILITY OF FUTURE OCCURRENCES

While documented instances in Dows are low, the number of events reported elsewhere in the County lead the HMPC to assess the probability of future occurrences for tornado/windstorm in Dows to be **Highly Likely**.

4.13.4 VULNERABILITY ASSESSMENT

Within Dows, tornado/windstorm pose a **High** risk due to probability or future occurrences and magnitude. This section provides further contextualization for the anticipated vulnerability of Dows to tornado/windstorm. Dows' vulnerability to tornados and windstorms do not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for tornadoes and windstorms, please refer to the base plan.

4.13.4.1 Critical Facilities

Critical facilities may be impacted or damaged by tornadoes and high-wind events. Essential infrastructure, including power systems, water and wastewater facilities, transportation networks, and communications systems, is particularly vulnerable to disruption from strong winds, windborne debris, fallen trees, and damaged utility lines. Damage to these facilities and systems can affect emergency response, public safety, service delivery, and community recovery following a tornado or severe wind event.

4.13.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources are at risk of impact and damage from tornadoes and high wind events. Natural resources such as forests, wetlands, and wildlife habitats may be damaged or destroyed by high winds, flying debris, and uprooted vegetation. Historic and cultural resources, including landmarks, heritage buildings, cemeteries, and tribal sites, are particularly vulnerable due to their age, structural fragility, and irreplaceable value. Tornadoes may cause partial or total destruction of these assets, resulting in the loss of community identity, historical continuity, and tourism value.

4.13.4.3 People

All individuals residing in Dows are at risk of impact and casualty. Individuals with disabilities, living alone, young children, and the elderly are at a greater risk, as they may find it difficult to quicky seek adequate

shelter. This risk is especially elevated for individuals living in mobile homes, which statistically account for a disproportionate number of tornado-related fatalities and injuries due to their limited structural resilience.

4.13.4.4 Structures and Systems

All structures and systems are at risk of impact, damage, and disruption to systems. Tornadoes have caused widespread damage to homes, businesses, farms, and public infrastructure. Hundreds of residential structures have been destroyed or severely damaged, and critical facilities like schools, fire stations, and police departments are often left inoperable due to roof failures, debris impacts, and power outages.

4.13.4.5 Changes in Development

Overall, population in the City of Dows has increased over the past several years, but this increase is minor and not expected to noticeably affect the community's vulnerability. Additionally, there are no plans for development which would affect vulnerability.

4.14 TRANSPORTATION INCIDENT

For detailed information on transportation incidents in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Dows for all profiled hazards.

4.14.1 LOCATION AND EXTENT

The transport of hazardous materials in Wright County can occur via trucks on the highways/roads and airplanes carrying hazardous cargo. Hazardous materials can be transported on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35.

In Dows, there are no major highways that run through the City. For more information on the location and extent of transportation incidents, please refer to the base plan.

4.14.2 PREVIOUS OCCURRENCES

Table 13 provides details of two air transportation incidents in Dows from 1967 to 2024 (57 years) from the National Transportation Safety Board (NTSB). There has been four reported aircraft incidents. None of the incidents caused any injuries or fatalities. There have been no reported rail or other transportation incidents in Dows. For more information on previous occurrences in Wright County, please refer to the base plan.

TABLE 13. WRIGHT COUNTY AIRCRAFT INCIDENTS/ACCIDENTS (1967-2024)

EVENT DATE	LOCATION	INJURY SEVERITY	AIRCRAFT DAMAGE	MAKE	BROAD PHASE OF FLIGHT
08/20/1992	Dows, IA	Non-Fatal	Substantial	Hiller	Maneuvering
06/21/1983	Dows, IA	Non-Fatal	Substantial	Cessna	Takeoff
03/17/1976	Dows, IA	Non-Fatal	Not Reported	Bell	Not Reported
10/05/1969	Dows, IA	Non-Fatal	Not Reported	Beech	Not Reported

Source: http://www.ntsb.gov/_layouts/ntsb.aviation/index.aspx.

4.14.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for transportation incident in Dows is **Highly Likely**.

4.14.4 VULNERABILITY ASSESSMENT

Within Dows, transportation incidents pose a **High** risk due to the number of transportation modalities and incidents that have occurred in the City. This section provides further contextualization for the anticipated vulnerability of Dows to transportation incidents. Dow's vulnerability to transportation incidents do not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for transportation incidents, please refer to the base plan.

4.14.4.1 Critical Facilities

All critical facilities are essentially at risk of damage or disruption due to transportation incidents. Transportation incidents can cause direct physical damage, disrupt operations, or injure workers.

4.14.4.2 Cultural, Historic, and Natural Resources

Transportation accidents, whether involving vehicles, rail, or aircraft, can pose serious threats to natural, cultural, and historical resources in Wright County. These incidents may result in direct physical damage, environmental contamination, or long-term degradation of sites that hold historical or cultural significance.

4.17.4.3 People

Transportation-related incidents involving passenger vehicles, aircraft, or rail systems pose significant risks to public safety and infrastructure. These events can result in a spectrum of consequences, from minor property damage to mass casualty incidents. The likelihood and severity of such accidents are influenced by factors including traffic volume, infrastructure condition, weather, and human error.

4.14.4.4 Structures and Systems

All structures and systems are essentially at risk of damage and disruption due to the nearby airports and rail. A transportation accident, such as a vehicular collision, rail incident, or aircraft crash, could have significant consequences for the City's structures and systems.

4.14.4.5 Changes in Development

Overall, population in the City of Dows has increased over the past several years, but this increase has been minor and is not expected to significantly affect overall vulnerability. Additionally, there are no plans for development in the community which would increase or decrease vulnerability.

5. MITIGATION STRATEGY

The Mitigation Strategy section of the base plan provides an overall blueprint for all participating jurisdictions in Wright County to become less vulnerable to its identified hazards and the findings and conclusions of the Capability and Risk Assessments. As established in the base plan, the overall goals of the Wright County mitigation strategy are consistent across all participating municipalities.

This section provides community-specific strategies for Dows, including the status of actions that were included in the previous plan and actions to be considered or pursued over the next five years. As noted in the base plan, the participants are not committing to undertaking every action suggested in this list but rather are proposing an extensive list of *potential* actions that they may wish to pursue, depending on the availability of funding. **Table 14** details the mitigation actions identified for the City of Dows and **Table 15** details the mitigation actions identified for the entire County, known as Countywide Actions

TABLE 14. UPDATED 2026 DOWS MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Dows – 1	Improve current warning siren in the City.	Tornado/Winds torm	Continue Not Started	City Council	County EMA	General Funds	Less than $10,000	3-5 years	H
Dows – 2	Expand the storm drainage to the east side of town and improve the drainage throughout town.	Flash Flood, River Flooding	Continue Not Started	City Council	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA)	$500,000 to $1,000,000	3-5 years	M
Dows – 3	Raise the elevation of the remainder of "River Road".	Flash Flood, River Flooding	Continue Not Started	City Council	County EMA	General Funds	$100,000 to $500,000	2-3 years	M
Dows – 4	Build public awareness of residents' responsibility in tree trimming.	Thunderstorm/ Lightning/Hail, Tornado/Winds torm, Severe Winter Storm	Continue In-Progress	City Council	County EMA	General Funds	Little or No Cost	1 year	L
Dows – 5	Establish temporary shelter(s) for residents when flooding requires them to vacate.	Flash Flood, River Flooding	Continue In-Progress	City Council	County EMA	General Funds	Less than $10,000	2-3 years	H
Dows - 6	Build public awareness on how to prepare and respond to all hazards.	All Hazards	Continue In-Progress	City Council	County EMA	General Funds	Little or No Cost	2-3 years	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Dows – 7	Pre-identify and develop mechanisms to share response and recovery information to residents after a disaster occurs.	All Hazards	Continue In-Progress	City Council	County EMA	General Funds	Little or no cost	2-3 years	L
Dows – 8	Provide new self-contained breathing apparatus" (SCBA) to the fire department.	Infrastructure Failure, Grass/Wildland Fire	Continue In-Progress	Fire Department	County EMA	General Funds	$10,000 to $50,000	1 year	M
Dows – 9	Update rescue trucks so victims can be contained.	Transportation Incident	Continue In-Progress	Fire Department	County EMA	General Funds	$50,000 to $100,000	2-3 years	M
Dows – 10	Enhance the fire department's decontamination capabilities.	Hazardous Materials	Continue Not Started	Fire Department	County EMA	General Funds	$10,000 to $50,000	3-5 years	L
Dows – 11	Expand on the sewer system infrastructure.	Drought	Continue In-Progress	City Council	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA)	$500,000 to $1,000,000	3-5 years	L
Dows – 12	Provide transportation for emergency response to get people off of the interstate during a tow ban.	Severe Winter Storm	Continue Not Started	City Council	County EMA	General Funds	$10,000 to $50,000	3-5 years	L
Dows - 13	Ensure the fire department is equipped with maps and air monitoring devices for any pipeline incidents.	Hazardous Materials	Continue In-Progress	Fire department	County EMA	General Funds	$10,000 to $50,000	3-5 years	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Dows – 14	Enforce the City Code of Ordinances for structural failures and burning bans.	Infrastructure Failure, Grass/Wildland Fire	Continue In-Progress	City Council	County EMA	General Funds	Little or No Cost	2-3 years	H
Dows – 15	Ensure proper company identification numbers are in place on pipelines.	Hazardous Materials	Continue In-Progress	City Council	County EMA	General Funds	Little or No Cost	2-3 years	L
Dows – 16	Build a tornado safe-room near the pool/campground.	Tornado/Winds torm	Continue In-Progress	City Council	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA)	$500,000 to $1,000,000	2-3 years	H
Dows - 17	Continue participating in the NFIP and continue to update and enforce the floodplain ordinance.	River Flooding	New	Floodplain manager	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds	Less than $10,000	3-5 years	H
Dows -18	Encourage residents to purchase weather radios	All Hazards	Continue In-Progress	City Council	County EMA	General Funds	Little or No Cost	3-5 years	M

TABLE 15. 2026 COUNTYWIDE ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA - 1	Encourage residents to purchase weather radios to stay informed on emergency information.	All Hazards	Continue In-Progress	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	1 year	M
CWA - 2	Increase coordination with regional and state agencies for early warning and monitoring of animal, plant, and crop disease	Animal/plant/crop disease	New	Environmental Health	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), USDA	Little or no cost	Ongoing	H
CWA - 3	Educate residents on water saving techniques and water conservation	Drought	New	County EMA , Participating Jurisdictions	Public Media	General Funds	Little or No Cost	1 year	L
CWA – 4	Promote tree planting in areas with low vegetation to increase shade coverage.	Extreme Heat	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	Ongoing	M
CWA – 5	Improve drainage infrastructure in areas where flash flooding frequently occurs.	Flash Flood	New	County EMA	Participating Jurisdictions	General Funds	$100,000 to $500,000	Ongoing	H
CWA – 6	Promote defensible landscape for homes, businesses and entities within WUI areas.	Grass and Wildland Fire	New	County EMA	Participating Jurisdictions	General Funds	Little to No Cost	Ongoing	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 7	Promote wetland restoration to reduce flooding impacts across the County.	River Flooding	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$100,000 to $500,000	Ongoing	H
CWA – 8	Promote snow safety to residents on how to prevent pipe breaks in their homes (e.g., insulating outdoor faucets, drip warm water from an indoor faucet) and what to do if a pipe breaks.	Severe Winter Storm	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	Little to No Cost	Ongoing	H
CWA – 9	Conduct Countywide trainings to practice responding to hazardous materials incidents.	Hazardous Materials	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA -10	Promote flu clinics across the County	Human Disease	New	County EMA , Participating Jurisdictions	County Public Health	CDC Grants, General Funds	$10,000 to $50,000	Ongoing	M
CWA – 11	Promote Tree Trimming across the County to prevent fallen trees on infrastructure.	Infrastructure Failure	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	2-3 years	M
CWA – 12	Conduct Countywide trainings to practice responding to terrorist incidents.	Terrorism	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 13	Conduct Countywide trainings to practice responding to transportation incidents.	Transportation Incident	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA - 14	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Thunderstorm/Lightning/Hail	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M
CWA – 15	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Tornado/Windstorm	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M

1.INTRODUCTION AND PLANNING PROCESS

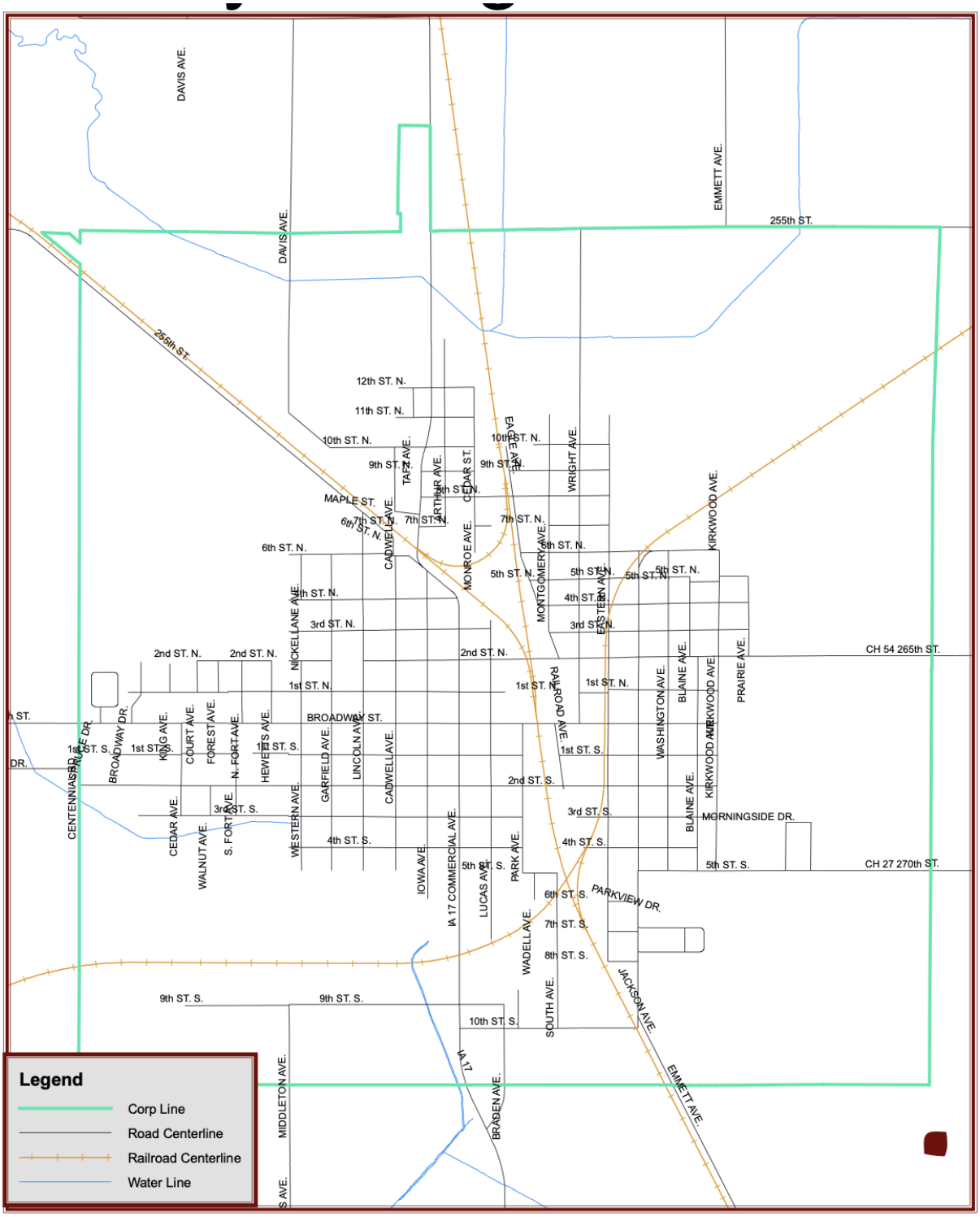
This annex provides more detailed information about the City of Eagle Grove. This annex includes the following:

- A more localized community profile, including more detailed mapping, population and demographic information, and critical facilities information
- City-level Hazard Identification and Risk Assessment (HIRA) information, including some more localized hazard maps and conclusions related to hazard risk and how it varies across the planning area
- A localized vulnerability assessment, including the likely impact of profiled hazards on critical facilities
- A detailed capability assessment, describing resources and tools available to the City and to participate in hazard mitigation and reduce hazard risk
- A mitigation strategy, describing a variety of actions the City may opt to take to reduce the risk associated with profiled hazards over the useful life of this plan

2. COMMUNITY PROFILE

The City of Eagle Grove is the largest City within Wright County with 3,602 residents. The City was officially incorporated in 1881. Eagle Grove was named in honor of the well-known nest of eagles that had been situated amongst a grove of Elm trees that overlooked the neighboring Boone River during the mid-1850's. Railroads served as a major catalyst in driving westward expansion to this portion of north-central Iowa. **Figure 1** displays the City of Eagle Grove.

FIGURE 1. CITY OF EAGLE GROVE



2.1 POPULATION AND DEMOGRAPHICS

In order to properly plan and prepare a jurisdiction for future emergencies and disasters, it is important to know the community's characteristics and demographics. Over the past several decades the City's population has decreased. **Table 1** shows the population trends over time for the City of Eagle Grove. The population decrease is similar to Wright County. The decrease in population also means that, in general, there are fewer individuals exposed to hazards within the community, slightly reducing the community's overall vulnerability. **Table 2** shows the demographic data. The median household income for the City is $63,135 and 22.5% of the population live below the poverty level. For comparison, the County's poverty level is at 11% and the U.S. at about 10.6% as of 2024.

TABLE 1. POPULATION TRENDS

JURISDICTION	2010 CENSUS POPULATION	2016 POPULATION ESTIMATE	2023 CENSUS POPULATION	% CHANGE 2010-2023
Eagle Grove	3,583	3,427	3,588	-.4%

Source: U.S. Census Bureau: 2010 Decennial Census, 2016 Population Estimates, 2020 Decennial, 2023 American Community Survey, 5-year Estimates.

TABLE 2. DEMOGRAPHIC DATA

JURISDICTION	POPULATION 18 YEARS AND OVER	UNEMPLOYMENT RATE (2025)[1]	MEDIAN HOUSEHOLD INCOME	PERCENT BELOW POVERTY LEVEL
Eagle Grove	2,449	-	$63,135	22.5%

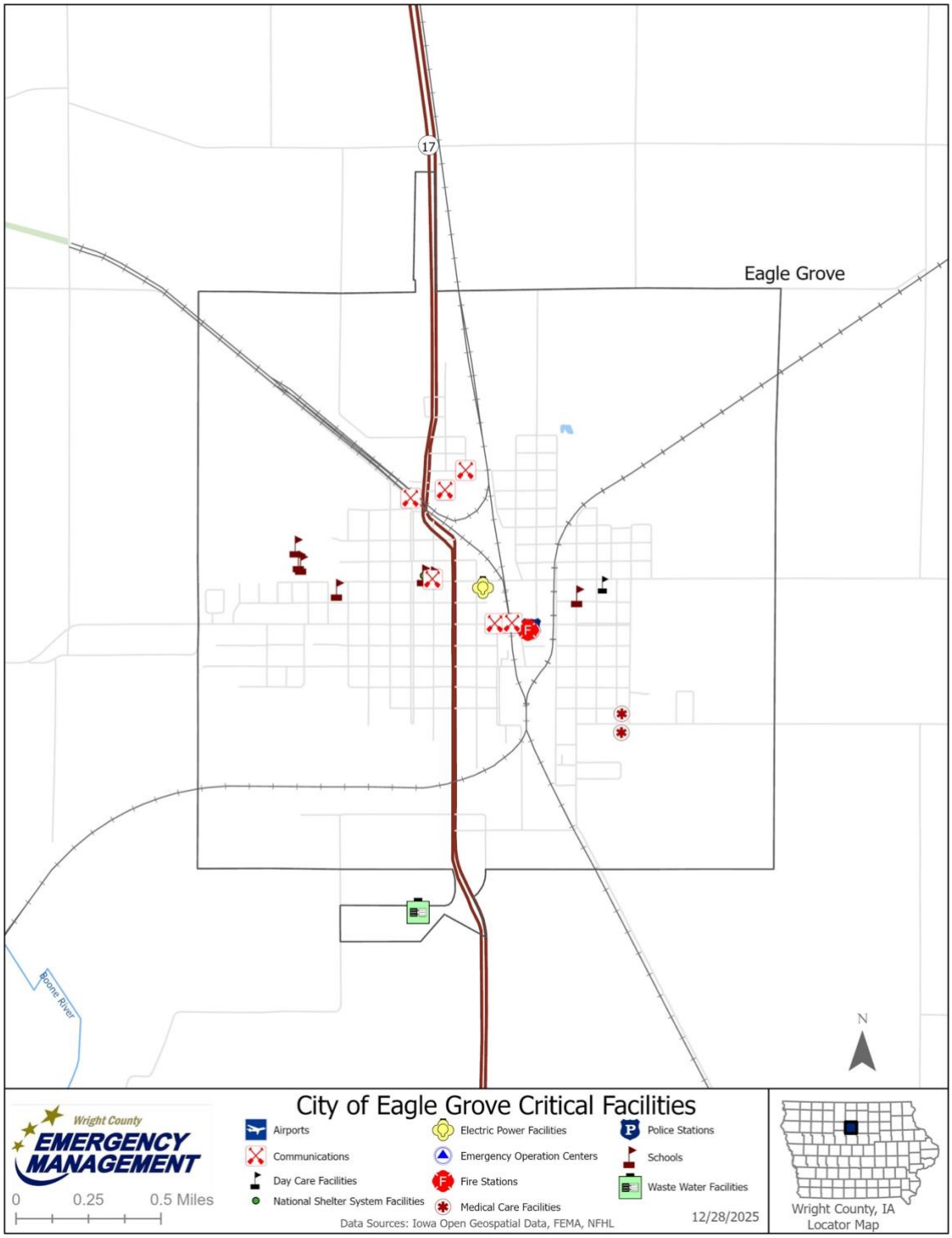
Source: U.S. Census, 2023 American Community Survey, 5-year Estimates

The median age in Eagle Grove is 32.5 years old and about 23.8% of the population speak a language other than English at home which is greater than the State of Iowa at 9.7%. Other languages spoken at home include Spanish, other Indo-European languages, and Asian and Pacific Islander languages. About 21.2% of the population have a bachelor's degree which is lower than the State of Iowa at 32%. There are 1,517 housing units within the City, 1,372 of which are occupied. Additionally, 17.3% of the population has a disability which is slightly higher than the State of Iowa at 12.9%.

2.2 CRITICAL FACILITIES

Critical facilities are the systems and structures that are essential to a jurisdiction's continued functioning, the failure of which would cause significant disruption. **Figure 2** displays the critical facilities within Eagle Grove. There are 18 critical facilities within Eagle Grove.

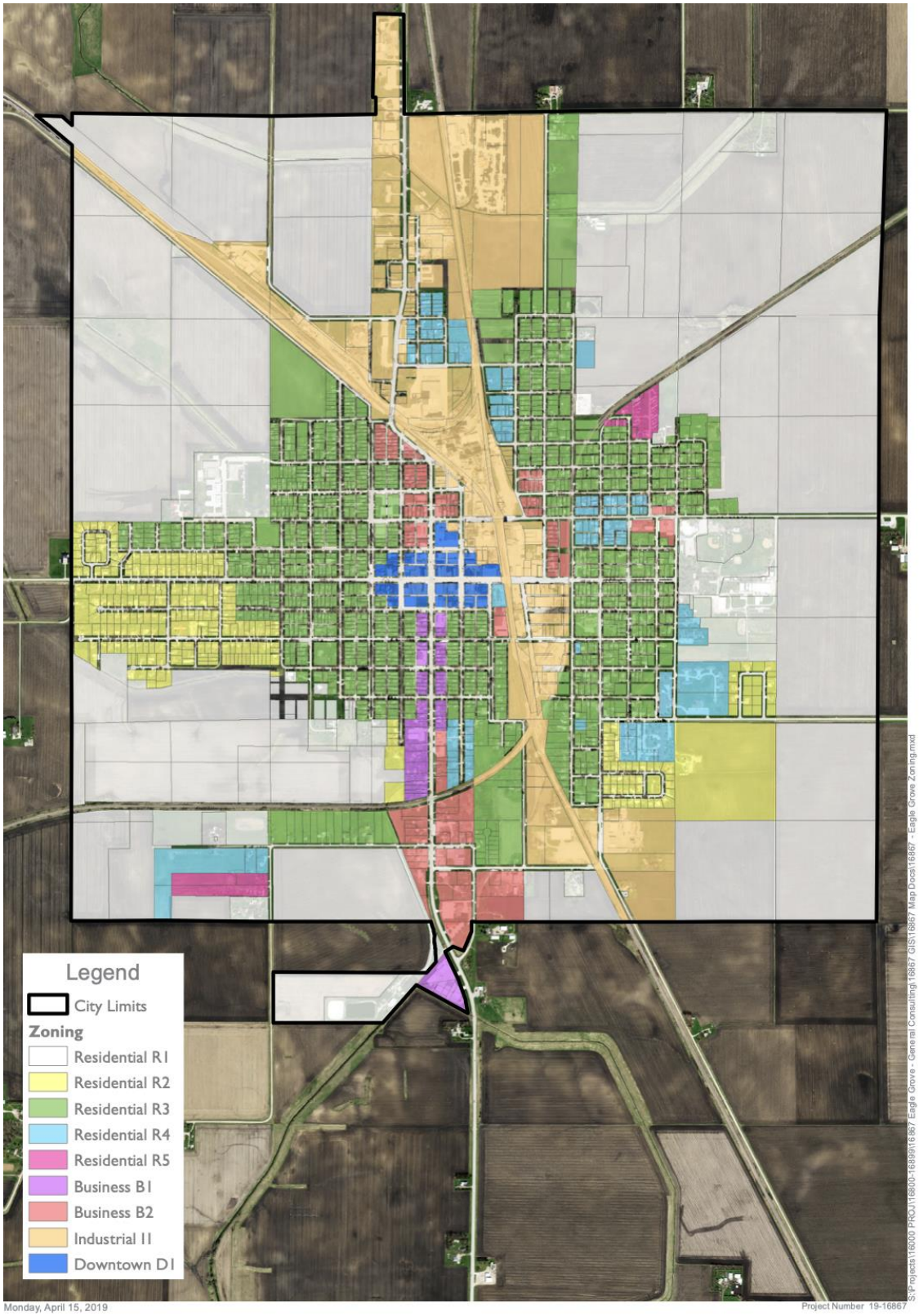
FIGURE 2. CRITICAL FACILITIES MAP



2.3 LAND USE AND DEVELOPMENT

The City of Eagle Grove contains a variety of land uses within the jurisdiction. Based on the 2014 Comprehensive Plan, 60.5% of the City's land is for agricultural use. Commercial development is generally concentrated along Highway 17/Commercial Avenue and along Broadway Street in the City's Central Business District. Industrial developments are typically the entire City, with single-family residential parcels being the most common type of residential land use within the community. The number of housing units in Eagle Grove has decreased significantly since 2010. According to the US Census Bureau, Eagle Grove recorded a 19.4% decrease in the number of housing units between 2010 and 2023, and no significant commercial, industrial, or agricultural developments have been reported. These trends indicate that the community's vulnerability related to building exposure has largely decreased since the previous plan due to fewer homes being exposed to hazards. Infill development opportunities are also present and are expected to increase as the City continues to partner with the Community Development Corporation to tear down identified uninhabitable housing units. The zoning map is shown in **Figure 3**.

FIGURE 3. EAGLE GROVE ZONING MAP (2019)



2.4 NATURAL, HISTORIC, AND CULTURAL RESOURCES

The City of Eagle Grove is home to many historical sites including the Carnegie Library Building which is a 100-year old structure. The Historical Society of Eagle Grove actively preserves and improves this structure. The Community Veterans Tower is 105-feet tall and was built by the Iowa Seed Company during the 1940's. The Eagle Grove Veterans Tower Board of Directors oversees the progress of this tribute. Additionally, there are several historic buildings in its Central Business District which is located in the heart of the community along Broadway Street. The natural, historical and cultural resources within the City of Eagle Grove are listed below.

- Eagle Grove Public Library
- Historical Society of Eagle Grove
- Eagle Grove Veterans Tower Board of Directors
- Wright County District Junior Fair
- Summerfest
- Various Christmas Events
- Farmer's Market
- Skate Park
- Fishpond
- Greenwood Park
- Hewett Park
- Jaycee Park
- Parkview Park
- Veterans Memorial Park

3. CAPABILITY ASSESSMENT

The capability assessment evaluates a jurisdiction's ability to implement a comprehensive mitigation strategy and identifies opportunities to establish or strengthen mitigation policies, programs, and projects. More generalized information about the goals of the capability assessment, including the process and methodology, is presented in the Capability Assessment portion of the base plan.

This section articulates specific information about the capabilities of Eagle Grove which include the following:

- Planning mechanisms
- Regulatory tools and programs
- Staff and technical capabilities
- Fiscal and other mechanisms
- Floodplain management and regulation

3.1 PLANNING MECHANISMS

Table 3 describes the planning mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Eagle Grove has a Comprehensive Plan, County Hazard Mitigation Plan, and Land Use Plan. In order to increase this capability, the City may seek to implement additional plans such as a Debris Management Plan, Continuity of Operations Plan, Emergency Operations Plan (EOP), and Disaster Recovery Plan. These plans can support the City in planning to remove debris, continue City operations, and recovering from disasters in the future.

TABLE 3. PLANNING MECHANISMS

PLANNING MECHANISMS	CITY OF EAGLE GROVE
Capital Improvement Plan (CIP)	No
Comprehensive Plan	Yes - 2017
Community Wildfire Protection Plan (CWPP)	No
Comprehensive Emergency Management Plan (CEMP)	No
Critical Facilities Plan	No
General Plan	No
Continuity of Operations Plan (COOP)	No
Debris Management Plan	No
Disaster Recovery Plan	No
Economic Development Plan	No
Emergency Operations Plan (EOP)	No
Environmental Impact Report (EIR)	No
Evacuation Plan	No

PLANNING MECHANISMS	CITY OF EAGLE GROVE
Flood Response Plan	No
Floodplain Management Plan/Flood Mitigation Plan	No
Hazard Mitigation Plan	Yes
Historic Preservation Plan	No
Land Use Plan	Yes - 2017
Natural Resource Protection Plan (NRPP)	No
Open Space Management Plan	No
Transportation Plan	No
Threat Hazard Identification and Risk Assessment (THIRA)	No
Watershed Plan	In Progress

3.2 REGULATORY TOOLS AND PROGRAMS

Table 4 describes the regulatory tools and programs that the jurisdiction has in place to support hazard mitigation. Currently, the City of Eagle Grove has adopted local floodplain management and ordinances as well as other stormwater management and subdivision regulations and ordinances. In order to increase this capability, the City may seek to adopt building codes and engage with community programs such as the Community Emergency Response Team (CERT).

TABLE 4. REGULATORY TOOLS AND PROGRAMS

REGUALTORY TOOLS AND PROGRAMS	CITY OF EAGLE GROVE
Building Codes	No
Citizen Corps – Community Emergency Response Team (CERT)	No
Community Rating System (CRS Program of the NFIP)	No
Emergency Management Accreditation Program (EMAP)	No
Fire Code	No
Firewise Community	No
Floodplain Management/Flood Damage Prevention Ordinance	Yes
Land Use/Development Planning	Yes
National Flood Insurance Program (NFIP)	No

REGUALTORY TOOLS AND PROGRAMS	CITY OF EAGLE GROVE
Post Disaster Redevelopment/Reconstruction Plan/Ordinance	No
Storm Ready	No
Stormwater Management Plan/Ordinance	No
Subdivision Regulations/Ordinance	Yes
Unified Development Ordinance	No
Zoning Ordinance	Yes

3.3 STAFF AND TECHNICAL CAPABILITIES

Table 5 describes the staff and technical capabilities that the jurisdiction has in place to support hazard mitigation. Currently, the City of Eagle Grove has engineers and planners. In order to increase this capability, the City may seek to increase the number of specialized staff to support hazard mitigation.

TABLE 5. STAFF AND TECHNICAL CAPABILITIES

STAFF AND TECHNICAL CAPABILITES	CITY OF EAGLE GROVE
Emergency Manager	No
Engineers or professional trained in construction practices related to buildings and/or infrastructure	Yes - On Retainer
Environmental Justice Specialists	No
Fiscal Management or Procurement Specialists	No
Floodplain Manager	No
Housing Specialist(s)	No
Land Surveyors	No
Land Use/Management/Development Planning	No
Planners or engineers with an understanding of natural and/or human caused hazards	Yes
Recreation/Green Space Specialist(s)	No
Resource Development Staff or Grant Writing	No
Scientists familiar with the hazards of the community	No
Staff experienced with Geographic Information Systems (GIS) or HAZUS	No
Staff with education or expertise to assess the	No

STAFF AND TECHNICAL CAPABILITES	CITY OF EAGLE GROVE
community's vulnerability to hazards	
Transportation Manager/Traffic Engineer	No

3.4 FISCAL AND OTHER MECHANISMS

Table 6 describes the fiscal and other mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Eagle Grove has applied for many grants and implement several fees and bonds to generate funds. These funds can be critical to funding future mitigation projects. To improve this capability, the City may look to continue to diversity funding mechanisms and apply for grants such as the HSGP, IIJA, and USDA grants.

TABLE 6. FISCAL AND OTHER MECHANISMS

FISCAL AND OTHER MECHANISMS	CITY OF EAGLE GROVE
Capital Improvement Programming	Yes
Community Development Block Grants (CDBG)	Yes
Development Impact Fees	No
FEMA Hazard Mitigation Assistance Grants (HMPG, FMA,PDM)	No
Gas/Electric Utility Fees	Yes - Water Sewer
General Obligation, Revenue, and/or Special Tax Bonds	Yes
Homeland Security Grants (HSGP)	No
Infrastructure Investment and Jobs Act (IIJA)	No
Infrastructure State Revolving Fund Loan	No
Partnering Agreements or Intergovernmental Agreements	No
Sewer/Water Fees	Yes - Water Sewer
Special Purpose Tax (or taxing districts)	No
Stormwater Utility Fees	No
USDA Grants	No
USDA Rural Development Agency Grants	No
US Economic Development Administration Grants	no

3.5 FLOODPLAIN MANAGEMENT AND REGULATION

Table 7 describes the National Floodplain Insurance Program (NFIP) Capability for the City of Eagle Grove. Currently, the City participates in the NFIP, and it has adopted and enforces floodplain management regulations and ordinances.

TABLE 7. FLOODPLAIN MANAGEMENT AND REGULATION

NFIP CAPABILITIES	CITY OF EAGLE GROVE
Has your community adopted a floodplain management ordinance that meets NFIP minimum criteria?	Yes
Has your community adopted the latest effective Flood Insurance Rate Map (FIRM)?	Yes – 2/20/2013
Do you regulate/permit development in the Special Food Hazard Area (SFHA)?	Yes
Which position or agency is in charge of NFIP compliance for your community?	Wright County Planning and Zoning Administrator
How do you implement the substantial improvement/substantial damage provisions of your floodplain management ordinance?	Through development review and permitting

4. HAZARD IDENTIFICATION AND RISK ASSESSMENT

The Hazard Identification and Risk Assessment (HIRA) process, described in more detail in the HIRA section of the base plan, involves identifying potential hazards, evaluating their likelihood and potential consequences, and estimating and describing the level of risk these hazards present to a community.

As described in the "HIRA Methodology" section of the base plan, participants in this plan update reconsidered the relative risk posed by the profiled hazards by conducting a hazard ranking process. **Table 8** below provides a summary of how those hazards were ranked in the City of Eagle Grove. Each of the 14 natural and manmade hazards discussed in this section are described in more detail in the HIRA section of the base plan. This section endeavors to provide more detailed, local-level information, mapping, and conclusions for these hazards wherever relevant.

TABLE 8. EAGLE GROVE HAZARD RANKING

JURISDICTION	ANIMAL/CROP/PLANT DISEASE	DROUGHT	EXTREME HEAT	FLASH FLOOD	GRASS OR WILDLAND FIRE	HAZARDOUS MATERIALS	HUMAN DISEASE	INFRASTRUCTURE FAILURE	RIVER FLOODING	SEVERE WINTER STORM	TERRORISM	THUNDERSTORM/LIGHTNING/HAIL	TORNADO/WINDSTORM	TRANSPORTATION INCIDENT
Eagle Grove	M	H	M	M	M	H	M	H	H	H	M	M	H	H

4.1 ANIMAL/PLANT/CROP DISEASE

For detailed information on animal, plant, and crop disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.1.1 LOCATION AND EXTENT

All of Wright County is subject to animal/livestock incidents and agricultural infestations, which includes the City of Eagle Grove. For more information on the location and extent of animal, plant, and crop disease, please refer to the base plan.

4.1.2 PREVIOUS OCCURRENCES

There are no previous occurrences that have been reported to impact the City of Eagle Grove specifically. For more information on previous occurrences in Wright County, please refer to the base plan.

4.1.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for animal/plant/crop/disease in Eagle Grove is **Unlikely**.

4.1.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, animal/plant/crop disease poses a **Medium** risk due to limited previous occurrences and impact to the City yet potential to cause economic instability. This section provides further contextualization for the anticipated vulnerability of the communities within Eagle Grove to animal/plant/crop disease. Eagle Grove's vulnerability to animal/plant/crop disease does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for animal/plant/crop disease, please refer to the base plan.

4.1.4.1 Critical Facilities

Animal, plant, and crop diseases have limited impact on critical facilities due to the hazard directly impacting animals, plants, and crops and related industries.

4.1.4.2 Cultural, Historic, and Natural Resources

Sensitive crops are those that are more susceptible to stress from environmental factors such as weather and crop diseases. There are several areas within Wright County that have sensitive crops and would be more vulnerable to disease. There are three locations within the City of Eagle Grove.

4.1.4.3 People

Animal, plant, and crop diseases can impact the population through food supply chain disruptions, increased food prices, local employment, and potential health impacts from zoonotic diseases such Highly Pathogenic Avian Influenza (HPAI).

4.1.4.4 Structures and Systems

Buildings, infrastructure, and critical facilities are not vulnerable to this hazard. Its impacts are primarily economic and environmental, rather than structural effects.

4.1.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.2 DROUGHT

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.2.1 LOCATION AND EXTENT

All of Wright County is subject to drought, and drought is normally a widespread hazard and not isolated to a single jurisdiction. For more information on the location and extent of drought, please refer to the base plan.

4.2.2 PREVIOUS OCCURRENCES

According to the National Drought Mitigation Center's Drought Impact Reporter, during the period from January 2007 through January 2026, nine were reported to affect Wright County. Impacts of recent drought periods in Iowa that affected Wright County are provided below. Unless otherwise indicated, these impacts are from the National Climatic Data Center. For more information on previous occurrences in Wright County, please refer to the base plan.

4.2.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for drought in Eagle Grove is **Highly Likely**.

4.2.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, drought poses a **High** risk due to potential impacts, largely to public health, agriculture, and the local economy. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to drought. Eagle Grove's vulnerability to drought does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for drought, please refer to the base plan.

4.2.4.1 Critical Facilities

All critical facilities in Eagle Grove may be impacted by drought and more so by water shortages during extreme drought conditions.

4.2.4.2 Cultural, Historic, and Natural Resources

All natural resources within the City can experience stress, tree mortality, soil compaction, erosion and loss of habitat or shade due to drought. Droughts may also erode cultural and historic resources within Eagle Grove as well.

4.2.4.3 People

All people residing in Eagle Grove may be impacted by Drought. Drought presents hazards to public health in extreme cases, where drinking water production cannot keep up with demand. Increased water demand may increase water rates and create financial hardship, especially for individuals and families living below poverty. In Eagle Grove, 22.5% of live below poverty. Additionally, the elderly and young children may be at greater risk of experiencing adverse health effects resulting from reduced water quality.

4.2.4.4 Structures and Systems

Structures could be impacted through cracks in foundation which can comprise the integrity and safety of the building. Additional impacts to structures could include landscaping and dried vegetation which can exacerbate urban fire and wildfire risk.

4.2.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to drought and water shortages in severe drought conditions. There are no plans for future development which may increase or decrease vulnerability.

4.3 EXTREME HEAT

For detailed information on extreme heat in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.3.1 LOCATION AND EXTENT

All of Wright County is subject to extreme heat as it is normally more of a widespread hazard and not isolated to a single jurisdiction. For more information on the location and extent of extreme heat, please refer to the base plan.

4.3.2 PREVIOUS OCCURRENCES

The following summarizes the National Weather Service Advisories, Watches, and Warnings for Heat or Excessive Heat in Wright County from 2000 to 2025 (25 years of data). For more information on previous occurrences in Wright County, please refer to the base plan.

- 46 Heat Advisories
- 2 Extreme Heat Watches
- 8 Excessive Heat Watches
- 7 Excessive Warnings

4.3.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for extreme heat in Eagle Grove is **Likely**.

4.3.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, extreme heat poses a **Medium** risk due to high likelihood of future occurrence and magnitude. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to extreme heat. Eagle Grove's vulnerability to extreme heat does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for extreme heat, please refer to the base plan.

4.3.4.1 Critical Facilities

All critical facilities may be at risk of impact depending on severity of extreme heat events. Extreme heat can significantly affect all critical facilities by compromising the structural integrity and operational reliability of critical facilities and infrastructure. During extreme heat events, it is likely that food, hydration, and shelter, as well as health and medical lifelines would be disrupted.

4.3.4.2 Cultural, Historic, and Natural Resources

Prolonged high temperatures and drought conditions can stress ecosystems, reduce biodiversity, and increase the risk of wildfires, especially in forested and agricultural areas. These changes threaten native species and disrupt ecological balance, which in turn affects the natural heritage in Eagle Grove. some historic buildings were built before the invention of central air conditioning and may lack proper cooling, posing risk to its inhabitants. Cultural traditions and outdoor events may be disrupted due to unsafe heat conditions, reducing community engagement and tourism.

4.3.4.3 People

All people residing in Eagle Grove are considered vulnerable to extreme heat. Those at greatest risk for heat-related illness and deaths include people 65 years of age and older, people who are overweight,

and people who are ill or on certain medications. Wright County's population over 65 years is higher than the national and state average at 20.9 percent.

4.3.4.4 Structures and Systems

All structures and systems may be at risk of impacts depending on the severity of extreme heat events. Extreme heat can also cause a strain on electricity delivery infrastructure which can be overloaded during peak use of electricity to power air conditioning during extreme heat events. Increased electricity use can increase rates and cause financial hardships, especially for individuals and families living under poverty. In Eagle Grove, 22.5% live in poverty.

4.3.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk overall risk to extreme heat. There are no plans for development which are anticipated to increase or decrease community vulnerability.

4.4 FLASH FLOOD

For detailed information on flash flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.4.1 LOCATION AND EXTENT

Wright County includes two major tributaries of the Mississippi River, including the Boone River and the upper portion of the Iowa River. The Boone Watershed intercepts the entire western and central portion of Wright County and is an area of gently flat to rolling hills. For more information on the location and extent of flash flood, please refer to the base plan.

4.4.2 PREVIOUS OCCURRENCES

There are no reported flash flood events that have occurred in Eagle Grove. For more information on previous occurrences within Wrigth County, please refer to the base plan.

4.4.3 PROBABILITY OF FUTURE OCCURRENCES

While there are no documented previous occurrences, flash flooding is sometimes underreported, and the number of events reported elsewhere in the community led the HMPC to assess the probability of future occurrences for flash flooding in Eagle Grove to be **Highly Likely**.

4.4.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, flash floods pose a **Medium** risk due to a highly likely probability of occurrences and moderate damages to property and crop for the County. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to flash flooding. Eagle Grove's vulnerability to flash flooding does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for flash flooding, please refer to the base plan.

4.4.4.1 Critical Facilities

Critical facilities in low lying areas may be at risk of impact from flash flood events. Critical facilities, such as hospitals, emergency operations centers, fire stations, schools, nursing homes, and water treatment plants, face varying levels of risk from flash flood events depending on their location, structural resilience, and operational readiness.

4.4.4.2 Cultural, Historic, and Natural Resources

Cultural, historic, and natural resources in low lying areas may be at risk of impact from flash flood events. Flooding can cause significant damage to Wright County's natural, historic, and cultural assets. Natural areas such as wetlands, forests, and waterways may experience erosion, pollution, and habitat loss, reducing their ecological value and ability to buffer future flood events. These changes can also affect recreational and conservation areas. Historic buildings and cultural landmarks are at risk of structural damage, deterioration, and loss of historically significant materials. Flooding may also disrupt cultural traditions tied to specific locations or community spaces.

4.4.4.3 People

Flooding presents a serious risk to residents across Wright County, particularly in low-lying areas with a history of flood events. Populations most at risk include older adults, low-income families, and individuals without access to flood insurance, lack of accessible emergency alert and notifications, or reliable transportation.

4.4.4.4 Structures and Systems

Structures and systems in low lying areas may be at risk of impact from flash flood events. Flash flooding can quickly inundate any low lying structures and systems. Damage to public infrastructure can cause costly repairs for the state, county, and city road/bridge maintenance departments. When sewer back-up occurs, this can result in costly clean-up for home and business owners, and it can also present a health hazard.

4.4.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to people as fewer people reside in the City. There are no plans for development which are anticipated to increase or decrease vulnerability.

4.5 GRASS OR WILDLAND FIRE

For detailed information on grass or wildland fire in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

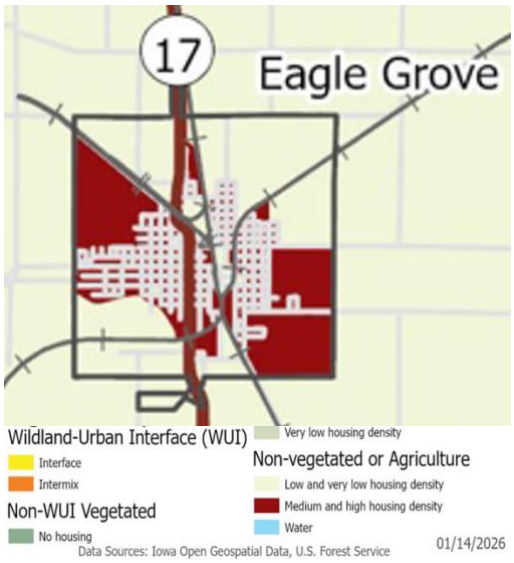
4.5.1 LOCATION AND EXTENT

Wildland/Grass fires are most likely to occur in the Wildland Urban Interface (WUI). This is the area where houses meet or intermingle with undeveloped wildland vegetation. Within the WUI, there are two specific areas identified:

- Interface
- Intermix

The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. **Figure 4** shows the WUI areas within Eagle Grove. On the map, the orange represents Intermix areas and the yellow represents Interface areas. The red indicates medium and high housing density that is unrelated to wildfire risk. For more information on the location and extent of grass or wildland fire, please refer to the base plan.

FIGURE 4. EAGLE GROVE WUI AREAS



4.5.2 PREVIOUS OCCURRENCES

According to the National Fire Incident Reporting System (NFIRS), there has been one fire incident in Wright County since 2017 near Cornelia. For more information on previous occurrences within Wright County, please refer to the base plan.

4.5.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for grass or wildland fire in Eagle Grove is **Possible.**

4.5.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, grass or wildland fire pose a **Medium** risk due to prevalence of WUI areas and limited previous occurrences. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to grass or wildland fire. Eagle Grove's vulnerability to grass and wildland fire does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for grass or wildland fires, please refer to the base plan.

4.5.4.1 Critical Facilities

There are no critical facilities in Eagle Grove that are within the WUI areas (Interface and Intermix). Critical facilities across the County may be vulnerable to disruption or damage from WUI fires, particularly those located near forested or undeveloped areas. These facilities include emergency operations centers, fire stations, hospitals, schools, water treatment plants, power substations, and communication infrastructure.

4.5.4.2 Cultural, Historic, and Natural Resources

Wildfire and Wildland-Urban Interface (WUI) areas can pose a risk to the County's natural, historic, and cultural resources. Wildfires can degrade ecosystems by destroying native vegetation, fragmenting wildlife habitats, and increasing soil erosion and water pollution. Smoke and airborne pollutants also impact air quality, affecting both environmental and human health. Culturally and historically significant sites, such as cemeteries and historic buildings, are vulnerable to direct fire damage and indirect impacts from suppression efforts and post-fire erosion.

4.5.4.3 People

Populations across Wright County face varying degrees of vulnerability to WUI fires, depending on factors such as proximity to wildland areas, housing density, socioeconomic conditions, and access to emergency services. In urbanizing areas, the expansion of housing into fire-prone zones increases the number of people and structures exposed to wildfire hazards.

4.5.4.4 Structures and Systems

Structure and systems in WUI areas may be at risk of impact from grass and wildland fires. Wildfires can be responsible for extensive damage to crops, the environment and occasionally residential or business facilities. Homes built in rural areas are more vulnerable since they are closer to wildland that can be burned, and rural homes tend to be further away from emergency services.

4.5.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to people as fewer people reside in the City. There are no plans for development which is anticipated to increase or decrease vulnerability.

4.6 HAZARDOUS MATERIALS

For detailed information on hazardous materials in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.6.1 LOCATION AND EXTENT

Fixed Hazardous Materials Incident

According to the Iowa Department of Natural Resources, there are 44 sites in Wright County that because of the volume or toxicity of the materials on site were designated as Tier II Facilities under the Superfund Amendments and Reauthorization Act. Within Eagle Grove there are nine Tier II facilities. For more information on the location and extent of hazardous materials, please refer to the base plan.

Transportation Hazardous Materials Incident

The transport of hazardous materials in Wright County can occur via trucks on the highways/roads and airplanes carrying hazardous cargo. Hazardous materials can be transported on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. In Eagle Grove, Highway 17 runs through the City and is at risk of transportation hazardous materials incidents.

Rail Transport

Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Gove.

Air Freight

There are three airports in Wright County; Belmond, Clarion, and Eagle Grove. Hazardous materials incidents can occur within these three airports across the County.

Pipeline Incident

There are no pipelines that run through the City of Eagle Grove, however there are pipelines located nearby and could impact residents of the City.

4.6.2 PREVIOUS OCCURRENCES

From 2017 to 2024, there have been eight hazardous materials spills reported to the Environmental Protection Agency (EPA) within Eagle Grove. There are no other types of hazardous materials incidents that have been reported to have occurred in Eagle Grove. For more information on previous occurrences within Wright County, please refer to the base plan.

4.6.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for hazardous materials in Eagle Grove is **Highly Likely**.

4.6.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, hazardous materials pose a **High** risk due to the number of previous occurrences and number of Tier II facilities in the City. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to hazardous materials. Eagle Grove's vulnerability to hazardous materials is higher from the risk of the county as a whole due to a higher concentration of assets at risk proportionately. For more information on the county's vulnerability assessment for hazardous materials, please refer to the base plan.

4.6.4.1 Critical Facilities

Facilities located near major transportation corridors or industrial zones are at higher risk of exposure to chemical spills, fires, or airborne toxins. These incidents can disrupt operations, damage infrastructure, and endanger occupants, especially in facilities that house vulnerable populations like the elderly or children. Additionally, facilities without proper ventilation systems, backup power, or shelter-in-place protocols are more susceptible to contamination and operational failure during an event. There are several critical facilities near transportation corridors and Tier II facilities within Eagle Grove.

4.6.4.2 Cultural, Historic, and Natural Resources

Hazardous materials incidents pose significant risks to natural, historic, and cultural resources across Wright County. These resources include wetlands, rivers, forests, historic buildings, archaeological sites, and culturally significant landmarks. A chemical spill or airborne release can contaminate soil and water, damage ecosystems, and degrade the physical integrity of historic structures. Natural resources such as wildlife habitats and water bodies are particularly vulnerable to long-term environmental damage, which can disrupt biodiversity and recreational use. Historic and cultural sites may suffer irreversible harm if exposed to corrosive or toxic substances, especially if they lack protective infrastructure or are located near transportation corridors or industrial zones.

4.6.4.3 People

Communities near major transportation routes, such as highways and rail lines, are at higher risk due to the frequent movement of hazardous substances. Industrial zones and agricultural areas with chemical storage facilities also present elevated risks of fixed-site incidents. These events can lead to chemical spills, fires, or airborne releases that threaten public health and safety.

Vulnerability is especially high among populations with limited mobility, such as the elderly, individuals with disabilities, and residents of schools, hospitals, and correctional facilities. These groups may face challenges during evacuation or shelter-in-place orders.

Additionally, low-income communities may struggle with access to protective equipment, transportation, and timely information, further increasing their vulnerability. Based on previous occurrences, there have been six injuries due to pipeline incidents.

4.6.4.4 Structures and Systems

There have been eight reported occurrences within Eagle Grove. It is difficult to determine the potential losses to existing development because of the variable nature of a hazardous materials spill. For example, a spill of a toxic airborne chemical in a populated area could have greater potential for loss of life. By contrast a spill of a very small amount of a chemical in a remote rural area would be much less costly and possibly limited to remediation of soil.

4.6.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to people as fewer people reside in the City. There are no plans for development which is anticipated to increase or decrease vulnerability.

4.7 HUMAN DISEASE

For detailed information on human disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.7.1 LOCATION AND EXTENT

Pandemics and epidemics do not affect a single geographic location; Wright County is equally vulnerable. Transmission can occur anywhere people interact, but locations with higher numbers of individuals create more opportunities for disease to spread. For more information on the location and extent of human disease, please refer to the base plan.

4.7.2 PREVIOUS OCCURRENCES

Pandemics and epidemics have had recurring and widespread effects on the County and across the world. While some events have been global in scale and others more localized, each has highlighted the vulnerability of the community to infectious disease and underscored the importance of preparedness and coordinated response. Since 1918, there have been six major epidemics or pandemics that are widely recognized by both the CDC and WHO, in addition to the COVID-19 pandemic. For more information on previous occurrences within Wright County, please refer to the base plan.

4.7.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for human disease in Eagle Grove is **Possible**.

4.7.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, human diseases pose a **Medium** risk due to low probability yet high risk to significantly impact the City. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to human disease. Eagle Grove's vulnerability to human disease does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for human disease, please refer to the base plan.

4.7.4.1 Critical Facilities

Infectious disease outbreaks can significantly disrupt the operation of critical facilities in Wright County. Healthcare facilities, including hospitals, clinics, and long-term care centers, are particularly vulnerable due to increased patient loads, limited surge capacity, and potential shortages of staff and medical supplies. These facilities must maintain continuity of operations while implementing infection control measures, such as isolation protocols and PPE usage.

Other essential facilities, such as emergency operations centers, law enforcement agencies, schools, and correctional institutions, may experience staffing shortages due to illness or quarantine, which can impair their ability to deliver vital services.

4.7.4.2 Cultural, Historic, and Natural Resources

Cultural institutions such as museums, historic sites, and art galleries may be closed or operate at reduced capacity during a pandemic. This can lead to decreased access to cultural resources for the public. Cultural organizations often rely on visitor revenue and donations to sustain operations. Reduced visitation and economic uncertainty during a pandemic can strain the financial stability of these institutions, impacting their ability to preserve cultural resources.

4.7.4.3 People

Wright County face notable vulnerabilities during a human infectious disease event due to a combination of environmental, healthcare, and socioeconomic factors. Transmission risks are heightened by close human contact, contaminated surfaces, and limited access to sanitation in some areas. Populations most at risk include the elderly, immuno-compromised individuals, and frontline workers.

The County's rural nature may limit healthcare surge capacity, making it harder to manage widespread outbreaks. Risk will vary based on geographical vaccination efforts and vaccination uptake by communities and individuals. Additionally, insurance, access to healthcare, as well as trust in the medical community can determine risk to population which can increase infection rates, hospitalizations, and mortality. [1]

4.7.4.4 Structures and Systems

Infectious diseases can impact critical infrastructure and systems, especially in rural and resource-limited areas. Healthcare facilities may face strain due to increased patient loads, limited surge capacity, and potential shortages of personal protective equipment (PPE), isolation space, and trained personnel.

4.7.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to people as fewer people reside in the City. There are no plans for development in the community which could increase or decrease its vulnerability.

[1] https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems

4.8 INFRASTRUCTURE FAILURE

For detailed information on infrastructure failure in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.8.1 LOCATION AND EXTENT

The entire planning area is at risk to all types of infrastructure failure included in the hazard description section, either from primary failure due to malfunction, degradation, or accidental or intentional damage or as a result of a secondary impact related to another hazard event. For more information on the location and extent of infrastructure failure, please refer to the base plan.

4.8.2 PREVIOUS OCCURRENCES

Infrastructure failure often occurs as a secondary impact to other hazard events. For specific descriptions, please see the Previous Occurrences section of the other hazards included in this plan. Infrastructure failures can also occur as a result of lack of maintenance, human error, and age deterioration. There have been no significant infrastructure failures reported in Wright County.

4.8.3 PROBABILITY OF FUTURE OCCURRENCES

While there have been no significant infrastructure failures reported previously, many minor infrastructure failures, such as road closures, downed power lines, loss of cellular signal, and others, go unreported. Therefore, the HMPC considers the probability of future occurrences for infrastructure failure in Eagle Grove to be **Highly Likely**.

4.8.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, infrastructure failure poses a **High** risk due to a high likelihood of future occurrence and high magnitude. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to infrastructure failure. Eagle Grove's vulnerability to infrastructure failure does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for infrastructure failure, please refer to the base plan.

4.8.4.1 Critical Facilities

All critical facilities within Eagle Grove may be all risk of impacts such as damage and disruption to services from infrastructure failure.

4.8.4.2 Cultural, Historic, and Natural Resources

Infrastructure failures have a limited impact to natural, historic, and cultural resources. Secondary impacts of infrastructure failures such as fires due to ruptured gas pipelines and contamination from wastewater, may pose a greater risk to these resources.

4.8.4.3 People

Infrastructure failure may impact all people within Eagle Grove due to the range of infrastructure failures such as transportation, sewer, water, energy, and communications. Certain population may be at increased risk such as older adults, individuals medically dependent on electricity and those with certain medical conditions.

4.8.4.4 Structures and Systems

Since infrastructure failures are generally a secondary or cascading impact of other hazards, it is not possible to quantify estimated potential losses specific to this hazard due to the variables associated with

affected population, duration of outages, etc. In some instances, failure of one system can impact others. For example, the loss of electricity may also lead to the loss of internet connectivity.

4.8.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to people as fewer people reside in the City. Additionally, there are no plans for development which are expected to increase or decrease vulnerability.

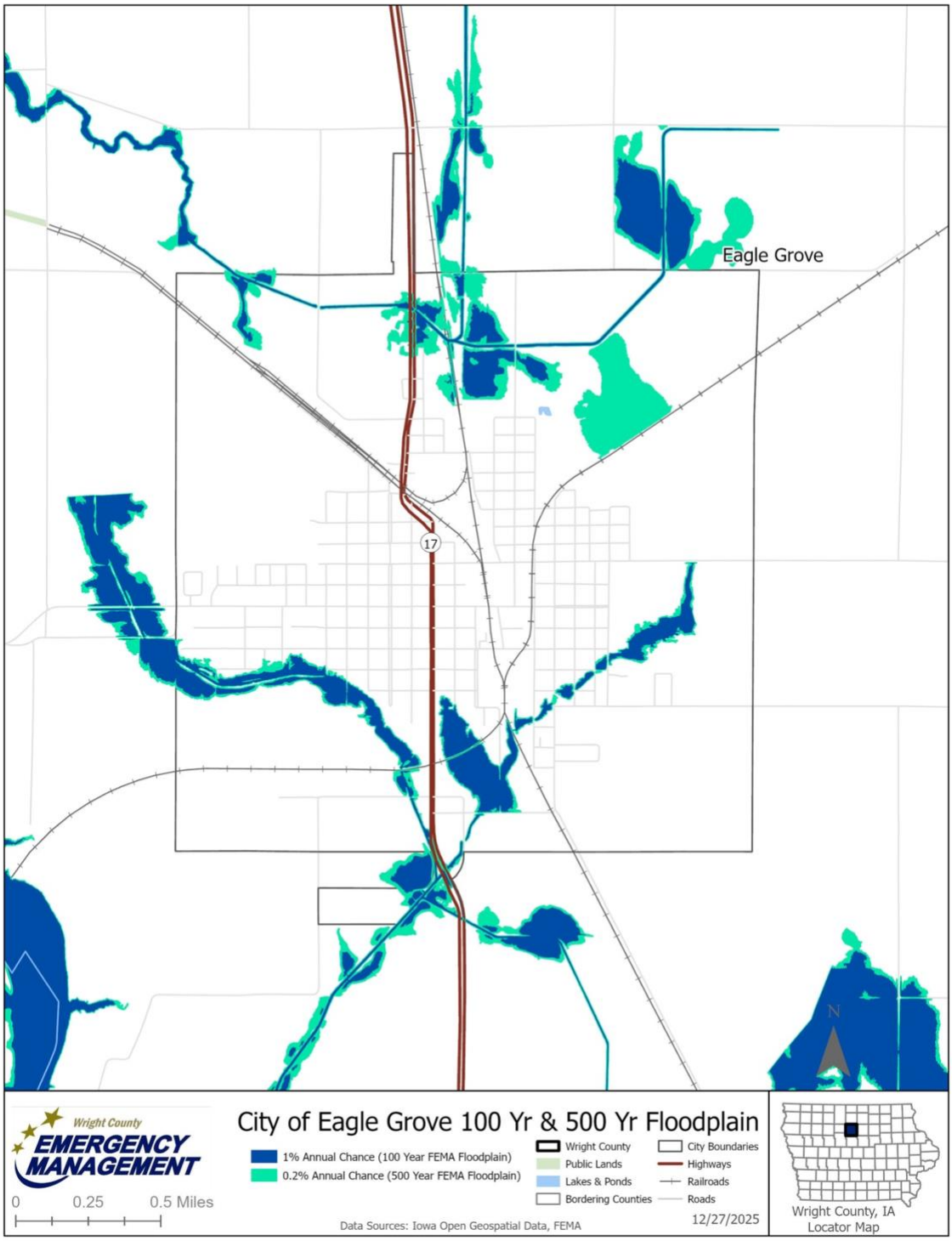
4.9 RIVER FLOODING

For detailed information on river flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.9.1 LOCATION AND EXTENT

Eagle Grove has both 100-year floodplains and 500-year floodplains that run throughout the northern and southern parts of the City. **Figure 5** displays both the 100-year and 500-year floodplains within Eagle Grove. For more information on the location and extent of river flooding, please refer to the base plan.

FIGURE 5. CITY OF EAGLE GROVE 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN



4.9.2 PREVIOUS OCCURRENCES

There have been 23 flood events that occurred in Eagle Grove and have caused zero property and crop damage. **Table 9** details the flood events in Eagle Grove since 1997. The majority of the flood events occurred in 2018 and in 2024. For more information on previous occurrences in Wright County, please refer to the base plan.

TABLE 9. NCDC WRIGHT COUNTY, IOWA FLOOD EVENTS SUMMARY, 1997-JUNE 2025

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
EAGLE GROVE	8/17/15	0	0
EAGLE GROVE	8/19/16	0	0
EAGLE GROVE	8/5/18	0	0
EAGLE GROVE	8/19/18	0	0
EAGLE GROVE	9/4/18	0	0
EAGLE GROVE	9/19/18	0	0
EAGLE GROVE	8/20/19	0	0
EAGLE GROVE	7/30/21	0	0
EAGLE GROVE ARPT	6/21/24	0	0
EAGLE GROVE ARPT	6/22/24	0	0
EAGLE GROVE	7/6/24	0	0
EAGLE GROVE	7/7/24	0	0
EAGLE GROVE	7/7/24	0	0

National Flood Insurance Program (NFIP) Participation

According to the Iowa Department of Natural Resources, there are no Repetitive Loss or Severe Repetitive Loss Properties in Wright County. **Table 10** provides details on NFIP participation for Eagle Grove as well as the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction, where applicable. The claims information is for the period from January 1, 1978 to Fall 2025

TABLE 10. NFIP PARTICIPATION, CURRENT, HISTORICAL POLICY AND CLAIM STATISTICS

COMMUNITY NAME	NFIP PARTICIPANT	CURR EFF MAP DATE	REG EMER DATE	POLICIES IN-FORCE	TOTAL COVERAGE	HISTORICAL CLAIMS	HISTORICAL TOTAL PAYMENTS
Eagle Grove	Yes	2/20/2013-M	09/04/2003	1	$350,000	0	$0

Source: Participation details from NFIP Community Status Book, 10/4/2017; https://www.fema.gov/national-flood-insurance-program-community-status-book; M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program: Policy and Loss Statistics from BureauNet, http://bsa.nfipstat.fema.gov/reports/reports.html;
**Closed Losses are those flood insurance claims that resulted in payment. Loss statistics are for the period from January 1, 1978 to Fall 2025.*

4.9.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for river flooding in Eagle Grove is **Highly Likely**.

4.9.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, river flooding pose a **High** risk due to high likelihood of future occurrence and the magnitude. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to river flooding. Eagle Grove's vulnerability to river flooding does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for riverine flooding, please refer to the base plan.

4.9.4.1 Critical Facilities

To analyze critical facilities at risk in the planning area, the inventory of critical and essential facilities and infrastructure in the planning area was compiled from various sources including the 2013 Wright County Multi-Jurisdictional Hazard Mitigation Plan, Wright County, HSIP Freedom 2015 and the Iowa Department of Natural Resources (NRGIS). A comparison was made of the 176 facilities in the critical facilities inventory with the FIRM layer to determine those facilities that would be damaged in the 1-percent and 0.2-percent annual chance flood events. This analysis determined that no facilities would be at risk in the 1-percent annual chance floodplain and the 0.2-percent annual chance floodplain.

4.9.4.2 Cultural, Historic, and Natural Resources

Please reference the flash flood section on potential impacts to natural, historic and cultural resources.

4.9.4.3 People

To estimate population displaced by a 1-percent annual chance flood, the number of residential structures impacted was multiplied by the average household size for each jurisdiction. According to the analysis, there would be a total of 13 residential structures impacted and an estimated 32 people displaced. **Table 11** provides the estimated structures and population that would be impacted.

TABLE 11. ESTIMATED DISPLACED POPULATION

JURISDICTION	RESIDENTIAL STRUCTURES IMPACTED	AVERAGE HOUSEHOLD SIZE	ESTIMATED DISPLACED POPULATION
Eagle Grove	13	2.46	32

4.9.4.4 Structures and Systems

The potential losses to existing development will be provided for the following categories of losses:

- Building/Contents Losses
- Estimated Population Displaced
- Agricultural Impacts
- Critical Facilities and Infrastructure at Risk

Table 12 provides the summary of potential flood loss estimates and impacted population for the 1-percent annual chance flood by jurisdiction based on the HAZUS Level 2 Analysis.

TABLE 12. POTENTIAL FLOOD LOSS ESTIMATES, 1-PERCENT ANNUAL CHANCE FLOOD

JURISDICTION	PROPERTY TYPE	IMPROVED PARCEL COUNTS	IMPROVED LOSSES	CONTENT LOSSES	INVENTORY LOSSES	TOTAL LOSSES
	Agriculture	2	$26	$158	$110	$294

JURISDICTION	PROPERTY TYPE	IMPROVED PARCEL COUNTS	IMPROVED LOSSES	CONTENT LOSSES	INVENTORY LOSSES	TOTAL LOSSES
Eagle Grove	Commercial	1	$177	$7,093	$9,375	$16,644
	Multi-Residential	2	$36,601	$18,005	$0	$54,605
	Residential	13	$76,076	$40,735	$0	$116,811
	Total	**18**	**$112,880**	**$65,990**	**$9,485**	**$188,355**

4.9.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to people as fewer people reside in the City. There are no plans for development which would significantly increase or decrease vulnerability.

4.10 SEVERE WINTER STORM

For detailed information on severe winter storms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.10.1 LOCATION AND EXTENT

The entire state of Iowa is vulnerable to heavy snow, extreme cold temperatures and freezing rain. Generally, winter storms occur between the months of November and March but can occur as early as October and as late as April. January has the highest monthly snowfall at about 9 inches of snow. For more information on the location and extent of severe winter storms, please refer to the base plan.

4.10.2 PREVIOUS OCCURRENCES

Due to the large scale of winter weather, all winter weather in Wright County is likely to have impacted clarion. From 1996 through October 2025, the National Climatic Data Center reports the following 124 severe winter weather events in Wright County:

- 34 - Blizzard
- 9 - Cold/Wind Chill
- 17 - Extreme Cold/Wind Chill
- 18 - Heavy Snow
- 14 – Ice Storm
- 32 – Winter Storm

For more information on previous occurrences in Wright County, please refer to the base plan.

4.10.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for severe winter storms in Eagle Grove is **Highly Likely**.

4.10.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, severe winter storms pose a **High** risk due to the high likelihood of occurrence and magnitude. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to sever winter storms. Eagle Grove's vulnerability to severe winter storms do not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for severe winter storms, please refer to the base plan.

4.10.4.1 Critical Facilities

All critical facilities within Eagle Grove may be at risk of impacts and disruption to services due to extreme cold temperatures and high snowfall. Hospitals, emergency shelters, and water treatment plants may face operational challenges during prolonged outages or freezing conditions.

4.10.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources may be at risk to impact from severe winter weather. Severe winter weather can significantly impact the County's natural, historic, and cultural assets. Ice storms and freezing temperatures often damage forests, wetlands, and wildlife habitats, leading to tree loss, habitat disruption, and increased runoff pollution from de-icing agents. These environmental changes can have lasting effects on local ecosystems and water quality. Historic buildings and cultural landmarks are vulnerable to structural damage from ice accumulation, freeze-thaw cycles, and water intrusion.

4.10.4.3 People

All people residing in Eagle Grove may be at risk of impact from severe winter storms from extreme cold temperatures and high snowfall. Residents who are elderly, disabled, or economically disadvantaged are at heightened risk during winter events due to limited access to reliable heating, transportation, and emergency services. Many older homes lack adequate insulation or backup power sources, making them susceptible to dangerously low indoor temperatures during prolonged power outages caused by ice storms.

Low-income households may struggle to afford increased heating costs or to repair damage from burst pipes and frozen infrastructure. Within Eagle Grove, over 22.5% of individuals live in poverty. Individuals who rely on electric-powered medical equipment face life-threatening challenges when outages occur. Additionally, rural isolation can delay emergency response times, leaving residents without timely access to medical care or warming centers.

4.10.4.4 Structures and Systems

Structures and systems can be damaged or impaired by loss of electricity from overhead power line damages which can burst water pipes in homes with electricity. Additionally, these storms cause moderate damages to structures and crops.

4.10.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to people as fewer people reside in the City. There are no plans for development which would significantly increase or decrease vulnerability.

4.11 TERRORISM

For detailed information on terrorism in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.11.1 LOCATION AND EXTENT

The entire planning area has a low potential for terrorist activity. However, there are areas with increased risk such as large events, schools, religious organizations, and government facilities. For more information on the location and extent of terrorism, please refer to the base plan.

4.11.2 PREVIOUS OCCURRENCES

There have not been any large-scale enemy attacks or acts of radiological terrorism in Iowa. There have been biological and chemical agent threats, animal rights activists' vandalism and many bomb threats. For more information on previous occurrences in Wright County, please refer to the base plan.

4.11.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for terrorism in Eagle Grove is **Unlikely**.

4.11.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, terrorism pose a **Medium** risk due to limited previous occurrences and the potential magnitude for such events. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to terrorism. Eagle Grove's vulnerability to terrorism do not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for terrorism, please refer to the base plan.

4.11.4.1 Critical Facilities

Essentially all critical facilities are at risk of damage or disruption of services from terrorism. Terrorism can disrupt and damage critical facilities such as physical damages which can cause public safety and public health concerns. There are no previous occurrences of terrorism impacting critical facilities in Eagle Grove.

4.11.4.2 Cultural, Historic, and Natural Resources

In some cases, terrorist attacks may target certain natural, cultural, or historic resources to erase a community's identity such as museums, monuments, and other cultural sites. Additionally, use of destructive weapons may pollute natural resources and cause environmental degradation and damage the local environmental and ecosystems.

4.11.4.3 People

Terrorist attacks can have a physical impact as well as a psychological impact. Terrorist attacks can cause injuries and fatalities, as well as long-term psychological trauma. Depending on the nature of the attack, the broader community can be impacted and disrupt societal and economic functioning. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

Some acts of terrorism are hate-based and therefore individuals and communities from certain religions, nationalities, race, ethnicism, sexuality, and gender are at increased risk of attacks, injury, or even death. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

4.11.4.4 Structures and Systems

Potential losses could include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses, loss of human life, injuries to persons, loss of food supplies, disruption of the food supply chain, and immediate damage to the surrounding environment.

4.11.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to people as fewer people reside in the City. There are no plans for development which would increase or decrease vulnerability.

4.12 THUNDERSTORM/LIGHTNING/HAIL

For detailed information on thunderstorms, lightning, and hail in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.12.1 LOCATION AND EXTENT

Thunderstorms, lightning, and hail can impact the entire County with relatively similar frequency. Although these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. Iowa experiences 40 storms per year in the northwest portion of the state and 60 per year in the southeast portion. For more information on the location and extent of thunderstorms, lightning, and hail, please refer to the base plan.

4.12.2 PREVIOUS OCCURRENCES

The NCDC reported 233 total thunderstorm events for the Wright County planning area from 1965 through October 2025. 42 of those thunderstorm events occurred in Eagle Grove. For more information on previous occurrences in Wright County, please refer to the base plan.

4.12.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for thunderstorm/lightning/hail in Eagle Grove is **Highly Likely**.

4.12.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, thunderstorm/lightning/hail pose a **Medium** risk due to a high likelihood of future occurrences. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to thunderstorm/lightning/hail. Eagle Grove's vulnerability to thunderstorm/lightning/hail does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for thunderstorm/lightning/hail, please refer to the base plan.

4.12.4.1 Critical Facilities

All critical facilities are at risk of impact from thunderstorms, lightning, and hail. Essential infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during severe storm events. In rural areas such as Wright County, this vulnerability is compounded by limited system redundancy and constrained emergency response capabilities, potentially slowing response and recovery efforts.

4.12.4.2 Cultural, Historic, and Natural Resources

Severe storms can significantly impact natural, historic, and cultural resources within Wright County. Natural areas such as wetlands, forests, and river systems are vulnerable to erosion, flooding, and contamination from stormwater runoff. However, these ecosystems also serve as natural buffers that help absorb rainfall and reduce flood risk, but when damaged, they lose their protective function and biodiversity suffers.

Historic and cultural resources-including landmarks, cemeteries, monuments, and archaeological sites are also at risk. Many of these structures are older and not built to withstand high winds or flooding. Storms can cause irreversible damage to fragile materials, displace artifacts, and erode land around culturally significant sites.

4.12.4.3 People

All people residing in Eagle Grove are vulnerable to impacts from thunderstorms, lightning, and hail. Populations with limited access to safe housing, emergency services, or reliable communication systems are especially at risk. Other vulnerable populations, such as the elderly, individuals with disabilities, and low-income households, may face greater challenges in preparing for, responding to, and recovering from storm events.

4.12.4.4 Structures and Systems

All structures and systems may be at risk of impact from thunderstorms, lightning, and hail. Most lightning damages occur to electronic equipment located inside buildings. But structural damage can also occur from hail or when a lightning strike causes a building fire. In addition, hail and lightning strikes can significant damage to crops. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes.

4.12.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to people as fewer people reside in the City. There are no plans for development which would increase or decrease vulnerability.

4.13 TORNADO/WINDSTORM

For detailed information on tornadoes or windstorms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.13.1 LOCATION AND EXTENT

Iowa is located in a region of the United States where tornadoes occur regularly. Although tornadoes are most common in May and June, they can occur during any month of the year. Tornado activity is also most likely from mid-afternoon through around sunset. Tornadoes can occur anywhere in Wright County, including the City of Eagle Grove. Additionally, All of Wright County, including Eagle Grove, is susceptible to high wind events. The County is located in Wind Zone IV, which is susceptible to winds up to 250 mph. More information on the location and extent of tornadoes and windstorms is provided in the base plan.

4.13.2 PREVIOUS OCCURRENCES

According to the NCDC database, there were 49 high wind events in Wright County from 1996 to October 2025. During this time period, there were no reported deaths or injuries. There was an estimated $1,395,210 in property damages. For more information on previous occurrences in Wright County, please refer to the base plan.

4.13.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences across the county, the probability of future occurrences for tornado/windstorm in Eagle Grove is **Highly Likely**.

4.13.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, tornadoes and windstorms pose a **High** risk due to probability or future occurrences and magnitude. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to tornado/windstorm. Eagle Grove's vulnerability does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for tornado/windstorm, please refer to the base plan.

4.13.4.1 Critical Facilities

All critical facilities are at risk of impact and damage from tornadoes and high wind events. Tornadoes and windstorms can cause physical damage, disrupt operations, or injure workers.

4.13.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources are at risk of impact and damage from tornadoes and high wind events. Natural resources such as forests, wetlands, and wildlife habitats may be damaged or destroyed by high winds, flying debris, and uprooted vegetation. Historic and cultural resources, including landmarks, heritage buildings, cemeteries, and tribal sites, are particularly vulnerable due to their age, structural fragility, and irreplaceable value. Tornadoes may cause partial or total destruction of these assets, resulting in the loss of community identity, historical continuity, and tourism value.

4.13.4.3 People

All individuals residing in Eagle Grove are at risk of impact and casualty. Populations residing in structures not designed as storm shelters are inherently vulnerable to tornado hazards. This risk is especially elevated for individuals living in mobile homes, which statistically account for a disproportionate number of tornado-related fatalities and injuries due to their limited structural resilience.

4.13.4.4 Structures and Systems

All structures and systems are at risk of impact, damage, and disruption to systems. Tornadoes have caused widespread damage to homes, businesses, farms, and public infrastructure. Hundreds of residential structures have been destroyed or severely damaged, and critical facilities like schools, fire stations, and police departments are often left inoperable due to roof failures, debris impacts, and power outages.

4.13.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to people as fewer people reside in the City. There are no current plans for development which would increase or decrease vulnerability.

4.14 TRANSPORTATION INCIDENT

For detailed information on transportation incidents in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Eagle Grove for all profiled hazards.

4.14.1 LOCATION AND EXTENT

Transportation incidents in Wright County can occur via trucks on the highways/roads, railways, and aircraft crashes. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. In Eagle Grove, Highway 3 runs through the City and is at risk of a transportation incident. For more information on the location and extent of transportation incidents, please refer to the base plan.

Rail Transport

Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Gove.

Air Freight

There are three airports in Wright County; Belmond, Clarion, and Eagle Grove. Hazardous materials incidents can occur within these three airports across the County.

4.14.2 PREVIOUS OCCURRENCES

Table 13 provides details of seven air transportation incidents in Eagle Grove from 1967 to 2024 (57 years) from the National Transportation Safety Board (NTSB). There have been no reported rail or other transportation incidents in Eagle Grove. For more information on previous occurrences in Wright County, please refer to the base plan.

TABLE 13. WRIGHT COUNTY AIRCRAFT INCIDENTS/ACCIDENTS (1967-2024)

EVENT DATE	LOCATION	INJURY SEVERITY	AIRCRAFT DAMAGE	MAKE	BROAD PHASE OF FLIGHT
07/03/2017	Eagle Grove	None	Substantial	Columbia Aircraft MFG	Landing
09/05/1981	Eagle Grove, IA	Non-Fatal	Destroyed	Cessna	Not Reported
07/10/1978	Eagle Grove, IA	Fatal (2)	Not Reported	Skylark	Not Reported
04/04/1976	Eagle Grove, IA	Non-Fatal	Not Reported	Piper	Not Reported
08/29/1972	Eagle Grove, IA	Non-Fatal	Not Reported	Piper	Not Reported
07/10/1969	Eagle Grove, IA	Non-Fatal	Not Reported	Piper	Not Reported
09/04/1968	Eagle Grove, IA	Non-Fatal	Not Reported	Cessna	Not Reported

4.14.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for transportation incidents in Eagle Grove is **Highly Likely.**

4.14.4 VULNERABILITY ASSESSMENT

Within Eagle Grove, transportation incidents pose a **High** risk due to the number of transportation modalities and incidents that have occurred in the City. This section provides further contextualization for the anticipated vulnerability of Eagle Grove to transportation incident. Eagle Grove's vulnerability to transportation incidents does not vary significantly from the risk of the county as a whole. For more information on the county's vulnerability assessment for transportation incidents, please refer to the base plan.

4.14.4.1 Critical Facilities

All critical facilities are risk of damage or disruption due to the nearby transportation incidents. Transportation incidents can physically damage structures, disrupt operations, or injure workers at critical facilities.

4.14.4.2 Cultural, Historic, and Natural Resources

Transportation accidents, whether involving vehicles, rail, or aircraft, can pose serious threats to natural, cultural, and historical resources in Wright County. These incidents may result in direct physical damage, environmental contamination, or long-term degradation of sites that hold historical or cultural significance.

4.14.4.3 People

Transportation-related incidents involving passenger vehicles, aircraft, or rail systems pose significant risks to public safety and infrastructure. These events can result in a spectrum of consequences, from minor property damage to mass casualty incidents. The likelihood and severity of such accidents are influenced by factors including traffic volume, infrastructure condition, weather, and human error. Based on previous occurrences in the City, there have been two reported injuries or fatalities.

4.14.4.4 Structures and Systems

All structures and systems are essentially at risk of damage and disruption due to the nearby airport, Highway 3, and rail. The County has several critical facilities and public services located near major transportation corridors. A transportation accident, such as a vehicular collision, rail incident, or aircraft crash could have significant consequences for the County's structures and systems.

4.14.4.5 Changes in Development

Overall, population in the City of Eagle Grove has decreased over the past several years which may decrease risk to people as fewer people reside in the City. There are no plans for development in Eagle Grove which are expected to increase or decrease vulnerability.

5. MITIGATION STRATEGY

The Mitigation Strategy section of the base plan provides an overall blueprint for all participating jurisdictions in Wright County to become less vulnerable to its identified hazards and the findings and conclusions of the Capability and Risk Assessments. As established in the base plan, the overall goals of the Wright County mitigation strategy are consistent across all participating municipalities.

This section provides community-specific strategies for Eagle Grove, including the status of actions that were included in the previous plan and actions to be considered or pursued over the next five years. As noted in the base plan, the participants are not committing to undertaking every action suggested in this list but rather are proposing an extensive list of *potential* actions that they may wish to pursue, depending on the availability of funding. **Table 14** details the mitigation actions identified for the City of Eagle Grove and **Table 15** details the mitigation actions identified for the entire County, known as Countywide Actions.

TABLE 14. UPDATED 2026 EAGLE GROVE MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTINGP ARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Eagle Grove - 1	Reconstruct / repair DD 15/15A to reduce the amount of flash flooding that occurs within town; Begin process of assessment of DD-15 infrastructure, classify drainage district if needed, explore mitigation and funding.	River Flooding	Continue In-Progress	Eagle Grove City Council As Trustees Of Dd-15	County Critical Assets Holder, Landowners	General Funds	$100,000 to $500,000	2-3 years	H
Eagle Grove - 2	Separating storm & sanitary sewer, eliminating connections to mitigate property damage due to backflow and flooding.	Flash Flood	Continue In-Progress	Street Department And Property Owners	DNR, FEMA, Community Members	FEMA HMA Grant (HMGP, BRIC, or FMA)	$100,000 to $500,000	More than 5 years	M
Eagle Grove - 3	Identify, pinpoint, and fix the inflow and infiltration of water into the tile system and its effect on the storm sewer. Knowing where all of these sources are throughout town, project could then be developed to reduce flash flooding and sewer backups.	Flash Flood	Continue In-Progress	Street Department	ITS Group	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds	Over $1,000,000	More than 5 years	H
Eagle Grove - 4	Continue mitigation activities and ordinances and hire a code enforcer.	Flash Flood; Grass/Wildland Fire; Infrastructure Failure; Severe Winter Storm; Thunderstorm/ Lightning/Hail;	Continue In-Progress	Planning and Zoning	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds	$50,000 to $100,000	More than 5 years	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTINGP ARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
		Tornado/Winds torm; Transportation Incident							
Eagle Grove - 5	Install a fixed generator for City Hall, EMS, Fire Dept., and Street Dept.	Flash Flood; Severe Winter Storm; Terrorism; Thunderstorm/ Lightning/Hail; Tornado/Winds torm; Transportation Incident	Continue In-Progress	City Council	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds	$100,000 to $500,000	1 year	H
Eagle Grove - 6	Install portable generator(s) for lift stations.	Flash Flood; Infrastructure Failure	Continue In-Progress	Street Department	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds	$50,000 to $100,000	1 year	H
Eagle Grove - 7	Develop a response & evacuation plan. Eagle Grove currently does not have a comprehensive evacuation plan written for citizens in response to a threat. Measure in place for communication but education and plan needs to be completed.	Hazardous Materials, Terrorism, Tornado/Winds torm	Continue In-Progress	Planning and Zoning	County EMA, Area Emergency Responders And Community Members	General Funds, In-Kind	$50,000 to $100,000	2-3 years	H
Eagle Grove - 8	Continue monitoring current industrial discharges and consider ordinance to address future industrial	Infrastructure Failure	Continue In-Progress	Planning and Zoning	County EMA	General Funds	Less than $10,000	Ongoing	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTINGP ARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
	discharge scenarios.								
Eagle Grove - 9	Establish an ordinance to bury power lines in future development.	Infrastructure Failure; Terrorism; Thunderstorm/ Lightning/Hail; Tornado/Winds torm; Transportation Incident	Continue In-Progress	Planning and Zoning	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds	Little or No Cost	3-5 years	H
Eagle Grove - 10	Build a FEMA approved tornado shelter, which is a building that is designed to withstand 250 mph winds and debris projectiles.	Tornado/Winds torm	Continue Not Started	City Council	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds; in-kind contributions; private non-profit	$500,000 to $1,000,000	More than 5 years	H
Eagle Grove - 11	Designate emergency shelters for people to take refuge in the event of a power outage, extreme temperatures, and hazardous weather.	Thunderstorm/ Lightning/Hail; Infrastructure Failure; Severe Winter Storm; Tornado/Winds torm; Extreme Heat	Continue In-Progress	Planning and Zoning	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds	Less than $10,000		H
Eagle Grove - 12	A program to promote and dispose safely of hazardous chemicals, such as paint, and toxic waste	Hazardous Materials	Continue In-Progress	North Central Recycling Center	County EMA	General Funds; in-kind	Less than $10,000	1 year	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTINGP ARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Eagle Grove - 13	Continue the training of the fire department to deal with hazardous materials as well as purchase equipment for the fire department so that they could be the first responders to a hazmat and safely handle the situation.	Hazardous Materials	Continue In-Progress	City Council, Fire Department	County EMA	General Funds	Little or No Cost	1 year	M
Eagle Grove - 14	Develop redundant power plan for government function, emergency response and public safety	Extreme Heat, Infrastructure Failure, Severe Winter Storm, Tornado/Winds torm	New	Planning and Zoning, Public Safety Agencies	FEMA, Community Members	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds, In-Kind	$50,000 to $100,000	3-5 years	M

TABLE 15. 2026 COUNTYWIDE ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA - 1	Encourage residents to purchase weather radios to stay informed on emergency information.	All Hazards	Continue In-Progress	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	1 year	M
CWA - 2	Increase coordination with regional and state agencies for early warning and monitoring of animal, plant, and crop disease	Animal/plant/crop disease	New	Environmental Health	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), USDA	Little or no cost	Ongoing	H
CWA - 3	Educate residents on water saving techniques and water conservation	Drought	New	County EMA , Participating Jurisdictions	Public Media	General Funds	Little or No Cost	1 year	L
CWA – 4	Promote tree planting in areas with low vegetation to increase shade coverage.	Extreme Heat	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	Ongoing	M
CWA – 5	Improve drainage infrastructure in areas where flash flooding frequently occurs.	Flash Flood	New	County EMA	Participating Jurisdictions	General Funds	$100,000 to $500,000	Ongoing	H
CWA – 6	Promote defensible landscape for homes, businesses and entities within WUI areas.	Grass and Wildland Fire	New	County EMA	Participating Jurisdictions	General Funds	Little to No Cost	Ongoing	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 7	Promote wetland restoration to reduce flooding impacts across the County.	River Flooding	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$100,000 to $500,000	Ongoing	H
CWA – 8	Promote snow safety to residents on how to prevent pipe breaks in their homes (e.g., insulating outdoor faucets, drip warm water from an indoor faucet) and what to do if a pipe breaks.	Severe Winter Storm	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	Little to No Cost	Ongoing	H
CWA – 9	Conduct Countywide trainings to practice responding to hazardous materials incidents.	Hazardous Materials	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA -10	Promote flu clinics across the County	Human Disease	New	County EMA , Participating Jurisdictions	County Public Health	CDC Grants, General Funds	$10,000 to $50,000	Ongoing	M
CWA – 11	Promote Tree Trimming across the County to prevent fallen trees on infrastructure.	Infrastructure Failure	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	2-3 years	M
CWA – 12	Conduct Countywide trainings to practice responding to terrorist incidents.	Terrorism	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 13	Conduct Countywide trainings to practice responding to transportation incidents.	Transportation Incident	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA - 14	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Thunderstorm/Lightning/Hail	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M
CWA – 15	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Tornado/Windstorm	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M

1.INTRODUCTION AND PLANNING PROCESS

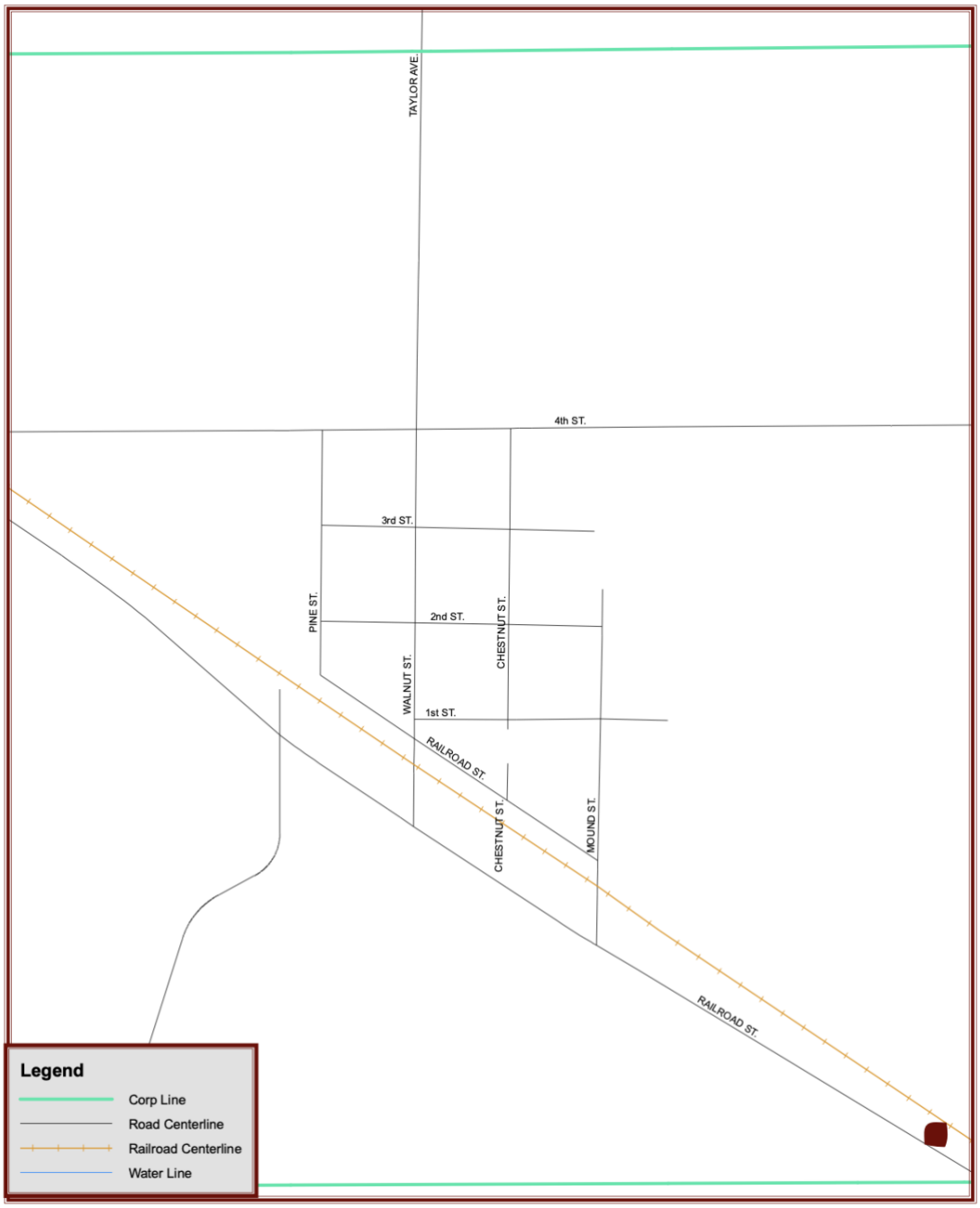
This annex provides more detailed information about the City of Galt. This annex includes the following:

- A more localized community profile, including more detailed mapping, population and demographic information, and critical facilities information
- City-level Hazard Identification and Risk Assessment (HIRA) information, including some more localized hazard maps and conclusions related to hazard risk and how it varies across the planning area
- A localized vulnerability assessment, including the likely impact of profiled hazards on critical facilities
- A detailed capability assessment, describing resource and tools available to the City and to participate in hazard mitigation and reduce hazard risk
- A mitigation strategy, describing a variety of actions the City may opt to take to reduce the risk associated with profiled hazards over the useful life of this plan

2. COMMUNITY PROFILE

The City of Galt is one of the smallest communities within Wright County, Iowa at .54 square miles. The City is located near the railroad and near Highway 69. **Figure 1** shows the City of Galt.

FIGURE 1: CITY OF GALT



2.1 POPULATION AND DEMOGRAPHICS

In order to properly plan and prepare a jurisdiction for future emergencies and disasters, it is important to know the community's characteristics and demographics. Over the past several decades the City's population has increased. **Table 1** shows the population trends over time for the City of Galt. The community's small population means that any change will look significant as a percentage. According to the US Census Bureau, the residents in Galt increased by 31.25% between 2010 and 2023, which could indicate that the communities overall vulnerability has increased due to more individuals being exposed to hazards. **Table 2** shows the demographic data. The median household income for the City and population below the poverty level data is unavailable as the City is very small.

TABLE 1. POPULATION TRENDS

JURISDICTION	2010 CENSUS POPULATION	2016 POPULATION ESTIMATE	2023 CENSUS POPULATION	% CHANGE 2010-2023
Galt	32	31	42	31.25%

Source: U.S. Census Bureau: 2010 Decennial Census, 2016 Population Estimates, 2020 Decennial, 2023 American Community Survey, 5-year Estimates.

TABLE 2. DEMOGRAPHIC DATA

JURISDICTION	POPULATION 18 YEARS AND OVER	UNEMPLOYMENT RATE (2025)[1]	MEDIAN HOUSEHOLD INCOME	PERCENT BELOW POVERTYLEVEL
Galt	34	-	N/A	N/A

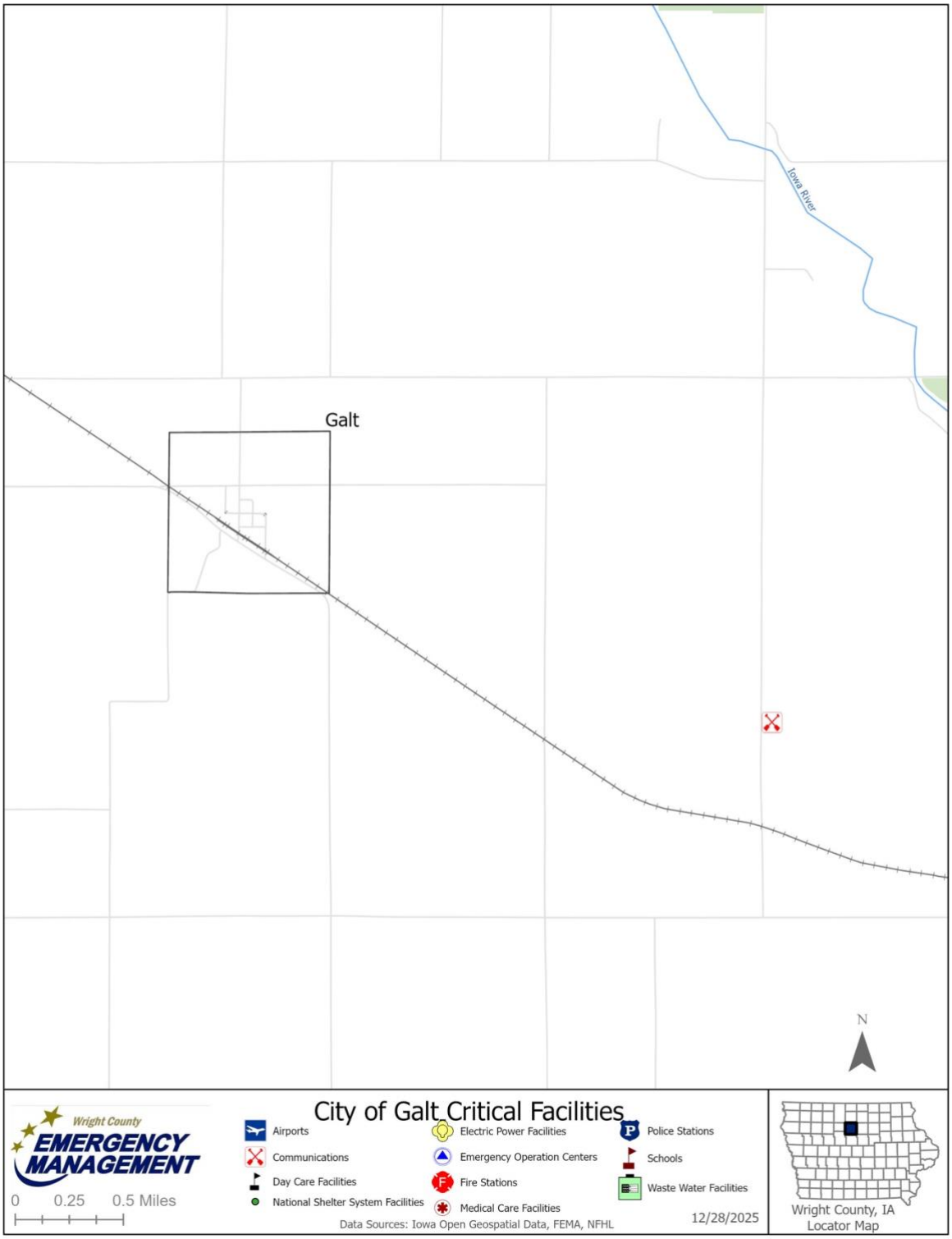
Source: U.S. Census, 2023 American Community Survey, 5-year Estimates

The median age in Galt is 43.5 years old and about 15.6% of the population speak a language other than English at home which is greater than the State of Iowa at 9.7%. Other languages spoken at home include Spanish. About 17.4% of the population have a bachelor's degree which is lower than the State of Iowa at 32%. There are 36 housing units within the City, 38 of which are occupied. Additionally, 14.7% of the population has a disability which is slightly higher than the State of Iowa at 12.9%

2.2 CRITICAL FACILITIES

Critical facilities are the systems and structures that are essential to a jurisdiction's continued functioning, the failure of which would cause significant disruption. **Figure 2** displays the critical facilities within Galt. There are no critical facilities within Galt, however there is one right outside of City limits.

FIGURE 2. CRITICAL FACILITIES MAP



2.3 LAND USE AND DEVELOPMENT

The City of Galt has limited land use compared to other cities and Wright County. However, the number of housing units in Galt has increased by more than 35% since 2010 according to the US Census Bureau. It is important to note that while the percent increase is significant, the total number of added homes is still in the single digits. Overall, Galt's overall vulnerability to hazards as a result of recent development within the community has remained largely unchanged or increased slightly since the previous plan update.

2.4 NATURAL, HISTORIC, AND CULTURAL RESOURCES

There are no reported historic places in the City of Galt according to the National Register of Historic Places. There are no other natural and cultural resources noted by the City of Galt.

3. CAPABILITY ASSESSMENT

The capability assessment evaluates a jurisdiction's ability to implement a comprehensive mitigation strategy and identifies opportunities to establish or strengthen mitigation policies, programs, and projects. More generalized information about the goals of the capability assessment, including the process and methodology, is presented in the Capability Assessment portion of the base plan.

This section articulates specific information about the capabilities of Galt and the plan participants within it. The City of Galt did not indicate the status of their planning, regulatory tools and programs, staff and technical, fiscal, and NFIP capabilities. Additionally, the City did not indicate ways in which to expand on their capabilities.

This section articulates specific information about the capabilities of Galt which include the following:

- Planning mechanisms
- Regulatory tools and programs
- Staff and technical capabilities
- Fiscal and other mechanisms
- Floodplain management and regulation

3.1 PLANNING MECHANISMS

Table 1 describes the planning mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Galt has not identified any planning mechanisms that it currently has in place. In order to increase this capability, the City may seek to develop and implement plans where appropriate.

TABLE 1. PLANNING MECHANISMS CAPABILITY

PLANNING MECHANISMS	CITY OF GALT
Capital Improvement Plan (CIP)	No
Comprehensive Plan	No
Community Wildfire Protection Plan (CWPP)	No
Comprehensive Emergency Management Plan (CEMP)	No
Critical Facilities Plan	No
General Plan	No
Continuity of Operations Plan (COOP)	No
Debris Management Plan	No
Disaster Recovery Plan	No
Economic Development Plan	No
Emergency Operations Plan (EOP)	No
Environmental Impact Report (EIR)	No
Evacuation Plan	No
Flood Response Plan	No
Floodplain Management Plan/Flood Mitigation Plan	No
Hazard Mitigation Plan	Yes
Historic Preservation Plan	No
Land Use Plan	No
Natural Resource Protection Plan (NRPP)	No
Open Space Management Plan	No
Transportation Plan	No
Threat Hazard Identification and Risk Assessment (THIRA)	No
Watershed Plan	No

3.2 REGULATORY TOOLS AND PROGRAMS

Table 2 describes the regulatory tools and programs that the jurisdiction has in place to support hazard mitigation. Currently, the City of Galt has not identified any regulatory tools and programs that are utilized by the community. In order to increase this capability, the City may resources necessary to develop or implement regulatory tools and programs.

TABLE 2. REGULATORY TOOLS AND PROGRAM CAPABILITY

REGUALTORY TOOLS AND PROGRAMS	CITY OF GALT
Building Codes	No
Citizen Corps – Community Emergency Response Team (CERT)	No
Community Rating System (CRS Program of the NFIP)	No
Emergency Management Accreditation Program (EMAP)	No
Fire Code	No
Firewise Community	No
Floodplain Management/Flood Damage Prevention Ordinance	No
Land Use/Development Planning	No
National Flood Insurance Program (NFIP)	No
Post Disaster Redevelopment/Reconstruction Plan/Ordinance	No
Storm Ready	No
Stormwater Management Plan/Ordinance	No
Subdivision Regulations/Ordinance	No
Unified Development Ordinance	No
Zoning Ordinance	No

3.3 STAFF AND TECHNICAL CAPABILITIES

Table 3 below describes the staff and technical capabilities that the jurisdiction has in place to support hazard mitigation. Currently, the City of Galt has not identified any staff or technical capabilities that it can utilize to help mitigate hazards. In order to increase this capability, the City may seek resources necessary to employ specialized staff to support hazard mitigation.

TABLE 3. STAFF AND TECHNICAL CAPABILITIES

STAFF AND TECHNICAL CAPABILITES	CITY OF GALT
Emergency Manager	No
Engineers or professional trained in construction practices related to buildings and/or infrastructure	No
Environmental Justice Specialists	No
Fiscal Management or Procurement Specialists	No
Floodplain Manager	No
Housing Specialist(s)	No
Land Surveyors	No
Land Use/Management/Development Planning	No
Planners or engineers with an understanding of natural and/or human caused hazards	No
Recreation/Green Space Specialist(s)	No
Resource Development Staff or Grant Writing	No
Scientists familiar with the hazards of the community	No
Staff experienced with Geographic Information Systems (GIS) or HAZUS	No
Staff with education or expertise to assess the community's vulnerability to hazards	No
Transportation Manager/Traffic Engineer	No

3.4 FISCAL AND OTHER MECHANISMS

Table 4 describes the fiscal and other mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Galt has not identified any fiscal or other mechanisms that could be utilized to help mitigate hazards. To improve this capability, the City may seek out state and federal funding opportunities.

TABLE 4. FISCAL AND OTHER MECHANISMS

FISCAL AND OTHER MECHANISMS	CITY OF GALT
Capital Improvement Programming	No
Community Development Block Grants (CDBG)	No
Development Impact Fees	No
FEMA Hazard Mitigation Assistance Grants (HMPG, FMA, PDM)	No
Gas/Electric Utility Fees	No
General Obligation, Revenue, and/or Special Tax Bonds	No
Homeland Security Grants (HSGP)	No
Infrastructure Investment and Jobs Act (IIJA)	No
Infrastructure State Revolving Fund Loan	No
Partnering Agreements or Intergovernmental Agreements	No
Sewer/Water Fees	No
Special Purpose Tax (or taxing districts)	No
Stormwater Utility Fees	No
USDA Grants	No
USDA Rural Development Agency Grants	No
US Economic Development Administration Grants	No

3.5 FLOODPLAIN MANAGEMENT AND REGULATION

Table 5 describes the National Floodplain Insurance Program (NFIP) Capability for the City of Clarion. Currently, the City does not participate in the NFIP, primarily due to limited resources and the absence of any Repetitive Loss or Severe Repetitive Loss properties within its jurisdiction.

TABLE 5. FLOODPLAIN MANAGEMENT AND REGULATION CAPABILITIES

NFIP CAPABILITIES	CITY OF GALT
Has your community adopted a floodplain management ordinance that meets NFIP minimum criteria?	No
Has your community adopted the latest effective Flood Insurance Rate Map (FIRM)?	No
Do you regulate/permit development in the Special Food Hazard Area (SFHA)?	No
Which position or agency is in charge of NFIP compliance for your community?	None
How do you implement the substantial improvement/substantial damage provisions of your floodplain management ordinance?	None

4. HAZARD IDENTIFICATION AND RISK ASSESSMENT

The Hazard Identification and Risk Assessment (HIRA) process, described in more detail in the HIRA section of the base plan, involves identifying potential hazards, evaluating their likelihood and potential consequences, and estimating and describing the level of risk these hazards present to a community.

As described in the "HIRA Methodology" section of the base plan, participants in this plan update reconsidered the relative risk posed by the profiled hazards by conducting a hazard ranking process. **Table 3** below provides a summary of how those hazards were ranked in the City of Galt. Each of the 14 natural and manmade hazards discussed in this section are described in more detail in the HIRA section of the base plan. This section endeavors to provide more detailed, local-level information, mapping, and conclusions for these hazards wherever relevant.

TABLE 3. GALT HAZARD RANKING

JURISDICTION	ANIMAL/CROP/PLANT DISEASE	DROUGHT	EXTREME HEAT	FLASH FLOOD	GRASS OR WILDLAND FIRE	HAZARDOUS MATERIALS INCIDENT	HUMAN DISEASE	INFRASTRUCTURE FAILURE	RIVER FLOODING	SEVERE WINTER STORM	TERRORISM	THUNDERSTORM/LIGHTNING/HAIL	TORNADO/WINDSTORM	TRANSPORTATION INCIDENT
Galt	M	H	M	L	L	M	M	H	H	H	M	M	H	H

4.1 ANIMAL/PLANT/CROP DISEASE

For detailed information on animal, plant, and crop disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.1.1 LOCATION AND EXTENT

All of Wright County is subject to animal/livestock incidents and agricultural infestations, which include the City of Galt. For more information on the location and extent of animal, plant, and crop disease, please refer to the base plan.

4.1.2 PREVIOUS OCCURRENCES

There are no previous occurrences that have been reported to impact the Galt specifically. For more information on previous occurrences in Wright County, please refer to the base plan.

4.1.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for animal/plant/crop/disease in Galt is **Unlikely**.

4.1.4 VULNERABILITY ASSESSMENT

Within Galt, animal/plant/crop disease poses a **Medium** risk due to limited previous occurrences and impact to the City yet potential to cause economic instability. This section provides further contextualization for the anticipated vulnerability of Galt to animal/plant/crop disease. For more information on the vulnerability assessment for animal, plant, and crop disease, please refer to the base plan.

4.1.4.1 Critical Facilities

Animal, plant, and crop diseases have limited impact on critical facilities due to the hazard directly impacting animals, plants, and crops and related industries.

4.1.4.2 Cultural, Historic, and Natural Resources

Sensitive crops are those that are more susceptible to stress from environmental factors such as weather and crop diseases. There are several areas within Wright County that have sensitive crops and would be more vulnerable to disease. There are zero locations identified within the City of Galt.

4.1.4.3 People

Animal, plant, and crop diseases can impact the population through food supply chain disruptions, increased food prices, local employment, and potential health impacts from zoonotic diseases such Highly Pathogenic Avian Influenza (HPAI).

4.1.4.4 Structures and Systems

Buildings, infrastructure, and critical facilities are not vulnerable to this hazard. Its impacts are primarily economic and environmental, rather than structural effects.

4.1.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.2 DROUGHT

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.2.1 LOCATION AND EXTENT

All of Wright County is subject to drought as drought normally is more of a widespread hazard and not isolated. For more information on the location and extent of drought, please refer to the base plan.

4.2.2 PREVIOUS OCCURRENCES

According to the National Drought Mitigation Center's Drought Impact Reporter, during the period from January 2007 through January 2026, nine were reported to affect Wright County. Impacts of recent drought periods in Iowa that affected Wright County are provided below. Unless otherwise indicated, these impacts are from the National Climatic Data Center. For more information on previous occurrences in Wright County, please refer to the base plan.

4.2.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for drought in Galt is **Highly Likely**.

4.2.4 VULNERABILITY ASSESSMENT

Within Galt, drought poses a **High** risk due to potential impacts, largely to public health, agriculture, and the local economy. This section provides further contextualization for the anticipated vulnerability of Galt to drought. Galt's vulnerability to drought is less compared to the risk of the county as a whole due to a low population and assets at risk. However, this does not result in a lower risk rating for this hazard compared to the County. For more information on the vulnerability assessment for drought, please refer to the base plan.

4.2.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.2.4.2 Cultural, Historic, and Natural Resources

All natural resources within the City can experience stress, tree mortality, soil compaction, erosion and loss of habitat or shade due to drought. Drought may also erode cultural and historic resources within Galt as well.

4.2.4.3 People

All people residing in Galt may be impacted by Drought. Drought presents hazards to public health in extreme cases, where drinking water production cannot keep up with demand. Increased water demand may increase water rates and create financial hardship, especially for individuals and families living below poverty. Additionally, the elderly and young children may be at greater risk of experiencing adverse health effects resulting from reduced water quality.

4.2.4.4 Structures and Systems

Areas associated with agricultural use are vulnerable to drought conditions which could result in a decrease in crop production or a decrease in available grazing area for livestock. In severe prolonged droughts, structures could be impacted through cracks in foundation which can comprise the integrity and safety of the building. Additional impact to structures could include landscaping and dried vegetation which can execrate urban fire and wildfire risk.

4.2.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.3 EXTREME HEAT

For detailed information on extreme heat in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.3.1 LOCATION AND EXTENT

All of Wright County is subject to extreme heat as it is normally more of a widespread hazard and not isolated. For more information on the location and extent of extreme heat, please refer to the base plan.

4.3.2 PREVIOUS OCCURRENCES

The following summarizes the National Weather Service Advisories, Watches, and Warnings for Heat or Excessive Heat in Wright County from 2000 to 2025 (25 years of data). For more information on previous occurrences in Wright County, please refer to the base plan.

- 46 Heat Advisories
- 2 Extreme Heat Watches
- 8 Excessive Heat Watches
- 7 Excessive Warnings

4.3.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for extreme heat in Galt is **Likely**.

4.3.4 VULNERABILITY ASSESSMENT

Within Galt, extreme heat poses a **Medium** risk due to high likelihood of future occurrence and magnitude. This section provides further contextualization for the anticipated vulnerability of Galt to extreme heat. Galt's vulnerability to extreme heat is less compared to the risk of the county as a whole due to a low population and assets at risk. However, this does not result in a lower risk rating for this hazard compared to the County. For more information on the county's vulnerability assessment for extreme heat , please refer to the base plan.

4.3.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.3.4.2 Cultural, Historic, and Natural Resources

Prolonged high temperatures and drought conditions can stress ecosystems, reduce biodiversity, and increase the risk of wildfires, especially in forested and agricultural areas. These changes threaten native species and disrupt ecological balance, which in turn affects the natural heritage in Galt. some historic buildings were built before the invention of central air conditioning and may lack proper cooling, posing risk to its inhabitants. Cultural traditions and outdoor events may be disrupted due to unsafe heat conditions, reducing community engagement and tourism.

4.3.4.3 People

All people residing in Galt may be at risk of extreme heat. Those at greatest risk for heat-related illness and deaths include people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. Wright County's population over 65 years is higher than the national and state average at 20.9 percent.

4.3.4.4 Structures and Systems

All structures and systems may be at risk of impacts depending on the severity of extreme heat events. Extreme heat can also cause a strain on electricity delivery infrastructure which can be overloaded during peak use of electricity to power air conditioning during extreme heat events. Increased electricity use can increase rates and cause financial hardships, especially for individuals and families living under poverty.

4.3.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.4 FLASH FLOOD

For detailed information on flash flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.4.1 LOCATION AND EXTENT

Wright County includes two major tributaries of the Mississippi River, including the Boone River and the upper portion of the Iowa River. The Boone Watershed intercepts the entire western and central portion of Wright County and is an area of gently flat to rolling hills. For more information on the location and extent of flash flooding, please refer to the base plan.

4.4.2 PREVIOUS OCCURRENCES

There are no reported flash flood events that have occurred in Galt. For more information on previous occurrences within Wrigth County, please refer to the base plan.

4.4.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences elsewhere in the county, the probability of future occurrences for flash flood in Galt is **Possible**.

4.4.4 VULNERABILITY ASSESSMENT

Within Galt, flash flooding poses a **Low** risk due to a highly likely probability of occurrences and moderate damages to property and crops. This section provides further contextualization for the anticipated vulnerability of Galt to flash flood. Galt's vulnerability to flash flood is less compared to the risk of the county as a whole due to a low population and assets at risk. For more information on the county's vulnerability assessment for flash flooding, please refer to the base plan.

4.4.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.4.4.2 Cultural, Historic, and Natural Resources

Cultural, historic, and natural resources in low lying areas may be at risk of impact from flash flood events. Flooding can cause significant damage to Wright County's natural, historic, and cultural assets. Natural areas such as wetlands, forests, and waterways may experience erosion, pollution, and habitat loss, reducing their ecological value and ability to buffer future flood events. These changes can also affect recreational and conservation areas. Historic buildings and cultural landmarks are at risk of structural damage, deterioration, and loss of historically significant materials. Flooding may also disrupt cultural traditions tied to specific locations or community spaces.

4.4.4.3 People

Flash flooding presents a serious risk to residents across Wright County, particularly in low-lying areas with a history of flood events. Populations most at risk include older adults, low-income families, and individuals without access to flood insurance, lack of accessible emergency alert and notifications, or reliable transportation.

4.4.4.4 Structures and Systems

Structures and systems in low lying areas are at risk of impact from flash flood events. Flash flooding can quickly inundate any low lying structures and systems. Damages to public infrastructure can be costly for

the state, county, and city road/bridge maintenance departments to repair. When sewer back-up occurs, this can result in costly clean-up for home and business owners, and it can present a health hazard.

4.4.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.5 GRASS OR WILDLAND FIRE

For detailed information on grass or wildland fire in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

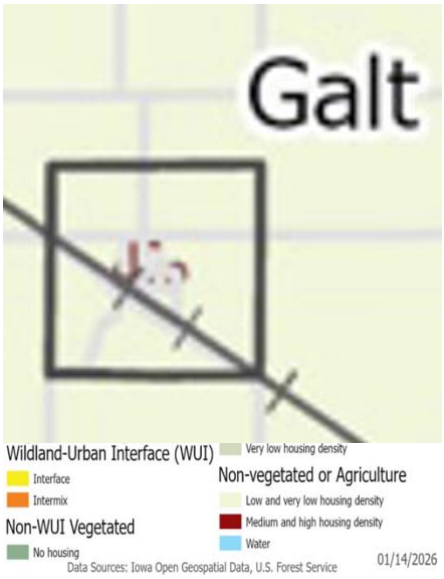
4.5.1 LOCATION AND EXTENT

Wildland/Grass fires are most likely to occur in the Wildland Urban Interface (WUI). This is the area where houses meet or intermingle with undeveloped wildland vegetation. Within the WUI, there are two specific areas identified:

- Interface
- Intermix

The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. **Figure 3** shows the WUI areas within Galt. On the map, the orange represents Intermix areas and the yellow represents Interface areas. The red indicates medium and high housing density that is unrelated to wildfire risk. For more information on the location and extent of grass or wildland fire, please refer to the base plan.

FIGURE 3. GALT WUI AREAS



4.5.2 PREVIOUS OCCURRENCES

According to the National Fire Incident Reporting System (NFIRS), there has been one fire incident in Wright County since 2017 near Cornelia. For more information on previous occurrences within Wright County, please refer to the base plan.

4.5.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for grass or wildland fire in Galt is **Possible**.

4.5.4 VULNERABILITY ASSESSMENT

Within Galt, grass or wildland fire pose a **Low** risk due to prevalence of WUI areas and limited previous occurrences. This section provides further contextualization for the anticipated vulnerability of Galt to grass or wildland fire. Galt's vulnerability to grass and wildland fire is less compared to the risk of the county as a whole due to a low population and assets at risk. For more information on the county's vulnerability assessment for grass and wildland fire, please refer to the base plan.

4.5.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.5.4.2 Cultural, Historic, and Natural Resources

Wildfire and Wildland-Urban Interface (WUI) areas can pose a risk to the County's natural, historic, and cultural resources. Wildfires can degrade ecosystems by destroying native vegetation, fragmenting wildlife habitats, and increasing soil erosion and water pollution. Smoke and airborne pollutants also impact air quality, affecting both environmental and human health. Culturally and historically significant sites, such as cemeteries and historic buildings, are vulnerable to direct fire damage and indirect impacts from suppression efforts and post-fire erosion.

4.5.4.3 People

Populations across Wright County face varying degrees of vulnerability to WUI fires, depending on factors such as proximity to wildland areas, housing density, socioeconomic conditions, and access to emergency services. In urbanizing areas, the expansion of housing into fire-prone zones increases the number of people and structures exposed to wildfire hazards.

4.5.4.4 Structures and Systems

Structure and systems in WUI areas may be at risk of impact from grass and wildland fires. Wildfires can be responsible for extensive damage to crops, the environment and occasionally residential or business facilities. Homes built in rural areas are more vulnerable since they are in closer to wildland where fires may originate, and they tend to be further way from emergency services.

4.5.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.6 HAZARDOUS MATERIALS

For detailed information on hazardous materials in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.6.1 LOCATION AND EXTENT

Fixed Hazardous Materials Incident

According to the Iowa Department of Natural Resources, there are 44 sites in Wright County that because of the volume or toxicity of the materials on site were designated as Tier II Facilities under the Superfund Amendments and Reauthorization Act. Within Galt there are zero Tier II facilities. For more information on the location and extent of hazardous materials, please refer to the base plan.

Transportation Hazardous Materials Incident

The transport of hazardous materials in Wright County can occur via trucks on the highways/roads, railways, and airplanes carrying hazardous cargo. Hazardous materials can be transported on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35.

Rail Transport

Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Grove. There main line does not run through Galt.

Air Freight

There are three airports in Wright County; Belmond, Clarion, and Eagle Grove. Hazardous materials incidents can occur within these three airports across the County. There are no airports in Galt.

Pipeline Incident

There are no major pipelines that run through the City of Galt, however there are pipelines located nearby and could impact residents of the City if a rupture occurs.

4.6.2 PREVIOUS OCCURRENCES

From 2017 to 2024, there have been eight hazardous materials spills reported to the Environmental Protection Agency (EPA) within Galt. There are no other types of hazardous materials incidents that have been reported to have occurred in Galt. For more information on previous occurrences within Wright County, please refer to the base plan.

4.6.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences reported elsewhere in Wright County, the probability of future occurrences for hazardous materials in Galt is **Possible**.

4.6.4 VULNERABILITY ASSESSMENT

Within Galt, hazardous materials pose a **Medium** risk due to the number of previous occurrences and magnitude. This section provides further contextualization for the anticipated vulnerability of Galt to hazardous materials. Galt's vulnerability to hazardous materials is less compared to the risk of the county as a whole due to a low population and assets at risk. However, this does not result in a lower risk rating for this hazard compared to the County. For more information on the vulnerability assessment for hazardous materials, please refer to the base plan.

4.6.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.6.4.2 Cultural, Historic, and Natural Resources

Hazardous material incidents pose significant risks to natural, historic, and cultural resources across Wright County. These resources include wetlands, rivers, forests, historic buildings, archaeological sites, and culturally significant landmarks. A chemical spill or airborne release can contaminate soil and water, damage ecosystems, and degrade the physical integrity of historic structures. Natural resources such as wildlife habitats and water bodies are particularly vulnerable to long-term environmental damage, which can disrupt biodiversity and recreational use. Historic and cultural sites may suffer irreversible harm if exposed to corrosive or toxic substances, especially if they lack protective infrastructure or are located near transportation corridors or industrial zones.

4.6.4.3 People

Communities near major transportation routes, such as highways and rail lines, are at higher risk due to the frequent movement of hazardous substances. Industrial zones and agricultural areas with chemical storage facilities also present elevated risks of fixed-site incidents. These events can lead to chemical spills, fires, or airborne releases that threaten public health and safety.

Vulnerability is especially high among populations with limited mobility, such as the elderly, individuals with disabilities, and residents of schools, hospitals, and correctional facilities. These groups may face challenges during evacuation or shelter-in-place orders.

Additionally, low-income communities may struggle with access to protective equipment, transportation, and timely information, further increasing their vulnerability. Based on previous occurrences, there have been six injuries due to pipeline incidents.

4.6.4.4 Structures and Systems

It is difficult to determine the potential losses to existing development because of the variable nature of a hazardous materials spill. For example, a spill of a toxic airborne chemical in a populated area could have greater potential for loss of life. By contrast a spill of a very small amount of a chemical in a remote rural area would be much less costly and possibly limited to remediation of soil.

4.6.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.7 HUMAN DISEASE

For detailed information on human disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.7.1 LOCATION AND EXTENT

Pandemics and epidemics do not affect a single geographic location; Wright County is equally vulnerable. Transmission can occur anywhere people interact, but locations with higher numbers of individuals create more opportunities for disease to spread. For more information on the location and extent of human disease, please refer to the base plan.

4.7.2 PREVIOUS OCCURRENCES

Pandemics and epidemics have had recurring and widespread effects on the County and across the world. While some events have been global in scale and others more localized, each has highlighted the vulnerability of the community to infectious disease and underscored the importance of preparedness and coordinated response. Since 1918, there have been six major epidemics or pandemics that are widely recognized by both the CDC and WHO, in addition to the COVID-19 pandemic. For more information on previous occurrences within Wright County, please refer to the base plan.

4.7.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for human disease in Galt is **Possible**.

4.7.4 VULNERABILITY ASSESSMENT

Within Galt, human diseases pose a **Medium** risk due to low probability yet high risk to significantly impact the City. This section provides further contextualization for the anticipated vulnerability of Galt to human disease. Galt's vulnerability to human disease is less compared to the risk of the county as a whole due to a low population and assets at risk. However, this does not result in a lower risk rating for this hazard compared to the County. For more information on the county's vulnerability assessment for human disease, please refer to the base plan.

4.7.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.7.4.2 Cultural, Historic, and Natural Resources

Cultural institutions such as museums, historic sites, and art galleries may be closed or operate at reduced capacity during a pandemic. This can lead to decreased access to cultural resources for the public. Cultural organizations often rely on visitor revenue and donations to sustain operations. Reduced visitation and economic uncertainty during a pandemic can strain the financial stability of these institutions, impacting their ability to preserve cultural resources.

4.7.4.3 People

Wright County face notable vulnerabilities during a human infectious disease event due to a combination of environmental, healthcare, and socioeconomic factors. Transmission risks are heightened by close human contact, contaminated surfaces, and limited access to sanitation in some areas. Populations most at risk include the elderly, immuno-compromised individuals, and frontline workers.

The County's rural nature may limit healthcare surge capacity, making it harder to manage widespread outbreaks. Risk will vary based on geographical vaccination efforts and vaccination uptake by communities

and individuals. Additionally, insurance, access to healthcare, as well as trust in the medical community can determine risk to population which can increase infection rates, hospitalizations, and mortality. [1]

4.7.4.4 Structures and Systems

Infectious diseases can significantly impact critical infrastructure and systems, especially in rural and resource-limited areas. Healthcare facilities may face strain due to increased patient loads, limited surge capacity, and potential shortages of personal protective equipment (PPE), isolation space, and trained personnel.

4.7.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

[1] https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems

4.8 INFRASTRUCTURE FAILURE

For detailed information on infrastructure failure in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.8.1 LOCATION AND EXTENT

The entire planning area is at risk to all types of infrastructure failure included in the hazard description section, either from primary failure due to malfunction, degradation, or accidental or intentional damage or as a result of a secondary impact related to another hazard event. For more information on the location and extent of infrastructure failure, please refer to the base plan.

4.8.2 PREVIOUS OCCURRENCES

Infrastructure failure often occurs as a secondary impact to other hazard events. For specific descriptions, please see the Previous Occurrences section of the other hazards included in this plan. Infrastructure failures can also occur as a result of lack of maintenance, human error, and age deterioration. There have been no significant infrastructure failures reported in Wright County.

4.8.3 PROBABILITY OF FUTURE OCCURRENCES

While there have been no significant infrastructure failures reported previously, many minor infrastructure failures, such as road closures, downed power lines, loss of cellular signal, and others, go unreported. Therefore, the HMPC considers the probability of future occurrences for infrastructure failure in Galt to be **Highly Likely**.

4.8.4 VULNERABILITY ASSESSMENT

Within Galt, infrastructure failures pose a **High** risk due to a high likelihood of future occurrence and high magnitude. This section provides further contextualization for the anticipated vulnerability of Galt to infrastructure failure. Galt's vulnerability to infrastructure failure is less compared to the risk of the county as a whole due to a low population and assets at risk. However, this does not result in a lower risk rating for this hazard compared to the County. For more information on the county's vulnerability assessment for infrastructure failure, please refer to the base plan.

4.8.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.8.4.2 Cultural, Historic, and Natural Resources

Infrastructure failures have a limited impact to natural, historic, and cultural resources. Secondary impacts of infrastructure failures such as fires due to ruptured gas pipelines and contamination from wastewater, may pose a greater risk to these resources.

4.8.4.3 People

Infrastructure failure may impact all people within Galt due to the range of infrastructure failures such as transportation, sewer, water, energy, and communications. Certain population may be at increased risk such as older adults, individuals medically dependent on electricity and those with certain medical conditions.

4.8.4.4 Structures and Systems

Since infrastructure failures are generally a secondary or cascading impact of other hazards, it is not possible to quantify estimated potential losses specific to this hazard due to the variables associated with

affected population, duration of outages, etc. In some instances, failure of one system can impact others. For example, the loss of electricity may also lead to the loss of internet connectivity.

4.8.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

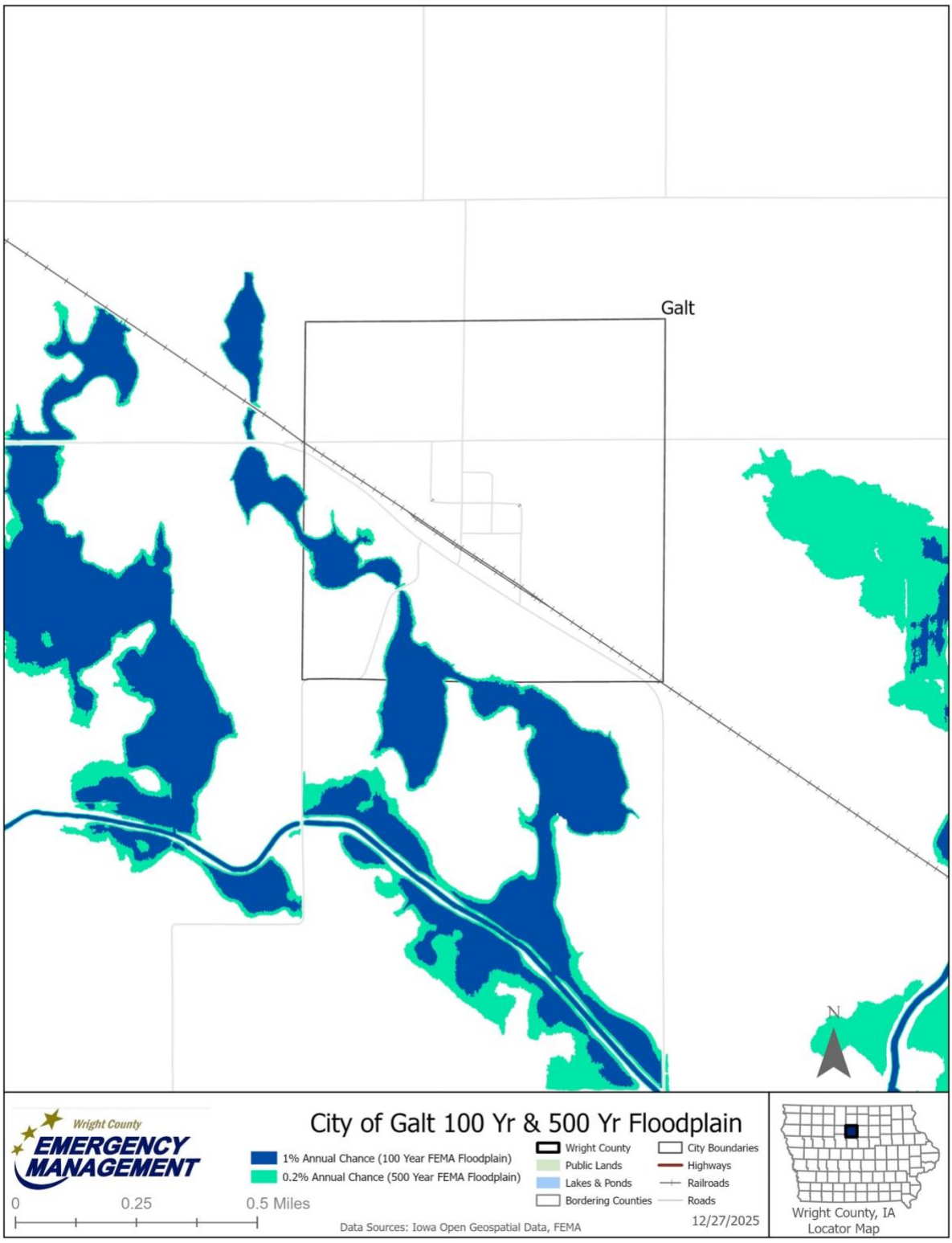
4.9 RIVER FLOODING

For detailed information on river flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.9.1 LOCATION AND EXTENT

Galt has both 100-year floodplains and 500-year floodplains that is contained in the southwestern part of the City. **Figure 4** displays both the 100-year and 500-year floodplains within Galt. For more information on the location and extent of river flooding, please refer to the base plan.

FIGURE 4. CITY OF GALT 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN



4.9.2 PREVIOUS OCCURRENCES

There have been zero events that occurred in Galt. For more information on previous occurrences in Wright County, please refer to the base plan.

4.9.3 PROBABILITY OF FUTURE OCCURRENCES

Although there have been no documented flooding events within Galt, the presence of floodplains in the City and floods documented elsewhere in the county led the HMPC to assess the probability of future occurrences for river flooding in Galt to be **Highly Likely**.

4.9.4 VULNERABILITY ASSESSMENT

Within Galt, river flooding poses a **High** risk due to high likelihood of future occurrence and the magnitude. This section provides further contextualization for the anticipated vulnerability of Galt to river flooding. Galt's vulnerability to river flooding is less compared to the risk of the county as a whole due to a low population and assets at risk. However, this does not result in a lower risk rating for this hazard compared to the County. For more information on the county's vulnerability assessment for river flooding, please refer to the base plan.

4.9.4.1 Critical Facilities

Galt did not identify any critical facilities within its jurisdiction which would be vulnerable to flooding.

4.9.4.2 Cultural, Historic, and Natural Resources

Please refer to the flash flood section on potential impacts to natural, historic and cultural resources.

4.9.4.3 People

Analysis of available data indicated that there are no residents of Galt currently living in a floodplain. However, individuals may be caught in flood conditions when traveling, and individuals who are elderly, have a disability, or lack access to a personal vehicle may be particularly vulnerable to flooding events.

4.9.4.4 Structures and Systems

According to analyses of available data, no structures were identified to be potentially damaged in this scenario.

4.9.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.10 SEVERE WINTER STORM

For detailed information on severe winter storms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.10.1 LOCATION AND EXTENT

The entire state of Iowa is vulnerable to heavy snow, extreme cold temperatures and freezing rain. Generally, winter storms occur between the months of November and March but can occur as early as October and as late as April. January has the highest monthly snowfall at about 9 inches of snow. For more information on the location and extent of severe winter storms, please refer to the base plan.

4.10.2 PREVIOUS OCCURRENCES

Due to the large scale of winter weather, all winter weather in Wright County is likely to have impacted clarion. From 1996 through October 2025, the National Climatic Data Center reports the following 124 severe winter weather events in Wright County:

- 34 - Blizzard
- 9 - Cold/Wind Chill
- 17 - Extreme Cold/Wind Chill
- 18 - Heavy Snow
- 14 – Ice Storm
- 32 – Winter Storm

For more information on previous occurrences in Wright County, please refer to the base plan.

4.10.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for severe winter storms in Galt is **Highly Likely**.

4.10.4 VULNERABILITY ASSESSMENT

Within Galt, severe winter storms pose a **High** risk due to the high likelihood of occurrence and magnitude. This section provides further contextualization for the anticipated vulnerability of Galt to severe winter storms. Galt's vulnerability to river flooding is less compared to the county due to a lower population at risk. For more information on the county's vulnerability assessment for severe winter storms, please refer to the base plan.

4.10.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.10.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources may be at risk to impact from severe winter weather. Severe winter weather can significantly impact the County's natural, historic, and cultural assets. Ice storms and freezing temperatures often damage forests, wetlands, and wildlife habitats, leading to tree loss, habitat disruption, and increased runoff pollution from de-icing agents. These environmental changes can have lasting effects on local ecosystems and water quality. Historic buildings and cultural landmarks are vulnerable to structural damage from ice accumulation, freeze-thaw cycles, and water intrusion.

4.10.4.3 People

All people residing in Galt may be at risk of impact from severe winter storms from extreme cold temperatures and high snowfall. Residents who are elderly, disabled, or economically disadvantaged are at heightened risk during winter events due to limited access to reliable heating, transportation, and emergency services. Many older homes lack adequate insulation or backup power sources, making them susceptible to dangerously low indoor temperatures during prolonged power outages caused by ice storms.

Low-income households may struggle to afford increased heating costs or to repair damage from burst pipes and frozen infrastructure. Individuals who rely on electric-powered medical equipment face life-threatening challenges when outages occur. Additionally, rural isolation can delay emergency response times, leaving residents without timely access to medical care or warming centers.

4.10.4.4 Structures and Systems

Structures and systems can be damaged or impaired by loss of electricity from overhead power line damages, which can cause water pipes to burst. Additionally, winter storms cause moderate damage to structures and crops.

4.10.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.11 TERRORISM

For detailed information on terrorism in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.11.1 LOCATION AND EXTENT

The entire planning area has a low potential for terrorist activity. However, there are areas with increased risk such as large events, schools, religious organizations, and government facilities. For more information on the location and extent of terrorism, please refer to the base plan.

4.11.2 PREVIOUS OCCURRENCES

There have not been any large-scale enemy attacks or acts of radiological terrorism in Iowa. There have been biological and chemical agent threats, animal rights activists' vandalism and many bomb threats. For more information on previous occurrences in Wright County, please refer to the base plan.

4.11.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for terrorism in Galt is **Unlikely**.

4.11.4 VULNERABILITY ASSESSMENT

Within Galt, terrorism pose a **Medium** risk due to limited previous occurrences and the potential magnitude for such events. This section provides further contextualization for the anticipated vulnerability of Galt to terrorism. Galt's vulnerability to terrorism is less compared to the county as a whole due to a lower population at risk. For more information on the county's vulnerability assessment for terrorism, please refer to the base plan.

4.11.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.11.4.2 Cultural, Historic, and Natural Resources

In some cases, terrorist attacks may target certain natural, cultural, or historic resources to erase a community's identity such as museums, monuments, and other cultural sites. Additionally, use of destructive weapons may pollute natural resources and cause environmental degradation and damage the local environmental and ecosystems.

4.11.4.3 People

Terrorist attacks can have a physical impact as well as a psychological impact. Terrorist attacks can cause injuries and fatalities, as well as long-term psychological trauma. Depending on the nature of the attack, the broader community can be impacted and disrupt societal and economic functioning. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

Some acts of terrorism are hate-based and therefore individuals and communities from certain religions, nationalities, race, ethnicism, sexuality, and gender are at increased risk of attacks, injury, or even death. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

4.11.4.4 Structures and Systems

Potential losses could include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses, loss of human life, injuries to persons, loss of food supplies, disruption of the food supply chain, and immediate damage to the surrounding environment.

4.11.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.12 THUNDERSTORM/LIGHTNING/HAIL

For detailed information on thunderstorms, lightning, and hail in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.12.1 LOCATION AND EXTENT

Thunderstorms can impact the entire County with relatively similar frequency. Although these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. Iowa experiences 40 storms per year in the northwest portion of the state and 60 per year in the southeast portion. For more information on the location and extent of thunderstorms, lightning, and hail, please refer to the base plan.

4.12.2 PREVIOUS OCCURRENCES

The NCDC reported 233 total thunderstorm events for the Wright County planning area from 1965 through October 2025. Three of those events have occurred in Galt. For more information on previous occurrences in Wright County, please see the base plan.

4.12.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for thunderstorm/lightning/hail in Galt is **Highly Likely**.

4.12.4 VULNERABILITY ASSESSMENT

Within Galt, thunderstorm/lightning/hail pose a **Medium** risk due to a high likelihood of future occurrences. This section provides further contextualization for the anticipated vulnerability of Galt to thunderstorm/lightning/hail. Galt's vulnerability to thunderstorm/lightning/hail is less compared to the county as a whole due to a lower population at risk. For more information on the county's vulnerability assessment for thunderstorm/lightning/hail, please refer to the base plan.

4.12.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.12.4.2 Cultural, Historic, and Natural Resources

Severe storms can significantly impact natural, historic, and cultural resources within Wright County. Natural areas such as wetlands, forests, and river systems are vulnerable to erosion, flooding, and contamination from stormwater runoff. However, these ecosystems also serve as natural buffers that help absorb rainfall and reduce flood risk, but when damaged, they lose their protective function and biodiversity suffers.

Historic and cultural resources-including landmarks, cemeteries, monuments, and archaeological sites are also at risk. Many of these structures are older and not built to withstand high winds or flooding. Storms can cause irreversible damage to fragile materials, displace artifacts, and erode land around culturally significant sites.

4.12.4.3 People

All people residing in Galt may be at risk of impact from thunderstorms, lightning, and hail. Populations with limited access to safe housing, emergency services, or reliable communication systems are especially at risk. Vulnerable populations, such as the elderly, individuals with disabilities, and low-income households, may face greater challenges in preparing for, responding to, and recovering from storm events.

4.12.4.4 Structures and Systems

All structures and systems may be at risk of impact from thunderstorms, lightning, and hail. Most lightning damages occur to electronic equipment located inside buildings. Structural damage can also occur as a result of hail impacts and lightning strikes. In addition, hail and lightning strikes can cause significant damage to crops. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes.

4.12.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.13 TORNADO/WINDSTORM

For detailed information on tornadoes and windstorms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.13.1 LOCATION AND EXTENT

Iowa is located in a region of the United States where tornadoes are common. Although tornadoes most often occur in May and June, they can occur during any month, with activity typically peaking from mid-afternoon to around sunset. Tornadoes can occur anywhere in the County, including Galt. For more information on the location and extent of tornadoes and windstorms, please refer to the base plan. Additionally, all of Wright County is susceptible to high wind events. The County is located in Wind Zone IV, which is susceptible to winds up to 250 mph.

4.13.2 PREVIOUS OCCURRENCES

According to the NCDC database, there were 49 high wind events in Wright County from 1996 to October 2025. During this time period, there were no reported deaths or injuries. There was an estimated $1,395,210 in property damages. For more information on previous occurrences in Wright County, please refer to the base plan.

4.13.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for tornadoes and windstorms in Galt is **Highly Likely**.

4.13.4 VULNERABILITY ASSESSMENT

Within Galt, tornadoes and windstorms pose a **High** risk due to probability or future occurrences and magnitude. This section provides further contextualization for the anticipated vulnerability of Galt to tornado/windstorm. For more information on the county's vulnerability assessment for tornado/windstorm, please refer to the base plan.

4.13.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.13.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources are at risk of impact and damage from tornadoes and high wind events. Natural resources such as forests, wetlands, and wildlife habitats may be damaged or destroyed by high winds, flying debris, and uprooted vegetation. Historic and cultural resources, including landmarks, heritage buildings, cemeteries, and tribal sites, are particularly vulnerable due to their age, structural fragility, and irreplaceable value. Tornadoes may cause partial or total destruction of these assets, resulting in the loss of community identity, historical continuity, and tourism value.

4.13.4.3 People

All individuals residing in Galt are at risk of impact and casualty. Populations residing in structures not designed as storm shelters are inherently vulnerable to tornado hazards. This risk is especially elevated for individuals living in mobile homes, which statistically account for a disproportionate number of tornado-related fatalities and injuries due to their limited structural resilience.

4.13.4.4 Structures and Systems

All structures and systems are at risk of impact, damage, and disruption to systems. Tornadoes have caused widespread damage to homes, businesses, farms, and public infrastructure. Hundreds of residential structures have been destroyed or severely damaged, and critical facilities like schools, fire stations, and police departments are often left inoperable due to roof failures, debris impacts, and power outages.

4.13.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

4.14 TRANSPORTATION INCIDENT

For detailed information on transportation incidents in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Galt for all profiled hazards.

4.14.1 LOCATION AND EXTENT

Transportation incidents in Wright County can occur via trucks on the highways/roads, railways, and aircraft crashes. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. For more information on the location and extent of transportation incidents, please refer to the base plan.

Rail Transport

Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Grove. There are no main rail lines in Galt.

Air Freight

There are three airports in Wright County: Belmond, Clarion, and Eagle Grove. Hazardous materials incidents can occur within these three airports across the County. There are no airports in Galt.

4.14.2 PREVIOUS OCCURRENCES

There have been no reported rail, air, or other transportation incidents in Galt. For more information on previous occurrences in Wright County, please refer to the base plan.

4.14.3 PROBABILITY OF FUTURE OCCURRENCES

While documentation of previous occurrences is limited, it is known that vehicle crashes are relatively common events in virtually any community. Therefore, the probability of future occurrences for transportation incidents in Galt is considered **Highly Likely**.

4.14.4 VULNERABILITY ASSESSMENT

Within Galt, transportation incidents pose a **High** risk due to the number of transportation modalities and incidents that have occurred in the City. This section provides further contextualization for the anticipated vulnerability of the communities within Galt to transportation incident. For more information on the county's vulnerability assessment for transportation incidents, please refer to the base plan.

4.14.4.1 Critical Facilities

There are no critical facilities identified by the City of Galt which would be vulnerable to this hazard.

4.14.4.2 Cultural, Historic, and Natural Resources

Transportation accidents, whether involving vehicles, rail, or aircraft, can pose serious threats to natural, cultural, and historical resources in Wright County. These incidents may result in direct physical damage, environmental contamination, or long-term degradation of sites that hold historical or cultural significance.

4.14.4.3 People

Transportation-related incidents involving passenger vehicles, aircraft, or rail systems pose significant risks to public safety and infrastructure. These events can result in a spectrum of consequences, from minor property damage to mass casualty incidents. The likelihood and severity of such accidents are influenced by factors including traffic volume, infrastructure condition, weather, and human error.

4.14.4.4 Structures and Systems

All structures and systems are essentially at risk of damage and disruption due to the nearby transportation incidents. These events can cause physical damage, disrupt operations or access, and injure workers.

4.14.4.5 Changes in Development

Overall, population in the City of Galt has increased in recent years, although this increase is small and not anticipated to noticeably impact the community's overall vulnerability. Future development is not expected to significantly impact the planning area's vulnerability to this hazard.

5. MITIGATION STRATEGY

The Mitigation Strategy section of the base plan provides an overall blueprint for all participating jurisdictions in Wright County to become less vulnerable to its identified hazards and the findings and conclusions of the Capability and Risk Assessments. As established in the base plan, the overall goals of the Wright County mitigation strategy are consistent across all participating municipalities.

This section provides community-specific strategies for Galt, including the status of actions that were included in the previous plan and actions to be considered or pursued over the next five years. As noted in the base plan, the participants are not committing to undertaking every action suggested in this list but rather are proposing an extensive list of *potential* actions that they may wish to pursue, depending on the availability of funding. **Table 4** details the mitigation actions identified for the City of Galt, and **Table 5** details the mitigation actions identified for the entire County, known as Countywide Actions.

TABLE 4. UPDATED 2026 GALT MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Galt - 1	Correct deficiencies, remediate violations and re-apply to FEMA NFIP program by adopting mandatory floodplain management regulations.	River Flooding	Not started	City Council	County EMA	General Funds	$100,000 to $500,000	2-3 years	H

TABLE 5. 2026 COUNTYWIDE ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA - 1	Encourage residents to purchase weather radios to stay informed on emergency information.	All Hazards	Continue In-Progress	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	1 year	M
CWA - 2	Increase coordination with regional and state agencies for early warning and monitoring of animal, plant, and crop disease	Animal/plant/crop disease	New	Environmental Health	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), USDA	Little or no cost	Ongoing	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA - 3	Educate residents on water saving techniques and water conservation	Drought	New	County EMA , Participating Jurisdictions	Public Media	General Funds	Little or No Cost	1 year	L
CWA – 4	Promote tree planting in areas with low vegetation to increase shade coverage.	Extreme Heat	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	Ongoing	M
CWA – 5	Improve drainage infrastructure in areas where flash flooding frequently occurs.	Flash Flood	New	County EMA	Participating Jurisdictions	General Funds	$100,000 to $500,000	Ongoing	H
CWA – 6	Promote defensible landscape for homes, businesses and entities within WUI areas.	Grass and Wildland Fire	New	County EMA	Participating Jurisdictions	General Funds	Little to No Cost	Ongoing	H
CWA – 7	Promote wetland restoration to reduce flooding impacts across the County.	River Flooding	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$100,000 to $500,000	Ongoing	H
CWA – 8	Promote snow safety to residents on how to prevent pipe breaks in their homes (e.g., insulating outdoor faucets, drip warm water from an indoor faucet) and what to do if a pipe breaks.	Severe Winter Storm	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	Little to No Cost	Ongoing	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 9	Conduct Countywide trainings to practice responding to hazardous materials incidents.	Hazardous Materials	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA -10	Promote flu clinics across the County	Human Disease	New	County EMA , Participating Jurisdictions	County Public Health	CDC Grants, General Funds	$10,000 to $50,000	Ongoing	M
CWA – 11	Promote Tree Trimming across the County to prevent fallen trees on infrastructure.	Infrastructure Failure	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	2-3 years	M
CWA – 12	Conduct Countywide trainings to practice responding to terrorist incidents.	Terrorism	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA – 13	Conduct Countywide trainings to practice responding to transportation incidents.	Transportation Incident	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA - 14	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Thunderstorm/Lightning/Hail	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M
CWA – 15	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Tornado/Windstorm	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M

1.INTRODUCTION AND PLANNING PROCESS

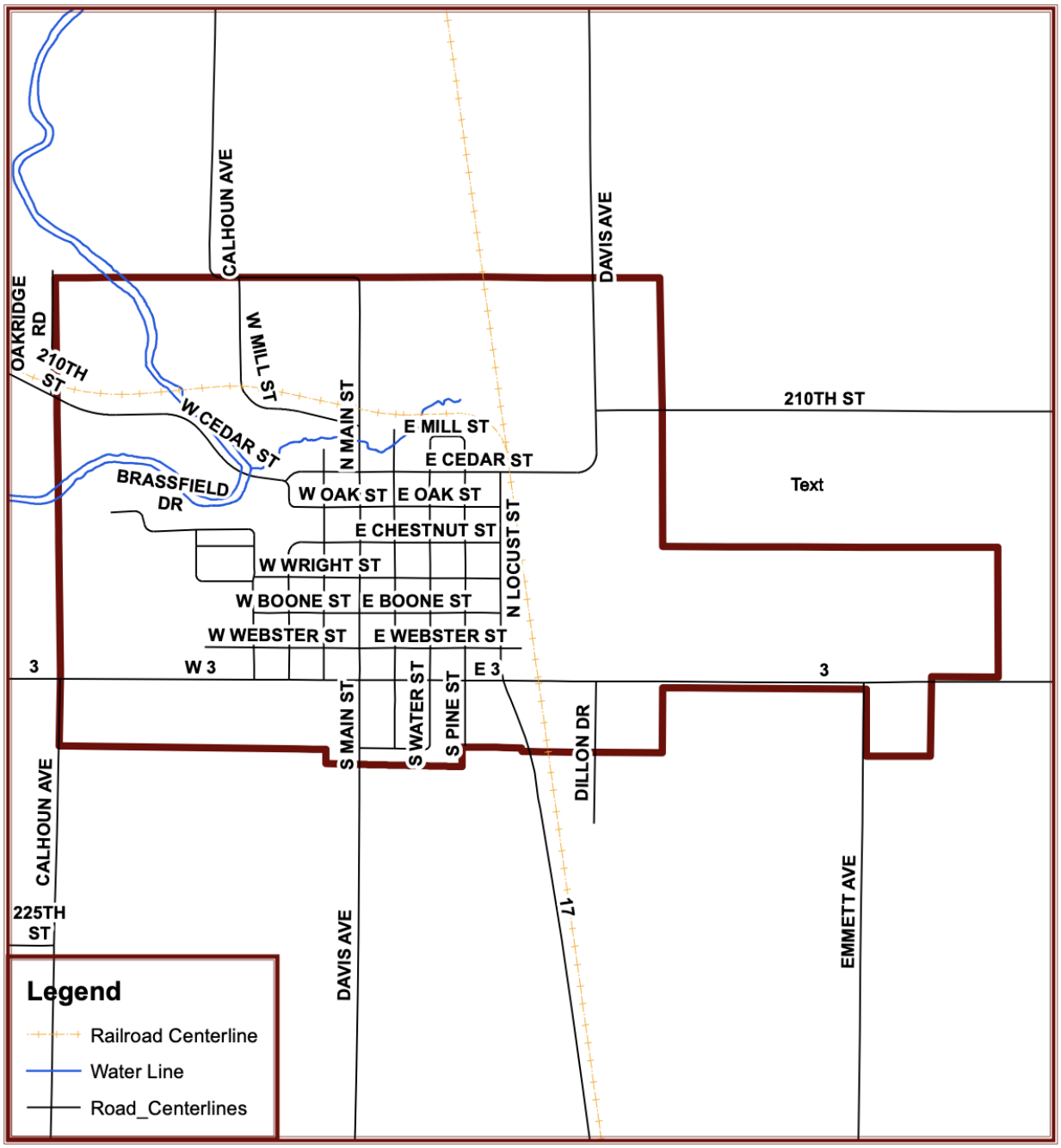
This annex provides more detailed information about the City of Goldfield. This annex includes the following:

- A more localized community profile, including more detailed mapping, population and demographic information, and critical facilities information
- City-level Hazard Identification and Risk Assessment (HIRA) information, including some more localized hazard maps and conclusions related to hazard risk and how it varies across the planning area
- A localized vulnerability assessment, including the likely impact of profiled hazards on critical facilities
- A detailed capability assessment, describing resources and tools available to the City to participate in hazard mitigation and reduce hazard risk
- A mitigation strategy, describing a variety of actions the City may opt to take to reduce the risk associated with profiled hazards over the useful life of this plan

2. COMMUNITY PROFILE

The City of Goldfield is a small City within Wright County, Iowa. The city covers an area of 1.19 square miles and, according to the most recent Census, has a population of 636 people. **Figure 1** displays the City of Goldfield.

FIGURE 1. CITY OF GOLDFIELD



2.1 POPULATION AND DEMOGRAPHICS

According to the US Census Bureau, Goldfield's population decreased by 3% between 2010 and 2023. As a result, the overall vulnerability of Goldfield resulting from population and demographic trends has slightly decreased due to fewer individuals exposed to hazards. **Table 1** shows the population trends over time for the City of Goldfield. **Table 2** shows additional demographic data. The median household income for the city is $53,492 and 13.2% of the population live below the poverty level. This is higher than the poverty rate across Wright County (11%) and the United States (10.6%).

TABLE 1. POPULATION TRENDS

JURISDICTION	2010 CENSUS POPULATION	2016 POPULATION ESTIMATE	2023 CENSUS POPULATION	% CHANGE 2010-2023
Goldfield	635	607	616	-3%

Sources: U.S. Census Bureau: 2010 Decennial Census, 2016 Population Estimates, 2020 Decennial, and 2023 American Community Survey, 5-year Estimates.

TABLE 2. DEMOGRAPHIC DATA

JURISDICTION	POPULATION 18YEARS AND OVER	UNEMPLOYMENT RATE (2025)	MEDIAN HOUSEHOLD INCOME	PERCENT BELOW POVERTY LEVEL
Goldfield	517	-	$53,492	13.2%

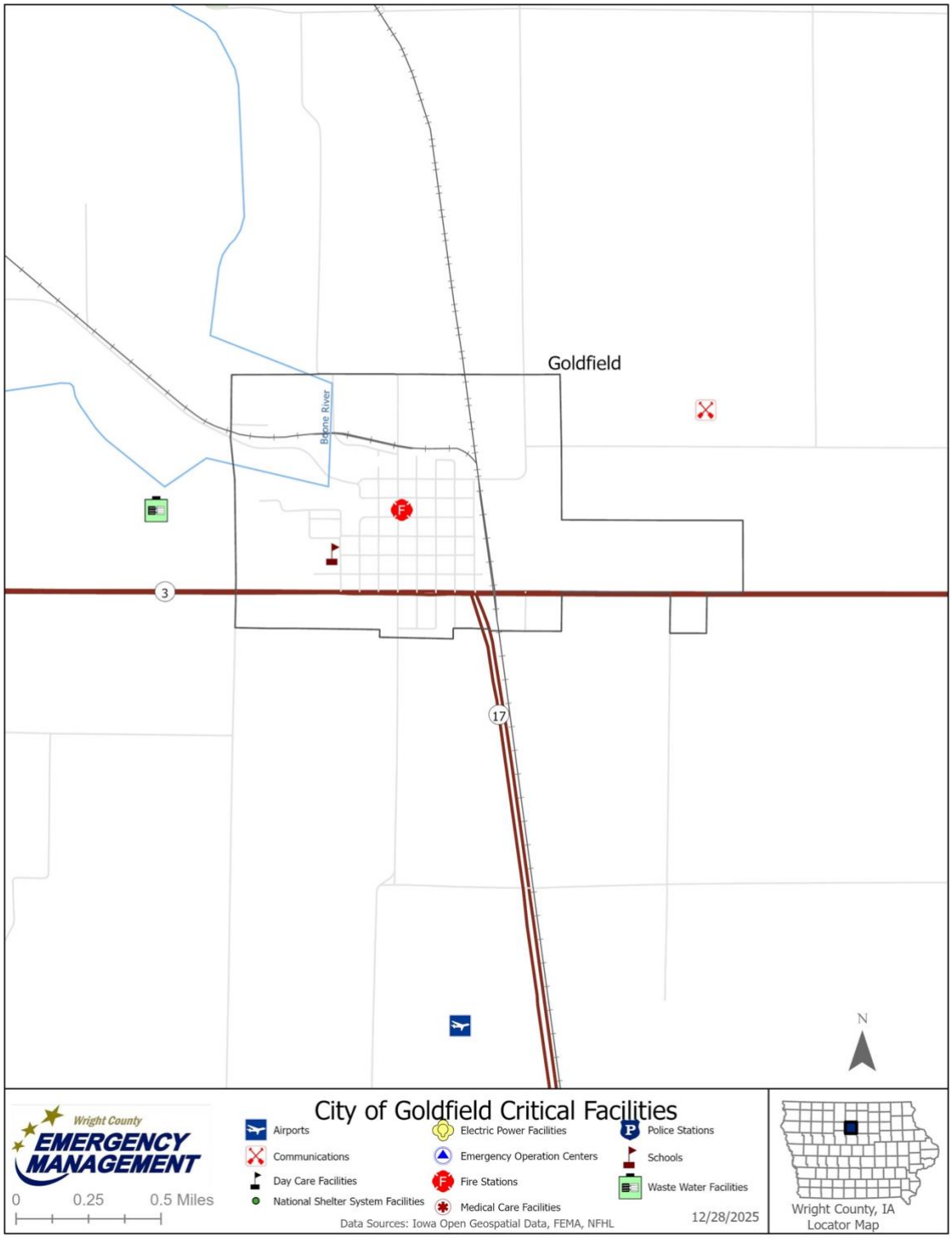
Source: U.S. Census, 2023 American Community Survey, 5-year Estimates

The median age in Clarion is 42.9 years old, and about 4.8% of the population speak a language other than English at home (lower than the statewide average of 9.7%). Other languages spoken at home include Spanish and other Indo-European languages. About 25.5% of the population have a bachelor's degree, lower than the Iowa average (32%). There are 305 housing units within the city, 259 of which are occupied. Additionally, 19.2% of the population has a disability which is higher than average across Iowa of 12.9%.

2.2 CRITICAL FACILITIES

Critical facilities are the systems and structures that are essential to a jurisdiction's continued functioning, the failure of which would cause significant disruption. **Figure 2** displays the critical facilities within Goldfield. There are two critical facilities within Goldfield (a day care facility and a fire station) and three directly outside City limits (a wastewater facility, a communications facility, and an airport).

FIGURE 2. CRITICAL FACILITIES MAP



2.3 LAND USE AND DEVELOPMENT

The City of Goldfield has limited development occurring within the jurisdiction. In 2006, a 50 million gallon per year ethanol plant was built in Goldfield by Central Iowa Renewable Energy LLC. The project brought approximately 40 new jobs to the community. According to the US Census Bureau, the number of housing units in Goldfield has decreased by 13% since 2010, and there is limited development occurring elsewhere in the City. As a result, the overall vulnerability of Goldfield has decreased since the previous plan due to fewer structures being exposed to hazards.

2.4 NATURAL, HISTORIC, AND CULTURAL RESOURCES

The City of Goldfield has one historic place according to the National Register of Historic Places which is The Boone River on Buchanan Avenue. Parks in the City include Old School Park and River Park.

3. CAPABILITY ASSESSMENT

The capability assessment evaluates a jurisdiction's ability to implement a comprehensive mitigation strategy and identifies opportunities to establish or strengthen mitigation policies, programs, and projects. More generalized information about the goals of the capability assessment, including the process and methodology, is presented in the Capability Assessment portion of the base plan.

This section articulates specific information about the capabilities of Goldfield which include the following:

- Planning mechanisms
- Regulatory tools and programs
- Staff and technical capabilities
- Fiscal and other mechanisms
- Floodplain management and regulation

3.1 PLANNING MECHANISMS

Table 3 describes the planning mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Goldfield has a Capital Improvement Plan (CIP), Comprehensive Plan, Critical Facilities Plan, Emergency Operations Plan (EOP), County Hazard Mitigation Plan, and Land Use Plan. In order to increase this capability, the City may seek to implement additional plans such as a Continuity of Operations Plan and Disaster Recovery Plan. These plans can support the City in maintaining City operations and recovering from disasters in the future.

TABLE 3. PLANNING MECHANISMS

PLANNING MECHANISMS	CITY OF GOLDFIELD
Capital Improvement Plan (CIP)	Yes
Comprehensive Plan	Yes
Community Wildfire Protection Plan (CWPP)	No
Comprehensive Emergency Management Plan (CEMP)	No
Critical Facilities Plan	Yes
General Plan	No
Continuity of Operations Plan (COOP)	No
Debris Management Plan	Yes
Disaster Recovery Plan	No
Economic Development Plan	Yes
Emergency Operations Plan (EOP)	Yes
Environmental Impact Report (EIR)	No
Evacuation Plan	No

PLANNING MECHANISMS	CITY OF GOLDFIELD
Flood Response Plan	No
Floodplain Management Plan/Flood Mitigation Plan	Yes
Hazard Mitigation Plan	Yes
Historic Preservation Plan	No
Land Use Plan	Unknown
Natural Resource Protection Plan (NRPP)	No
Open Space Management Plan	No
Transportation Plan	No
Threat Hazard Identification and Risk Assessment (THIRA)	No
Watershed Plan	No

3.2 REGULATORY TOOLS AND PROGRAMS

Table 4 describes the regulatory tools and programs that the jurisdiction has in place to support hazard mitigation. Currently, the City of Goldfield has adopted building codes and floodplain management ordinances as well as other stormwater management and subdivision regulations and ordinances. In order to increase this capability, the City may seek to update their building codes and engage with community programs such as a Community Emergency Response Team (CERT).

TABLE 4. REGULATORY TOOLS AND PROGRAMS

REGULATORY TOOLS AND PROGRAMS	CITY OF GOLFIELD
Building Codes	Yes
Citizen Corps – Community Emergency Response Team (CERT)	No
Community Rating System (CRS Program of the NFIP)	No
Emergency Management Accreditation Program (EMAP)	No
Fire Code	No
Firewise Community	No
Floodplain Management/Flood Damage Prevention Ordinance	Yes
Land Use/Development Planning	Yes
National Flood Insurance Program (NFIP)	Yes

REGULATORY TOOLS AND PROGRAMS	CITY OF GOLFIELD
Post Disaster Redevelopment/Reconstruction Plan/Ordinance	No
Storm Ready	No
Stormwater Management Plan/Ordinance	Yes
Subdivision Regulations/Ordinance	Yes
Unified Development Ordinance	No
Zoning Ordinance	Yes

3.3 STAFF AND TECHNICAL CAPABILITIES

Table 5 describes the staff and technical capabilities that the jurisdiction has in place to support hazard mitigation. Currently, the City of Goldfield indicated that they do not have any staff and technical resources. In order to increase this capability, the City may seek to increase the number of specialized staff to support hazard mitigation.

TABLE 5. STAFF AND TECHNICAL CAPABILITIES

STAFF AND TECHNICAL CAPABILITES	CITY OF GOLDFIELD
Emergency Manager	No
Engineers or professional trained in construction practices related to buildings and/or infrastructure	No
Environmental Justice Specialists	No
Fiscal Management or Procurement Specialists	No
Floodplain Manager	Wright County Planning and Zoning Administrator
Housing Specialist(s)	No
Land Surveyors	No
Land Use/Management/Development Planning	No
Planners or engineers with an understanding of natural and/or human caused hazards	No
Recreation/Green Space Specialist(s)	No
Resource Development Staff or Grant Writing	No
Scientists familiar with the hazards of the community	No
Staff experienced with Geographic Information Systems (GIS) or HAZUS	No

STAFF AND TECHNICAL CAPABILITES	CITY OF GOLDFIELD
Staff with education or expertise to assess the community's vulnerability to hazards	No
Transportation Manager/Traffic Engineer	No

3.4 FISCAL AND OTHER MECHANISMS

Table 6 describes the fiscal and other mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Goldfield has applied for many grants and implemented several fees and bonds to generate funds. To improve this capability, the City may look to continue to diversify its funding mechanisms and apply for grants such as the HSGP, IIJA, and USDA grants.

TABLE 6. FISCAL AND OTHER MECHANISMS

FISCAL AND OTHER MECHANISMS	CITY OF GOLFIELD
Capital Improvement Programming	Yes
Community Development Block Grants (CDBG)	Yes
Development Impact Fees	Yes - Building Permits
FEMA Hazard Mitigation Assistance Grants (HMPG, FMA, BRIC)	No
Gas/Electric Utility Fees	Yes
General Obligation, Revenue, and/or Special Tax Bonds	Yes
Homeland Security Grants (HSGP)	No
Infrastructure Investment and Jobs Act (IIHA)	No
Infrastructure State Revolving Fund Loan	No
Partnering Agreements or Intergovernmental Agreements	No
Sewer/Water Fees	Yes
Special Purpose Tax (or taxing districts)	No
Stormwater Utility Fees	No
USDA Grants	No
USDA Rural Development Agency Grants	No
US Economic Development Administration Grants	No

3.5 FLOODPLAIN MANAGEMENT AND REGULATION

Table 7 describes the National Floodplain Insurance Program (NFIP) capabilities of the City of Goldfield. Currently, the City participates in the NFIP and has adopted and enforces floodplain management regulations and ordinances.

TABLE 7. FLOODPLAIN MANAGEMENT AND REGULATION

NFIP CAPABILITIES	CITY OF GOLDFIELD
Has your community adopted a floodplain management ordinance that meets NFIP minimum criteria?	Yes
Has your community adopted the latest effective Flood Insurance Rate Map (FIRM)?	Yes – 2/20/2013
Do you regulate/permit development in the Special Food Hazard Area (SFHA)?	Yes
Which position or agency is in charge of NFIP compliance for your community?	Wright County Planning and Zoning Administrator
How do you implement the substantial improvement/substantial damage provisions of your floodplain management ordinance?	Through development review and permitting

4. HAZARD IDENTIFICATION AND RISK ASSESSMENT

The Hazard Identification and Risk Assessment (HIRA) process, described in more detail in the HIRA section of the base plan, involves identifying potential hazards, evaluating their likelihood and potential consequences, and estimating and describing the level of risk these hazards present to a community.

As described in the "HIRA Methodology" section of the base plan, participants in this plan update reconsidered the relative risk posed by the profiled hazards by conducting a hazard ranking process. **Table 8** below provides a summary of how those hazards were ranked in the City of Goldfield. Each of the 14 natural and manmade hazards discussed in this section are described in more detail in the HIRA section of the base plan. This section endeavors to provide more detailed, local-level information, mapping, and conclusions for these hazards wherever relevant.

TABLE 8. GOLDFIELD HAZARD RANKING

JURISDICTION	ANIMAL/CROP/PLANT DISEASE	DROUGHT	EXTREME HEAT	FLASH FLOOD	GRASS OR WILDLAND FIRE	HAZARDOUS MATERIALS	HUMAN DISEASE	INFRASTRUCTURE FAILURE	RIVER FLOODING	SEVERE WINTER STORM	TERRORISM	THUNDERSTORM/LIGHTNING/HAIL	TORNADO/WINDSTORM	TRANSPORTATION INCIDENT
Goldfield	M	H	M	M	L	M	M	H	H	H	M	M	H	H

4.1 ANIMAL/PLANT/CROP DISEASE

For detailed information on animal, plant, and crop disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.1.1 LOCATION AND EXTENT

All of Wright County is subject to animal/livestock incidents and agricultural infestations, which include the City of Goldfield. For more information on the location and extent of animal, plant, and crop disease, please refer to the base plan.

4.1.2 PREVIOUS OCCURRENCES

There are no previous occurrences that have been reported to impact the City of Goldfield specifically. For more information on previous occurrences in Wright County, please refer to the base plan.

4.1.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for animal/plant/crop/disease in Goldfield is **Unlikely**.

4.1.4 VULNERABILITY ASSESSMENT

Within Goldfield, animal/plant/crop disease poses a **Medium** risk due to limited previous occurrences and impact to the City yet potential to cause economic instability. Goldfield's vulnerability to animal/plant/crop disease does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for animal/plant/crop disease, please refer to the base plan.

4.1.4.1 Critical Facilities

Animal, plant, and crop diseases have limited impact on critical facilities due to the hazard directly impacting animals, plants, and crops and related industries.

4.1.4.2 Cultural, Historic, and Natural Resources

Sensitive crops are those that are more susceptible to stress from environmental factors such as weather and crop diseases. There are several areas within Wright County that have sensitive crops and would be more vulnerable to disease. There are three locations within the City of Goldfield.

4.1.4.3 People

Animal, plant, and crop diseases can impact the population through food supply chain disruptions, increased food prices, local unemployment, and potential health impacts from zoonotic diseases such Highly Pathogenic Avian Influenza (HPAI).

4.1.4.4 Structures and Systems

Buildings, infrastructure, and critical facilities are not vulnerable to this hazard. Its impacts are primarily economic and environmental, rather than structural.

4.1.4.5 Changes in Development

Overall, population in the City of Goldfield has decreased over the past several years. However, agriculture has increased, which could increase risk of crop diseases impacting the local economy.

Future development is not expected to significantly impact the planning area's vulnerability to this hazard. However, according to the 2022 USDA Census, Wright County has increased farm acreage and sales. If crop production and numbers of animals/livestock increases, the amount vulnerable to infestation also increases.

4.2 DROUGHT

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.2.1 LOCATION AND EXTENT

All of Wright County is subject to drought as drought normally is more of a widespread hazard and not isolated. For more information on the location and extent of drought, please refer to the base plan.

4.2.2 PREVIOUS OCCURRENCES

According to the National Drought Mitigation Center's Drought Impact Reporter, during the period from January 2007 through January 2026, nine droughts were reported to affect Wright County. Impacts of recent drought periods in Iowa that affected Wright County are provided below in section 4.2.4. Unless otherwise indicated, these impacts are from the National Climatic Data Center. For more information on previous occurrences in Wright County, please refer to the base plan.

4.2.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for drought in Goldfield is **Highly Likely**.

4.2.4 VULNERABILITY ASSESSMENT

Within Goldfield, drought poses a **High** risk due to potential impacts, largely to public health, agriculture, and the local economy. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to drought. Goldfield's vulnerability to drought does not vary significantly from the risk of the county as a whole. For more information on the vulnerability of Wright County to drought, please refer to the base plan.

4.2.4.1 Critical Facilities

The operation of all critical facilities in Goldfield may be impacted by drought if extreme drought conditions lead to water shortages.

4.2.4.2 Cultural, Historic, and Natural Resources

All natural resources within the City can lead to stressed vegetation, tree mortality, soil compaction, erosion and loss of habitat or shade due to drought. Drought may also erode cultural and historic resources within Goldfield as well.

4.2.4.3 People

All people residing in Goldfield may be impacted by Drought. Drought presents hazards to public health in extreme cases, where drinking water production cannot keep up with demand. Increased water demand may increase water rates and create financial hardship, especially for individuals and families living below poverty. In Goldfield, 13.2% of residents live below the poverty line. Additionally, the elderly and young children may be at greater risk of experiencing adverse health effects resulting from reduced water quality.

4.2.4.4 Structures and Systems

Areas associated with agricultural use are vulnerable to drought conditions which could result in a decrease in crop production or a decrease in available grazing area for livestock. Drought has minimal effect on houses and buildings. In severe prolonged droughts, structures could be impacted through cracks in

foundations, which can comprise the integrity and safety of the building. Additional impact to structures could include risk to landscaping and dried vegetation which can exacerbate urban fire and wildfire risk.

4.2.4.5 Changes in Development

Overall, population in the City of Goldfield has slightly decreased over the past 16 years, which may decrease risk.

4.3 EXTREME HEAT

For detailed information on extreme heat in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.3.1 LOCATION AND EXTENT

All of Wright County is subject to extreme heat as it is normally more of a widespread hazard and not isolated. For more information on the location and extent of extreme heat, please refer to the base plan.

4.3.2 PREVIOUS OCCURRENCES

The following summarizes the National Weather Service Advisories, Watches, and Warnings for Heat or Excessive Heat in Wright County from 2000 to 2025 (25 years of data). For more information on previous occurrences in Wright County, please refer to the base plan.

- 46 Heat Advisories
- 2 Extreme Heat Watches
- 8 Excessive Heat Watches
- 7 Excessive Warnings

4.3.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for extreme heat in Goldfield is **Likely**.

4.3.4 VULNERABILITY ASSESSMENT

Within Goldfield, extreme heat poses a **Medium** risk due to high likelihood of future occurrence and magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to extreme heat. Goldfield's vulnerability to extreme heat does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for extreme heat, please refer to the base plan.

4.3.4.1 Critical Facilities

Extreme heat can significantly affect all critical facilities by compromising the structural integrity and operational reliability of critical facilities and infrastructure. During extreme heat events, it is likely that food, hydration, and shelter, as well as health and medical lifelines would be disrupted.

4.3.4.2 Cultural, Historic, and Natural Resources

Prolonged high temperatures and drought conditions can stress ecosystems, reduce biodiversity, and increase the risk of wildfires, especially in forested and agricultural areas. These changes threaten native species and disrupt ecological balance. Some historic buildings were built before the invention of central air conditioning and may lack proper cooling, posing risk to their inhabitants. Cultural traditions and outdoor events may be disrupted due to unsafe heat conditions, reducing community engagement and tourism.

4.3.4.3 People

All people residing in Goldfield may be at risk of impact, especially heat-related illnesses, depending on the severity of extreme heat events. Those at greatest risk for heat-related illness and deaths include people 65 years of age and older, people who are overweight, and people who are ill or on certain

medications. Wright County's population over 65 years is higher than the national and state average at 20.9 percent.

4.3.4.4 Structures and Systems

All structures and systems may be at risk of impacts depending on the severity of extreme heat events. Extreme heat can cause a strain on electricity delivery infrastructure which can be overloaded during peak use of electricity to power air conditioning during extreme heat events. Increased electricity use can increase rates and cause financial hardships, especially for individual and families living under poverty. In Goldfield, 13.2% of residents live in poverty.

4.3.4.5 Changes in Development

Overall, population in the City of Goldfield has slightly decreased over the past 16 years, which may decrease risk.

4.4 FLASH FLOOD

For detailed information on flash flood in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.4.1 LOCATION AND EXTENT

Wright County includes two major tributaries of the Mississippi River, including the Boone River and the upper portion of the Iowa River. The Boone Watershed intercepts the entire western and central portion of Wright County and is an area of gently flat to rolling hills. For more information on the location and extent of flash flood risk, please refer to the base plan.

4.4.2 PREVIOUS OCCURRENCES

There have been two reported flash flood events in Goldfield. For more information on previous occurrences within Wright County, please refer to the base plan. **Table 9** provides a summary of the NCDC data.

TABLE 9. NCDC WRIGHT COUNTY, IOWA FLASH FLOOD EVENTS SUMMARY, 1997-JUNE 2025

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
GOLDFIELD	8/28/07	$10,000	$10000
GOLDFIELD	9/23/16	$10,000	$0

Source: NCDC

4.4.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for flash flood in Goldfield is **Highly Likely**.

4.4.4 VULNERABILITY ASSESSMENT

Within Goldfield, flash flood poses a **Medium** risk due to a highly likely probability of occurrences and moderate damages to property and crops for the County. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to flash flood. Goldfield's vulnerability to flash flood does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for flash flood, please refer to the base plan.

4.4.4.1 Critical Facilities

Critical facilities in low lying areas may be at risk of impact from flash flood events. Critical facilities, such as hospitals, emergency operations centers, fire stations, schools, nursing homes, and water treatment plants, face varying levels of risk from flash flood events depending on their location, structural resilience, and operational readiness.

4.4.4.2 Cultural, Historic, and Natural Resources

Cultural, historic, and natural resources in low lying areas may be at risk of impact from flash flood events. Flooding can cause significant damage to Wright County's natural, historic, and cultural assets. Natural areas such as wetlands, forests, and waterways may experience erosion, pollution, and habitat loss,

reducing their ecological value and ability to buffer future flood events. These changes can also affect recreational and conservation areas. Historic buildings and cultural landmarks are at risk of structural damage, deterioration, and loss of historically significant materials. Flooding may also disrupt cultural traditions tied to specific locations or community spaces.

4.4.4.3 People

People residing in low lying areas may be at risk of impact from flash flood events. Flooding presents a serious risk to residents across Wright County, particularly in low-lying areas with a history of flood events. Populations most at risk include older adults, low-income families, and individuals without access to flood insurance, lack of accessible emergency alert and notifications, or reliable transportation.

4.4.4.4 Structures and Systems

Structures and systems in low lying areas may be at risk of impact from flash flood events. Flash flooding can quickly flood any low-lying structures and systems that are inundated. These damages can cause costly repairs for state, county, and city road/bridge maintenance departments. When sewer back-up occurs, this can result in costly clean-up for home and business owners as well as present a health hazard.

4.4.4.5 Changes in Development

Overall, population in the City of Goldfield has slightly decreased over the past 16 years, which may decrease risk.

4.5 GRASS OR WILDLAND FIRE

For detailed information on grass or wildland fire in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

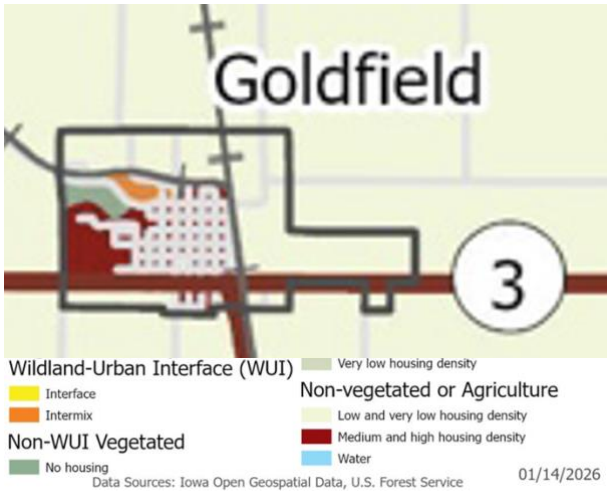
4.5.1 LOCATION AND EXTENT

Wildland and grass fires are most likely to occur in the Wildland Urban Interface (WUI). This is the area where houses meet or intermingle with undeveloped wildland vegetation. Within the WUI, there are two specific areas identified:

- Interface
- Intermix

The interface areas are those areas that abut wildland vegetation and the intermix areas are those areas that intermingle with wildland areas. **Figure 3** shows the WUI areas within Goldfield. For more information on the location and extent of grass or wildland fire, please refer to the base plan.

FIGURE 3. GOLDFIELD WUI AREAS



4.5.2 PREVIOUS OCCURRENCES

According to the National Fire Incident Reporting System (NFIRS), there has been one fire incident in Wright County since 2017 near Cornelia. For more information on previous occurrences within Wright County, please refer to the base plan.

4.5.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for grass or wildland fire in Goldfield is **Possible**.

4.5.4 VULNERABILITY ASSESSMENT

Within Goldfield, grass or wildland fire pose a **Low** risk due to low prevalence of WUI areas and limited previous occurrences. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to grass or wildland fire. Goldfield's vulnerability to grass and wildland fires

is lower than the risk of the county as a whole. For more information on the vulnerability assessment for grass or wildland fires, please refer to the base plan.

4.5.4.1 Critical Facilities

There are no critical facilities in Goldfield that are within the WUI areas (Interface and Intermix). Critical facilities across the county may be vulnerable to disruption or damage from WUI fires, particularly those located near forested or undeveloped areas. These facilities include emergency operations centers, fire stations, hospitals, schools, water treatment plants, power substations, and communication infrastructure.

4.5.4.2 Cultural, Historic, and Natural Resources

Wildfire in Wildland-Urban Interface (WUI) areas can pose a risk to the County's natural, historic, and cultural resources. Wildfires can degrade ecosystems by destroying native vegetation, fragmenting wildlife habitats, and increasing soil erosion and water pollution. Smoke and airborne pollutants also impact air quality, affecting both environmental and human health. Culturally and historically significant sites, such as cemeteries and historic buildings, are vulnerable to direct fire damage and indirect impacts from suppression efforts and post-fire erosion.

4.5.4.3 People

Populations across Wright County face varying degrees of vulnerability to WUI fires, depending on factors such as proximity to wildland areas, housing density, socioeconomic conditions, and access to emergency services.

4.5.4.4 Structures and Systems

Structure and systems in WUI areas may be at risk of impact from grass and wildland fires. Wildfires can be responsible for extensive damage to crops, the environment and occasionally residential or business facilities. Homes built in rural areas are more vulnerable since they are in closer proximity to land that is burned, and homeowners are more likely to burn trash and debris in rural locations like Goldfield.

4.5.4.5 Changes in Development

Overall, population in the City of Goldfield has slightly decreased over the past 16 years, which may decrease risk.

4.6 HAZARDOUS MATERIALS INCIDENTS

For detailed information on hazardous materials in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.6.1 LOCATION AND EXTENT

Fixed Hazardous Materials Incident

According to the Iowa Department of Natural Resources, there are 44 sites in Wright County that because of the volume or toxicity of the materials on site were designated as Tier II Facilities under the Superfund Amendments and Reauthorization Act. Within Goldfield there are four Tier II facilities. For more information on the location and extent of hazardous materials risk, please refer to the base plan.

Transportation Hazardous Materials Incident

The transport of hazardous materials in Wright County can occur via trucks on the highways/roads and airplanes carrying hazardous cargo. Hazardous materials can be transported on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. In Goldfield, Highway 3 runs through the City and is at risk of transportation hazardous materials incidents.

Rail Transport

Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Gove. The UP railroad does not run through Goldfield.

Air Freight

There are no airports within Goldfield.

Pipeline Incident

There are no pipeline that runs through the City of Goldfield, however there are pipelines located nearby and could impact residents of the City.

4.6.2 PREVIOUS OCCURRENCES

From 2017 to 2024, there were 61 hazardous materials spills reported to the Environmental Protection Agency (EPA) within Goldfield. There are no other types of hazardous materials incidents that have been reported to have occurred in Goldfield. For more information on previous occurrences within Wright County, please refer to the base plan.

4.6.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for hazardous materials in Goldfield is **Likely**.

4.6.4 VULNERABILITY ASSESSMENT

Within Goldfield, hazardous materials pose a **Medium** risk due to the number of previous occurrences and presence of Tier II facilities in the City. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to hazardous materials. Goldfield's vulnerability to hazardous materials does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for hazardous materials, please refer to the base plan.

4.6.4.1 Critical Facilities

There are several critical facilities near transportation corridors and Tier II facilities within Goldfield. Hazardous materials incidents can disrupt operations, damage infrastructure, and endanger occupants, especially in facilities that house vulnerable populations like the elderly or children. Additionally, facilities without proper ventilation systems, backup power, or shelter-in-place protocols are more susceptible to contamination and operational failure during a HazMat event.

4.6.4.2 Cultural, Historic, and Natural Resources

HazMat incidents pose significant risks to natural, historic, and cultural resources across Wright County. These resources include wetlands, rivers, forests, historic buildings, archaeological sites, and culturally significant landmarks. A chemical spill or airborne release can contaminate soil and water, damage ecosystems, and degrade the physical integrity of historic structures. Natural resources such as wildlife habitats and water bodies are particularly vulnerable to long-term environmental damage, which can disrupt biodiversity and recreational use. Historic and cultural sites may suffer irreversible harm if exposed to corrosive or toxic substances, especially if they lack protective infrastructure or are located near transportation corridors or industrial zones.

4.6.4.3 People

Six injuries associated with hazmat incidents have been reported in Goldfield, and future incidents could cause further harm to people. Communities near major transportation routes, such as highways and rail lines, are at higher risk due to the frequent movement of hazardous substances. Industrial zones and agricultural areas with chemical storage facilities also present elevated risks of fixed-site incidents. These events can lead to chemical spills, fires, or airborne releases that threaten public health and safety.

Vulnerability is especially high among populations with limited mobility, such as the elderly, individuals with disabilities, and residents of schools, hospitals, and correctional facilities. These groups may face challenges during evacuation or shelter-in-place orders.

Additionally, low-income communities may struggle with access to protective equipment, transportation, and timely information, further increasing their vulnerability.

4.6.4.4 Structures and Systems

There have been 61 reported occurrences within Goldfield. While there is no information on how much damage those events caused, it is likely that hazard materials incidents have caused significant financial and physical damages.

It is difficult to determine the potential losses to existing development because of the variable nature of a hazardous materials spill. For example, a spill of a toxic airborne chemical in a populated area could have greater potential for loss of life. By contrast a spill of a very small amount of a chemical in a remote rural area would be much less costly and possibly limited to remediation of soil.

4.6.4.5 Changes in Development

Overall, population in the City of Goldfield has decreased over the past 16 years, which may reduce risk to people as fewer people reside in the City.

4.7 HUMAN DISEASE

For detailed information on human disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.7.1 LOCATION AND EXTENT

Pandemics and epidemics do not affect a single geographic location; all of Wright County is equally vulnerable. Transmission can occur anywhere people interact, but locations with higher numbers of individuals create more opportunities for disease to spread. For more information on the location and extent of human disease, please refer to the base plan.

4.7.2 PREVIOUS OCCURRENCES

Pandemics and epidemics have had recurring and widespread effects on the County and across the world. While some events have been global in scale and others more localized, each has highlighted the vulnerability of the community to infectious disease and underscored the importance of preparedness and coordinated response. Since 1918, there have been six major epidemics or pandemics that are widely recognized by both the CDC and WHO, in addition to the COVID-19 pandemic. For more information on previous occurrences within Wright County, please refer to the base plan.

4.7.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for human disease in Goldfield is **Possible**.

4.7.4 VULNERABILITY ASSESSMENT

Within Goldfield, human disease poses a **Medium** risk due to low probability yet high risk to significantly impact the City. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to human disease. Goldfield's vulnerability to human disease does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for human disease, please refer to the base plan.

4.7.4.1 Critical Facilities

Infectious disease outbreaks can significantly disrupt the operation of critical facilities in Wright County. Healthcare facilities, including hospitals, clinics, and long-term care centers, are particularly vulnerable due to increased patient loads, limited surge capacity, and potential shortages of staff and medical supplies. These facilities must maintain continuity of operations while implementing infection control measures, such as isolation protocols and PPE usage.

Other essential facilities, such as emergency operations centers, law enforcement agencies, schools, and correctional institutions, may experience staffing shortages due to illness or quarantine, which can impair their ability to deliver vital services.

4.7.4.2 Cultural, Historic, and Natural Resources

Cultural institutions may be closed or operate at reduced capacity during a pandemic. This can lead to decreased access to cultural resources for the public.

4.7.4.3 People

Wright County faces notable vulnerabilities during a human infectious disease event due to a combination of environmental, healthcare, and socioeconomic factors. Transmission risks are heightened by close human

contact, contaminated surfaces, and limited access to sanitation in some areas. Populations most at risk include the elderly, immuno-compromised individuals, and frontline workers.

The county's rural nature may limit healthcare surge capacity, making it harder to manage widespread outbreaks. Risk will vary based on geographical vaccination efforts and vaccination uptake by communities and individuals, if available. Additionally, insurance, access to healthcare, as well as trust in the medical community can determine risk to population which can increase infection rates, hospitalizations, and mortality. [1] Additionally, due to the high percentage of individuals living in poverty, Goldfield may be more at risk to health impacts from human disease.

4.7.4.4 Structures and Systems

Infectious disease events can significantly impact critical infrastructure and systems, especially in rural and resource-limited areas. Healthcare facilities may face strain due to increased patient loads, limited surge capacity, and potential shortages of personal protective equipment (PPE), isolation space, and trained personnel.

4.7.4.5 Changes in Development

Overall, population in the City of Goldfield has decreased over the past 16 years, which may reduce risk to people as fewer people reside in the City.

[1] https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems

4.8 INFRASTRUCTURE FAILURE

For detailed information on infrastructure failure in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.8.1 LOCATION AND EXTENT

The entire planning area is at risk to all types of infrastructure failure, either from primary failure due to malfunction, degradation, or accidental or intentional damage, or as a secondary impact of another hazard event. For more information on the location and extent of infrastructure failure, please refer to the base plan.

4.8.2 PREVIOUS OCCURRENCES

Infrastructure failure often occurs as a secondary impact to other hazard events. In addition to failure/impacts as a result of other hazard events, infrastructure failure can also occur as a result of lack of maintenance, human error, and age deterioration. There have been no significant infrastructure failures reported in Wright County.

4.8.3 PROBABILITY OF FUTURE OCCURRENCES

Even though there have been no significant infrastructure failures, small and local-impact-level failures are commonplace throughout the country. For this reason, the probability of future occurrences for infrastructure failure in Goldfield is **Highly Likely**.

4.8.4 VULNERABILITY ASSESSMENT

Within Goldfield, infrastructure failure poses a **High** risk due to a high likelihood of future occurrence and potential high magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to infrastructure failure. Goldfield's vulnerability to infrastructure failure does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for infrastructure failure, please refer to the base plan.

4.8.4.1 Critical Facilities

All critical facilities within Goldfield may be all risk of impacts such as damage and disruption to services from infrastructure failure.

4.8.4.2 Cultural, Historic, and Natural Resources

Infrastructure failure has a limited impact to natural, historic, and cultural resources. Secondary impacts of infrastructure failures such as fires due to ruptured gas pipelines and contamination from wastewater, may pose a greater risk to these resources.

4.8.4.3 People

Infrastructure failure may impact all people within Goldfield due to the range of infrastructure failures such as transportation, sewer, water, energy, and communications. Certain population may be at increased risk such as older adults, individuals medically dependent on electricity and those with certain medical conditions.

4.8.4.4 Structures and Systems

Since utility/infrastructure failure is generally a secondary or cascading impact of other hazards, it is not possible to quantify estimated potential losses specific to this hazard due to the variables associated with

affected population, duration of outages, etc. In some instances, failure of one system can impact others. For example, the loss of electricity may also lead to the loss of internet connectivity.

4.8.4.5 Changes in Development

Overall, population in the City of Goldfield has decreased over the past 16 years, which may reduce risk to people as fewer people reside in the City.

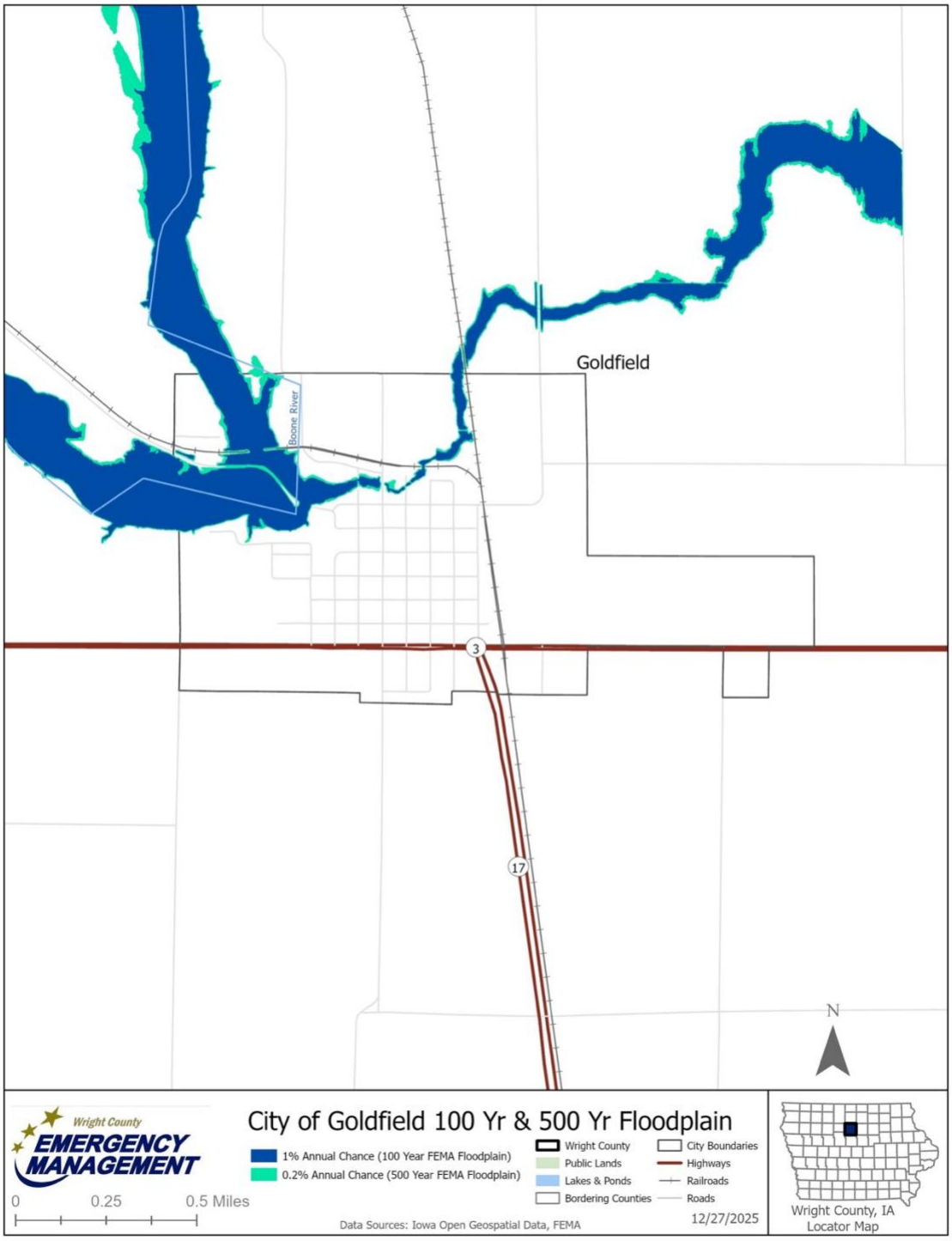
4.9 RIVER FLOODING

For detailed information on river flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.9.1 LOCATION AND EXTENT

Goldfield has both 100-year floodplains and 500-year floodplains, which are largely located in the northern part of the City. **Figure 4** displays both the 100-year and 500-year floodplains within Goldfield. For more information on the location and extent of river flooding, please refer to the base plan.

FIGURE 4. CITY OF GOLDFIELD 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN



4.9.2 PREVIOUS OCCURRENCES

There has been one flood event in Goldfield since 1997, in addition to the 25 countywide flood events, which did not cause any property or crop damage (see **Table 10**). For more information on previous occurrences in Wright County, please refer to the base plan.

TABLE 10. NCDC WRIGHT COUNTY, IOWA FLOOD EVENTS SUMMARY, 1997-JUNE 2025

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
GOLDFIELD	4/10/13	$0	$0

National Flood Insurance Program (NFIP) Participation

According to the Iowa Department of Natural Resources, there are no Repetitive Loss or Severe Repetitive Loss Properties in Wright County. **Table 11** provides details on NFIP participation for Goldfield as well as the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction, where applicable. The claims information is for the period from January 1, 1978 to Fall 202.

TABLE 11. NFIP PARTICIPATION, CURRENT, HISTORICAL POLICY AND CLAIM STATISTICS

COMMUNITY NAME	NFIP PARTICIPANT	CURR EFF MAP DATE	REG EMER DATE	POLICIES IN-FORCE	TOTAL COVERAGE	HISTORICAL CLAIMS	HISTORICAL TOTAL PAYMENTS
Goldfield	Yes	2/20/2013-M	2/20/2013	1	$350,000.00	1	$2,369.00

4.9.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for river flooding in Goldfield is **Highly Likely**.

4.9.4 VULNERABILITY ASSESSMENT

Within Goldfield, river flooding pose a **High** risk due to high likelihood of future occurrence and the potential magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to river flooding. For more information on the vulnerability assessment for river flooding, please refer to the base plan.

4.9.4.1 Critical Facilities

There are no critical facilities within the 100-year and 500-year floodplain within the City of Goldfield.

4.9.4.2 Cultural, Historic, and Natural Resources

Please reference the flash flood section on potential impacts to natural, historic and cultural resources.

4.9.4.3 People

To estimate population displaced by a 1-percent annual chance flood, the number of residential structures impacted was multiplied by the average household size for each jurisdiction.

According to the HAZUS Level 2 analysis, there would be a total of one residential structure impacted and an estimated two people displaced. **Table 12** provides more detail.

TABLE 12. ESTIMATED DISPLACED POPULATION

JURISDICTION	RESIDENTIAL STRUCTURES IMPACTED	AVERAGE HOUSEHOLD SIZE	ESTIMATED DISPLACED POPULATION
Goldfield	1	2.15	2

4.9.4.4 Structures and Systems

Table 13. provides a summary of potential flood losses and impacted population for the 1-percent annual chance flood.

TABLE 13. POTENTIAL FLOOD LOSS ESTIMATES, 1-PERCENT ANNUAL CHANCE FLOOD

JURISDICTION	PROPERTY TYPE	IMPROVED PARCEL COUNTS	IMPROVED LOSSES	CONTENT LOSSES	INVENTORY LOSSES	TOTAL LOSSES
Goldfield	Agriculture	1	$693	$2,443	$2,976	$6,112
	Residential	1	$12,410	$7,000	$0	$19,410
	Total	**2**	**$13,103**	**$9,443**	**$2,976**	**$25,522**

4.9.4.5 Changes in Development

Overall, population in the City of Goldfield has decreased over the past 16 years, which may reduce risk to people as fewer people reside in the City.

4.10 SEVERE WINTER STORM

For detailed information on severe winter storm in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.10.1 LOCATION AND EXTENT

The entire state of Iowa is vulnerable to heavy snow, extreme cold temperatures and freezing rain. Generally, winter storms occur between the months of November and March but can occur as early as October and as late as April. January has the highest monthly snowfall at about 9 inches of snow. For more information on the location and extent of severe winter storms, please refer to the base plan.

4.10.2 PREVIOUS OCCURRENCES

From 1996 through October 2025, the National Climatic Data Center reports the following 124 severe winter weather events impacting Goldfield:

- 34 - Blizzard
- 9 - Cold/Wind Chill
- 17 - Extreme Cold/Wind Chill
- 2 - Heavy Snow

For more information on previous occurrences in Wright County, please refer to the base plan.

4.10.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for severe winter storms in Goldfield is **Highly Likely**.

4.10.4 VULNERABILITY ASSESSMENT

Within Goldfield, severe winter storms pose a **High** risk due to the high likelihood of occurrence and magnitude. Goldfield's vulnerability to severe winter storms does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for severe winter storms, please refer to the base plan.

4.10.4.1 Critical Facilities

All critical facilities within Goldfield may be at risk of impacts and disruption to services due to extreme cold temperatures and high snowfall. Hospitals, emergency shelters, and water treatment plants may face operational challenges during prolonged outages or freezing conditions.

4.10.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources may be at risk to impact from severe winter weather. Severe winter weather can significantly impact the County's natural, historic, and cultural assets. Ice storms and freezing temperatures often damage forests, wetlands, and wildlife habitats, leading to tree loss, habitat disruption, and increased runoff pollution from de-icing agents. These environmental changes can have lasting effects on local ecosystems and water quality. Historic buildings and cultural landmarks are vulnerable to structural damage from ice accumulation, freeze-thaw cycles, and water intrusion.

4.10.4.3 People

All people residing in Goldfield may be at risk of impact from severe winter storms from extreme cold temperatures and high snowfall. Residents who are elderly, disabled, or economically disadvantaged are

at heightened risk during winter events due to limited access to reliable heating, transportation, and emergency services. Many homes in rural areas lack adequate insulation or backup power sources, making them susceptible to dangerously low indoor temperatures during prolonged power outages caused by ice storms.

Low-income households may struggle to afford increased heating costs or to repair damage from burst pipes and frozen infrastructure. Within Goldfield, 13.2% of individuals live in poverty. Individuals who rely on electric-powered medical equipment face life-threatening challenges when outages occur. Additionally, rural isolation can delay emergency response times, leaving residents without timely access to medical care or warming centers.

4.10.4.4 Structures and Systems

Structures and systems can be damaged or impaired by loss of electricity from overhead power line damages which can burst water pipes in homes with electricity. Additionally, these storms can cause moderate damages to structures and crops.

4.10.4.5 Changes in Development

Overall, population in the City of Goldfield has decreased over the past 16 years, which may reduce risk to people as fewer people reside in the City.

4.11 TERRORISM

For detailed information on terrorism in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.11.1 LOCATION AND EXTENT

The entire planning area has a low potential for terrorist activity. However, large events, schools, religious buildings, and government facilities may be at increased risk. For more information on the location and extent of terrorism, please refer to the base plan.

4.11.2 PREVIOUS OCCURRENCES

There have not been any terrorism events in Goldfield. For more information on previous occurrences in Wright County, please refer to the base plan.

4.11.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for terrorism in Goldfield is **Unlikely**.

4.11.4 VULNERABILITY ASSESSMENT

Within Goldfield, terrorism pose a **Medium** risk due to limited previous occurrences and the potential magnitude for such events. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to terrorism. Goldfield's vulnerability to terrorism does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for terrorism, please refer to the base plan.

4.11.4.1 Critical Facilities

Essentially all critical facilities are at risk of damage or disruption of services from terrorism. Terrorism can disrupt and damage critical facilities, which can cause public safety and public health concerns.

4.11.4.2 Cultural, Historic, and Natural Resources

In some cases, terrorist attacks may target certain natural, cultural, or historic resources to erase a community's identity such as museums, monuments, and other cultural sites. Additionally, use of destructive weapons may pollute natural resources and cause environmental degradation and damage the local environmental and ecosystems.

4.11.4.3 People

Terrorist attacks can have a physical impact as well as a psychological impact. Terrorist attacks can cause injuries and fatalities, as well as long-term psychological trauma. Depending on the nature of the attack, the broader community can be impacted and disrupt societal and economic functioning. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

4.11.4.4 Structures and Systems

Potential losses could include damaged facilities, lost economic opportunities for businesses, loss of human life, injuries to persons, loss of food supplies, disruption of the food supply chain, and immediate damage to the surrounding environment.

4.11.4.5 Changes in Development

Overall, population in the City of Goldfield has decreased over the past 16 years, which may reduce risk to people as fewer people reside in the City.

4.12 THUNDERSTORM/LIGHTNING/HAIL

For detailed information on thunderstorm, lightning, and hail in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.12.1 LOCATION AND EXTENT

Thunderstorms and the associated hail and lightning impact the entire County with relatively similar frequency. Although these events occur throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur in more densely developed areas as well as to cropland. Iowa experiences 40 storms per year in the northwest portion of the state and 60 per year in the southeast portion. For more information on the location and extent of thunderstorm, lightning, and hail, please refer to the base plan.

4.12.2 PREVIOUS OCCURRENCES

The NCDC reported 233 total thunderstorm events for the Wright County planning area from 1965 through October 2025. 12 of the thunderstorm events occurred in Goldfield. For more information on previous occurrences in Wright County, please reference the base plan.

4.12.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences of thunderstorm, lightning, and hail in Goldfield is **Highly Likely**.

4.12.4 VULNERABILITY ASSESSMENT

Within Goldfield, thunderstorm, lightning, and hail pose a **Medium** risk due to a high likelihood of future occurrences. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to this hazard. Goldfield's vulnerability does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for thunderstorm/lightning/hail, please refer to the base plan.

4.12.4.1 Critical Facilities

All critical facilities are at risk of impact from thunderstorm, lightning, and hail. Essential infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during severe storm events. In rural areas such as Wright County, this vulnerability is compounded by limited system redundancy and constrained emergency response capabilities, making recovery slower and impacts more severe.

4.12.4.2 Cultural, Historic, and Natural Resources

Severe storms can significantly impact natural, historic, and cultural resources within Wright County. Natural areas such as wetlands, forests, and river systems are vulnerable to erosion, flooding, and contamination from stormwater runoff. However, these ecosystems also serve as natural buffers that help absorb rainfall and reduce flood risk, but when damaged, they lose their protective function and biodiversity suffers.

Historic and cultural resources-including landmarks, cemeteries, monuments, and archaeological sites are also at risk. Many of these structures are older and not built to withstand high winds or flooding. Storms can cause irreversible damage to fragile materials, displace artifacts, and erode land around culturally significant sites.

4.12.4.3 People

All people residing in Goldfield may be at risk of impact from thunderstorm, lightning, and hail. Severe storms pose significant vulnerability to people, especially in Iowa, where atmospheric conditions frequently support the development of hazardous weather. This vulnerability stems from both direct physical threats and indirect social and economic impacts.

Populations with limited access to safe housing, emergency services, or reliable communication systems are especially at risk. Vulnerable populations, such as the elderly, individuals with disabilities, and low-income households, may face greater challenges in preparing for, responding to, and recovering from storm events. There have not been any fatalities in Wright County from lightning strikes.

4.12.4.4 Structures and Systems

All structures and systems may be at risk of impact from thunderstorms, lightning, and hail. Most lightning damages occur to electronic equipment located inside buildings. But structural damage can also occur when a lightning strike causes a building fire. In addition, lightning strikes can cause damages to crops if fields light on fire. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes.

4.12.4.5 Changes in Development

Overall, population in the City of Goldfield has decreased over the past 16 years, which may reduce risk to people as fewer people reside in the City.

4.13 TORNADO/WINDSTORM

For detailed information on tornado and windstorm in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.13.1 LOCATION AND EXTENT

Iowa is located in a part of the United States where tornadoes are a common occurrence. Most tornadoes occur in May and June but can occur during any month, and are most likely to occur between mid-afternoon and sunset. Tornadoes can occur anywhere throughout the County, including Goldfield. For more information on the location and extent of tornado and windstorms, please refer to the base plan.

All of Wright County and Goldfield is susceptible to high wind events. The County is located in Wind Zone IV, which is susceptible to winds up to 250 mph.

4.13.2 PREVIOUS OCCURRENCES

According to the NCDC database, there were 49 high wind events in Wright County from 1996 to October 2025, none of which occurred in Goldfield.

4.13.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for tornado/windstorm in Goldfield is **Highly Likely**.

4.13.4 VULNERABILITY ASSESSMENT

Within Goldfield, tornadoes and windstorms pose a **High** risk due to probability or future occurrences and magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to tornadoes and windstorms. Goldfield's vulnerability does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for tornadoes and windstorms, please refer to the base plan.

4.13.4.1 Critical Facilities

All critical facilities are at risk of impact and damage from tornadoes and high wind events. Essential infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during tornadoes. Tornadoes can disrupt critical infrastructure such as communications and energy due to high winds and debris.

4.13.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources are at risk of impact and damage from tornadoes and high wind events. Natural resources such as forests, wetlands, and wildlife habitats may be damaged or destroyed by high winds, flying debris, and uprooted vegetation. Historic and cultural resources, including landmarks, heritage buildings, cemeteries, and tribal sites, are particularly vulnerable due to their age, structural fragility, and irreplaceable value. Tornadoes may cause partial or total destruction of these assets, resulting in the loss of community identity, historical continuity, and tourism value.

4.13.4.3 People

All individuals residing in Goldfield are at risk of impact and casualty. Populations residing in structures not designed as storm shelters are inherently vulnerable to tornado hazards. This risk is especially elevated for individuals living in mobile homes, which account for a disproportionate number of tornado-related fatalities and injuries due to their limited structural resilience.

4.13.4.4 Structures and Systems

All structures and systems are at risk of impact, damage, and disruption. Tornadoes have caused widespread damage to homes, businesses, farms, and public infrastructure. Hundreds of residential structures have been destroyed or severely damaged, and critical facilities like schools, fire stations, and police departments are often left inoperable due to roof failures, debris impacts, and power outages.

4.13.4.5 Changes in Development

Overall, population in the City of Goldfield has decreased over the past 16 years which may reduce risk to people as fewer people reside in the City.

4.14 TRANSPORTATION INCIDENT

For detailed information on transportation incidents in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Goldfield for all profiled hazards.

4.14.1 LOCATION AND EXTENT

Transportation incidents are possible throughout Goldfield. In Goldfield, Highway 3 runs through the City and poses a particularly high risk. For more information on the location and extent of transportation incidents, please refer to the base plan.

Rail Transport

The Union Pacific Railroad (UP) is the sole rail operator in Wright County and its lines do not go through Goldfield

Air Freight

There are no airports in Goldfield, although one lies just outside of the city.

4.14.2 PREVIOUS OCCURRENCES

Low-level transportation incidents (automobile accidents) are common throughout the country. **Table 14** provides details of one air transportation incident in Goldfield between 1967 and 2024 (57 years) from the National Transportation Safety Board (NTSB). There have been no reported rail or other transportation incidents in Goldfield. For more information on previous occurrences in Wright County, please refer to the base plan.

TABLE 14. WRIGHT COUNTY AIRCRAFT INCIDENTS/ACCIDENTS (1967-2024)

EVENT DATE	LOCATION	INJURY SEVERITY	AIRCRAFT DAMAGE	MAKE	BROAD PHASE OF FLIGHT
05/28/1978	Goldfield, IA	Non-Fatal	Not Reported	Grumman	Not Reported

Source: http://www.ntsb.gov/_layouts/ntsb.aviation/index.aspx.

4.14.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for transportation incident in Goldfield is **Highly Likely**, with the primary threat coming from automobile accidents.

4.14.4 VULNERABILITY ASSESSMENT

Within Goldfield, transportation incidents pose a **High** risk due to the number of transportation modalities and incidents that have occurred in the City. This section provides further contextualization for the anticipated vulnerability of the communities within Goldfield to transportation incident. Goldfield's vulnerability to transportation incidents does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for transportation incidents, please refer to the base plan.

4.14.4.1 Critical Facilities

All critical facilities are essentially at risk of damage or disruption due to the nearby airport and possible plane crashes impacting the City and Highway 3. Transportation incidents can disrupt other critical infrastructure such as communications and energy due to damages.

4.14.4.2 Cultural, Historic, and Natural Resources

Transportation accidents, whether involving vehicles, rail, or hazardous material spills, can pose serious threats to natural, cultural, and historical resources in Wright County. These incidents may result in direct physical damage, environmental contamination, or long-term degradation of sites that hold historical or cultural significance.

4.14.4.3 People

Transportation-related incidents involving passenger vehicles and aircraft pose significant risks to public safety and infrastructure. These events can result in a spectrum of consequences, from minor property damage to mass casualty incidents. The likelihood and severity of such accidents are influenced by factors including traffic volume, infrastructure condition, weather, and human error.

4.14.4.4 Structures and Systems

All structures and systems are essentially at risk of damage and disruption due to the nearby airport and Highway 3. The County has several critical infrastructure and public services located near major transportation corridors. A transportation accident could have significant consequences for the County's structures and systems.

4.14.4.5 Changes in Development

Overall, population in the City of Goldfield has decreased over the past 16 years which may reduce risk to people as fewer people reside in the City.

5. MITIGATION STRATEGY

The Mitigation Strategy section of the base plan provides a blueprint for all communities within Wright County to become less vulnerable to the profiled hazards. As established in the base plan, the overall goals of the Wright County mitigation strategy are consistent across all participating municipalities.

This section provides community-specific strategies for Goldfield, including the status of actions that were included in the previous plan and actions to be considered or pursued over the next five years. As noted in the base plan, the participants are not committing to undertaking every action suggested in this list but rather are proposing an extensive list of *potential* actions that they may wish to pursue, depending on the availability of funding. **Table 15** details the mitigation actions identified for the City of Goldfield and **Table 16** details the mitigation actions identified for the entire County, known as Countywide Actions.

TABLE 15. UPDATED 2026 GOLDFIELD MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Goldfield - 1	Continue HazMat Operations training for fire fighters	Hazardous Materials	Continue In-Progress	Fire Chief	County EMA; Region V HazMat	General Funds	$10,000 to $50,000	2-3 years	M
Goldfield - 2	Continue Incident Command training for fire fighters	Hazardous Materials; Severe Winter Storm; Thunderstorm/ Lightning/Hail; Tornado/Winds torm; Human Disease; Infrastructure Failure; Transportation Incident; River Flooding	Continue In-Progress	Fire Chief; Mayor	County EMA; Region V HazMat	General Funds	Less than $10,000	3-5 years	L
Goldfield - 3	Continue weather spotters training	Thunderstorm/ Lightning/Hail; Tornado/Winds torm	Continue In-Progress	City Council; Fire Chief	Sheriff; County EMA	General Funds	Less than $10,000	3-5 years	L
Goldfield - 4	Continue as part of Region V HazMat	Hazardous Materials	Continue In-Progress	Fire Chief; EMA	County EMA	General Funds	$10,000 to $50,000	More than 5 years	L
Goldfield - 5	Keep HazMat kit in fire station	Hazardous Materials	Continue In-Progress	Fire Chief; Mayor	Region V HazMat Team	General Funds	$10,000 to $50,000	2-3 years	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Goldfield - 6	Offer flu clinic in town	Human Disease	Continue In-Progress	City Hall; Women's Club	County Public Health	General Funds	Less than $10,000	1 year	H
Goldfield - 7	Make list of locations which could serve as community shelter	Hazardous Materials; Severe Winter Storm; Thunderstorm/ Lightning/Hail; Tornado/Windstorm	Continue In-Progress	City Council; Fire Chief	County EMA; Community churches	General Funds	Less than $10,000	2-3 years	L
Goldfield - 8	Purchase gas detector for fire department	Hazardous Materials; infrastructure failure	Continue Not Started	City Council; Fire Chief	Mid-American Energy	General Funds	Less than $10,000	2-3 years	H
Goldfield - 9	Purchase fixed generators for Water Plant and Lift Station so that they will continue to operate when electricity fails.	Infrastructure Failure; River Flooding	Continue In-Progress	City Council	County EMA	General Funds	$10,000 to $50,000	2-3 years	H
Goldfield - 10	Enforce Floodplain Management Ordinance	River Flooding	Continue In-Progress	City Council	County EMA	General Funds	Less than $10,000	3-5 years	H
Goldfield - 11	Build Retaining wall around lift station	River Flooding; Flash Flood	New	Water Department	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA); General Funds	$100,000 to $500,000	3-5 years	M

TABLE 16. 2026 COUNTYWIDE ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA - 1	Encourage residents to purchase weather radios to stay informed on emergency information.	All Hazards	Continue In-Progress	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	1 year	M
CWA - 2	Increase coordination with regional and state agencies for early warning and monitoring of animal, plant, and crop disease	Animal/plant/crop disease	New	Environmental Health	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), USDA	Little or no cost	Ongoing	H
CWA - 3	Educate residents on water saving techniques and water conservation	Drought	New	County EMA , Participating Jurisdictions	Public Media	General Funds	Little or No Cost	1 year	L
CWA – 4	Promote tree planting in areas with low vegetation to increase shade coverage.	Extreme Heat	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	Ongoing	M
CWA – 5	Improve drainage infrastructure in areas where flash flooding frequently occurs.	Flash Flood	New	County EMA	Participating Jurisdictions	General Funds	$100,000 to $500,000	Ongoing	H
CWA – 6	Promote defensible landscape for homes, businesses and entities within WUI areas.	Grass and Wildland Fire	New	County EMA	Participating Jurisdictions	General Funds	Little to No Cost	Ongoing	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 7	Promote wetland restoration to reduce flooding impacts across the County.	River Flooding	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$100,000 to $500,000	Ongoing	H
CWA – 8	Promote snow safety to residents on how to prevent pipe breaks in their homes (e.g., insulating outdoor faucets, drip warm water from an indoor faucet) and what to do if a pipe breaks.	Severe Winter Storm	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	Little to No Cost	Ongoing	H
CWA – 9	Conduct Countywide trainings to practice responding to radiological incidents.	Hazardous Materials	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA -10	Promote flu clinics across the County	Human Disease	New	County EMA , Participating Jurisdictions	County Public Health	CDC Grants, General Funds	$10,000 to $50,000	Ongoing	M
CWA – 11	Promote Tree Trimming across the County to prevent fallen trees on infrastructure.	Infrastructure Failure	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	2-3 years	M
CWA – 12	Conduct Countywide trainings to practice responding to terrorist incidents.	Terrorism	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 13	Conduct Countywide trainings to practice responding to transportation incidents.	Transportation Incident	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA - 14	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Thunderstorm/Lightning/Hail	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M
CWA – 15	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Tornado/Windstorm	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M

1.INTRODUCTION AND PLANNING PROCESS

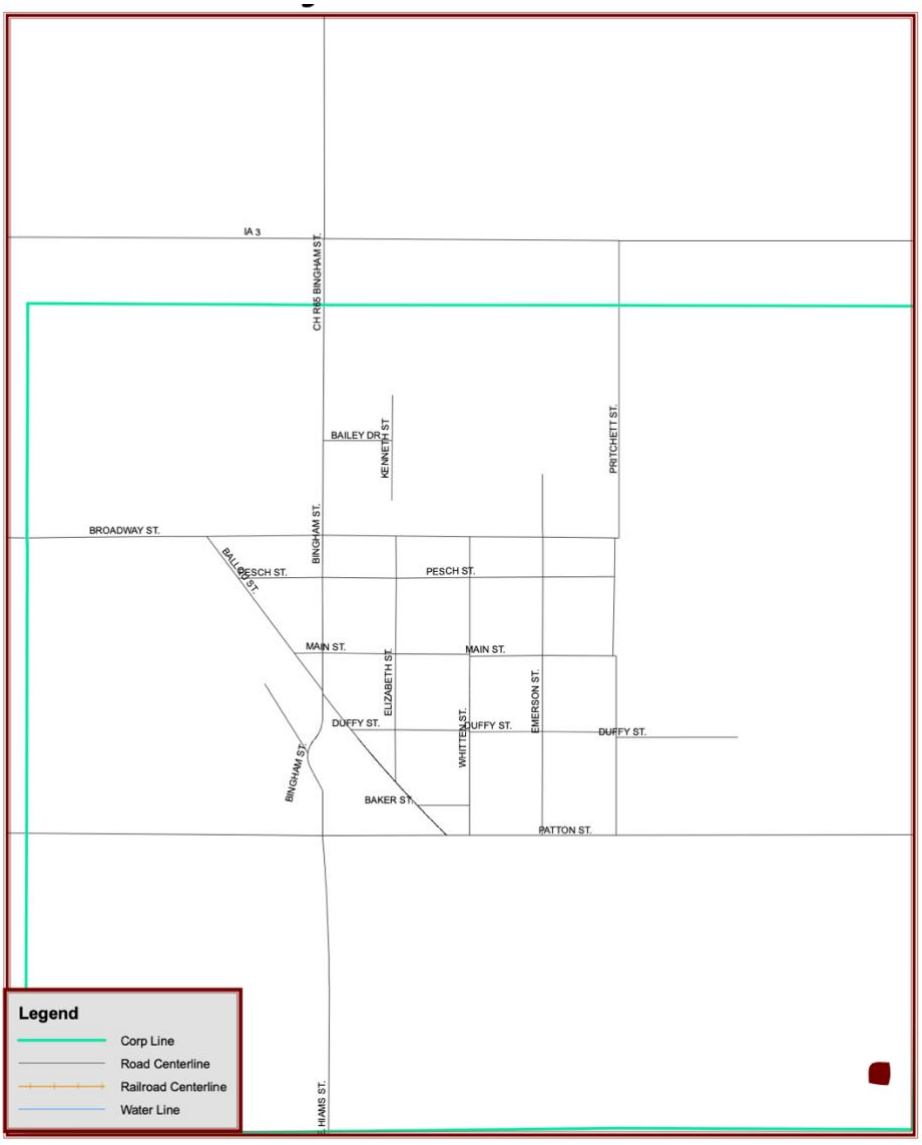
This annex provides more detailed information about the City of Rowan. This annex includes the following:

- A more localized community profile, including more detailed mapping, population and demographic information, and critical facilities information
- City-level Hazard Identification and Risk Assessment (HIRA) information, including some more localized hazard maps and conclusions related to hazard risk and how it varies across the planning area
- A localized vulnerability assessment, including the likely impact of profiled hazards on critical facilities
- A detailed capability assessment, describing resource and tools available to the City and to participate in hazard mitigation and reduce hazard risk
- A mitigation strategy, describing a variety of actions the City may opt to take to reduce the risk associated with profiled hazards over the useful life of this plan

2. COMMUNITY PROFILE

The City of Rowan is a small town located in Wright County, Iowa. The City of Rowan has one of the lowest populations within the County, with just over 200 residents. The City is located along Highway 3 and 7 miles east of Interstate 35 in the eastern portion of Wright County. The City is also a 10-mile commute to either Belmond or Clarion. **Figure 1** displays the boundaries of the City.

FIGURE 1. CITY OF ROWAN



2.1 POPULATION AND DEMOGRAPHICS

In order to properly plan and prepare a jurisdiction for future emergencies and disasters, it is important to know the community's characteristics and demographics. Over the past several decades the City's population has increased, and this increase generally means that the community's overall vulnerability is elevated due to more individuals being exposed to hazards. **Table 1** shows the population trends over time for the City of Rowan. **Table 2** shows some additional demographic data. The median household income for the City is $64,625 and 14.3% of the population live below the poverty level. For comparison, the County's poverty level is 11% and the U.S. national average is 10.6%.

TABLE 1. POPULATION TRENDS

JURISDICTION	2010 CENSUS POPULATION	2016 POPULATION ESTIMATE	2023 CENSUS POPULATION	% CHANGE 2010-2023
Rowan	158	157	209	32.28%

Source: U.S. Census Bureau: 2010 Decennial Census, 2016 Population Estimates, 2020 Decennial, 2023 American Community Survey, 5-year Estimates.

TABLE 2. DEMOGRAPHIC DATA

JURISDICTION	POPULATION 18YEARS AND OVER	UNEMPLOYMENT RATE (2025)	MEDIAN HOUSEHOLD INCOME	PERCENT BELOW POVERTYLEVEL
Rowan	143	-	$56,875	23.4%

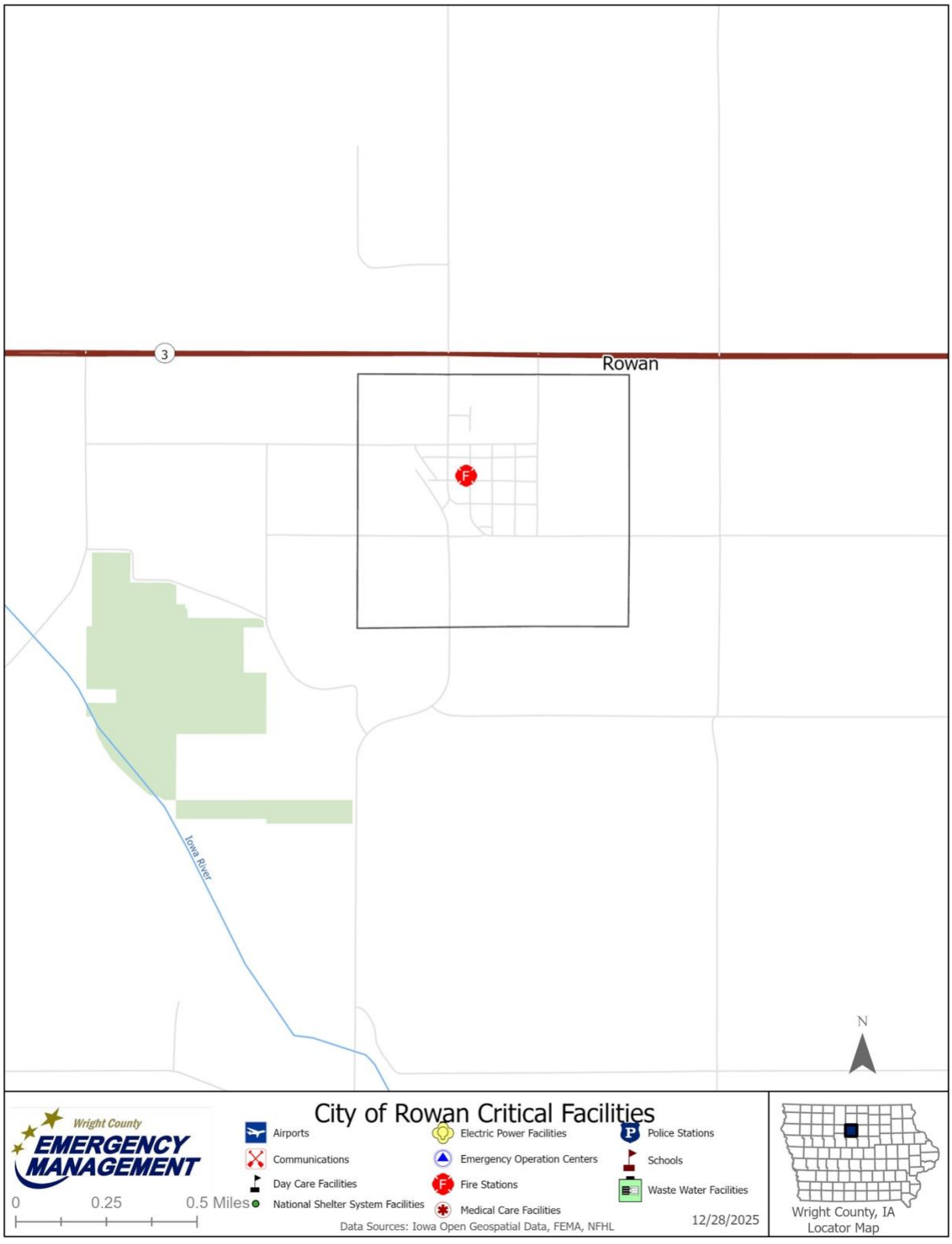
Source: U.S. Census, 2023 American Community Survey, 5-year Estimates

The median age in Rowan is 28.3 years old, younger than the Iowa state average of 39 years old. 8.7% of the population speak a language other than English at home which is lower than the State of Iowa at 9.7%. Spanish is the primary non-English language spoken at home. About 3.8% of the population have a bachelor's degree, which is much lower than the State of Iowa at 32%. There are 80 housing units within the City, 72 of which are occupied. Additionally, 19.4% of the population has a disability, which is higher than the State of Iowa at 12.9%.

2.2 CRITICAL FACILITIES

Critical facilities are the systems and structures that are essential to a jurisdiction's continued functioning, the failure of which would cause significant disruption. **Figure 2** displays the critical facilities within Rowan. There is one critical facility within Rowan.

FIGURE 2. CRITICAL FACILITIES MAP



2.3 LAND USE AND DEVELOPMENT

According to the US Census Bureau, the number of housing units in the City of Rowan decreased by 11.58% since 2010, and there are no significant commercial, industrial, or agricultural developments to report.

2.4 NATURAL, HISTORIC, AND CULTURAL RESOURCES

There are no reported historic resources in the City of Rowan according to the National Register of Historic Places. Cultural and natural resources in the city include the following:

- Iowa River Players Community Theater
- Rowan Community Building
- Rowan Public Library
- City Hall
- Community Center
- Bingham Park

3. CAPABILITY ASSESSMENT

The capability assessment evaluates a jurisdiction's ability to implement a comprehensive mitigation strategy, and identifies opportunities to establish or strengthen mitigation policies, programs, and capacities. More generalized information about the goals of the capability assessment, including the process and methodology, is presented in the Capability Assessment portion of the base plan.

This section articulates specific information about the capabilities of Rowan which include the following:

- Planning mechanisms
- Regulatory tools and programs
- Staff and technical capabilities
- Fiscal and other mechanisms
- Floodplain management and regulation

3.1 PLANNING MECHANISMS

Table 3 describes the planning mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Rowan does not have any planning mechanisms in place. In order to increase this capability the City may seek to implement plans such as a Comprehensive Plan or General Plan. Additionally, implementing a Debris Management Plan, Continuity of Operations Plan, and Disaster Recovery Plan as these plans can support the City in planning to remove debris, continu City operations, and recovering from disasters in the future.

TABLE 3. PLANNING MECHANISMS

PLANNING MECHANISMS	CITY OF ROWAN
Capital Improvement Plan (CIP)	No
Comprehensive Plan	No
Community Wildfire Protection Plan (CWPP)	No
Comprehensive Emergency Management Plan (CEMP)	No
Critical Facilities Plan	No
General Plan	No
Continuity of Operations Plan (COOP)	No
Debris Management Plan	No
Disaster Recovery Plan	No
Economic Development Plan	No
Emergency Operations Plan (EOP)	No
Environmental Impact Report (EIR)	No
Evacuation Plan	No

PLANNING MECHANISMS	CITY OF ROWAN
Flood Response Plan	No
Floodplain Management Plan/Flood Mitigation Plan	No
Hazard Mitigation Plan	No
Historic Preservation Plan	No
Land Use Plan	No
Natural Resource Protection Plan (NRPP)	No
Open Space Management Plan	No
Transportation Plan	No
Threat Hazard Identification and Risk Assessment (THIRA)	No
Watershed Plan	No

3.2 REGULATORY TOOLS AND PROGRAMS

Table 4 describes the regulatory tools and programs that the jurisdiction has in place to support hazard mitigation. Currently, the City of Rowan do not have any regulatory tools or programs. In order to increase this capability the City may seek to update their building codes and engage with community programs such as the Community Emergency Response Team (CERT).

TABLE 4. REGULATORY TOOLS AND PROGRAMS

REGULATORY TOOLS AND PROGRAMS	CITY OF ROWAN
Building Codes	No
Citizen Corps – Community Emergency Response Team (CERT)	No
Community Rating System (CRS Program of the NFIP)	No
Emergency Management Accreditation Program (EMAP)	No
Fire Code	No
Firewise Community	No
Floodplain Management/Flood Damage Prevention Ordinance	No
Land Use/Development Planning	No
National Flood Insurance Program (NFIP)	No – community does not have any Repetitive Loss (RL) or Severe Repetitive Loss (SRL) in its jurisdiction

REGULATORY TOOLS AND PROGRAMS	CITY OF ROWAN
Post Disaster Redevelopment/Reconstruction Plan/Ordinance	No
Storm Ready	No
Stormwater Management Plan/Ordinance	No
Subdivision Regulations/Ordinance	No
Unified Development Ordinance	No
Zoning Ordinance	No

3.3 STAFF AND TECHNICAL CAPABILITIES

Table 5 describes the staff and technical capabilities that the jurisdiction has in place to support hazard mitigation. Currently, the City of Rowan does not have any staff or technical capabilities available to support hazard mitigation. In order to increase this capability the City may seek to increase the number of specialized staff to support hazard mitigation.

TABLE 5. STAFF AND TECHNICAL CAPABILITIES

STAFF AND TECHNICAL CAPABILITES	CITY OF ROWAN
Emergency Manager	No
Engineers or professional trained in construction practices related to buildings and/or infrastructure	No
Environmental Justice Specialists	No
Fiscal Management or Procurement Specialists	No
Floodplain Manager	No
Housing Specialist(s)	No
Land Surveyors	No
Land Use/Management/Development Planning	No
Planners or engineers with an understanding of natural and/or human caused hazards	No
Recreation/Green Space Specialist(s)	No
Resource Development Staff or Grant Writing	No
Scientists familiar with the hazards of the community	No
Staff experienced with Geographic Information Systems (GIS) or HAZUS	No

STAFF AND TECHNICAL CAPABILITES	CITY OF ROWAN
Staff with education or expertise to assess the community's vulnerability to hazards	No
Transportation Manager/Traffic Engineer	No

3.4 FISCAL AND OTHER MECHANISMS

Table 6 describes the fiscal and other mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Rowan does not have any notable fiscal or other capabilities in place to realistically support hazard mitigation efforts. The ability to seek and manage mitigation funds can be critical to completing future mitigation projects. To improve this capability, the City may look to apply for grants.

TABLE 6. FISCAL AND OTHER MECHANISMS

FISCAL AND OTHER MECHANISMS	CITY OF ROWAN
Capital Improvement Programming	No
Community Development Block Grants (CDBG)	No
Development Impact Fees	No
FEMA Hazard Mitigation Assistance Grants (HMPG, FMA,PDM)	No
Gas/Electric Utility Fees	No
General Obligation, Revenue, and/or Special Tax Bonds	No
Homeland Security Grants (HSGP)	No
Infrastructure Investment and Jobs Act (IIJA)	No
Infrastructure State Revolving Fund Loan	No
Partnering Agreements or Intergovernmental Agreements	No
Sewer/Water Fees	No
Special Purpose Tax (or taxing districts)	No
Stormwater Utility Fees	No
USDA Grants	No
USDA Rural Development Agency Grants	No
US Economic Development Administration Grants	No

3.5 FLOODPLAIN MANAGEMENT AND REGULATION

Table 7 describes the National Floodplain Insurance Program (NFIP) Capability for the City of Rowan. Currently, the City does not participate in the NFIP and has been sanctioned since 1977.

TABLE 7. FLOODPLAIN MANAGEMENT AND REGULATION

NFIP CAPABILITIES	CITY OF ROWAN
Has your community adopted a floodplain management ordinance that meets NFIP minimum criteria?	No
Has your community adopted the latest effective Flood Insurance Rate Map (FIRM)?	No- Sanctioned 11/05/1977
Do you regulate/permit development in the Special Food Hazard Area (SFHA)?	No
Which position or agency is in charge of NFIP compliance for your community?	No
How do you implement the substantial improvement/substantial damage provisions of your floodplain management ordinance?	No

4. HAZARD IDENTIFICATION AND RISK ASSESSMENT

The Hazard Identification and Risk Assessment (HIRA) process, described in more detail in the HIRA section of the base plan, involves identifying potential hazards, evaluating their likelihood and potential consequences, and estimating and describing the level of risk these hazards present to a community.

As described in the "HIRA Methodology" section of the base plan, participants in this plan update reconsidered the relative risk posed by the profiled hazards by conducting a hazard ranking process. **Table 8** below provides a summary of how those hazards were ranked in the City of Rowan. Each of the 14 natural and manmade hazards discussed in this section are described in more detail in the HIRA section of the base plan. This section endeavors to provide more detailed, local-level information, mapping, and conclusions for these hazards wherever relevant.

TABLE 8. EAGLE GROVE HAZARD RANKING

JURISDICTION	ANIMAL/CROP/PLANT DISEASE	DROUGHT	EXTREME HEAT	FLASH FLOOD	GRASS OR WILDLAND FIRE	HAZARDOUS MATERIALS	HUMAN DISEASE	INFRASTRUCTURE FAILURE	RIVER FLOODING	SEVERE WINTER STORM	TERRORISM	THUNDERSTORM/LIGHTNING/HAIL	TORNADO/WINDSTORM	TRANSPORTATION INCIDENT
Rowan	M	H	M	M	L	M	M	H	M	H	M	M	H	H

4.1 ANIMAL/PLANT/CROP DISEASE

For detailed information on animal, plant, and crop disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.1.1 LOCATION AND EXTENT

All of Wright County is subject to animal/livestock incidents and agricultural infestations, which include the City of Rowan. For more information on the location and extent of animal, plant, and crop disease, please refer to the base plan.

4.1.2 PREVIOUS OCCURRENCES

There are no previous occurrences that have been reported to impact the City of Rowan specifically. For more information on previous occurrences in Wright County, please refer to the base plan.

4.1.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for animal/plant/crop/disease in Rowan is **Unlikely**.

4.1.4 VULNERABILITY ASSESSMENT

Within Rowan, animal/plant/crop disease poses a **Medium** risk due to limited previous occurrences and impact to the City yet potential to cause economic instability. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to animal/plant/crop disease. Rowan's vulnerability to animal/plant/crop disease does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for animal, plant, and crop disease, please refer to the base plan.

4.1.4.1 Critical Facilities

Animal, plant, and crop diseases have limited impact on critical facilities due to the hazard directly impacting animals, plants, and crops and related industries.

4.1.4.2 Cultural, Historic, and Natural Resources

Sensitive crops are those that are more susceptible to stress from environmental factors such as weather and crop diseases. There are several areas within Wright County that have sensitive crops and would be more vulnerable to disease, but there are no such locations within the City of Rowan.

4.1.4.3 People

Animal, plant, and crop diseases can impact the population through food supply chain disruptions, increased food prices, local employment, and potential health impacts from zoonotic diseases such Highly Pathogenic Avian Influenza (HPAI).

4.1.4.4 Structures and Systems

Buildings, infrastructure, and critical facilities are not vulnerable to this hazard. Its impacts are primarily economic and environmental, rather than structural.

4.1.4.5 Changes in Development

Overall, population in the City of Rowan has increased over the past several years. Agriculture has increased, which in turn could increase risk of crop diseases impacting the local economy.

4.2 DROUGHT

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.2.1 LOCATION AND EXTENT

All of Wright County is subject to drought as drought normally is generally a widespread hazard, not isolated. For more information on the location and extent of drought, please refer to the base plan.

4.2.2 PREVIOUS OCCURRENCES

According to the National Drought Mitigation Center's Drought Impact Reporter, during the period from January 2007 through January 2026, nine droughts were reported to affect Wright County. Impacts of recent drought periods in Iowa that affected Wright County are provided below. Unless otherwise indicated, these impacts are from the National Climatic Data Center. For more information on previous occurrences in Wright County, please refer to the base plan.

4.2.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for drought in Rowan is **Highly Likely**.

4.2.4 VULNERABILITY ASSESSMENT

Within Rowan, drought poses a **High** risk due to potential impacts, largely to public health, agriculture, and the local economy. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to drought. Rowan's vulnerability to drought does not vary significantly from the risk of the rest of the county. For more information on the vulnerability assessment for drought, please refer to the base plan.

4.2.4.1 Critical Facilities

All critical facilities in Rowan may be impacted by drought and by water shortages during extreme drought conditions.

4.2.4.2 Cultural, Historic, and Natural Resources

Drought can lead to stressed vegetation, tree mortality, soil compaction, erosion and loss of habitat or shade. Drought is not expected to substantively impact cultural or historic resources.

4.2.4.3 People

All people residing in Rowan may be impacted by Drought. Drought presents hazards to public health in extreme cases, where drinking water production cannot keep up with demand. Increased water demand may increase water rates and create financial hardship, especially for individuals and families living below poverty. In Rowan, 23.4% of residents live below the poverty line. Additionally, the elderly and young children may be at greater risk of experiencing adverse health effects resulting from reduced water quality.

4.2.4.4 Structures and Systems

Drought has minimal effects on houses and buildings. In severe prolonged droughts, structures could be impacted through cracks in foundation which can comprise the integrity and safety of a building. Additional impact to structures could include damage to landscaping and dried vegetation, which can execrate urban fire and wildfire risk.

4.2.4.5 Changes in Development

Overall, population in the City of Rowan has increased over the past several years which may increase risk. Increased water usage may strain the local water infrastructure in severe drought conditions.

4.3 EXTREME HEAT

For detailed information on extreme heat in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.3.1 LOCATION AND EXTENT

All of Wright County is subject to extreme heat as it is normally a widespread hazard. For more information on the location and extent of extreme heat, please refer to the base plan.

4.3.2 PREVIOUS OCCURRENCES

The following summarizes the National Weather Service Advisories, Watches, and Warnings for Heat or Excessive Heat in Wright County from 2000 to 2025 (25 years of data). For more information on previous occurrences in Wright County, please refer to the base plan.

- 46 Heat Advisories
- 2 Extreme Heat Watches
- 8 Excessive Heat Watches
- 7 Excessive Warnings

4.533 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for extreme heat in Rowan is **Likely**.

4.3.4 VULNERABILITY ASSESSMENT

Within Rowan, extreme heat poses a **Medium** risk due to high likelihood of future occurrence and magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to extreme heat. Rowan's vulnerability to extreme heat does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for extreme heat, please refer to the base plan.

4.3.4.1 Critical Facilities

All critical facilities may be at risk of impact depending on severity of extreme heat events. Extreme heat can significantly affect nearly all critical facilities by compromising their structural integrity and operational reliability. During extreme heat events, it is likely that food, hydration, and shelter, as well as health and medical lifelines would be disrupted.

4.3.4.2 Cultural, Historic, and Natural Resources

Prolonged high temperatures and drought conditions can stress ecosystems, reduce biodiversity, and increase the risk of wildfires, especially in forested and agricultural areas. These changes threaten native species and disrupt ecological balance. Some historic buildings were built before the invention of central air conditioning and may lack proper cooling, posing risk to its inhabitants. Cultural traditions and outdoor events may be disrupted due to unsafe heat conditions.

4.3.4.3 People

All people residing in Rowan may be at risk of impact, especially heat-related illnesses, depending on the severity of extreme heat events. Those at greatest risk for heat-related illness and deaths include people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. Wright County's population over 65 years is higher than the national and state average at 20.9 percent.

4.3.4.4 Structures and Systems

All structures and systems may be at risk of impacts depending on the severity of extreme heat events. Extreme heat can also cause a strain on electricity delivery infrastructure which can be overloaded during peak use of electricity to power air conditioning during extreme heat events. Increased electricity use can increase rates and cause financial hardships, especially for individuals and families living under poverty. In Rowan, 23.4% of residents live in poverty.

4.3.4.5 Changes in Development

Overall, population in the City of Rowan has increased over the past several years which may increase risk. Increase electricity usage may strain the local infrastructure during extreme heat events.

4.4 FLASH FLOOD

For detailed information on flash flood in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.4.1 LOCATION AND EXTENT

Wright County includes two major tributaries of the Mississippi River, including the Boone River and the upper portion of the Iowa River. The Boone Watershed intercepts the entire western and central portion of Wright County and is an area of gently flat to rolling hills. For more information on the location and extent of flash flood, please refer to the base plan.

4.4.2 PREVIOUS OCCURRENCES

Information from the NCDC was obtained from 1997 to June 2025 to determine previous occurrences for flash flood in the planning area. During this time period there were two reported flood incidents. No deaths or injuries were reported for any of the events. Since 1997 there have been $150,000 in property damage and $250,000 in crop damage related to flash flooding. **Table 9** provides a summary of the NCDC data. For more information on previous occurrences within Wrigth County, please refer to the base plan.

TABLE 9. NCDC WRIGHT COUNTY, IOWA FLASH FLOOD EVENTS SUMMARY, 1997-JUNE 2025

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
ROWAN	6/22/97	$100,000	$50,000
ROWAN	9/23/16	$50,000	$200,000

Source: NCDC

4.4.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for flash flood in Rowan is **Highly Likely**.

4.4.4 VULNERABILITY ASSESSMENT

Within Rowan, flash flood poses a **Low** risk due to a highly likely probability of occurrences and moderate damages to property and crop for the County. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to flash flood. Rowan's vulnerability to flash flood is lower than the risk to the county as a whole. For more information on the vulnerability assessment for flash flood, please refer to the base plan.

4.4.4.1 Critical Facilities

Critical facilities in low lying areas may be at risk of impact from flash flood events. Critical facilities, such as hospitals, emergency operations centers, fire stations, schools, nursing homes, and water treatment plants, face varying levels of risk from flash flood events depending on their location, structural resilience, and operational readiness.

4.4.4.2 Cultural, Historic, and Natural Resources

Cultural, historic, and natural resources in low lying areas may be at risk of impact from flash flood events. Flooding can cause significant damage to Wright County's natural, historic, and cultural assets. Natural

areas such as wetlands, forests, and waterways may experience erosion, pollution, and habitat loss, reducing their ecological value and ability to buffer future flood events. These changes can also affect recreational and conservation areas. Historic buildings and cultural landmarks are at risk of structural damage, deterioration, and loss of historically significant materials.

4.4.4.3 People

People residing in low lying areas may be at risk of impact from flash flood events. Flooding presents a serious risk to residents across Wright County, particularly in low-lying areas with a history of flood events. Populations most at risk include older adults, low-income families, and individuals without access to emergency alerts and notifications or reliable transportation.

4.4.4.4 Structures and Systems

Structures and systems in low lying areas may be at risk of impact from flash flood events. Flash flooding can quickly flood any low-lying structures and systems that are inundated. These damages can cause costly repairs for state, county, and city road/bridge maintenance departments. When sewer back-up occurs, this can result in costly clean-up for home and business owners as well as present a health hazard.

4.4.4.5 Changes in Development

Overall, population in the City of Rowan has increased over the past several years which may increase risk as more people reside in the City.

4.5 GRASS OR WILDLAND FIRE

For detailed information on grass or wildland fire in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

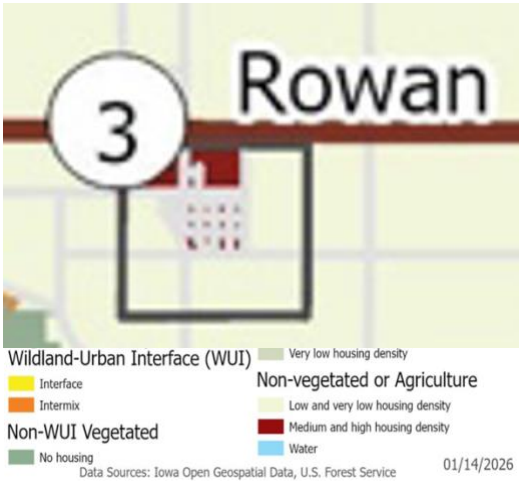
4.5.1 LOCATION AND EXTENT

Wildland/Grass fires are most likely to occur in the Wildland Urban Interface (WUI). This is the area where houses meet or intermingle with undeveloped wildland vegetation. Within the WUI, there are two specific areas identified:

- Interface
- Intermix

The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. **Figure 3** shows the WUI areas within Rowan. On the map, the orange represents Intermix areas and the yellow represents Interface areas. The red indicates medium and high housing density that is unrelated to wildfire risk. For more information on the location and extent of grass or wildland fire, please refer to the base plan.

FIGURE 3. ROWAN WUI AREAS



4.5.2 PREVIOUS OCCURRENCES

According to the National Fire Incident Reporting System (NFIRS), there has been one grass or wildland fire incident in Wright County since 2017, near Cornelia. For more information on previous occurrences within Wright County, please refer to the base plan.

4.5.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for grass or wildland fire in Rowan is **Possible**.

4.5.4 VULNERABILITY ASSESSMENT

Within Rowan, grass or wildland fire pose a **Medium** risk due to presence of WUI areas and limited previous occurrences. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to grass or wildland fire. Rowan's vulnerability to grass and wildland is lower

than the risk to the county as a whole. For more information on the vulnerability assessment for grass or wildland fires, please refer to the base plan.

4.5.4.1 Critical Facilities

There are no critical facilities in Rowan that are within the WUI areas (Interface and Intermix). Critical facilities across the County may be vulnerable to disruption or damage from WUI fires, particularly those located near forested or undeveloped areas. These facilities include emergency operations centers, fire stations, hospitals, schools, water treatment plants, power substations, and communication infrastructure.

4.5.4.2 Cultural, Historic, and Natural Resources

Wildfire and Wildland-Urban Interface (WUI) areas can pose a risk to the County's natural, historic, and cultural resources. Wildfires can degrade ecosystems by destroying native vegetation, fragmenting wildlife habitats, and increasing soil erosion and water pollution. Smoke and airborne pollutants also impact air quality, affecting both environmental and human health. Culturally and historically significant sites, such as cemeteries and historic buildings, are vulnerable to direct fire damage and indirect impacts from suppression efforts and post-fire erosion.

4.5.4.3 People

Populations across Wright County face varying degrees of vulnerability to WUI fires, depending on factors such as proximity to wildland areas, housing density, socioeconomic conditions, and access to emergency services. In urbanizing areas, the expansion of housing into fire-prone zones increases the number of people and structures exposed to wildfire hazards.

4.5.4.4 Structures and Systems

Structure and systems in WUI areas may be at risk of impact from grass and wildland fires. Wildfires can be responsible for extensive damage to crops, the environment and occasionally residential or business facilities. Homes built in rural areas are more vulnerable since they are in closer proximity to land that is burned, and homeowners are more likely to burn trash and debris in rural locations.

4.5.4.5 Changes in Development

Overall, population in the City of Rowan has increased over the past several years which may increase risk as more people reside in the City.

4.6 HAZARDOUS MATERIALS

For detailed information on hazardous materials in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.6.1 LOCATION AND EXTENT

Fixed Hazardous Materials Incident

According to the Iowa Department of Natural Resources, there are 44 sites in Wright County that were designated as Tier II Facilities under the Superfund Amendments and Reauthorization Act due to the volume or toxicity of the materials on site. None of these facilities are located within Rowan. For more information on the location and extent of hazardous materials risk, please refer to the base plan.

Transportation Hazardous Materials Incident

The transport of hazardous materials in Wright County can occur via trucks on the highways/roads and airplanes carrying hazardous cargo. Hazardous materials can be transported on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. Highway 3 runs through Rowan, creating risk of a transportation hazardous materials incident.

Rail Transport

No rail transportation infrastructure runs through Rowan. The Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Gove.

Air Freight

There are three airports in Wright County (in Belmond, Clarion, and Eagle Grove). Hazardous materials incidents can occur near these three airports across the County. There are no airports in Rowan.

Pipelines

There are no pipelines that run through the City of Rowan.

4.6.2 PREVIOUS OCCURRENCES

From 2017 to 2024, there have been no hazardous materials spills or other hazardous materials incidents reported to the Environmental Protection Agency (EPA) within Rowan. For more information on previous occurrences within Wright County, please refer to the base plan.

4.6.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for hazardous materials in Rowan is **Possible**.

4.6.4 VULNERABILITY ASSESSMENT

Within Rowan, hazardous materials pose a **Medium** risk due to the number of previous occurrences and magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to hazardous materials incidents. Rowan's vulnerability to hazardous materials does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for hazardous materials, please refer to the base plan.

4.6.4.1 Critical Facilities

Facilities located near major transportation corridors or industrial zones are at higher risk of exposure to chemical spills, fires, or airborne toxins. These incidents can disrupt operations, damage infrastructure, and endanger occupants, especially in facilities that house vulnerable populations like the elderly or children. Additionally, facilities without proper ventilation systems, backup power, or shelter-in-place protocols are more susceptible to contamination and operational failure during a HazMat event. There are several critical facilities near transportation corridors within Rowan.

4.6.4.2 Cultural, Historic, and Natural Resources

HazMat incidents pose significant risks to natural, historic, and cultural resources across Wright County. These resources include wetlands, rivers, forests, historic buildings, archaeological sites, and culturally significant landmarks. A chemical spill or airborne release can contaminate soil and water, damage ecosystems, and degrade the physical integrity of historic structures. Natural resources such as wildlife habitats and water bodies are particularly vulnerable to long-term environmental damage, which can disrupt biodiversity and recreational use. Historic and cultural sites may suffer irreversible harm if exposed to corrosive or toxic substances, especially if they lack protective infrastructure or are located near transportation corridors or industrial zones.

4.6.4.3 People

Communities near major transportation routes, such as highways and rail lines, are at higher risk due to the frequent movement of hazardous substances. Industrial zones and agricultural areas with chemical storage facilities also present elevated risks of fixed-site incidents. These events can lead to chemical spills, fires, or airborne releases that threaten public health and safety.

Vulnerability is especially high among populations with limited mobility, such as the elderly, individuals with disabilities, and residents of schools, hospitals, and correctional facilities. These groups may face challenges during evacuation or shelter-in-place orders.

Additionally, low-income communities may struggle with access to protective equipment, transportation, and timely information, further increasing their vulnerability.

4.6.4.4 Structures and Systems

It is difficult to determine the potential losses to existing development because of the variable nature of a hazardous materials spill. For example, a spill of a toxic airborne chemical in a populated area could have greater potential for loss of life. By contrast a spill of a very small amount of a chemical in a remote rural area would be much less costly and possibly limited to remediation of soil.

4.6.4.5 Changes in Development

Overall, population in the City of Rowan has increased over the past several years which may increase risk to people, as more people reside in the City.

4.7 HUMAN DISEASE

For detailed information on human disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.7.1 LOCATION AND EXTENT

Pandemics and epidemics do not affect a single geographic location; all areas of Wright County are equally vulnerable, including Rowan. Transmission can occur anywhere people interact, but locations with higher numbers of individuals create more opportunities for disease to spread. For more information on the location and extent of human disease, please refer to the base plan.

4.7.2 PREVIOUS OCCURRENCES

Pandemics and epidemics have had recurring and widespread effects on the County and across the world. While some events have been global in scale and others more localized, each has highlighted the vulnerability of the community to infectious disease and underscored the importance of preparedness and coordinated response. Since 1918, there have been six major epidemics or pandemics that were widely recognized by both the CDC and WHO, in addition to the COVID-19 pandemic. For more information on previous occurrences within Wright County, please refer to the base plan.

4.7.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for human disease in Rowan is **Possible**.

4.7.4 VULNERABILITY ASSESSMENT

Within Rowan, human disease poses a **Medium** risk due to low probability yet high risk to significantly impact the city. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to human disease. Rowan's vulnerability to human disease does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for human disease, please refer to the base plan.

4.7.4.1 Critical Facilities

Infectious disease outbreaks can significantly disrupt the operation of critical facilities in Wright County. These facilities may experience staffing shortages due to illness or quarantine, which can impair their ability to deliver vital services.

4.7.4.2 Cultural, Historic, and Natural Resources

Cultural institutions such as the Iowa River Players Community Theatre, Rowan Public Library, and the community center may be closed or operate at reduced capacity during a pandemic. This can lead to decreased access to cultural resources for the public.

4.7.4.3 People

Wright County faces notable vulnerabilities during a human infectious disease event due to a combination of environmental, healthcare, and socioeconomic factors. Transmission risks are heightened by close human contact, contaminated surfaces, and limited access to sanitation in some areas. Populations most at risk include the elderly, immuno-compromised individuals, and frontline workers.

The County's rural nature may limit healthcare surge capacity, making it harder to manage widespread outbreaks. Risk will vary based on geographical vaccination efforts and vaccination uptake by communities

and individuals. Additionally, insurance coverage, access to healthcare, and trust in the medical community can determine risk to population which can increase infection rates, hospitalizations, and mortality.[1] Due to the high percentage of individuals living in poverty, Rowan may be at greater risk of health impacts from human disease.

4.7.4.4 Structures and Systems

The impacts of human disease do not usually extend to physical structures and systems, but a lack of staffing could lead to issues with maintaining existing structures in a pandemic event.

4.7.4.5 Changes in Development

The population of the City of Rowan has increased over the past several years, which may increase risk.

[1] https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems

4.8 INFRASTRUCTURE FAILURE

For detailed information on infrastructure failure in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.8.1 LOCATION AND EXTENT

The entire planning area is at risk from all types of infrastructure failure included in the hazard description section, either from primary failure due to malfunction, degradation, or accidental or intentional damage or as a result of a secondary impact related to another hazard event. For more information on the location and extent of infrastructure failure, please refer to the base plan.

4.8.2 PREVIOUS OCCURRENCES

Infrastructure Failure often occurs as a secondary impact of other hazard events. For specific descriptions, please see the Previous Occurrences section of the other hazards included in this plan. In addition to failures or impacts as a result of other hazard events, infrastructure failure can also occur as a result of lack of maintenance, human error, or deterioration. There have been no significant infrastructure failures reported in Wright County.

4.8.3 PROBABILITY OF FUTURE OCCURRENCES

Based on the general aging status of infrastructure statewide, the probability of future occurrences for infrastructure failure in Rowan is **Highly Likely**.

4.8.4 VULNERABILITY ASSESSMENT

Within Rowan, infrastructure failure poses a **High** risk due to a high likelihood of future occurrence and high potential magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to infrastructure failure. Rowan's vulnerability to infrastructure failure does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for infrastructure failure, please refer to the base plan.

4.8.4.1 Critical Facilities

All critical facilities within Rowan may be all risk of impacts such as damage and disruption to services from infrastructure failure.

4.8.4.2 Cultural, Historic, and Natural Resources

Infrastructure failures have a limited impact to natural, historic, and cultural resources. Secondary impacts of infrastructure failures such as fires due to ruptured gas pipelines and contamination from wastewater may pose a greater risk to these resources.

4.8.4.3 People

Infrastructure failure may impact all people within Rowan, particularly those impacting transportation, utility, and communications systems. Certain population may be at increased risk such as older adults or those who are medically dependent on electricity.

4.8.4.4 Structures and Systems

As utility/infrastructure failure is generally a secondary or cascading impact of other hazards, it is not possible to quantify estimated potential losses specific to this hazard due to the variables associated with affected population, duration of outages, etc. In some instances, failure of one system can impact others. For example, the loss of electricity may also lead to the loss of internet connectivity.

4.8.4.5 Changes in Development

The population of the City of Rowan has increased over the past several years, which may increase risk.

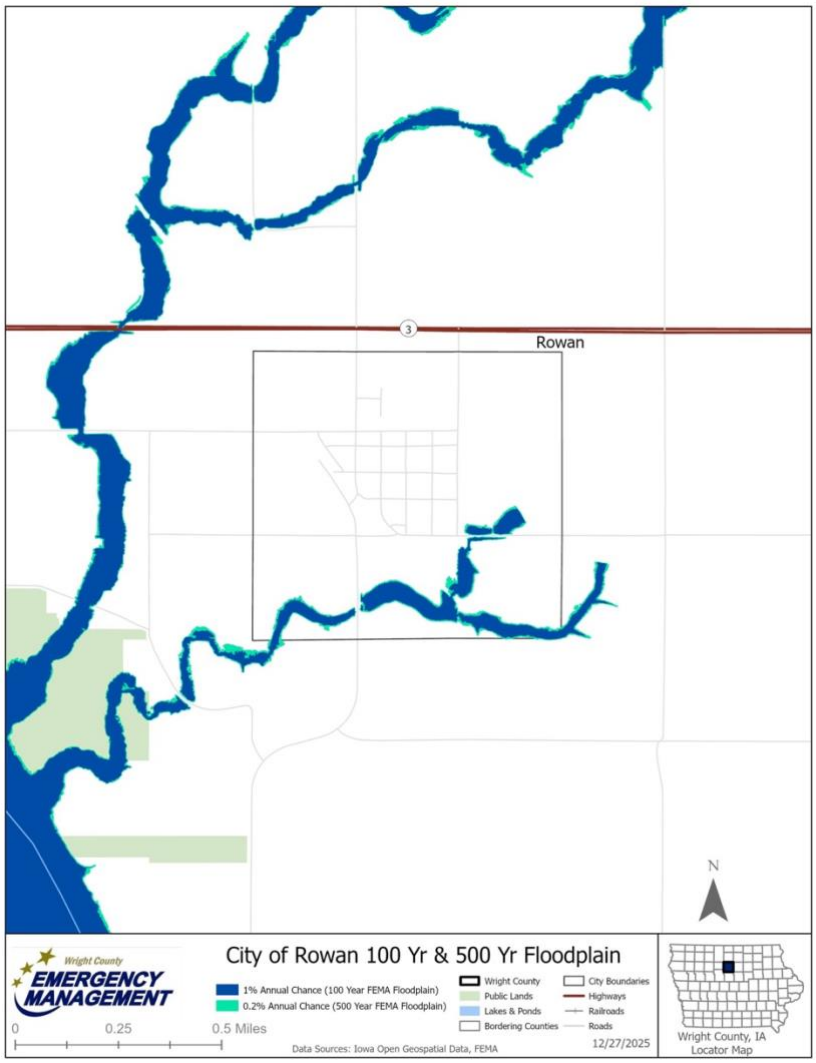
4.9 RIVER FLOODING

For detailed information on river flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.9.1 LOCATION AND EXTENT

Rowan has both 100-year floodplains and 500-year floodplains, centered largely on the southern part of the city, as shown in **Figure 4.** For more information on the location and extent of river flooding, please refer to the base plan.

FIGURE 4. CITY OF ROWAN 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN



4.9.2 PREVIOUS OCCURRENCES

There have been no reported flood events in Rowan causing any property or crop damage.

4.9.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for river flooding in Rowan is **Highly Likely**.

4.9.4 VULNERABILITY ASSESSMENT

Within Rowan, river flooding poses a **Medium** risk due to high likelihood of future occurrence, despite the relatively low expected impact to facilities and infrastructure. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to river flooding. Rowan's vulnerability to riverine flooding is lower than the risk to the county as a whole. For more information on the vulnerability assessment for riverine flooding, please refer to the base plan.

4.9.4.1 Critical Facilities

To analyze critical facilities at risk in the planning area, the inventory of critical and essential facilities and infrastructure in the planning area was compiled from various sources including the previous Wright County Multi-Jurisdictional Hazard Mitigation Plan, Wright County, and the Iowa Department of Natural Resources (NRGIS). A comparison was made of the facilities in the critical facilities inventory with the FIRM layer to determine those facilities that would be damaged in the 1-percent and 0.2-percent annual chance flood events.

4.9.4.2 Cultural, Historic, and Natural Resources

Please reference the flash flood section on potential impacts to natural, historic and cultural resources.

4.9.4.3 People

In Rowan, a 100-year or 500-year flood would not be expected to displace any residents.

4.9.4.4 Structures and Systems

In Rowan, a 100-year or 500-year flood would not be expected to damage any structures.

4.9.4.5 Changes in Development

Overall, the population of the City of Rowan has increased over the past several years, which may increase risk.

4.10 SEVERE WINTER STORM

For detailed information on severe winter storms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.10.1 LOCATION AND EXTENT

The entire state of Iowa is vulnerable to heavy snow, extreme cold temperatures and freezing rain. Generally, winter storms occur between the months of November and March but can occur as early as October and as late as April. January has the highest monthly snowfall at about 9 inches of snow. For more information on the location and extent of severe winter storms, please refer to the base plan.

4.10.2 PREVIOUS OCCURRENCES

From 1996 through October 2025, the National Climatic Data Center reports the following severe winter weather events:

- 34 - Blizzard
- 9 - Cold/Wind Chill
- 17 - Extreme Cold/Wind Chill
- 2 - Heavy Snow

For more information on previous occurrences in Wright County, please refer to the base plan.

4.10.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for severe winter storms in Rowan is **high**.

4.10.4 VULNERABILITY ASSESSMENT

Within Rowan, severe winter storms pose a **High** risk due to the high likelihood of occurrence and significant potential magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to severe winter storms. Rowan's vulnerability to severe winter storms does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for severe winter storms, please refer to the base plan.

4.10.4.1 Critical Facilities

All critical facilities within Rowan may be at risk of impacts and disruption to services due to extreme cold temperatures and high snowfall. Hospitals, emergency shelters, and water treatment plants may face operational challenges during prolonged outages or freezing conditions.

4.10.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources may be at risk to impact from severe winter weather. Severe winter weather can significantly impact the County's natural, historic, and cultural assets. Ice storms and freezing temperatures often damage forest and wildlife habitats, leading to tree loss, habitat disruption, and increased runoff pollution from de-icing agents. These environmental changes can have lasting effects on local ecosystems and water quality. Historic buildings and cultural landmarks are vulnerable to structural damage from ice accumulation, freeze-thaw cycles, and water intrusion.

4.10.4.3 People

All people residing in Rowan may be at risk of impact from severe winter storms due to extreme cold temperatures and high snowfall. Residents who are elderly, disabled, or economically disadvantaged are at heightened risk during winter events due to limited access to reliable heating, transportation, and emergency services. Many homes in rural areas lack adequate insulation or backup power sources, making them susceptible to dangerously low indoor temperatures during prolonged power outages caused by ice storms.

Low-income households may struggle to afford increased heating costs or to repair damage from burst pipes and frozen infrastructure. Within Rowan, over 23.4% of individuals live in poverty. Those who rely on electricity to power medical equipment can face life-threatening challenges when outages occur. Additionally, rural isolation can delay emergency response times, leaving residents without timely access to medical care or warming centers.

4.10.4.4 Structures and Systems

Structures and systems can be damaged or impaired by loss of electricity from overhead power line damages, and from secondary hazards following power loss like burst water pipes. Additionally, these storms cause moderate damages to structures and crops.

4.10.4.5 Changes in Development

Overall, population in the City of Rowan has increased over the past several years, which may increase risk.

4.11 TERRORISM

For detailed information on terrorism in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.11.1 LOCATION AND EXTENT

The entire planning area has a low potential for terrorist activity. However, there are areas that face increased risk such as schools, religious organizations, and government facilities. For more information on the location and extent of terrorism, please refer to the base plan.

4.11.2 PREVIOUS OCCURRENCES

There have not been any large-scale enemy attacks or acts of radiological terrorism in Iowa. There have been biological and chemical agent threats, animal rights activists' vandalism and many bomb threats. For more information on previous occurrences in Wright County, please refer to the base plan.

4.11.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for terrorism in Rowan is **Unlikely**.

4.11.4 VULNERABILITY ASSESSMENT

Within Rowan, terrorism poses a **Medium** risk due to limited previous occurrences and the potential magnitude for such events. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to terrorism. Rowan's vulnerability to terrorism does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for terrorism, please refer to the base plan.

4.11.4.1 Critical Facilities

There are no previous occurrences of terrorism impacting critical facilities in Rowan, but essentially all critical facilities are at some level of risk of damage or disruption of services from terrorism. Terrorism can disrupt and damage critical facilities and cause a variety of public safety and public health concerns.

4.11.4.2 Cultural, Historic, and Natural Resources

In some cases, terrorist attacks may target certain natural, cultural, or historic resources. Additionally, use of destructive weapons may pollute natural resources and cause environmental degradation and damage the local environmental and ecosystems.

4.11.4.3 People

Terrorist attacks can cause injuries and fatalities, as well as long-term psychological trauma. Depending on the nature of the attack, the broader community can be impacted and its societal and economic functioning disrupted. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

Some acts of terrorism are hate-based and therefore individuals and communities from certain religions, nationalities, race, ethnicism, sexuality, and gender are at increased risk of attacks, injury, or even death. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

4.11.4.4 Structures and Systems

Potential losses could include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses, loss of human life, injuries to persons, loss of food supplies, disruption of the food supply chain, and immediate damage to the surrounding environment.

4.11.4.5 Changes in Development

Overall, population in the City of Rowan has increased over the past several years, which may increase risk.

4.12 THUNDERSTORM/LIGHTNING/HAIL

For detailed information on thunderstorm, lightning, and hail in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.12.1 LOCATION AND EXTENT

Thunderstorms and the associated hail and lightning impact the entire County with relatively similar frequency. Although, these events can occur throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur in more densely developed urban areas or to cropland. Iowa experiences 40 storms per year in the northwest portion of the state and 60 per year in the southeast portion. For more information on the location and extent of thunderstorm, lightning, and hail, please refer to the base plan.

4.12.2 PREVIOUS OCCURRENCES

The NCDC reported 233 total thunderstorm events for the Wright County planning area from 1965 through October 2025. Five of those thunderstorm events occurred in Rowan. For more information on previous occurrences in Wright County, please reference the base plan.

4.12.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences of thunderstorm, lightning, and hail in Rowan is **Highly Likely**.

4.12.4 VULNERABILITY ASSESSMENT

Within Rowan, thunderstorm, lightning, and hail pose a **Medium** risk due to a high likelihood of future occurrences. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to this hazard. Rowan's vulnerability does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for thunderstorm/lightning/hail, please refer to the base plan.

4.12.4.1 Critical Facilities

All critical facilities are at risk of impact from thunderstorm, lightning, and hail. Essential infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during severe storm events. In rural areas such as Wright County, this vulnerability is compounded by limited system redundancy and constrained emergency response capabilities, making recovery slower and impacts more severe.

4.12.4.2 Cultural, Historic, and Natural Resources

Severe storms can significantly impact natural, historic, and cultural resources within Wright County. Natural areas such as forests and river systems are vulnerable to erosion, flooding, and contamination from stormwater runoff. However, these ecosystems also serve as natural buffers that help absorb rainfall and reduce flood risk, but when damaged, they lose their protective function and biodiversity suffers.

Many historic structures were not built to withstand high winds or flooding. Storms can cause irreversible damage to fragile materials, displace artifacts, and erode land around culturally significant sites.

4.12.4.3 People

All people residing in Rowan may be at risk of impact from thunderstorm, lightning, and hail. Severe storms pose significant risk to people, especially in Iowa, where atmospheric conditions frequently support the

development of hazardous weather. This vulnerability stems from both direct physical threats and indirect social and economic impacts. There have not been any fatalities in Wright County from lightning strikes.

Populations with limited access to safe housing, emergency services, or reliable communication systems are especially at risk. Vulnerable populations, such as the elderly, individuals with disabilities, and low-income households, may face greater challenges in preparing for, responding to, and recovering from storm events.

4.12.4.4 Structures and Systems

All structures and systems may be at risk of impact from thunderstorms, lightning, and hail. Most lightning damages occur to electronic equipment located inside buildings, but structural damage can also occur when a lightning strike causes a building fire. In addition, lightning strikes can cause damages to crops if fields light on fire. Communications equipment and warning transmitters and receivers can also be impacted by lightning strikes.

4.12.4.5 Changes in Development

Overall, the population of the City of Rowan has increased over the past several years, which may increase risk.

4.13 TORNADO/WINDSTORM

For detailed information on tornado and windstorm in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.13.1 LOCATION AND EXTENT

Iowa is located in a part of the United States where tornadoes are a common occurrence. Most tornadoes occur in May and June (but can occur during any month) and are most likely to occur between mid-afternoon and sunset. Tornadoes can occur anywhere throughout the County, including Rowan. For more information on the location and extent of tornado and windstorms, please refer to the base plan.

All of Wright County and Rowan is susceptible to high wind events. The County is located in Wind Zone IV, which is susceptible to winds up to 250 mph.

4.13.2 PREVIOUS OCCURRENCES

No tornadoes or significant wind events have been recorded in Rowan. For more information on previous occurrences in Wright County, please refer to the base plan.

4.13.3 PROBABILITY OF FUTURE OCCURRENCES

The probability of future occurrences of tornado/windstorm in Rowan is **Highly Likely**.

4.13.4 VULNERABILITY ASSESSMENT

Within Rowan, tornado/windstorm pose a **High** risk due to the potential magnitude of such a storm should occur. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to tornado/windstorm. Rowan's vulnerability to tornado/windstorm do not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for tornado/windstorm, please refer to the base plan.

4.13.4.1 Critical Facilities

All critical facilities are at risk of impact and damage from tornadoes and high wind events. Essential infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during tornadoes due to high winds and debris.

4.13.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources are at risk of impact and damage from tornadoes and high wind events. Natural resources such as forests, wetlands, and wildlife habitats may be damaged or destroyed by high winds, flying debris, and uprooted vegetation. Historic and cultural resources are often particularly vulnerable due to their age, structural fragility, and irreplaceable value. Tornadoes may cause partial or total destruction of these assets.

4.13.4.3 People

All individuals residing in Rowan are at risk of impact and casualty. Populations residing in structures not designed as storm shelters are inherently vulnerable to tornado hazards. This risk is especially elevated for individuals living in mobile homes, which statistically account for a disproportionate number of tornado-related fatalities and injuries due to their limited structural resilience.

4.13.4.4 Structures and Systems

All structures and systems are at risk of impact, damage, and disruption. Tornadoes have caused widespread damage to homes, businesses, farms, and public infrastructure in other communities, and could do the same in Rowan. Critical facilities like schools, fire stations, and police departments are often left inoperable following tornadoes due to roof failures, debris impacts, and power outages.

4.13.4.5 Changes in Development

Overall, the population of Rowan has increased over the past several years, which may increase risk.

4.14 TRANSPORTATION INCIDENT

For detailed information on transportation incidents in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Rowan for all profiled hazards.

4.14.1 LOCATION AND EXTENT

A transportation incident could take place on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35.

In Rowan, Highway 3 runs through the city and poses risk of transportation incidents, including those involving hazardous materials. For more information on the location and extent of transportation incidents, please refer to the base plan.

Rail Transport

There are no rail transport lines through Rowan.

Air Freight

There are three airports in Wright County (in Belmond, Clarion, and Eagle Grove). Air incidents could potentially occur anywhere near these airports, but there are no airports located in Rowan itself.

4.14.2 PREVIOUS OCCURRENCES

According to the National Transportation Safety Board (NTSB), there have no significant transportation incidents reported in Rowan. However, small scale transportation incidents related to auto accidents are common.

4.14.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for transportation incident in Rowan is **Highly Likely**.

4.14.4 VULNERABILITY ASSESSMENT

Within Rowan, transportation incident pose a **High** risk due to the commonality of road traffic accidents. This section provides further contextualization for the anticipated vulnerability of the communities within Rowan to transportation incidents. Rowan's vulnerability to transportation incidents does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for transportation incidents, please refer to the base plan.

4.14.4.1 Critical Facilities

All critical facilities could potentially be damaged by an automobile accident, airplane crash, or other transportation incident. Utility and communications systems are most likely to be impacted, as an isolated incident in one area could potentially affect these systems more broadly.

4.14.4.2 Cultural, Historic, and Natural Resources

Transportation accidents, whether involving vehicles, rail, or hazardous material spills, can pose threats to natural, cultural, and historical resources in Wright County. These incidents may result in direct physical damage, environmental contamination, or long-term degradation of sites that hold historical or cultural significance.

4.14.4.3 People

Transportation-related incidents involving passenger vehicles pose significant risks to public safety and infrastructure. The likelihood and severity of such accidents are influenced by factors including traffic volume, infrastructure condition, weather, and human error.

4.14.4.4 Structures and Systems

All structures and systems are at some level of risk of damage and disruption from transportation incidents, due to their proximity to roadways.

4.14.4.5 Changes in Development

Overall, the population of Rowan has increased over the past several years, which may increase risk.

5. MITIGATION STRATEGY

The Mitigation Strategy section of the base plan provides a blueprint for all communities within Wright County to become less vulnerable to the profiled hazards. As established in the base plan, the overall goals of the Wright County mitigation strategy are consistent across all participating municipalities.

This section provides community-specific strategies for Rowan, including the status of actions that were included in the previous plan and actions to be considered or pursued over the next five years. As noted in the base plan, the participants are not committing to undertaking every action suggested in this list but rather are proposing an extensive list of *potential* actions that they may wish to pursue, depending on the availability of funding. **Table 10** details the mitigation actions identified for the City of Rowan and **Table 11** details the mitigation actions identified for the entire County, known as Countywide Actions.

TABLE 10. UPDATED 2026 ROWAN MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Rowan - 1	Establish an ordinance on water conservation during a drought	Drought	Continue Not Started	City Council	County EMA	General Funds	Little or No Cost	3-5 years	M
Rowan - 2	Develop a platform for hazard information sharing	All Hazards	Continue Not Started	City Council	County EMA	General Funds	Little or No Cost	1 year	L
Rowan – 3	Purchase commercial leaf blowers for the fire department to blow out grassfires	Grass/Wildland Fire	Continue Not Started	Fire Department	County EMA	General Funds	Less than $10,000	2-3 years	M
Rowan – 4	Develop a plan for setting up the portable generator to provide backup power to the church and community center in Rowan in the case of a power outage	Infrastructure Failure	Continue In-Progress	City Council; Fire Department	County EMA	General Funds; FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	2-3 years	M
Rowan – 5	Provide the fire department with mask and filtering systems for grassfires	Grass/Wildland Fire	Continue Not Started	Fire Department	County EMA	General Funds	$10,000 to $50,000	3-5 years	H
Rowan – 6	Provide the fire department with a fire hose cleaning apparatus	Grass/Wildland Fire	Continue Not Started	Fire Department	County EMA	General Funds	Less than $10,000	3-5 years	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Rowan – 7	Locate funding to tear down dilapidating structures	Infrastructure Failure; Tornado/Windstorm; Thunderstorm/ Lightning/Hail	Continue In-Progress	City Council	County EMA	General Funds; FEMA HMA Grant (HMGP, BRIC, or FMA)	$100,000 to $500,000	3-5 years	L
Rowan – 8	Improve/expand on the storm sewer system.	Flash Flood	Continue In-Progress	City Council	County EMA	General Funds	$100,000 to $500,000	3-5 years	M
Rowan – 9	Purchase a permanent generator for the church shelter	Infrastructure Failure	Continue Not Started	City Council	County EMA	General Funds; FEMA HMA Grant (HMGP, BRIC, or FMA)	$10,000 to $50,000	1 year	H
Rowan – 10	Purchase and install a new warning siren for the City.	Tornado/Windstorm	Continue Not Started	City Council	County EMA	General Funds; FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	2-3 years	H
Rowan – 11	Provide window blockades or shutters for businesses and residents in that event of a hailstorm.	Thunderstorm/ Lightning/Hail	Continue Not Started	City Council	County EMA	General Funds	Less than $10,000	3-5 years	M
Rowan – 12	Correct deficiencies, remediate violations and re-apply to FEMA NFIP program by adopting mandatory floodplain management regulations.	River Flooding	NEW	City Council	County EMA	General Funds	$100,000 to $500,000	2-3 years	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Rowan – 13	Promote tree trimming across the City to prevent downed branches after severe storms	Tornado/Windstorm, Thunderstorm/ Lightning/Hail	Continue In-Progress	City Council	County EMA	General Funds	Little or No Cost	2-3 years	M

TABLE 11. 2026 COUNTYWIDE ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA - 1	Encourage residents to purchase weather radios to stay informed on emergency information.	All Hazards	Continue In-Progress	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	1 year	M
CWA - 2	Increase coordination with regional and state agencies for early warning and monitoring of animal, plant, and crop disease	Animal/plant/crop disease	New	Environmental Health	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), USDA	Little or no cost	Ongoing	H
CWA - 3	Educate residents on water saving techniques and water conservation	Drought	New	County EMA , Participating Jurisdictions	Public Media	General Funds	Little or No Cost	1 year	L
CWA – 4	Promote tree planting in areas with low vegetation to increase shade coverage.	Extreme Heat	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	Ongoing	M
CWA – 5	Improve drainage infrastructure in areas where flash flooding frequently occurs.	Flash Flood	New	County EMA	Participating Jurisdictions	General Funds	$100,000 to $500,000	Ongoing	H
CWA – 6	Promote defensible landscape for homes, businesses and entities within WUI areas.	Grass and Wildland Fire	New	County EMA	Participating Jurisdictions	General Funds	Little to No Cost	Ongoing	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 7	Promote wetland restoration to reduce flooding impacts across the County.	River Flooding	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$100,000 to $500,000	Ongoing	H
CWA – 8	Promote snow safety to residents on how to prevent pipe breaks in their homes (e.g., insulating outdoor faucets, drip warm water from an indoor faucet) and what to do if a pipe breaks.	Severe Winter Storm	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	Little to No Cost	Ongoing	H
CWA – 9	Conduct Countywide trainings to practice responding to radiological incidents.	Hazardous Materials	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA -10	Promote flu clinics across the County	Human Disease	New	County EMA , Participating Jurisdictions	County Public Health	CDC Grants, General Funds	$10,000 to $50,000	Ongoing	M
CWA – 11	Promote Tree Trimming across the County to prevent fallen trees on infrastructure.	Infrastructure Failure	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	2-3 years	M
CWA – 12	Conduct Countywide trainings to practice responding to terrorist incidents.	Terrorism	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 13	Conduct Countywide trainings to practice responding to transportation incidents.	Transportation Incident	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA - 14	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Thunderstorm/Lightning/Hail	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M
CWA – 15	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Tornado/Windstorm	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M

1.INTRODUCTION AND PLANNING PROCESS

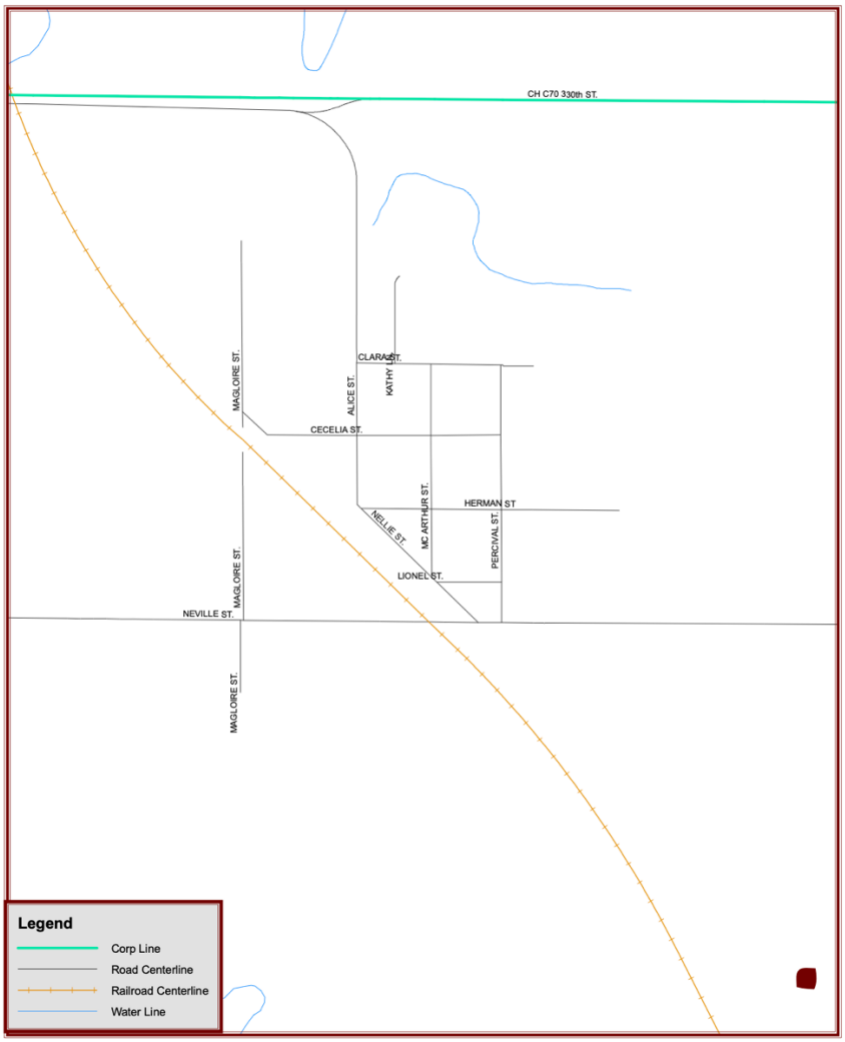
This annex provides more detailed information about the City of Woolstock. This annex includes the following:

- A more localized community profile, including more detailed mapping, population and demographic, and critical facilities information
- City-level Hazard Identification and Risk Assessment (HIRA) information, including some more localized hazard maps and conclusions related to hazard risk and how it varies across the planning area
- A localized vulnerability assessment, including the likely impact of profiled hazards on critical facilities
- A detailed capability assessment, describing resource and tools available to the City to participate in hazard mitigation and reduce hazard risk
- A mitigation strategy, describing a variety of actions the City may opt to take to reduce the risk associated with profiled hazards over the useful life of this plan

2. COMMUNITY PROFILE

The City of Woolstock is one of the smallest jurisdictions within Wright County, Iowa. The total areas of Woolstock is about 1.05 square miles. The City was established in the 1850s and is located east of the Boone River. **Figure 1** displays the City of Woolstock.

FIGURE 1. CITY OF WOOLSTOCK



2.1 POPULATION AND DEMOGRAPHICS

Recently, the City's population has increased modestly, growing by approximately 8.9% since 2010. This corresponds to a minor increase in vulnerability within Woolstock, as there are more residents exposed to hazards. **Table 1** shows the population trends over time for the City of Woolstock. **Table 2** shows the demographic data. The median household income for the City is $56,528 and 5.5% of the population live below the poverty level, lower than the county average (11%) and national average (10.6%).

TABLE 1. POPULATION TRENDS

JURISDICTION	2010 CENSUS POPULATION	2016 POPULATION ESTIMATE	2023 CENSUS POPULATION	% CHANGE 2010-2023
Woolstock	168	163	183	8.93%

Source: U.S. Census Bureau: 2010 Decennial Census, 2016 Population Estimates, 2023 American Community Survey, 5-year Estimates

TABLE 2. DEMOGRAPHIC DATA

JURISDICTION	POPULATION 18YEARS AND OVER	UNEMPLOYMENT RATE (2025)[1]	MEDIAN HOUSEHOLD INCOME	PERCENT BELOW POVERTY LEVEL
Woolstock	140	-	$85,000	5.5%

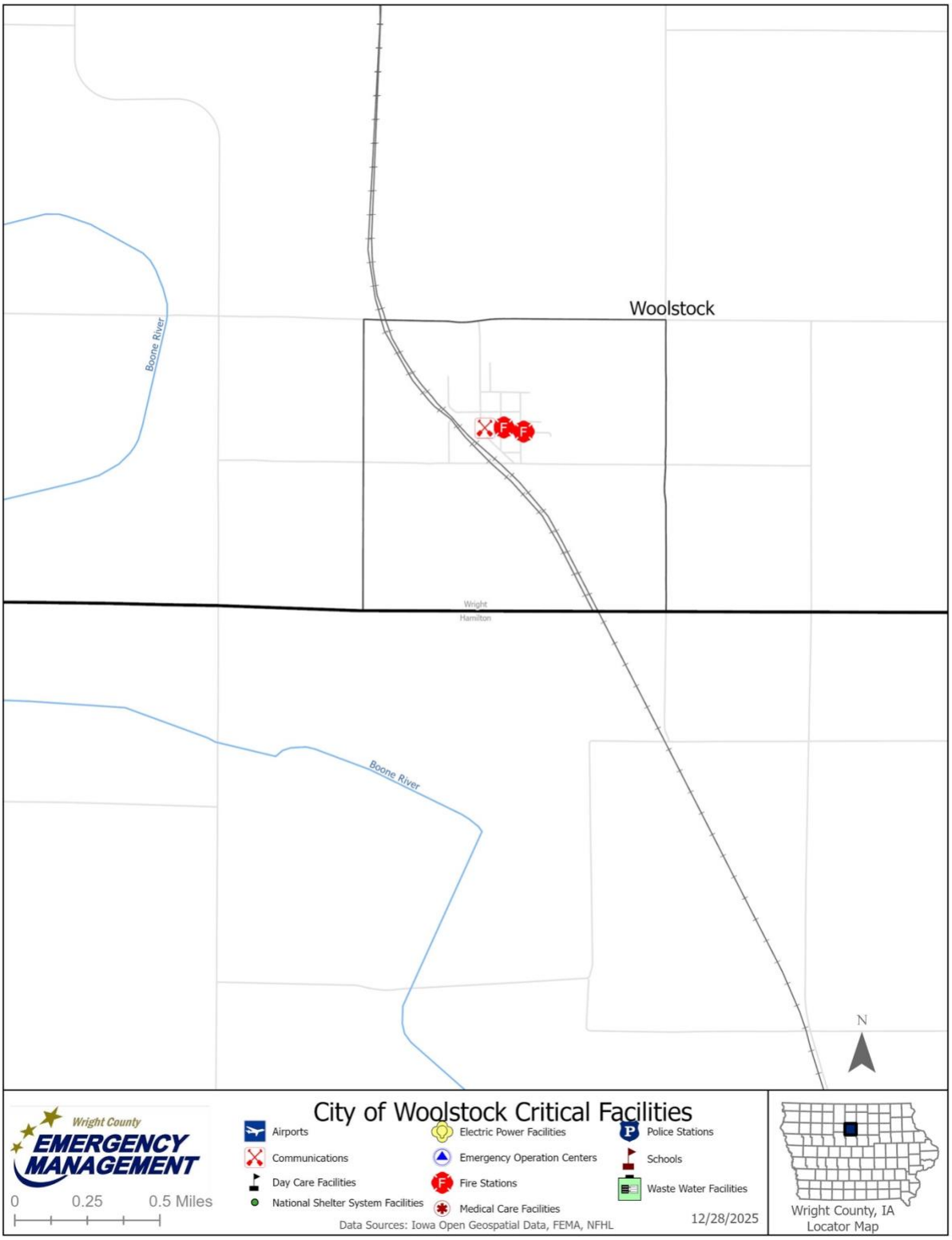
Source: U.S. Census, 2023 American Community Survey, 5-year Estimates

The median age in Woolstock is 44.3 years old. 15.3% of the population speak a language other than English at home (higher than the statewide rate of 9.7%), and the most commonly-spoken non-English language is Spanish. About 5.3% of the population have a bachelor's degree, lower than the State average rate of 32%. There are 96 housing units within the City, 92 of which are occupied. 13.3% of the population has a disability, which is slightly higher than the statewide average of 12.9%.

2.2 CRITICAL FACILITIES

Critical facilities are the systems and structures that are essential to a jurisdiction's continued functioning, the failure of which would cause significant disruption. **Figure 2** displays the critical facilities within Woolstock. There are three critical facilities within Woolstock.

FIGURE 2. CRITICAL FACILITIES MAP



2.3 LAND USE AND DEVELOPMENT

Woolstock is a very small community, and does not substantively regulate land use. There are no significant new developments since the last plan update. Although the population of Woolstock increased has increased since 2010, the number of housing units has gone down.

2.4 NATURAL, HISTORIC, AND CULTURAL RESOURCES

There are no significant historic resources in the City of Woolstock according to the National Register of Historic Places. Two of the main cultural and natural resources in the City are the George Reeves Memorial and the Woolstock Park.

3. CAPABILITY ASSESSMENT

The capability assessment evaluates a jurisdiction's ability to implement a comprehensive mitigation strategy and identifies opportunities to establish or strengthen mitigation policies, programs, and projects. More generalized information about the goals of the capability assessment, including the process and methodology, is presented in the Capability Assessment portion of the base plan.

This section articulates specific information about the capabilities of Woolstock which include the following:

- Planning mechanisms
- Regulatory tools and programs
- Staff and technical capabilities
- Fiscal and other mechanisms
- Floodplain management and regulation

3.1 PLANNING MECHANISMS

Table 3 describes the planning mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Woolstock does not have any planning mechanisms in place other than the hazard mitigation plan. In order to increase this capability the City may seek to establish plans such as a Comprehensive Plan or General Plan. Additionally, implementing a Debris Management Plan, Continuity of Operations Plan, and Disaster Recovery Plan.

TABLE 3. PLANNING MECHANISMS

PLANNING MECHANISMS	CITY OF WOOLSTOCK
Capital Improvement Plan (CIP)	No
Comprehensive Plan	No
Community Wildfire Protection Plan (CWPP)	No
Comprehensive Emergency Management Plan (CEMP)	No
Critical Facilities Plan	No
General Plan	No
Continuity of Operations Plan (COOP)	No
Debris Management Plan	No
Disaster Recovery Plan	No
Economic Development Plan	No
Emergency Operations Plan (EOP)	No
Environmental Impact Report (EIR)	No
Evacuation Plan	No

PLANNING MECHANISMS	CITY OF WOOLSTOCK
Flood Response Plan	No
Floodplain Management Plan/Flood Mitigation Plan	No
Hazard Mitigation Plan	Yes
Historic Preservation Plan	No
Land Use Plan	No
Natural Resource Protection Plan (NRPP)	No
Open Space Management Plan	No
Transportation Plan	No
Threat Hazard Identification and Risk Assessment (THIRA)	No
Watershed Plan	No

3.2 REGULATORY TOOLS AND PROGRAMS

Table 4 describes the regulatory tools and programs that the jurisdiction has in place to support hazard mitigation. Currently, the City of Woolstock do not have any regulatory tools and programs that could support mitigation. In order to increase this capability the City may seek to update their building codes and engage with community programs such as a Community Emergency Response Team (CERT).

TABLE 4. REGULATORY TOOLS AND PROGRAMS

REGULATORY TOOLS AND PROGRAMS	CITY OF WOOLSTOCK
Building Codes	No
Citizen Corps – Community Emergency Response Team (CERT)	No
Community Rating System (CRS Program of the NFIP)	No
Emergency Management Accreditation Program (EMAP)	No
Fire Code	No
Firewise Community	No
Floodplain Management/Flood Damage Prevention Ordinance	No
Land Use/Development Planning	No
National Flood Insurance Program (NFIP)	No

REGULATORY TOOLS AND PROGRAMS	CITY OF WOOLSTOCK
Post Disaster Redevelopment/Reconstruction Plan/Ordinance	No
Storm Ready	No
Stormwater Management Plan/Ordinance	No
Subdivision Regulations/Ordinance	No
Unified Development Ordinance	No
Zoning Ordinance	No

3.3 STAFF AND TECHNICAL CAPABILITIES

Table 5 describes the staff and technical capabilities that the jurisdiction has in place to support hazard mitigation. Currently, the City of Woolstock does not have any significant staff and technical capabilities that could be utilized to implement hazard mitigation. In order to increase this capability the City may seek to increase its access to specialized staff through mutual aid or other means.

TABLE 5. STAFF AND TECHNICAL CAPABILITIES

STAFF AND TECHNICAL CAPABILITES	CITY OF WOOLSTOCK
Emergency Manager	No
Engineers or professional trained in construction practices related to buildings and/or infrastructure	No
Environmental Justice Specialists	No
Fiscal Management or Procurement Specialists	No
Floodplain Manager	Wright County Planning and Zoning Adminstrator
Housing Specialist(s)	No
Land Surveyors	No
Land Use/Management/Development Planning	No
Planners or engineers with an understanding of natural and/or human caused hazards	No
Recreation/Green Space Specialist(s)	No
Resource Development Staff or Grant Writing	No
Scientists familiar with the hazards of the community	No
Staff experienced with Geographic Information Systems (GIS) or HAZUS	No

STAFF AND TECHNICAL CAPABILITES	CITY OF WOOLSTOCK
Staff with education or expertise to assess the community's vulnerability to hazards	No
Transportation Manager/Traffic Engineer	No

3.4 FISCAL AND OTHER MECHANISMS

Table 6 describes the fiscal and other mechanisms that the jurisdiction has in place to support hazard mitigation. Currently, the City of Woolstock does not have significant fiscal capacity. To improve this capability, the City may look to apply for grants.

TABLE 6. FISCAL AND OTHER MECHANISMS

FISCAL AND OTHER MECHANISMS	CITY OF WOOLSTOCK
Capital Improvement Programming	No
Community Development Block Grants (CDBG)	No
Development Impact Fees	No
FEMA Hazard Mitigation Assistance Grants (HMPG, FMA,PDM)	No
Gas/Electric Utility Fees	No
General Obligation, Revenue, and/or Special Tax Bonds	No
Homeland Security Grants (HSGP)	No
Infrastructure Investment and Jobs Act (IIJA)	No
Infrastructure State Revolving Fund Loan	No
Partnering Agreements or Intergovernmental Agreements	No
Sewer/Water Fees	No
Special Purpose Tax (or taxing districts)	No
Stormwater Utility Fees	No
USDA Grants	No
USDA Rural Development Agency Grants	No
US Economic Development Administration Grants	No

3.5 FLOODPLAIN MANAGEMENT AND REGULATION

Table 7 describes the National Floodplain Insurance Program (NFIP) Capability for the City of Woolstock. Currently, the City does not participate in the NFIP and has been sanctioned since 1977.

TABLE 7. FLOODPLAIN MANAGEMENT AND REGULATION

NFIP CAPABILITIES	CITY OF WOOLSTOCK
Has your community adopted a floodplain management ordinance that meets NFIP minimum criteria?	No – community does not have any Repetitive Loss (RL) or Severe Repetitive Loss (SRL) properties
Has your community adopted the latest effective Flood Insurance Rate Map (FIRM)?	No – Sanctioned 06/25/1977
Do you regulate/permit development in the Special Food Hazard Area (SFHA)?	No
Which position or agency is in charge of NFIP compliance for your community?	No
How do you implement the substantial improvement/substantial damage provisions of your floodplain management ordinance?	No

4. HAZARD IDENTIFICATION AND RISK ASSESSMENT

The Hazard Identification and Risk Assessment (HIRA) process, described in more detail in the HIRA section of the base plan, involves identifying potential hazards, evaluating their likelihood and potential consequences, and estimating and describing the level of risk these hazards present to a community.

As described in the "HIRA Methodology" section of the base plan, participants in this plan update reconsidered the relative risk posed by the profiled hazards by conducting a hazard ranking process. **Table 8** below provides a summary of how those hazards were ranked in the City of Woolstock. Each of the 14 natural and manmade hazards discussed in this section are described in more detail in the HIRA section of the base plan. This section endeavors to provide more detailed, local-level information, mapping, and conclusions for these hazards wherever relevant.

TABLE 8. WOOLSTOCK HAZARD RANKING

JURISDICTION	ANIMAL/CROP/PLANT DISEASE	DROUGHT	EXTREME HEAT	FLASH FLOOD	GRASS OR WILDLAND FIRE	HAZARDOUS MATERIALS INCIDENT	HUMAN DISEASE	INFRASTRUCTURE FAILURE	RIVER FLOODING	SEVERE WINTER STORM	TERRORISM	THUNDERSTORM/LIGHTNING/HAIL	TORNADO/WINDSTORM	TRANSPORTATION INCIDENT
Woolstock	M	H	M	L	L	L	M	H	H	H	M	M	H	H

4.1 ANIMAL/PLANT/CROP DISEASE

For detailed information on animal, plant, and crop disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.1.1 LOCATION AND EXTENT

All of Wright County is subject to animal/livestock incidents and agricultural infestations, which include the City of Woolstock. For more information on the location and extent of animal, plant, and crop disease, please refer to the base plan.

4.1.2 PREVIOUS OCCURRENCES

There are no previous occurrences that have been reported to impact the City of Woolstock specifically. For more information on previous occurrences in Wright County, please refer to the base plan.

4.1.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for animal/plant/crop/disease in Woolstock is **Unlikely**.

4.1.4 VULNERABILITY ASSESSMENT

Within Woolstock, animal/plant/crop disease poses a **Medium** risk due to limited previous occurrences and impact to the City yet potential to cause economic instability. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to animal/plant/crop disease. Woolstock's vulnerability to animal/plant/crop disease does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for animal, plant, and crop disease, please refer to the base plan.

4.1.4.1 Critical Facilities

Animal, plant, and crop diseases have limited impact on critical facilities due to the hazard directly impacting animals, plants, and crops and related industries.

4.1.4.2 Cultural, Historic, and Natural Resources

Sensitive crops (those that are most susceptible to stress from environmental factors such as weather and crop diseases) are not known to be present in Woolstock.

4.1.4.3 People

Animal, plant, and crop diseases can impact the population through food supply chain disruptions, increased food prices, local employment, and potential health impacts from zoonotic diseases such Highly Pathogenic Avian Influenza (HPAI).

4.1.4.4 Structures and Systems

Buildings, infrastructure, and critical facilities are not vulnerable to this hazard. Its impacts are primarily economic and environmental.

4.1.4.5 Changes in Development

Overall, the population of the City of Woolstock has increased over the past several years. Agriculture has increased, which could increase risk of crop diseases impacting the local economy.

4.2 DROUGHT

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.2.1 LOCATION AND EXTENT

All of Wright County is subject to drought, which tends to impact broad areas simultaneously. For more information on the location and extent of drought, please refer to the base plan.

4.2.2 PREVIOUS OCCURRENCES

According to the National Drought Mitigation Center's Drought Impact Reporter, during the period from January 2007 through January 2026, nine droughts were reported to affect Wright County. For more information on previous occurrences in Wright County, please refer to the base plan.

4.2.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for drought in Woolstock is **Highly Likely**.

4.2.4 VULNERABILITY ASSESSMENT

Within Woolstock, drought poses a **High** risk due to potential impacts, largely to public health, agriculture, and the local economy. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to drought. Woolstock's vulnerability to drought does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for drought, please refer to the base plan.

4.2.4.1 Critical Facilities

All critical facilities in Woolstock may be impacted by drought, particularly in the event of water shortages during extreme drought conditions.

4.2.4.2 Cultural, Historic, and Natural Resources

Drought can lead to stressed vegetation, tree mortality, soil compaction, erosion and loss of habitat or shade. Drought is not expected to substantively impact cultural or historic resources.

4.2.4.3 People

All people residing in Woolstock may be impacted by Drought. Drought can present hazards to public health in extreme cases where drinking water production cannot keep up with demand. Increased water demand may increase water rates and create financial hardship, especially for individuals and families living below poverty. Additionally, the elderly and young children may be at greater risk of experiencing adverse health effects resulting from reduced water quality.

4.2.4.4 Structures and Systems

Agricultural systems are highly vulnerable to drought conditions which could result in a decrease in crop production or a decrease in available grazing area for livestock. Drought has minimal effect on houses and buildings. In severe prolonged droughts, structures could be impacted through cracks in foundation which can comprise their integrity and safety. Additional impact to structures could include damage to landscaping and dried vegetation, which can execrate urban fire and wildfire risk.

4.2.4.5 Changes in Development

Overall, population in the City of Woolstock has increased over the past several years which may increase risk. Increased water usage may strain the local water infrastructure in severe drought conditions.

4.3 EXTREME HEAT

For detailed information on extreme heat in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.3.1 LOCATION AND EXTENT

All of Wright County is subject to extreme heat as it is normally a widespread hazard. For more information on the location and extent of extreme heat, please refer to the base plan.

4.3.2 PREVIOUS OCCURRENCES

The following summarizes the National Weather Service Advisories, Watches, and Warnings for Heat or Excessive Heat in Wright County from 2000 to 2025 (25 years of data). For more information on previous occurrences in Wright County, please refer to the base plan.

- 46 Heat Advisories
- 2 Extreme Heat Watches
- 8 Excessive Heat Watches
- 7 Excessive Warnings

4.3.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for extreme heat in Woolstock is **Likely**.

4.3.4 VULNERABILITY ASSESSMENT

Within Woolstock, extreme heat poses a **Medium** risk due to high likelihood of future occurrence and magnitude This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to extreme heat. Woolstock's vulnerability to extreme heat does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for extreme heat, please refer to the base plan.

4.3.4.1 Critical Facilities

All critical facilities may be at risk of impact depending on severity of extreme heat events. Extreme heat can significantly affect nearly all critical facilities by compromising their structural integrity and operational reliability. During extreme heat events, it is likely that food, hydration, and shelter, as well as health and medical lifelines would be disrupted.

4.3.4.2 Cultural, Historic, and Natural Resources

Prolonged high temperatures and drought conditions can stress ecosystems, reduce biodiversity, and increase the risk of wildfires, especially in forested and agricultural areas. These changes threaten native species and disrupt ecological balance. Some historic buildings were built before the invention of central air conditioning and may lack proper cooling, posing risk to its inhabitants. Cultural traditions and outdoor events may be disrupted due to unsafe heat conditions.

4.3.4.3 People

All people residing in Woolstock may be at risk of impact, especially heat-related illnesses depending on the severity of extreme heat events. Those at greatest risk for heat-related illness and deaths include people 65 years of age and older, people who are overweight, and people who are ill or on certain

medications. Wright County's population over 65 years is higher than the national and state average at 20.9 percent.

4.3.4.4 Structures and Systems

All structures and systems may be at risk of impacts depending on the severity of extreme heat events. Extreme heat can cause a strain on electricity delivery infrastructure which can be overloaded during peak use of electricity to power air conditioning during extreme heat events. Increased electricity use can increase rates and cause financial hardships, especially for individuals and families living in poverty.

4.3.4.5 Changes in Development

Overall, population in the City of Woolstock has increased over the past several years which may increase risk. Increased electricity usage may strain infrastructure during extreme heat events.

4.4 FLASH FLOOD

For detailed information on flash flood in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.4.1 LOCATION AND EXTENT

Wright County includes two major tributaries of the Mississippi River, including the Boone River and the upper portion of the Iowa River. The Boone Watershed intercepts the entire western and central portion of Wright County and is an area of gently flat to rolling hills. For more information on the location and extent of flash flood please refer to the base plan.

4.4.2 PREVIOUS OCCURRENCES

There have been no reported flash flood events in Woolstock. For more information on previous occurrences within Wright County, please refer to the base plan.

4.4.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for flash flood in Woolstock is **Possible**.

4.4.4 VULNERABILITY ASSESSMENT

Within Woolstock, flash flood poses a **Low** risk due to a medium probability of occurrence and moderate potential for damages to property and crop for the County. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to flash flood. Woolstock's vulnerability to flash flood is lower than the risk to the county as a whole. For more information on the vulnerability assessment for flash flood, please refer to the base plan.

4.4.4.1 Critical Facilities

There are no critical facilities in the floodplain in Woolstock. However, critical facilities can still face varying levels of risk from flash flood events even outside the floodplain, particularly if drainage issues are present.

4.4.4.2 Cultural, Historic, and Natural Resources

There are no significant cultural, historic, or natural resources in the floodplain in Woolstock. Natural areas such as wetlands, forests, and waterways may experience erosion, pollution, and habitat loss, reducing their ecological value and ability to buffer future flood events. These changes can also affect recreational and conservation areas. Flooding may also disrupt cultural traditions tied to specific locations or community spaces.

4.4.4.3 People

There are very few people residing in low lying areas in Woolstock that may be at risk of impact from flash flood events. See section 4.12.4.3 (in the river flooding profile).

4.4.4.4 Structures and Systems

Structures and systems in low lying areas may be at risk of impact from flash flood events. Flash flooding can quickly flood any low lying structures and systems that are inundated. These damages can cause costly repairs for state, county, and city road/bridge maintenance departments. When sewer back-up occurs, this can result in costly clean-up for home and business owners as well as present a health hazard.

4.4.4.5 Changes in Development

Overall, the population of Woolstock has increased over the past several years, which may increase risk.

4.5 GRASS OR WILDLAND FIRE

For detailed information on grass or wildland fire in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

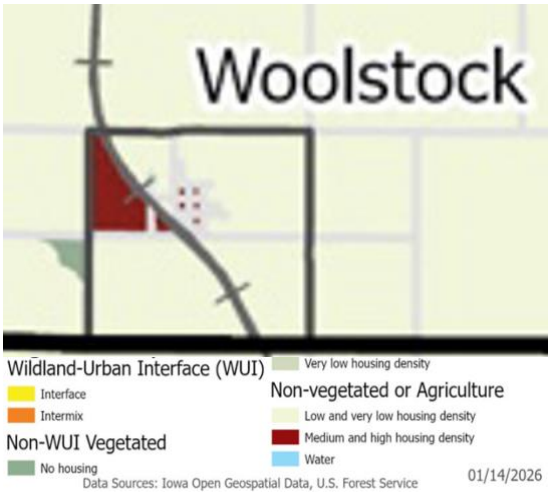
4.5.1 LOCATION AND EXTENT

Wildland/Grass fires are most likely to occur in the Wildland Urban Interface (WUI). This is the area where houses meet or intermingle with undeveloped wildland vegetation. Within the WUI, there are two specific areas identified:

- Interface
- Intermix

The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. **Figure 3** shows that there are no WUI areas within Woolstock. For more information on the location and extent of grass or wildland fire, please refer to the base plan.

FIGURE 3. WOOLSTOCK WUI AREAS



4.5.2 PREVIOUS OCCURRENCES

According to the National Fire Incident Reporting System (NFIRS), there has been one fire incident in Wright County since 2017, near Cornelia. For more information on previous occurrences within Wright County, please refer to the base plan.

4.5.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for grass or wildland fire in Woolstock is **Possible**

4.5.4 VULNERABILITY ASSESSMENT

Within Woolstock, grass or wildland fires pose a **Low** risk due to the lack of WUI areas and limited previous occurrences. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to grass or wildland fire. Woolstock's vulnerability to grass or wildland fire is

lower than the risk to the county as a whole. For more information on the vulnerability assessment for grass or wildland fires, please refer to the base plan.

4.5.4.1 Critical Facilities

There are no critical facilities in Woolstock that are within WUI areas (Interface and Intermix). However, wildfires are possible outside the WUI.

4.5.4.2 Cultural, Historic, and Natural Resources

There are no significant cultural or historic resources in a WUI area in Woolstock. Wildfires can degrade ecosystems by destroying native vegetation, fragmenting wildlife habitats, and increasing soil erosion and water pollution. Smoke and airborne pollutants also impact air quality, affecting both environmental and human health.

4.5.4.3 People

Populations across Wright County face varying degrees of vulnerability to wildfires, depending on factors such as proximity to wildland areas, housing density, socioeconomic conditions, and access to emergency services. However, the risk to people in Woolstock is low due to a lack of WUI areas.

4.5.4.4 Structures and Systems

Structures and systems in WUI areas may be at risk of impact from grass and wildland fires. Wildfires can be responsible for extensive damage to crops, the environment and occasionally residential or business facilities. Homes built in rural areas are more vulnerable since they are in closer proximity to land that is burned, and homeowners are more likely to burn trash and debris in rural locations.

4.5.4.5 Changes in Development

The population of Woolstock has increased over the past several years, which may increase risk.

4.6 HAZARDOUS MATERIALS

For detailed information on hazardous materials in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.6.1 LOCATION AND EXTENT

Fixed Hazardous Materials Incident

According to the Iowa Department of Natural Resources, there are 44 sites in Wright County that were designated as Tier II Facilities under the Superfund Amendments and Reauthorization Act due to the volume or toxicity of the materials on site. Three of these facilities are located in Woolstock. For more information on the location and extent of hazardous materials risk, please refer to the base plan.

Transportation Hazardous Materials Incident

No main transportation corridors run through Woolstock. However, hazardous materials could be transported on any of the roads in Wright County.

Rail Transport

No rail transportation infrastructure runs through Woolstock. The Union Pacific Railroad (UP) is the sole rail operator in Wright County. The main line runs northeast-southwest through Belmond, Clarion, and Eagle Gove.

Air Freight

There are three airports in Wright County (in Belmond, Clarion, and Eagle Grove). Hazardous materials incidents can occur in any areas near these three airports, although there are no airports in Woolstock itself.

Pipeline Incident

There are no pipelines that runs through the City of Woolstock.

4.6.2 PREVIOUS OCCURRENCES

From 2017 to 2024, there have been no hazardous materials spills or other hazardous materials incidentsreported to the Environmental Protection Agency (EPA) within Woolstock. For more information on previous occurrences within Wright County, please refer to the base plan.

4.6.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for hazardous materials in Woolstock is **Unlikely**.

4.6.4 VULNERABILITY ASSESSMENT

Within Woolstock, hazardous materials pose a **Low** risk due to the lack of previous occurrences and low number of Tier II facilities in the City. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to hazardous materials. Woolstock's vulnerability to hazardous materials is lower than the risk to the county as a whole. For more information on the vulnerability assessment for hazardous materials, please refer to the base plan.

4.6.4.1 Critical Facilities

There are several critical facilities near transportation corridors and Tier II facilities within Woolstock. Facilities located near major transportation corridors or industrial zones are at higher risk of exposure to chemical spills, fires, or airborne toxins. These incidents can disrupt operations, damage infrastructure, and endanger occupants, especially in facilities that house vulnerable populations like the elderly or children. Additionally, facilities without proper ventilation systems, backup power, or shelter-in-place protocols are more susceptible to contamination and operational failure during a HazMat event.

4.6.4.2 Cultural, Historic, and Natural Resources

Hazardous material (HazMat) incidents pose significant risks to natural, historic, and cultural resources across Wright County. These resources include wetlands, rivers, forests, and culturally significant landmarks. A chemical spill or airborne release can contaminate soil and water, damage ecosystems, and degrade the physical integrity of historic structures. Natural resources such as wildlife habitats and water bodies are particularly vulnerable to long-term environmental damage, which can disrupt biodiversity and recreational use. Historic and cultural sites may suffer irreversible harm if exposed to corrosive or toxic substances, especially if they lack protective infrastructure or are located near transportation corridors or industrial zones.

4.6.4.3 People

Communities near major transportation routes, such as highways and rail lines, are at higher risk due to the frequent movement of hazardous substances. Industrial zones and agricultural areas with chemical storage facilities also present elevated risks of fixed-site incidents. These events can lead to chemical spills, fires, or airborne releases that threaten public health and safety.

Vulnerability is especially high among populations with limited mobility, such as the elderly, individuals with disabilities, and residents of schools, hospitals, and correctional facilities. These groups may face challenges during evacuation or shelter-in-place orders.

Additionally, low-income communities may struggle with access to protective equipment, transportation, and timely information, further increasing their vulnerability.

4.6.4.4 Structures and Systems

It is difficult to determine the potential losses to existing development because of the variable nature of a hazardous materials spill. For example, a spill of a toxic airborne chemical in a populated area could have greater potential for loss of life. By contrast a spill of a very small amount of a chemical in a remote rural area would be much less costly and possibly limited to remediation of soil.

4.6.4.5 Changes in Development

Woolstock's recent population increases may increase hazard-related risk.

4.7 HUMAN DISEASE

For detailed information on human disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.7.1 LOCATION AND EXTENT

Pandemics and epidemics do not affect a single geographic location; all of Wright County is equally vulnerable. Transmission can occur anywhere people interact, but locations with higher numbers of individuals create more opportunities for disease to spread. For more information on the location and extent of human disease, please refer to the base plan.

4.7.2 PREVIOUS OCCURRENCES

Pandemics and epidemics have had recurring and widespread effects on the County and across the world. While some events have been global in scale and others more localized, each has highlighted the vulnerability of the community to infectious disease and underscored the importance of preparedness and coordinated response. Since 1918, there have been six major epidemics or pandemics that were widely recognized by both the CDC and WHO, in addition to the COVID-19 pandemic. For more information on previous occurrences within Wright County, please refer to the base plan.

4.7.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for human disease in Woolstock is **Possible**.

4.7.4 VULNERABILITY ASSESSMENT

Within Woolstock, human disease poses a **Medium** risk due to low probability yet high risk to significantly impact the City. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to human disease. Woolstock's vulnerability to human disease does not vary significantly from the risk of the county as a whole. For more information on the vulnerability assessment for human disease, please refer to the base plan.

4.7.4.1 Critical Facilities

Infectious disease outbreaks can significantly disrupt the operation of critical facilities in Wright County. These facilities may experience staffing shortages due to illness or quarantine, which can impair their ability to deliver vital services.

4.7.4.2 Cultural, Historic, and Natural Resources

Cultural institutions may be closed or operate at reduced capacity during a pandemic. This can lead to decreased access to cultural resources for the public.

4.7.4.3 People

Wright County faces notable vulnerabilities during a human infectious disease event due to a combination of environmental, healthcare, and socioeconomic factors. There are no medical providers in Woolstock, and residents generally travel to another city or town to receive care. Transmission risks are heightened by close human contact, contaminated surfaces, and limited access to sanitation in some areas. Populations most at risk include the elderly, immuno-compromised individuals, and frontline workers.

Risk will vary based on geographical vaccination efforts and vaccination uptake by communities and individuals. Additionally, insurance, access to healthcare, as well as trust in the medical community can

determine risk to population which can increase infection rates, hospitalizations, and mortality. [1] Due to the high percentage of individuals living in poverty, Woolstock may be more at risk to health impacts from human disease.

4.7.4.4 Structures and Systems

The impacts of human disease do not usually extend to physical structures and systems, but a lack of staffing could lead to issues with maintaining existing structures in a pandemic event.

4.7.4.5 Changes in Development

Overall, population in the City of Woolstock has increased over the past several years which may increase risk to people as more people reside in the City.

[1] https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems

4.8 INFRASTRUCTURE FAILURE

For detailed information on infrastructure in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.8.1 LOCATION AND EXTENT

The entire planning area is at risk to all types of infrastructure failure included in the hazard description section, either from primary failure due to malfunction, degradation, or accidental or intentional damage or as a result of a secondary impact related to another hazard event. For more information on the location and extent of infrastructure failure risk, please refer to the base plan.

4.8.2 PREVIOUS OCCURRENCES

Infrastructure Failure often occurs as a secondary impact of other hazard events. For specific descriptions, please see the Previous Occurrences section of the other hazards included in this plan. In addition to failures or impacts as a result of other hazard events, infrastructure failure can also occur as a result of lack of maintenance, human error, or deterioration. There have been no significant infrastructure failures reported in Wright County.

4.8.3 PROBABILITY OF FUTURE OCCURRENCES

Based on the general aging status of infrastructure statewide, the probability of future occurrences for infrastructure failure in Woolstock is **Highly Likely**.

4.8.4 VULNERABILITY ASSESSMENT

Within Woolstock, infrastructure failure pose a **High** risk due to a high likelihood of future occurrence and high potential magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to infrastructure failure. Woolstock's vulnerability to infrastructure failure does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for infrastructure failure, please refer to the base plan.

4.8.4.1 Critical Facilities

All critical facilities within Woolstock may be at risk of impacts (such as damage and disruption to services) from infrastructure failure.

4.8.4.2 Cultural, Historic, and Natural Resources

Infrastructure failures have a limited impact to natural, historic, and cultural resources. Secondary impacts of infrastructure failures such as fires due to ruptured gas pipelines and contamination from wastewater may pose a greater risk to these resources.

4.8.4.3 People

Infrastructure failures, at their most significant, could impact the entire population of Woolstock. Certain populations may be at increased risk from the impact of infrastructure failure, such as older adults or those who are medically dependent on electricity.

4.8.4.4 Structures and Systems

Since infrastructure failure is generally a secondary or cascading impact of other hazards, it is not possible to quantify estimated potential losses specific to this hazard due to the variables associated with affected population, duration of outages, etc. In some instances, failure of one system can impact others.

4.8.4.5 Changes in Development

Overall, the population of the City of Woolstock has increased over the past several years, which may increase risk.

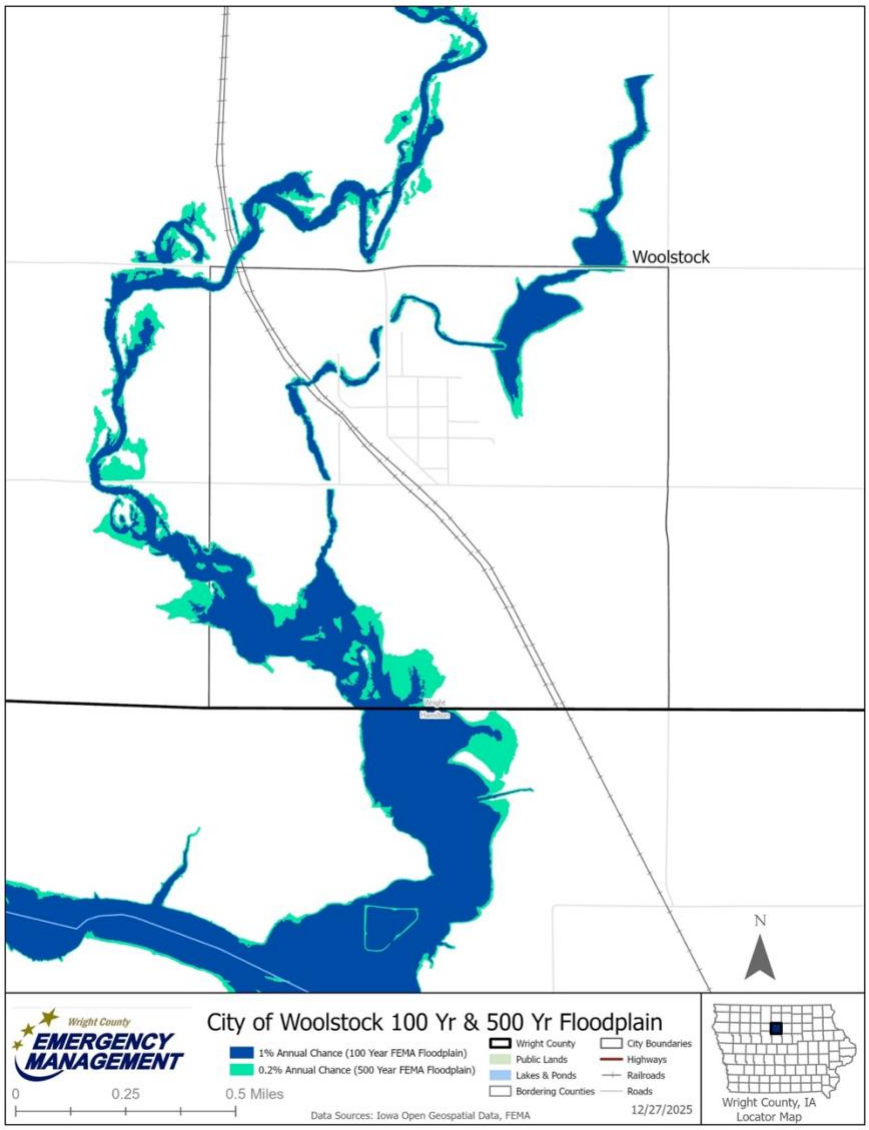
4.9 RIVER FLOODING

For detailed information on river flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.9.1 LOCATION AND EXTENT

Parts of Woolstock are in the 100-year floodplain or 500-year floodplain, as shown in **Figure 4**. For more information on the location and extent of river flooding, please refer to the base plan.

FIGURE 4. CITY OF WOOLSTOCK 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN



4.9.2 PREVIOUS OCCURRENCES

There have been no reported previous occurrences of river flooding within Woolstock.

National Flood Insurance Program (NFIP) Participation

Woolstock does not participate in the National Flood Insurance Program (NFIP), and has been sanctioned since 1977. According to the Iowa Department of Natural Resources, there are no Repetitive Loss or Severe Repetitive Loss Properties in Wright County. **Table 9** provides further details regarding NFIP participation in Woolstock.

TABLE 9. NFIP PARTICIPATION, CURRENT, HISTORICAL POLICY AND CLAIM STATISTICS

COMMUNITY NAME	NFIP PARTICIPANT	CURR EFF MAP DATE	REG EMER DATE	POLICIES IN-FORCE	TOTAL COVERAGE	HISTORICAL CLAIMS	HISTORICAL TOTAL PAYMENTS
Woolstock	No-Sanctioned 6/25/1977	10/20/2013	N/A	0	$0	$0	$0

4.9.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for river flooding in Woolstock is **Highly Likely**.

4.9.4 VULNERABILITY ASSESSMENT

Within Woolstock, river flooding pose a **High** risk due to high likelihood of future occurrence and the potentially significant magnitude of a flooding event. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to river flooding. Woolstock's vulnerability to river flooding does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for river flooding, please refer to the base plan.

4.9.4.1 Critical Facilities

To analyze critical facilities at risk in the planning area, the inventory of critical and essential facilities and infrastructure in the planning area was compiled from various sources including the previous Wright County Multi-Jurisdictional Hazard Mitigation Plan, Wright County, and the Iowa Department of Natural Resources (NRGIS). A comparison was made of the 176 facilities in the critical facilities inventory with the FIRM layer to determine those facilities that would be damaged in the 1-percent and 0.2-percent annual chance flood events.

4.9.4.2 Cultural, Historic, and Natural Resources

Please reference the flash flood section for information regarding potential impacts to natural, historic and cultural resources.

4.9.4.3 People

To estimate population displaced by a 1-percent annual chance flood, the number of residential structures impacted was multiplied by the average household size for each jurisdiction.

In Woolstock, one household would be displaced by a 1-percent annual chance flood. See **Table 10** for more information.

TABLE 10. ESTIMATED DISPLACED POPULATION

JURISDICTION	RESIDENTIAL STRUCTURES IMPACTED	AVERAGE HOUSEHOLD SIZE	ESTIMATED DISPLACED POPULATION
Woolstock	1	1.83	2

4.9.4.4 Structures and Systems

A 100-year or 1-percent annual chance flood would be expected to damage one structure in Woolstock. See **Table 11** for more information.

TABLE 11. POTENTIAL FLOOD LOSS ESTIMATES, 1-PERCENT ANNUAL CHANCE FLOOD

JURISDICTION	PROPERTY TYPE	IMPROVED PARCEL COUNTS	IMPROVED LOSSES	CONTENT LOSSES	INVENTORY LOSSES	TOTAL LOSSES
Woolstock	Residential	1	$10,410	$4,103	$0	$14,513
	Total	**1**	**$10,410**	**$4,103**	**$0**	**$14,513**

4.9.4.5 Changes in Development

Overall, the population of the City of Woolstock has increased over the past several years, which may increase risk.

4.10 SEVERE WINTER STORM

For detailed information on severe winter storms in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.10.1 LOCATION AND EXTENT

The entire state of Iowa is vulnerable to heavy snow, extreme cold temperatures, and freezing rain. Generally, winter storms occur between the months of November and March but can occur as early as October and as late as April. January has the highest monthly snowfall at about 9 inches of snow. For more information on the location and extent of severe winter storms, please refer to the base plan.

4.10.2 PREVIOUS OCCURRENCES

From 1996 through October 2025, the National Climatic Data Center reports the following severe winter weather events:

- 34 - Blizzard
- 9 - Cold/Wind Chill
- 17 - Extreme Cold/Wind Chill
- 2 - Heavy Snow

For more information on previous occurrences in Wright County, please refer to the base plan.

4.10.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for severe winter storms in Woolstock is **Highly Likely**.

4.10.4 VULNERABILITY ASSESSMENT

Within Woolstock, severe winter storms pose a **High** risk due to the high likelihood of occurrence and magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to severe winter storms. Woolstock's vulnerability to severe winter storms does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for severe winter storms, please refer to the base plan.

4.10.4.1 Critical Facilities

All critical facilities within Woolstock may be at risk of impacts and disruption to services due to extreme cold temperatures and high snowfall.

4.10.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources may be at risk to impact from severe winter weather. Ice storms and freezing temperatures often damage forests, wetlands, and wildlife habitats, leading to tree loss, habitat disruption, and increased runoff pollution from de-icing agents. These environmental changes can have lasting effects on local ecosystems and water quality. Historic buildings and cultural landmarks are vulnerable to structural damage from ice accumulation, freeze-thaw cycles, and water intrusion.

4.10.4.3 People

All people residing in Woolstock may be at risk of impact from severe winter storms from extreme cold temperatures and high snowfall. Residents who are elderly, disabled, or economically disadvantaged are at heightened risk during winter events due to limited access to reliable heating, transportation, and

emergency services. Many homes in rural areas lack adequate insulation or backup power sources, making them susceptible to dangerously low indoor temperatures during prolonged power outages caused by ice storms.

Low-income households may struggle to afford increased heating costs or to repair damage from burst pipes and frozen infrastructure. Within Woolstock, 5.5% of individuals live in poverty. Individuals who rely on electric-powered medical equipment can face life-threatening challenges when outages occur. Additionally, rural isolation can delay emergency response times, leaving residents without timely access to medical care or warming centers.

4.10.4.4 Structures and Systems

Structures and systems can be damaged or impaired by loss of electricity from overhead power line damages, and from secondary hazards following power loss like burst water pipes. Additionally, these storms cause moderate damages to structures and crops.

4.10.4.5 Changes in Development

Overall, the population of the City of Woolstock has increased over the past several years, which may increase risk.

4.11 TERRORISM

For detailed information on terrorism in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.11.1 LOCATION AND EXTENT

The entire planning area has a low potential for terrorist activity. However, there are areas that face increased risk such as schools, religious organizations, and government facilities. For more information on the location and extent of terrorism risk, please refer to the base plan.

4.11.2 PREVIOUS OCCURRENCES

There have not been any large-scale enemy attacks or acts of radiological terrorism in Iowa. There have been biological and chemical agent threats, animal rights activists' vandalism and many bomb threats. For more information on previous occurrences in Wright County, please refer to the base plan.

4.11.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for terrorism in Woolstock is **Unlikely**

4.11.4 VULNERABILITY ASSESSMENT

Within Woolstock, terrorism pose a **Medium** risk due to limited previous occurrences and the potential magnitude for such events. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to terrorism. Woolstock's vulnerability to terrorism does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for terrorism, please refer to the base plan.

4.11.4.1 Critical Facilities

There are no previous occurrences of terrorism impacting critical facilities in Woolstock, but essentially all critical facilities are at some level of risk of damage or disruption of services from terrorism. Terrorism can disrupt and damage critical facilities and cause a variety of public safety and public health concerns.

4.11.4.2 Cultural, Historic, and Natural Resources

In some cases, terrorist attacks may target certain natural, cultural, or historic resources. Additionally, use of destructive weapons may pollute natural resources and cause environmental degradation and damage the local environmental and ecosystems.

4.11.4.3 People

Terrorist attacks can cause injuries and fatalities, as well as long-term psychological trauma. Depending on the nature of the attack, the broader community can be impacted and its societal and economic functioning disrupted. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

Some acts of terrorism are hate-based and therefore individuals and communities from certain religions, nationalities, race, ethnicism, sexuality, and gender are at increased risk of attacks, injury, or even death. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

4.11.4.4 Structures and Systems

Potential losses could include cost of repair or replacement of damaged facilities, lost economic opportunities for businesses, loss of human life, injuries to persons, loss of food supplies, disruption of the food supply chain, and immediate damage to the surrounding environment.

4.11.4.5 Changes in Development

Overall, population in the City of Woolstock has increased over the past several years, which may increase risk.

4.12 THUNDERSTORM/LIGHTNING/HAIL

For detailed information on thunderstorm, lightning, and hail in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.12.1 LOCATION AND EXTENT

Thunderstorms and the associated hail and lightning impact the entire County with relatively similar frequency. Although, these events can occur throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur in more densely developed urban areas as well as to cropland. Iowa experiences 40 storms per year in the northwest portion of the state and 60 per year in the southeast portion. For more information on the location and extent of thunderstorm, lightning, and hail, please refer to the base plan.

4.12.2 PREVIOUS OCCURRENCES

The NCDC reported 233 total thunderstorm events for the Wright County planning area from 1965 through October 2025. Seven of those thunderstorm events occurred in Woolstock. For more information on previous occurrences in Wright County, please reference the base plan.

4.12.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences of thunderstorm, lightning, and hail in Woolstock is **Highly Likely**.

4.12.4 VULNERABILITY ASSESSMENT

Within Woolstock, thunderstorm, lightning, and hail pose a **Medium** risk due to a high likelihood of future occurrences. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to thunderstorm, lightning, and hail. Woolstock's vulnerability does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment, please refer to the base plan.

4.12.4.1 Critical Facilities

All critical facilities are at risk of impact from thunderstorm, lightning, and hail. Essential infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during severe storm events. In rural areas such as Wright County, this vulnerability is compounded by limited system redundancy and constrained emergency response capabilities, making recovery slower and impacts more severe.

4.12.4.2 Cultural, Historic, and Natural Resources

Severe storms can significantly impact natural, historic, and cultural resources within Wright County. Natural areas such as wetlands, forests, and river systems are vulnerable to erosion, flooding, and contamination from stormwater runoff. However, these ecosystems also serve as natural buffers that help absorb rainfall and reduce flood risk, but when damaged, they lose their protective function and biodiversity suffers.

Historic and cultural resources are also at risk. Many of these structures are older and not built to withstand high winds or flooding.

4.12.4.3 People

All people residing in Woolstock may be at risk of impact from thunderstorm, lightning, and hail. Severe storms pose significant vulnerability to people, especially in Iowa, where atmospheric conditions frequently support the development of hazardous weather. This vulnerability stems from both direct physical threats and indirect social and economic impacts. There have not been any fatalities in Wright County from lightning strikes.

Populations with limited access to safe housing, emergency services, or reliable communication systems are especially at risk. Vulnerable populations, such as the elderly, individuals with disabilities, and low-income households, may face greater challenges in preparing for, responding to, and recovering from storm events.

4.12.4.4 Structures and Systems

All structures and systems may be at risk of impact from thunderstorms, lightning, and hail. Most lightning damages occur to electronic equipment located inside buildings. But structural damage can also occur when a lightning strike causes a building fire. In addition, lightning strikes can cause damages to crops if fields light on fire. Communications equipment and warning transmitters and receivers can also be impacted by lightning strikes.

4.12.4.5 Changes in Development

Overall, the population of the City of Woolstock has increased over the past several years, which may increase risk.

4.13 TORNADO/WINDSTORM

4.13.1 LOCATION AND EXTENT

Iowa is located in a part of the United States where tornadoes are a common occurrence. Most tornadoes occur in May and June (but can occur during any month) and are most likely to occur between mid-afternoon and sunset. Tornadoes can occur anywhere throughout the County, including Rowan. For more information on the location and extent of tornado and windstorms, please refer to the base plan.

All of Wright County and Woolstock is susceptible to high wind events. The County is located in Wind Zone IV, which is susceptible to winds up to 250 mph.

4.13.2 PREVIOUS OCCURRENCES

No tornadoes or significant wind events have been recorded in Woolstock. For more information on previous occurrences in Wright County, please refer to the base plan.

4.13.3 PROBABILITY OF FUTURE OCCURRENCES

The probability of future occurrences of tornado/windstorm in Rowan is **Highly Likely**.

4.13.4 VULNERABILITY ASSESSMENT

Within Woolstock, tornado/windstorm pose a **High** risk due to probability or future occurrences and potential for significant magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to tornado/windstorm. Woolstock's vulnerability to tornado/windstorm does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for tornadoes and windstorms, please refer to the base plan.

4.13.4.1 Critical Facilities

All critical facilities are at risk of impact and damage from tornadoes and high wind events. Essential infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during tornadoes. Tornadoes can disrupt critical infrastructure such as communications and energy due to high winds and debris.

4.13.4.2 Cultural, Historic, and Natural Resources

All cultural, historic, and natural resources are at risk of impact and damage from tornadoes and high wind events. Natural resources such as forests, wetlands, and wildlife habitats may be damaged or destroyed by high winds, flying debris, and uprooted vegetation. Historic and cultural resources are often particularly vulnerable due to their age, structural fragility, and irreplaceable value. Tornadoes may cause partial or total destruction of these assets.

4.13.4.3 People

All individuals residing in Woolstock are at risk of impact and casualty. Populations residing in structures not designed as storm shelters are inherently vulnerable to tornado hazards. This risk is especially elevated for individuals living in mobile homes, which statistically account for a disproportionate number of tornado-related fatalities and injuries due to their limited structural resilience.

4.13.4.4 Structures and Systems

All structures and systems are at risk of impact, damage, and disruption. Tornadoes have caused widespread damage to homes, businesses, farms, and public infrastructure in other communities, and could

do the same in Woolstock. Critical facilities like schools, fire stations, and police departments are often left inoperable following tornadoes due to roof failures, debris impacts, and power outages.

4.13.4.5 Changes in Development

Overall, the population of the City of Woolstock has increased over the past several years, which may increase risk.

4.14 TRANSPORTATION INCIDENT

For detailed information on transportation incident in Wright County, please refer to the base plan. This annex only includes information that is specific to the City of Woolstock for all profiled hazards.

4.14.1 LOCATION AND EXTENT

A transportation incident could take place on any of the roads in Wright County. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. No major transportation corridors pass through Woolstock, controlling risk. For more information on the location and extent of transportation incidents, please refer to the base plan.

Rail Transport

There are no rail transport lines through Woolstock.

Air Freight

There are three airports in Wright County (in Belmond, Clarion, and Eagle Grove). Air incidents could potentially occur anywhere near these airports, but there are no airports located in Woolstock itself.

4.14.2 PREVIOUS OCCURRENCES

According to the National Transportation Safety Board (NTSB), there have no significant transportation incidents reported in Woolstock. However, small scale transportation incidents related to auto accidents are common.

4.14.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for transportation incident in Woolstock is **Highly Likely**.

4.14.4 VULNERABILITY ASSESSMENT

Within Woolstock, transportation incident pose a **High** risk due to the commonality of road traffic accidents. This section provides further contextualization for the anticipated vulnerability of the communities within Woolstock to transportation incident. Woolstock's vulnerability to transportation incidents does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for transportation incidents, please refer to the base plan.

4.14.4.1 Critical Facilities

All critical facilities could potentially be damaged by an automobile accident, airplane crash, or other transportation incident. Utility and communications systems are most likely to be impacted, as an isolated incident in one area could potentially affect these systems more broadly.

4.14.4.2 Cultural, Historic, and Natural Resources

Transportation accidents, whether involving vehicles, rail, or hazardous material spills, can pose threats to natural, cultural, and historical resources in Wright County. These incidents may result in direct physical damage, environmental contamination, or long-term degradation of sites that hold historical or cultural significance.

4.14.4.3 People

Transportation-related incidents involving passenger vehicles pose significant risks to public safety and infrastructure. The likelihood and severity of such accidents are influenced by factors including traffic volume, infrastructure condition, weather, and human error.

4.14.4.4 Structures and Systems

All structures and systems are at some level of risk of damage and disruption from transportation incidents, due to their proximity to roadways.

4.14.4.5 Changes in Development

Overall, the population of Woolstock has increased over the past several years, which may increase risk.

5. MITIGATION STRATEGY

The Mitigation Strategy section of the base plan provides a blueprint for all communities within Wright County to become less vulnerable to the profiled hazards. As established in the base plan, the overall goals of the Wright County mitigation strategy are consistent across all participating municipalities.

This section provides community-specific strategies for Woolstock, including the status of actions that were included in the previous plan and actions to be considered or pursued over the next five years. As noted in the base plan, the participants are not committing to undertaking every action suggested in this list but rather are proposing an extensive list of *potential* actions that they may wish to pursue, depending on the availability of funding. **Table 12** details the mitigation actions identified for the City of Woolstock and **Table 13** details the mitigation actions identified for the entire County, known as Countywide Actions.

TABLE 12. UPDATED 2026 WOOLSTOCK MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Woolstock - 1	Adopt an ordinance that prohibits open burning in dry weather.	Grass/Wildland Fire	Continue Not Started	City Council	County EMA	General Funds	Little or No Cost	1 year	H
Woolstock - 2	Inform the public through mailings or public announcements about the dangers of hail, transportation emergencies, watershed pollution, grassfires and other hazards affecting the city	All Hazards	Continue Not Started	City Council	County EMA	General Funds	Little or No Cost	1 year	H
Woolstock - 3	Adopt a water rationing ordinance in times of extreme drought and heat in order to conserve water supplies.	Drought; Extreme Heat	Continue Not Started	City Council	Water Districts	General Funds	Little or No Cost	1 year	M
Woolstock - 4	Purchase tree trimming equipment and/or contract with outside entity to trim trees away from power lines throughout the city.	Infrastructure Failure; Tornado/Windstorm; Thunderstorm/ Lightning/Hail	Continue Not Started	City Council	Power Company	General Funds	Less than $10,000	2-3 years	H
Woolstock - 5	Retrofit the Woolstock Community Hall and supply it to serve as a warming and cooling shelter during emergencies or outages.	Extreme Heat	Continue Not Started	City Council	County EMA	General Funds	$10,000 to $50,000	3-5 years	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Woolstock - 6	Initiate an inspection program so that the fire department is able to inspect city buildings and provide recommendations for fire safety.	Infrastructure Failure	Continue Not Started	Fire Department	City Council	General Funds	Less than $10,000	2-3 years	H
Woolstock - 7	Purchase and install generator and wiring to Community Hall so that the Hall will continue to operate when electricity fails.	Infrastructure Failure	Continue Not Started	City Council	County EMA	General Funds	Less than $10,000	2-3 years	H
Woolstock - 8	Install more sirens and early warning systems	Tornado/Winds torm	Continue Not Started	City Council	County EMA	General Funds	Less than $10,000	1 year	H
Woolstock – 9	Correct deficiencies, remediate violations and re-apply to FEMA by adopting mandatory floodplain management regulations.	River Flooding	New	City Council	County EMA	General Funds	$100,000 to $500,000	2-3 years	H

TABLE 13. 2026 COUNTYWIDE ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA - 1	Encourage residents to purchase weather radios to stay informed on emergency information.	All Hazards	Continue In-Progress	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	1 year	M
CWA - 2	Increase coordination with regional and state agencies for early warning and monitoring of animal, plant, and crop disease	Animal/plant/crop disease	New	Environmental Health	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), USDA	Little or no cost	Ongoing	H
CWA - 3	Educate residents on water saving techniques and water conservation	Drought	New	County EMA , Participating Jurisdictions	Public Media	General Funds	Little or No Cost	1 year	L
CWA – 4	Promote tree planting in areas with low vegetation to increase shade coverage.	Extreme Heat	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	Ongoing	M
CWA – 5	Improve drainage infrastructure in areas where flash flooding frequently occurs.	Flash Flood	New	County EMA	Participating Jurisdictions	General Funds	$100,000 to $500,000	Ongoing	H
CWA – 6	Promote defensible landscape for homes, businesses and entities within WUI areas.	Grass and Wildland Fire	New	County EMA	Participating Jurisdictions	General Funds	Little to No Cost	Ongoing	H

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 7	Promote wetland restoration to reduce flooding impacts across the County.	River Flooding	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$100,000 to $500,000	Ongoing	H
CWA – 8	Promote snow safety to residents on how to prevent pipe breaks in their homes (e.g., insulating outdoor faucets, drip warm water from an indoor faucet) and what to do if a pipe breaks.	Severe Winter Storm	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	Little to No Cost	Ongoing	H
CWA – 9	Conduct Countywide trainings to practice responding to radiological incidents.	Hazardous Materials	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA -10	Promote flu clinics across the County	Human Disease	New	County EMA , Participating Jurisdictions	County Public Health	CDC Grants, General Funds	$10,000 to $50,000	Ongoing	M
CWA – 11	Promote Tree Trimming across the County to prevent fallen trees on infrastructure.	Infrastructure Failure	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	2-3 years	M
CWA – 12	Conduct Countywide trainings to practice responding to terrorist incidents.	Terrorism	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 13	Conduct Countywide trainings to practice responding to transportation incidents.	Transportation Incident	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA - 14	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Thunderstorm/Lightning/Hail	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M
CWA – 15	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Tornado/Windstorm	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M

1.INTRODUCTION AND PLANNING PROCESS

This annex provides more detailed information about the three school districts serving Wright County. This annex includes the following:

- A more localized District profile, including more detailed mapping, population and demographic information, and critical facilities information
- District-level Hazard Identification and Risk Assessment (HIRA) information, including some more localized hazard maps and conclusions related to hazard risk and how it varies across the planning area
- A localized vulnerability assessment, including the likely impact of profiled hazards on critical facilities
- A detailed capability assessment, describing resource and tools available to the Districts to participate in hazard mitigation and reduce hazard risk
- A mitigation strategy, describing a variety of actions the Districts may opt to take to reduce the risk associated with profiled hazards over the useful life of this plan

2. COMMUNITY PROFILE

2.1 OVERVIEW

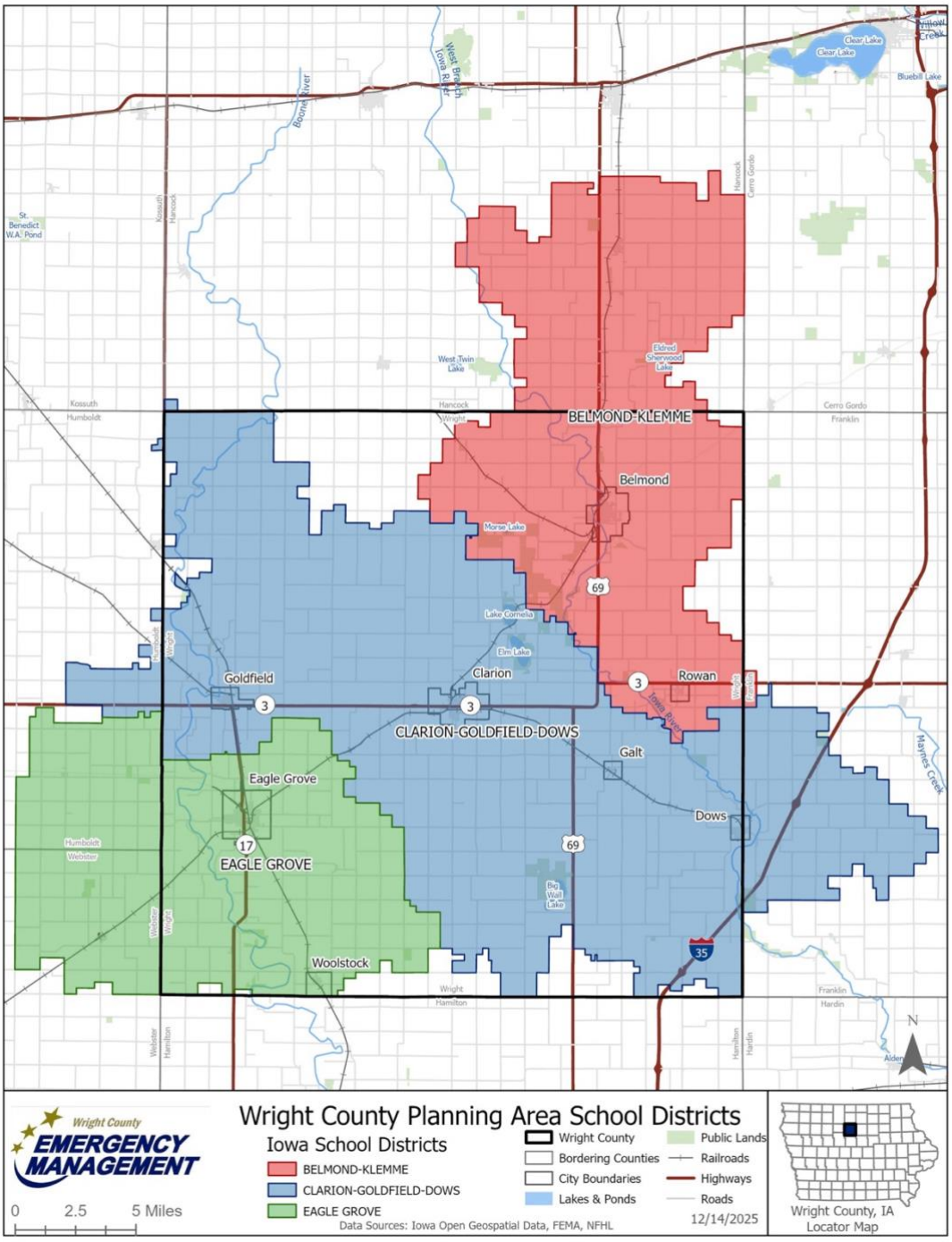
The following school districts that participated in development of this plan:

- Belmond-Klemme Public School District
- Clarion-Goldfield-Dows Public School District
- Eagle Grove Public School District

The capabilities of school districts are fundamentally different than those of the municipalities and other jurisdictions participating in this plan. General information about each of the three school districts serving Wright County are detailed below.

Figure 1 displays where the three school districts are located within Wright County.

FIGURE 1. WRIGHT COUNTY SCHOOL DISTRICTS



2.2 CRITICAL FACILITIES

The maps below describe the location of critical facilities within each school district. Although these critical facilities are overwhelmingly not owned or operated by the districts (which intersect multiple municipalities and unincorporated county areas), disaster impacts to these critical facilities could affect each respective district's schools or students. Broadly speaking, hazard impacts to critical facilities in any of the other participating jurisdictions have a high likelihood of impacting the school districts, either directly or indirectly.

FIGURE 2. BELMOND-KLEMME SCHOOL DISTRICT CRITICAL FACILITIES MAP

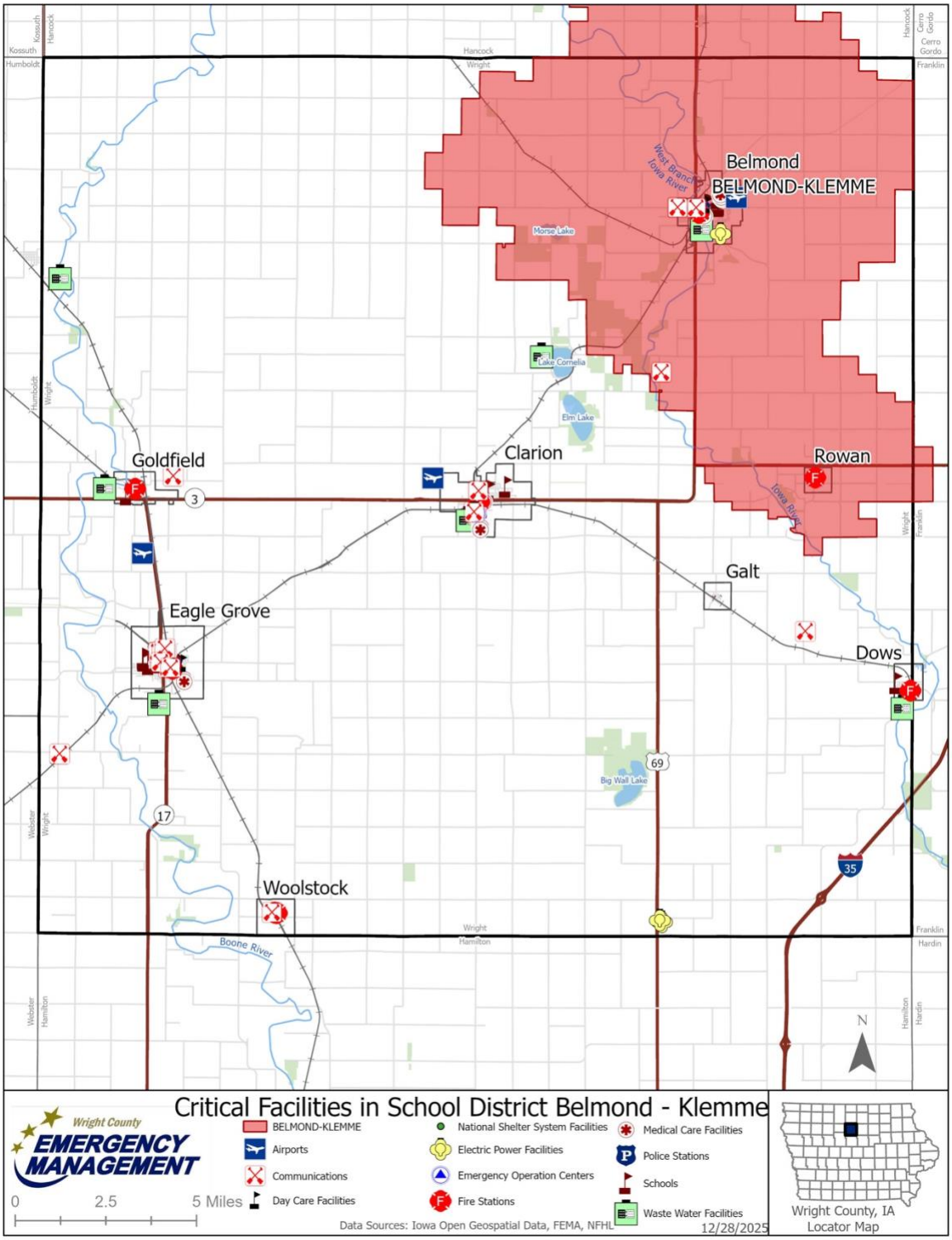


FIGURE 3. CLARION-GOLDFIELD-DOWS SCHOOL DISTRICT CRITICAL FACILITIES MAP

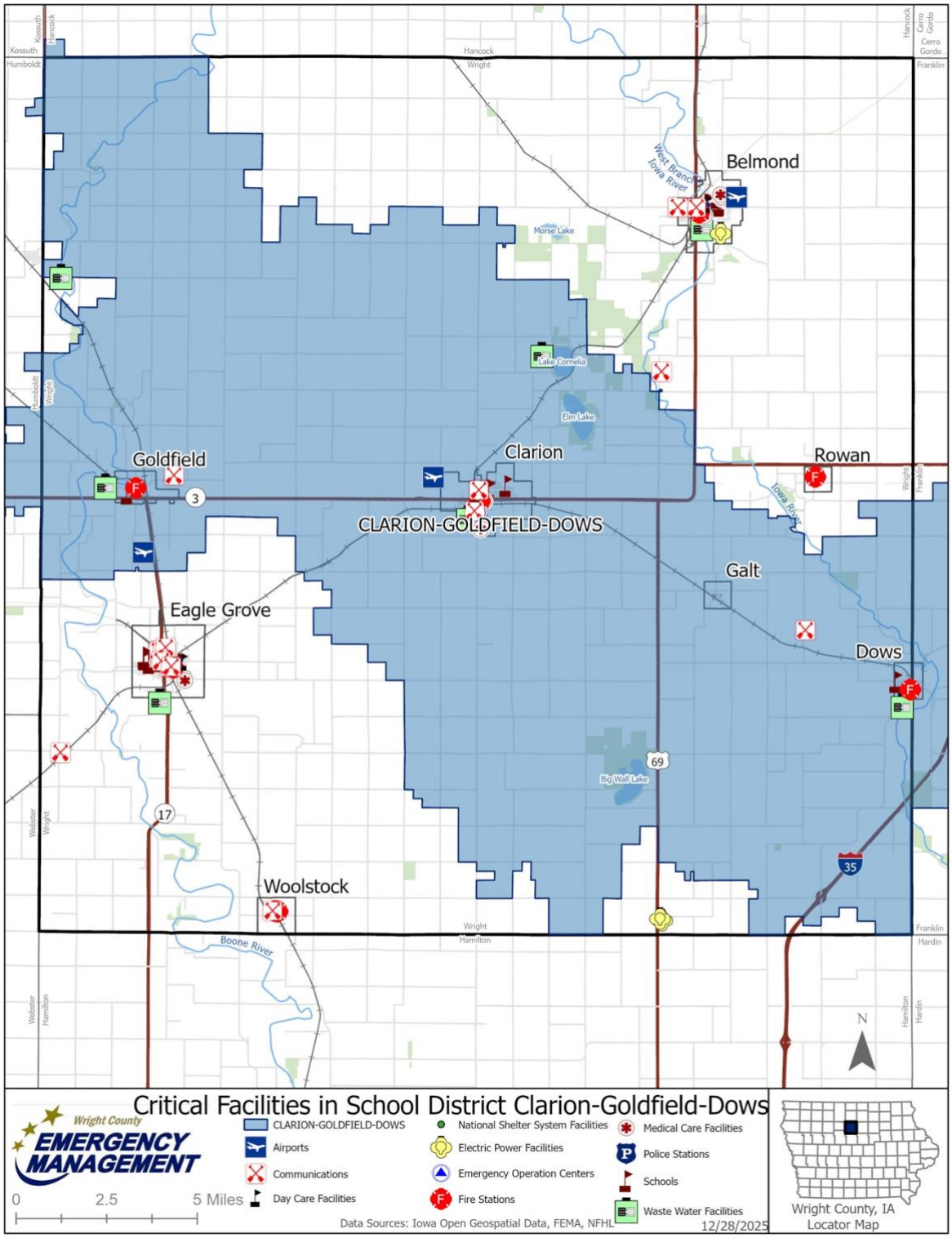
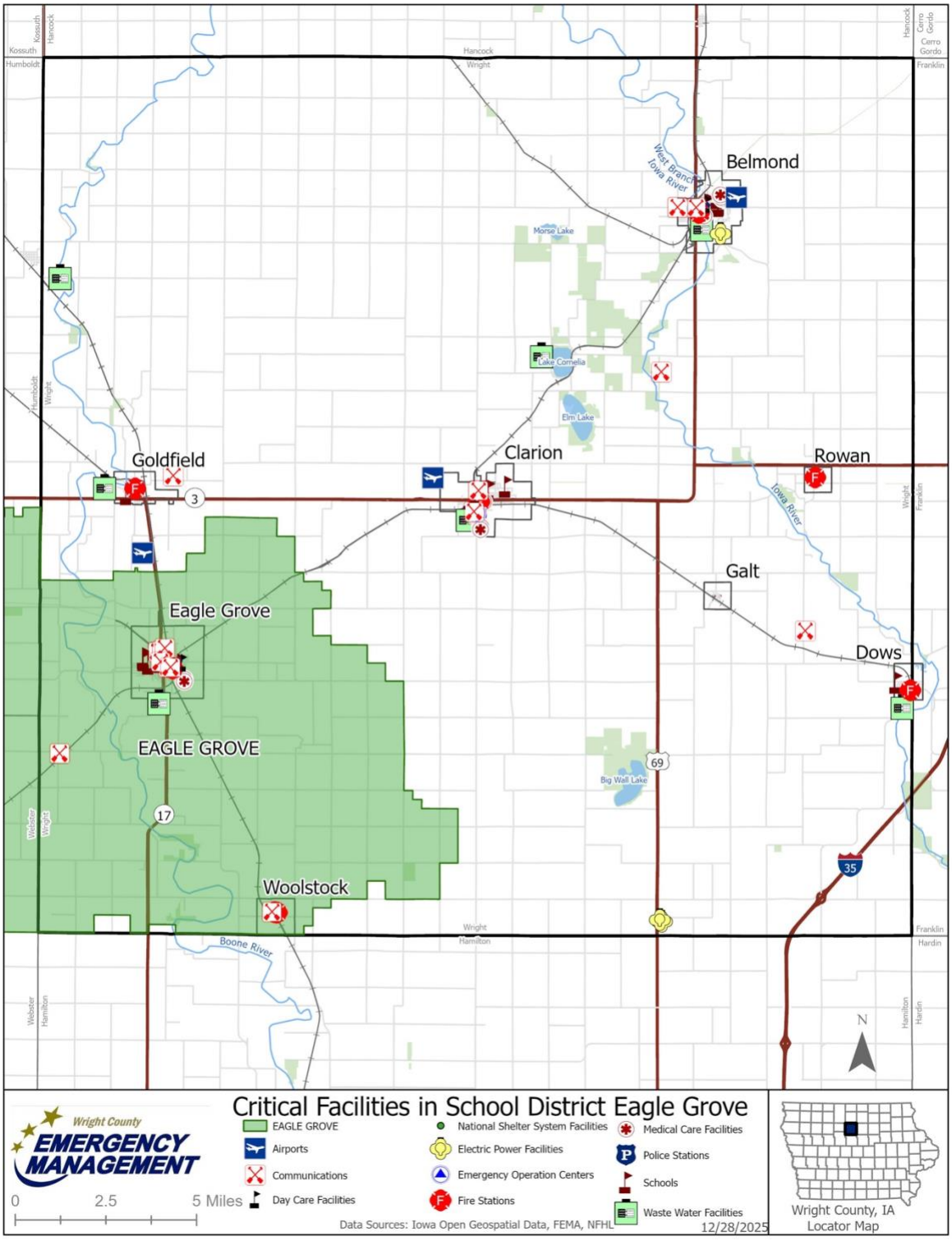


FIGURE 4. GOLDFIELD SCHOOL DISTRICT CRITICAL FACILITIES MAP



3. CAPABILITY ASSESSMENT

The capability assessment evaluates a jurisdiction's ability to implement a comprehensive mitigation strategy and identifies opportunities to establish or strengthen mitigation policies, programs, and projects. Because the capabilities that might be available to a municipality or county are very different from those that might be available to a school district, the structure of this assessment does not mirror those of the other participating jurisdictions in this plan.

3.1 AUTHORITIES AND POLICIES

All three school districts are required to adhere to Iowa State building codes. Both Clarion-Goldfield-Dows and Eagle Grove CSD have a Weapons Policy to prevent weapons from entering school property and potentially causing disruption and harm to the schools, but most other regulatory tools (like land use or development ordinances) usually used to support risk reduction are not relevant to school districts. Their primary authorities are related to the buildings they themselves own and operate.

3.2 PROGRAMS, FUNDING, AND RESOURCES

3.2.1 Programs

Clarion-Goldfield-Dows and Eagle Grove CSD have a Capital Improvement Plan and a School Emergency Plan. In addition to those plans, Eagle Grove CSD has an evacuation plan, remote learning plan, master plan, and a security plan from the state. Belmond-Klemme CSD does not maintain such plans.

Because they are not municipalities or counties, none of the three school districts are eligible to participate in the NFIP.

3.2.2 Funding

In the past, the school districts have been able to obtain funding from several funding mechanisms which include the following:

- Capital improvement project funding
- Local funds
- Physical Plant & Equipment Levy (PPEL)
- Secure Advanced Vision For Education (SAVE)
- General obligation bonds
- Special tax bonds
- Private activities and donations
- State and federal funds

3.2.3 Resources

Clarion-Goldfield-Dows and Eagle Grove CSD have a full-time Building Official as well as Public Information Officer to coordinate all information to the public. Additionally, each of the school districts have public alert systems.

3.3 FACILITY AND STUDENT INFORMATION

This section provides general information about students and facilities in each school district.

Belmond-Klemme Community School District

There are three key facilities operated by the Belmond-Klemme CSD:

- Richard O. Jacobson Elementary School
- The Belmond-Klemme Junior/Senior High School
- Central District Office

For the 2025-2026 school year, there were 713 students enrolled across both schools in the district.

Clarion-Goldfield-Dows Community School District

There are four key facilities operated by the Clarion-Goldfield-Dows CSD:

- Clarion-Goldfield-Dows Elementary School
- Clarion-Goldfield-Dows Middle School
- Clarion-Goldfield-Dows High School
- Clarion-Goldfield-Dows School District Office

For the 2025-2026 school year, there were 982 students enrolled across the three schools in the district.

Eagle Grove Community School District

There are five key facilities operated or utilized by Eagle Grove CSD:

- Eagle Grove Elementary
- Robert Blue Middle School
- Eagle Grove High School
- The Emerson Admin Building (site of some high school classes)
- ICCC Academy (site of some high school classes)

More detailed information about the three schools operated by the district is provided below in **Table 1**.

TABLE 1. EAGLE GROVE CSD FACILITY AND STUDENT INFORMATION

SCHOOL	NUMBER OF ENROLLED STUDENTS (2025-2026)	NUMBER OF STUDENTS UTILIZING SCHOOL TRANSPORTATION	NUMBER OF STUDENTS QUALIFYING FOR FREE OR REDUCED LUNCH	DOES THIS SCHOOL HAVE SHELTER-IN-PLACE CAPABILITIES?	DOES THIS SCHOOL SERVE AS AN EMERGENCY SHELTER FOR NON-STUDENT RESIDENTS?
Eagle Grove Elementary	410	300	179	Yes	No
Robert Blue Middle School	265	100	180	Yes	No

Eagle Grove High School	291	50	254	Yes	No

3.4 CHANGES IN DEVELOPMENT AND PRIORITIES

Belmond-Klemme Public School District

Since the 2019-2020 school year (during which the plan was last updated), enrollment has decreased slightly (from 774 to 713). There have been no significant changes in priorities or development.

Clarion-Goldfield-Dows Public School District

Since the 2019-2020 school year (during which the plan was last updated), enrollment has increased very slightly (from 973 to 982). There have been no significant changes in priorities or development.

Eagle Grove Public School District

There has been an increased enrollment within the school District. Additionally, with a new political environment, the migrant population has decreased since last January, reducing demand on schools.

3.5 ABILITY TO EXPAND AND IMPROVE CAPABILITIES

The three school districts that participated in this plan update have confirmed that they do not see a realistic path to expanding their ability to support hazard mitigation, based on resource and personnel constraints.

4. HAZARD IDENTIFICATION AND RISK ASSESSMENT

The Hazard Identification and Risk Assessment (HIRA) process, described in more detail in the HIRA section of the base plan, involves identifying potential hazards, evaluating their likelihood and potential consequences, and estimating and describing the level of risk these hazards present to a community.

As described in the "HIRA Methodology" section of the base plan, participants in this plan update reconsidered the relative risk posed by the profiled hazards by conducting a hazard ranking process. **Table 2** below provides a summary of how those hazards were ranked for each of the school districts. Each of the 14 natural and manmade hazards discussed in this section are described in more detail in the HIRA section of the base plan. This section endeavors to provide more detailed, local-level information, mapping, and conclusions for these hazards wherever relevant.

TABLE 2. HAZARD RANKING SUMMARY BY PUBLIC SCHOOL DISTRICT

JURISDICTION	ANIMAL/CROP/PLANT DISEASE	DROUGHT	EXTREME HEAT	FLASH FLOOD	GRASS OR WILDLAND FIRE	HAZARDOUS MATERIALS	HUMAN DISEASE	INFRASTRUCTURE FAILURE	RIVER FLOODING	SEVERE WINTER STORM	TERRORISM	THUNDERSTORM/LIGHTNING/HAIL	TORNADO/WINDSTORM	TRANSPORTATION INCIDENT
Belmond-Klemme CSD	L	H	M	L	L	L	M	H	M	H	M	M	H	H
Clarion-Goldfield-Dows CSD	L	H	M	L	L	L	M	H	M	H	M	M	H	H
Eagle Grove CSD	L	H	M	L	L	L	M	H	M	H	M	M	H	H

4.1 ANIMAL/PLANT/CROP DISEASE

For detailed information on animal, plant, and crop disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the school districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.1.1 LOCATION AND EXTENT

All of Wright County is subject to animal/livestock incidents and agricultural infestations. For more information on the location and extent of animal, plant, and crop disease, please refer to the base plan.

4.1.2 PREVIOUS OCCURRENCES

There are no previous occurrences that have been reported to impact the three school districts. For more information on previous occurrences in Wright County, please refer to the base plan.

4.1.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences of animal, plant, or crop disease impacting the three school districts is **Unlikely**.

4.1.4 VULNERABILITY ASSESSMENT

Across all three School Districts, animal/plant/crop disease poses a **Low** risk based on the minimal impact that this hazard poses to the School Districts. This section provides further contextualization for the anticipated vulnerability of the communities from animal, plant, or crop disease. The School District's vulnerability is lower than the risk of the county as a whole. For more information on the vulnerability assessment, please refer to the base plan.

4.1.4.1 Critical Facilities

Animal, plant, or crop diseases are not expected to impact the districts' critical facilities.

4.1.4.2 Cultural, Historic, and Natural Resources

Animal, plant, or crop diseases are not expected to impact the cultural, historic, or natural resources relevant to the school districts.

4.1.4.3 People

Animal, plant, or crop diseases can cause economic disruption or impact food supply chains, both of which could hinder the districts' ability to serve their students.

4.1.4.4 Structures and Systems

Animal, plant, or crop diseases are not expected to impact the districts' structures or systems.

4.1.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.2 DROUGHT

For detailed information on drought in Wright County, please refer to the base plan. This annex only includes information that is specific to the School Districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.2.1 LOCATION AND EXTENT

All of Wright County is subject to drought, which tends to impact broad areas simultaneously. For more information on the location and extent of drought, please refer to the base plan.

4.2.2 PREVIOUS OCCURRENCES

According to the National Drought Mitigation Center's Drought Impact Reporter, during the period from January 2007 through January 2026, nine were reported to affect Wright County. For more information on previous occurrences in Wright County, please refer to the base plan.

4.2.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences of drought impacting all three School Districts is **Highly Likely**.

4.2.4 VULNERABILITY ASSESSMENT

Within all three School Districts, drought poses a **High** risk due to potential impacts, largely to public health, agriculture, and the local economy. This section provides further contextualization for the anticipated vulnerability of the communities within the School Districts to drought. The School District's vulnerability to drought does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for drought, please refer to the base plan.

4.2.4.1 Critical Facilities

All critical facilities across all three School Districts may be impacted by drought, particularly in the event of water shortages during extreme drought conditions. Water shortages could disrupt the ability to provide education.

4.2.4.2 Cultural, Historic, and Natural Resources

There are no significant historic or natural resources on school district property. Water shortages related to drought could impact the districts' ability to provide opportunities for students to participate in school sports.

4.2.4.3 People

All staff, administration, and students within the three School Districts may be impacted by Drought. Drought presents hazards to public health in extreme cases, where drinking water production cannot keep up with demand. Increased water demand may increase water rates and create financial hardship, especially for individual and families living below poverty. Additionally, young children may be at greater risk of experiencing adverse health effects resulting from reduced water quality.

4.2.4.4 Structures and Systems

Drought has minimal effect on all school buildings within the three school districts. In severe prolonged droughts, structures could be impacted through cracks in foundation which can comprise the integrity and safety of buildings. Additional impacts to structures could include damage to landscaping and dried vegetation, which can execrate urban fire and wildfire risk.

4.2.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.3 EXTREME HEAT

For detailed information on extreme heat in Wright County, please refer to the base plan. This annex only includes information that is specific to the School Districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.3.1 LOCATION AND EXTENT

All of Wright County is subject to extreme heat as it is normally a widespread hazard. For more information on the location and extent of extreme heat, please refer to the base plan.

4.3.2 PREVIOUS OCCURRENCES

The following summarizes the National Weather Service Advisories, Watches, and Warnings for Heat or Excessive Heat in Wright County from 2000 to 2025 (25 years of data). For more information on previous occurrences in Wright County, please refer to the base plan.

- 46 Heat Advisories
- 2 Extreme Heat Watches
- 8 Excessive Heat Watches
- 7 Excessive Warnings

There are no reported instances of extreme heat events substantively impacting the school districts.

4.3.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences within the County, the probability of future occurrences for extreme heat in all three school districts is **Likely**.

4.3.4 VULNERABILITY ASSESSMENT

Within all three School Districts, extreme heat poses a **Medium** risk due to high likelihood of future occurrence and magnitude. This section provides further contextualization for the anticipated vulnerability of the school districts to extreme heat. The School District's vulnerability to extreme heat does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for extreme heat, please refer to the base plan.

4.3.4.1 Critical Facilities

All critical facilities within all three School Districts may be at risk in the event of a severe extreme heat event taking place during the school year. The need to keep buildings cool can strain electrical systems, which could lead to system failures.

4.3.4.2 Cultural, Historic, and Natural Resources

There are no significant historic or natural resources on school district property. Extreme heat could impact the districts' ability to provide students with the opportunity to participate in sports.

4.3.4.3 People

All staff, administration and students within the schools may be at risk of impact, especially of heat-related illnesses. The need to remain indoors to keep students and teachers cool could impact the delivery of school programs.

4.3.4.4 Structures and Systems

Extreme heat can cause a strain on electricity delivery infrastructure, which can be overloaded during peak use of electricity during extreme heat events.

4.3.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.4 FLASH FLOOD

For detailed information on flash flood in Wright County, please refer to the base plan. This annex only includes information that is specific to the School Districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.4.1 LOCATION AND EXTENT

Wright County includes two major tributaries of the Mississippi River, including the Boone River and the upper portion of the Iowa River. The Boone Watershed intercepts the entire western and central portion of Wright County and is an area of gently flat to rolling hills. For more information on the location and extent of flash flood, please refer to the base plan.

4.4.2 PREVIOUS OCCURRENCES

Belmond-Klemme Public School District

Within the Belmond-Klemme Public School District boundary, there have been three flash flood incidents since 1997, impacting the ability of students in the district to attend school. More details are provided in **Table 3**.

TABLE 3. FLASH FLOOD PREVIOUS OCCURRENCES (1997-2025)

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
ROWAN	6/22/97	$100,000	$50,000
ROWAN	9/23/16	$50,000	$200,000
OLAF	6/25/25	$0	$0

Clarion-Goldfield-Dows Public School District

Within the Clarion-Goldfield-Dows Public School District boundary, there have been 11 flash flood incidents since 1997, impacting the ability of students in the district to attend school. More details are provided in **Table 4**.

TABLE 4. FLASH FLOOD PREVIOUS OCCURRENCES (1997-2025)

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
CLARION	6/22/07	$100,000	$250,000
GOLDFIELD	8/28/07	$10,000	$10,000
CLARION ARPT	5/6/08	$25,000	$0
GOLDFIELD	6/4/08	$25,000	$0
CLARION ARPT	6/8/08	$20,000	$0
CLARION	6/23/10	$50,000	$10,000
HOLMES	6/25/10	$100,000	$0
CLARION	7/23/10	$15,000	$0
GOLDFIELD	9/23/16	$10,000	$0

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
CLARION ARPT	7/7/24	$0	$0
CLARION	7/7/24	$0	$0

Eagle Grove Public School District

Within the Eagle Grove Public School District boundary, there have been six flash flood incidents since 1997, impacting the ability of students in the district to attend school. More details are provided in **Table 5**.

TABLE 5. FLASH FLOOD PREVIOUS OCCURRENCES (1997-2025)

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
EAGLE GROVE	5/21/04	$50,000	$20,000
EAGLE GROVE	8/19/07	$30,000	$5,000
EAGLE GROVE	6/4/08	$50,000	$0
EAGLE GROVE ARPT	6/8/08	$25,000	$0
EAGLE GROVE	7/7/24	$0	$0
EAGLE GROVE	7/7/24	$0	$0

4.4.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for flash flood in all three School Districts is **Possible**.

4.4.4 VULNERABILITY ASSESSMENT

Within all three School Districts, flash flood poses a **Low** risk due to a highly likely probability of occurrences but minimal likelihood of damage to school district buildings or direct impacts to staff and students, other than the ability of students who live in the flooded area to travel to school. This section provides further contextualization for the anticipated vulnerability of the communities within the School Districts to flash flood. The School District's vulnerability to flash flood is lower than the risk of the county as a whole. For more information on the vulnerability assessment for flash flood, please refer to the base plan.

4.4.4.1 Critical Facilities

The critical facilities operated by the three districts are not likely to be directly impacted by flash flooding, as none of them are in low-lying areas.

4.4.4.2 Cultural, Historic, and Natural Resources

There are no significant historic or natural resources on school district property, and flash flooding is not expected to significantly impact school culture.

4.4.4.3 People

Flash flooding could impact the ability of students or teachers living in low lying areas to attend school.

4.4.4.4 Structures and Systems

Critical facilities that serve school district buildings (like electricity distribution systems or other utilities) that are impacted by a flash flood could indirectly impact the districts' ability to continue educating students.

4.4.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.5 GRASS OR WILDLAND FIRE

For detailed information on grass or wildland fire in Wright County, please refer to the base plan. This annex only includes information that is specific to the School Districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.5.1 LOCATION AND EXTENT

Wildland/Grass fires are most likely to occur in the Wildland Urban Interface (WUI). This is the area where houses meet or intermingle with undeveloped wildland vegetation. Within the WUI, there are two specific areas identified:

- Interface
- Intermix

The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. All three school districts have WUI areas that include both interface and intermixes and are at risk for fire incidents. For more information on the location and extent of grass or wildland fire, please refer to the base plan.

4.5.2 PREVIOUS OCCURRENCES

According to the National Fire Incident Reporting System (NFIRS), there has been one fire incident in Wright County since 2017, near Cornelia, in the Clarion-Goldfield-Dows Public School District. For more information on previous occurrences within Wright County, please refer to the base plan.

4.5.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for grass or wildland fire impacting the three school districts is **Possible**.

4.5.4 VULNERABILITY ASSESSMENT

Within all three School Districts, grass or wildland fire pose a **Low** risk due to the limited number of previous occurrences. This section provides further contextualization for the anticipated vulnerability of the communities within the school districts to grass or wildland fire. Their vulnerability to grass or wildland fire is lower than the risk of the county as a whole. For more information on the vulnerability assessment for grass or wildland fire, please refer to the base plan.

4.5.4.1 Critical Facilities

There are no critical facilities in Wright County that are within the WUI areas (Interface and Intermix), so potential risk from this hazard to critical facilities is low.

4.5.4.2 Cultural, Historic, and Natural Resources

There are no significant historic or natural resources on school district property. Fires can cause air quality issues that impact the districts' ability to provide students with opportunities to participate in sports.

4.5.4.3 People

Grass and wildland fires can cause air quality issues that present health and safety risks to teachers and students. If students live in areas directly impacted by wildfire, it could impact their ability to attend school.

4.5.4.4 Structures and Systems

Wildfires can impact utility systems. If school buildings lose utility services, they may be unable to operate.

4.5.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.6 HAZARDOUS MATERIALS

For detailed information on hazardous materials in Wright County, please refer to the base plan. This annex only includes information that is specific to the School Districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.6.1 LOCATION AND EXTENT

Fixed Hazardous Materials Incident

According to the Iowa Department of Natural Resources, there are 44 sites in Wright County that were designated as Tier II Facilities under the Superfund Amendments and Reauthorization Act due to the volume or toxicity of the materials on site. Many of these facilities are in close enough proximity to residential areas to potentially impact homes, and thus teachers and students.

Transportation Hazardous Materials Incident

Transportation-related HazMat incidents could impact any road in Wright County, potentially impacting the ability of students to travel to school.

Rail Transport

Rail transport related HazMat incidents could occur anywhere on the Union Pacific (UP) railroad, the sole operator of rail in Wright County. The main line runs through Belmond, Clarion, and Eagle Grove and could potentially impact all three districts.

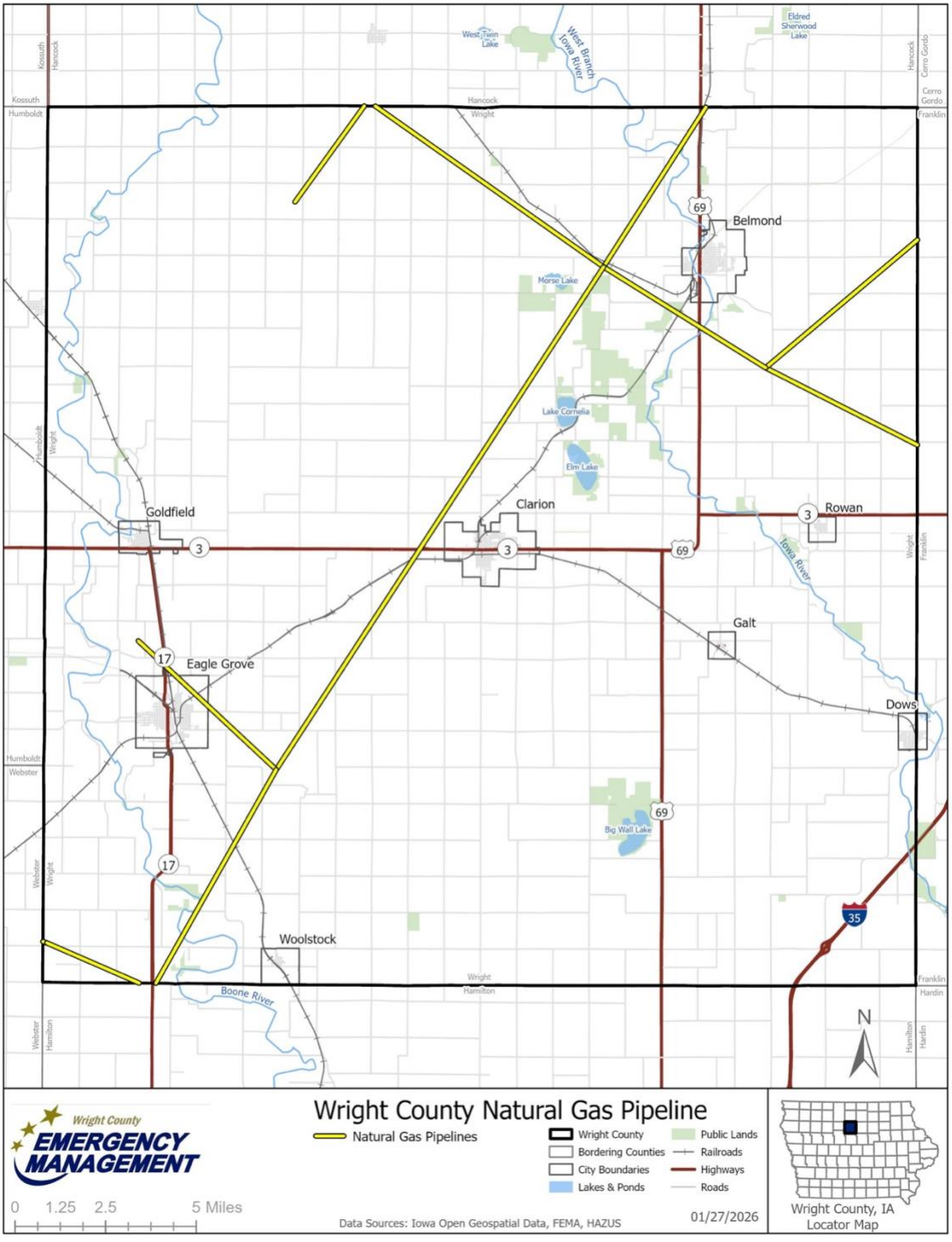
Air Freight

There are three airports in Wright County (in Belmond, Clarion, and Eagle Grove). An air freight incident at any of these airports could impact homes, and thus teachers and students.

Pipeline Incident

There are multiple pipelines in Wright County, an incident along any of which could impact homes, and thus teachers and students. **Figure 5** shows the location of pipelines in Wright County.

FIGURE 5. WRIGHT COUNTY PIPELINES



4.6.2 PREVIOUS OCCURRENCES

According to the EPA, from 2017 to 2024 (7 years), there were been 109 hazardous materials spills reported in Wright County. None of these was of a level of severity that required significant response or recovery resources or created a lasting community impact.

Belmond-Klemme Public School District

Within the school district, there have been 22 reported hazardous materials incidents. These incidents occurred in Belmond.

Clarion-Goldfield-Dows Public School District

Within the school district, there have been 69 reported hazardous materials incidents. Eight incidents occurred in Galt and 61 incidents occurred in Goldfield.

Eagle Grove Public School District

Within the school district, there have been eight recorded hazardous materials incidents. These incidents occurred in Goldfield.

4.6.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for hazardous materials in all three of the School Districts is **Unlikely**.

4.6.4 VULNERABILITY ASSESSMENT

Within all three of the School Districts, hazardous materials pose a **Low** risk due to the limited impact to the School Districts. This section provides further contextualization for the anticipated vulnerability of the school districts to hazardous materials. The School District's vulnerability to hazardous materials is lower than the risk of the county as a whole. While hazardous materials incidents have occurred in the School Districts, there is a minimal anticipated impact to the School Districts themselves, their authorities, and the services they provide. For more information on the vulnerability assessment for hazardous materials, please refer to the base plan.

4.6.4.1 Critical Facilities

School facilities located near major transportation corridors or industrial zones are at higher risk of exposure to chemical spills, fires, or airborne toxins. These incidents can disrupt operations, damage infrastructure, and endanger students. Additionally, facilities without proper ventilation systems, backup power, or shelter-in-place protocols are more susceptible to contamination and operational failure during a HazMat event.

4.6.4.2 Cultural, Historic, and Natural Resources

There are no significant historic or natural resources on school district property. HazMat incidents could lead to shelter-in-place orders, which could negatively impact sports and other school events.

4.6.4.3 People

Hazardous materials incidents that occur during the school day may impact the health and safety of the staff and students within all three School Districts.

4.6.4.4 Structures and Systems

HazMat incidents could disrupt transportation systems, impacting the ability of students to attend school or of the districts to provide transportation.

4.6.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.7 HUMAN DISEASE

For detailed information on human disease in Wright County, please refer to the base plan. This annex only includes information that is specific to the School Districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.7.1 LOCATION AND EXTENT

Pandemics and epidemics do not affect a single geographic location; all areas of Wright County and of the three school districts are equally vulnerable. Transmission can occur anywhere people interact, but locations with higher numbers of individuals create more opportunities for disease to spread. For more information on the location and extent of human disease, please refer to the base plan.

4.7.2 PREVIOUS OCCURRENCES

Pandemics and epidemics have had recurring and widespread effects on the County and across the world. While some events have been global in scale and others more localized, each has highlighted the vulnerability of the community to infectious disease and underscored the importance of preparedness and coordinated response. Since 1918, there have been six major epidemics or pandemics that are widely recognized by both the CDC and WHO, in addition to the COVID-19 pandemic. For more information on previous occurrences within Wright County, please refer to the base plan.

4.7.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for human disease for all three School Districts is **Possible.**

4.7.4 VULNERABILITY ASSESSMENT

Human disease pose a **Medium** risk to the school districts due to low probability yet high risk to significantly impact the City. This section provides further contextualization for the anticipated vulnerability of the communities within the school districts to human disease. The School District's vulnerability to human disease does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for human disease, please refer to the base plan.

4.7.4.1 Critical Facilities

Infectious disease outbreaks can significantly disrupt the operation of schools. Staffing shortages could impact the ability of maintenance crews to perform their routine work, which could impact the safety of critical facilities if taking place over an extended period of time.

4.7.4.2 Cultural, Historic, and Natural Resources

The need for social distancing, potential school closures and remote learning, and stay-in-place orders would negatively impact the ability of school districts to provide extracurricular programming and opportunities to participate in sports.

4.7.4.3 People

Students may be at heightened risk during disease outbreaks due to the close proximity with others that takes place in classrooms.

4.7.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.8 INFRASTRUCTURE FAILURE

For detailed information on infrastructure failure in Wright County, please refer to the base plan. This annex only includes information that is specific to the school districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.8.1 LOCATION AND EXTENT

The entire planning area is at risk to all types of infrastructure failure included in the hazard description section, either from primary failure due to malfunction, degradation, or accidental or intentional damage or as a result of a secondary impact related to another hazard event. For more information on the location and extent of infrastructure failure, please refer to the base plan.

4.8.2 PREVIOUS OCCURRENCES

Infrastructure Failure often occurs as a secondary impact of other hazard events. For specific descriptions, please see the Previous Occurrences section of the other hazards included in this plan. In addition to failures or impacts as a result of other hazard events, infrastructure failure can also occur as a result of lack of maintenance, human error, or deterioration. There have been no significant infrastructure failures reported in Wright County.

4.8.3 PROBABILITY OF FUTURE OCCURRENCES

Based on the general aging status of infrastructure statewide, the probability of future occurrences for infrastructure failure impacting the three school districts is **Highly Likely**.

4.8.4 VULNERABILITY ASSESSMENT

Within all three School Districts, infrastructure failure pose a **High** risk due to a high likelihood of future occurrence and high potential magnitude. This section provides further contextualization for the anticipated vulnerability of the communities within the school districts to infrastructure failure. The risk of infrastructure failure to the school districts mirrors the risk to the county as a whole. For more information on the vulnerability assessment for infrastructure failure, please refer to the base plan.

4.8.4.1 Critical Facilities

All critical facilities within the three school districts could potentially be impacted by infrastructure failure. This includes both the direct impact to school buildings of failing utility systems and the indirect impact to students and teachers of transportation system failure.

4.8.4.2 Cultural, Historic, and Natural Resources

There are no significant historic or natural resources on school district property. Utility failures impacting school buildings or transportation system failures impacting the ability of students to attend school could reduce the districts' ability to provide extracurricular opportunities to students.

4.8.4.3 People

Utility system failure could impact the ability of schools to provide food, sanitation, and appropriately heated or cooled spaces, creating health and safety risks to individuals.

4.8.4.4 Structures and Systems

Since utility/infrastructure failure is generally a secondary or cascading impact of other hazards, it is not possible to quantify estimated potential losses specific to this hazard due to the variables associated with affected population, duration of outages, etc. In some instances, failure of one system can impact others.

The loss of electricity may also lead to the loss of internet connectivity, and transportation system failures could impact other utilities.

4.8.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.9 RIVER FLOODING

For detailed information on river flooding in Wright County, please refer to the base plan. This annex only includes information that is specific to the school districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.9.1 LOCATION AND EXTENT

Figures 6, 7, and 8 show the location of the 100-year and 500-year floodplains within each school district's boundaries. Each district contains areas of 1% and .02% annual chance floodplain.

FIGURE 6. BELMOND-KLEMME SCHOOL DISTRICT AND THE 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN

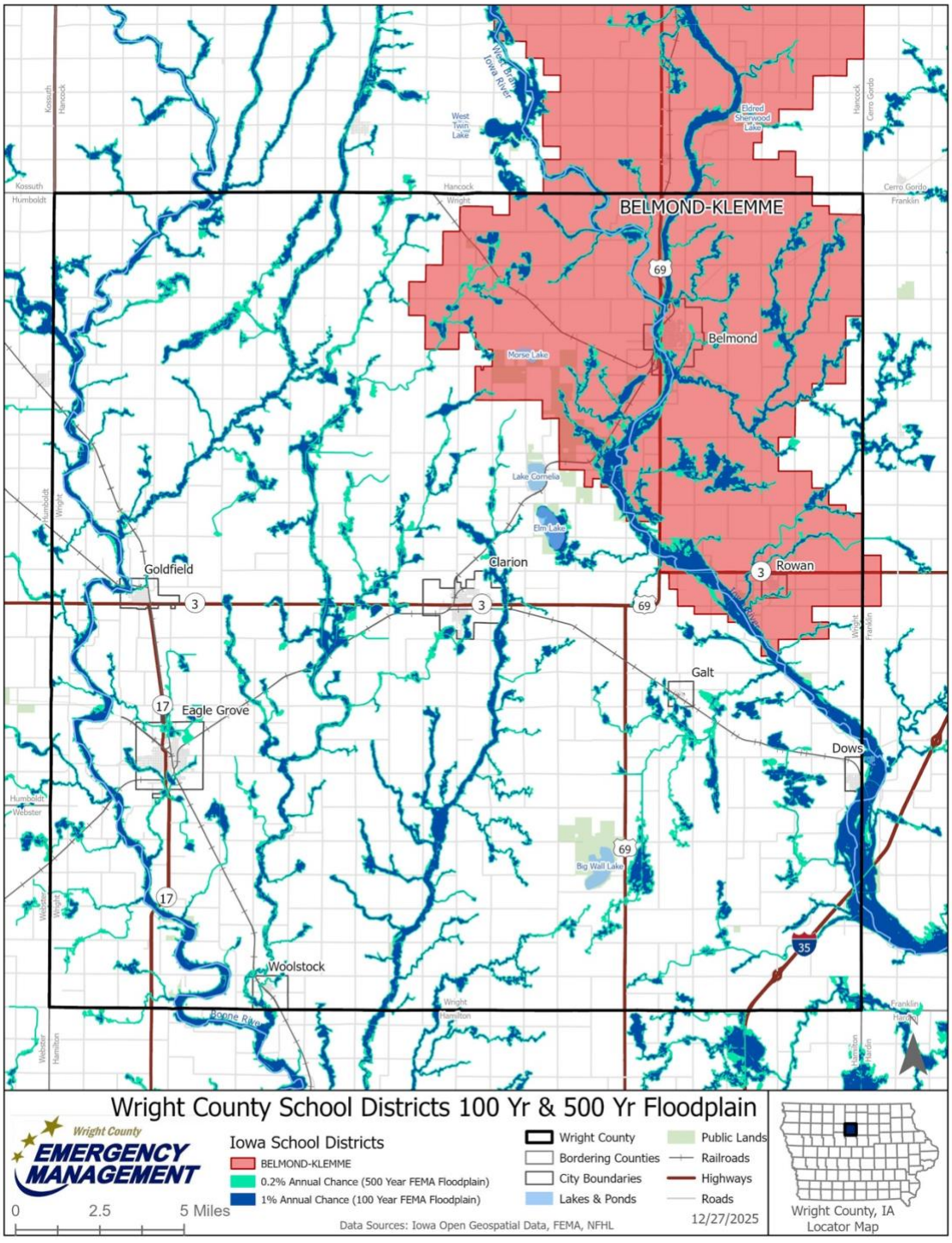


FIGURE 7. CLARION-GOLDFIELD SCHOOL DISTRICT AND THE 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN

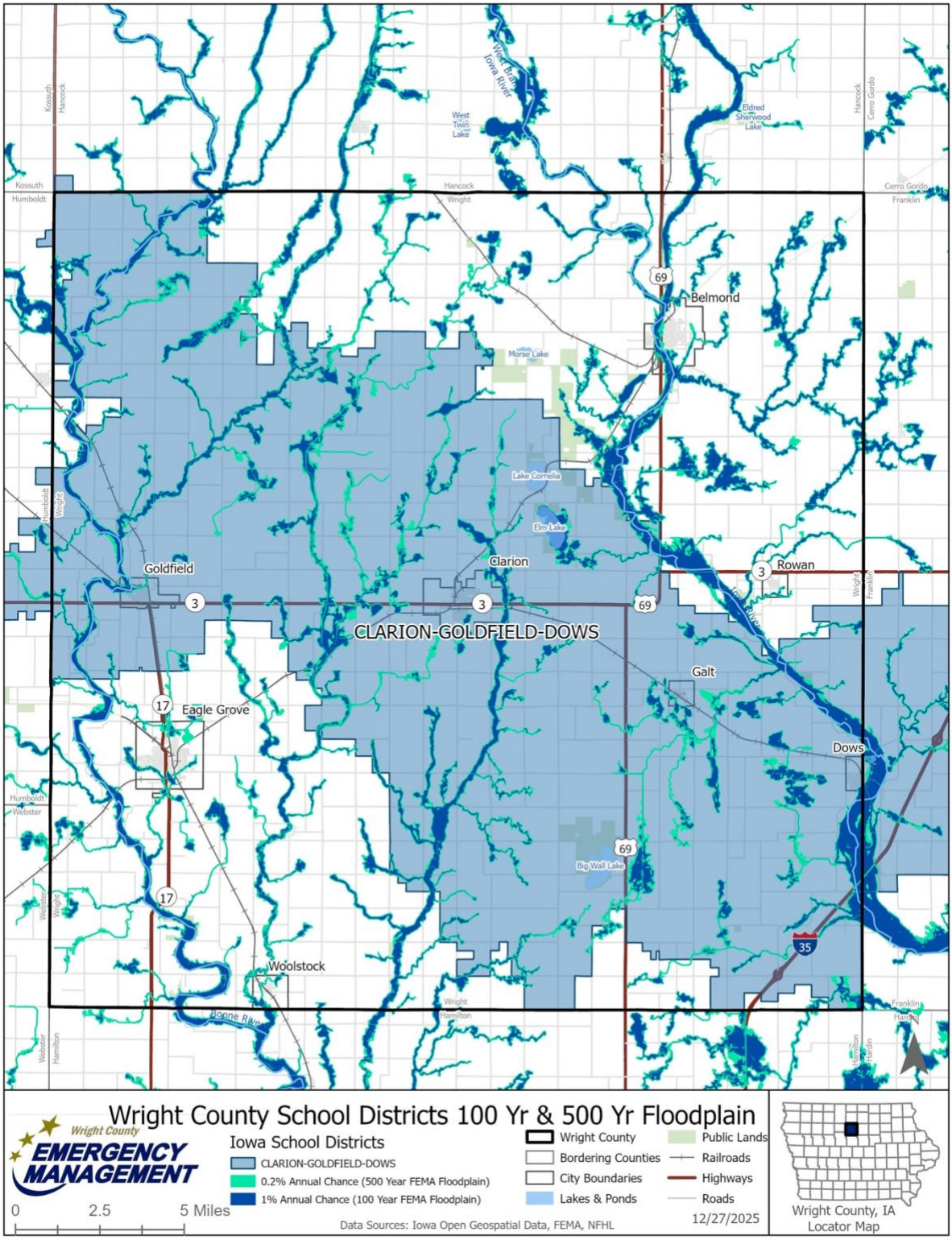
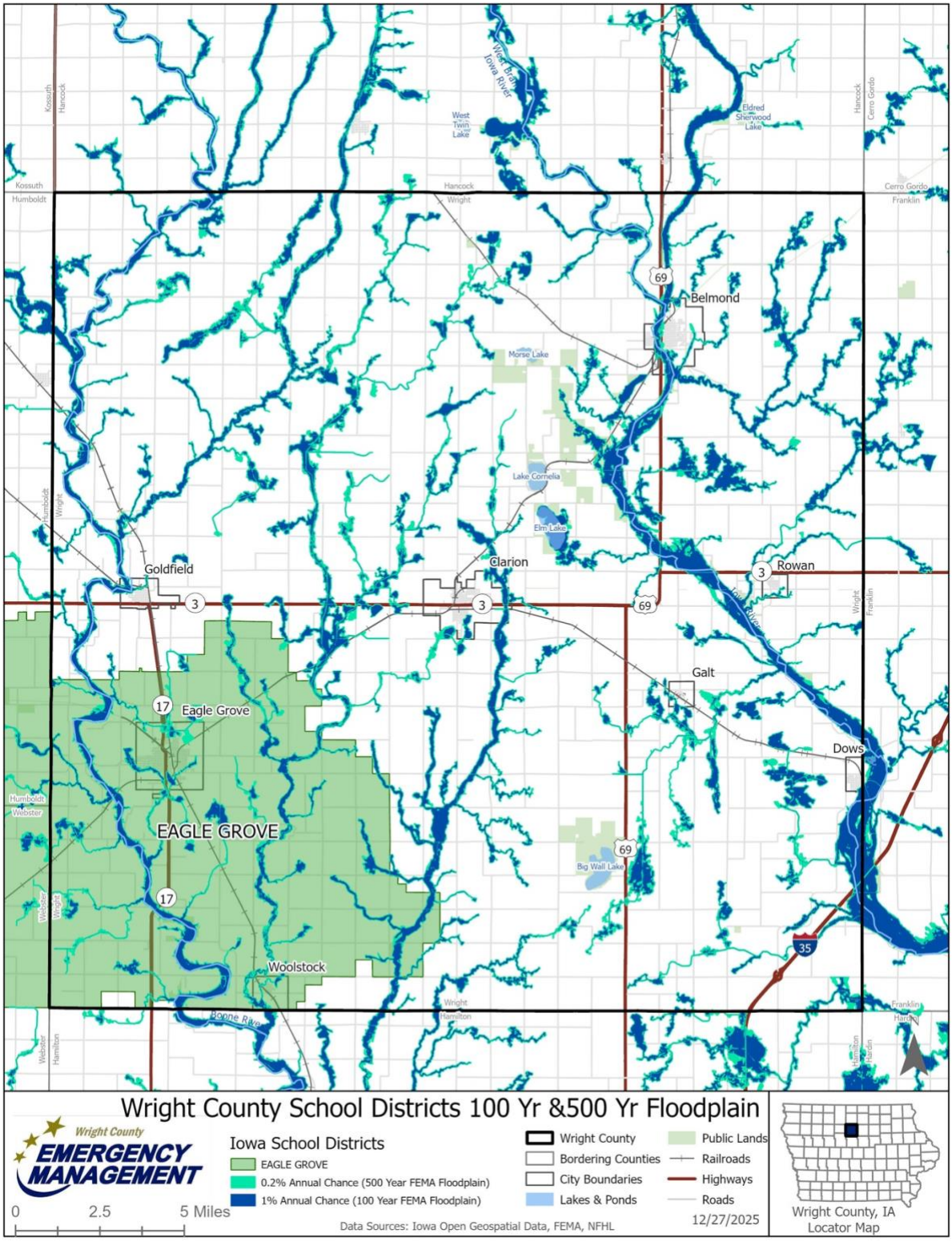


FIGURE 8. EAGLE GROVE SCHOOL DISTRICT AND THE 1-PERCENT ANNUAL CHANCE AND .02 PERCENT ANNUAL CHANCE FLOODPLAIN



4.9.2 PREVIOUS OCCURRENCES

Belmond-Klemme Public School District

There have been eight flood events within the Belmond-Klemme School District since 1997 causing over $385,000 in property damage and $2,175,000 in crop damage, as detailed in **Table 6.**

TABLE 6. NCDC BELMOND-KLEMME FLOOD EVENTS SUMMARY, 1997-JUNE 2025

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
BELMOND	3/12/10	$50,000	$0
BELMOND	6/26/10	$200,000	$2,000,000
BELMOND	7/1/10	$10,000	$25,000
BELMOND	7/26/10	$0	$0
BELMOND	5/27/13	$50,000	$0
BELMOND	5/23/16	$0	$0
BELMOND	9/23/16	$50,000	$100,000
BELMOND	9/20/18	$25,000	$50,000

Clarion-Goldfield-Dows Public School District

There have been eight flood events within the Clarion-Goldfield-Dows School District since 1997 causing over $425,000 in property damage and $530,000 in crop damage, as detailed in **Table 7**w.

TABLE 7. NCDC CLARION-GOLDFIELD-DOWS FLOOD EVENTS SUMMARY, 1997-JUNE 2025

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
CLARION	6/20/98	$75,000	$10,000
CLARION	6/29/98	$50,000	$10,000
CLARION	6/11/08	$0	$0
HOLMES	6/23/10	$100,000	$10,000
CLARION	6/25/10	$0	$0
GOLDFIELD	4/10/13	$0	$0
CLARION	5/23/16	$0	$0
CLARION	5/23/16	$0	$0
CLARION	8/11/16	$0	$0
CLARION	9/22/16	$0	$0
CLARION ARPT	9/22/16	$0	$0
CORNELIA	9/23/16	$0	$0
CLARION	8/5/18	$0	$0
CLARION ARPT	9/5/18	$100,000	$250,000
CLARION	9/19/18	$0	$0
DOWS	9/19/18	$0	$0

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
CORNELIA	9/21/18	$100,000	$250,000
CORNELIA	3/15/19	$0	$0
CLARION	8/20/21	$0	$0
CLARION	7/7/24	$0	$0

Eagle Grove Public School District

There have been 13 flood events within the Clarion-Goldfield-Dows School District since 1997, none of which caused property or crop damage. **Table 8** details more information below.

TABLE 8. NCDC EAGLE GROVE FLOOD EVENTS SUMMARY, 1997-JUNE 2025

LOCATION	DATE	PROPERTY DAMAGE	CROP DAMAGE
EAGLE GROVE	8/17/15	$0	$0
EAGLE GROVE	8/19/16	$0	$0
EAGLE GROVE	8/5/18	$0	$0
EAGLE GROVE	8/19/18	$0	$0
EAGLE GROVE	9/4/18	$0	$0
EAGLE GROVE	9/19/18	$0	$0
EAGLE GROVE	8/20/19	$0	$0
EAGLE GROVE	7/30/21	$0	$0
EAGLE GROVE ARPT	6/21/24	$0	$0
EAGLE GROVE ARPT	6/22/24	$0	$0
EAGLE GROVE	7/6/24	$0	$0
EAGLE GROVE	7/7/24	$0	$0
EAGLE GROVE	7/7/24	$0	$0

4.9.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for river flooding for all three School Districts is **Possible**, as not all previous occurrences have directly impacted the School Districts themselves.

4.9.4 VULNERABILITY ASSESSMENT

Within all three School Districts, river flooding poses a **Medium** risk due to limited previous occurrences directly impacting the schools. This section provides further contextualization for the anticipated vulnerability of the school districts to river flooding. Their vulnerability to river flooding is lower than the risk to the county as a whole, due to a lack of district-owned facilities in the floodplain. For more information on the vulnerability assessment for river flooding, please refer to the base plan.

4.9.4.1 Critical Facilities

None of the school districts' critical facilities are in the floodplain. Impacts to other critical facilities could impact public safety more broadly, impacting the districts' ability to provide services to students.

4.9.4.2 Cultural, Historic, and Natural Resources

Flooding is not expected to impact cultural, historic, or natural resources relevant to the school districts.

4.9.4.3 People

Any flood impacts to residential areas or structures countywide could affect students and their ability to attend school. A 1-percent annual chance flood would be expected to impact 298 residential structures countywide and displace 687 people, of which a large number are schoolchildren.

4.9.4.4 Structures and Systems

None of the school districts' critical facilities are in the floodplain. Impacts to other structures or systems could impact public safety more broadly, impacting the districts' ability to provide services to students.

4.9.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.10 SEVERE WINTER STORM

For detailed information on severe winter storm in Wright County, please refer to the base plan. This annex only includes information that is specific to the school districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.10.1 LOCATION AND EXTENT

The entire state of Iowa, including all three school districts, are vulnerable to heavy snow, extreme cold temperatures and freezing rain. Generally, winter storms occur between the months of November and March but can occur as early as October and as late as April. January has the highest monthly snowfall, with an average of about 9 inches of snow. For more information on the location and extent of severe winter storms, please refer to the base plan.

4.10.2 PREVIOUS OCCURRENCES

From 1996 through October 2025, the National Climatic Data Center reports the following severe winter weather events:

- 34 - Blizzard
- 9 - Cold/Wind Chill
- 17 - Extreme Cold/Wind Chill
- 2 - Heavy Snow

For more information on previous occurrences in Wright County, please refer to the base plan.

4.10.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for severe winter storms in all three of the School Districts is **Highly Likely**.

4.10.4 VULNERABILITY ASSESSMENT

Across all three School Districts, severe winter storms pose a **High** risk due to the high likelihood of occurrence and potential magnitude. This section provides further contextualization for the anticipated vulnerability of the school districts to severe winter storms. Their vulnerability to severe winter storms does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for severe winter storms, please refer to the base plan.

4.10.4.1 Critical Facilities

All critical facilities within the three School Districts may be at risk of impacts and disruption to services due to extreme cold temperatures and high snowfall.

4.10.4.2 Cultural, Historic, and Natural Resources

There are no significant historic or natural resources on school district property. Extreme cold temperatures and high snowfall could impact the districts' ability to provide extracurricular opportunities to students.

4.10.4.3 People

All staff and students may be at risk of impact from severe winter storms from extreme cold temperatures and high snowfall. Some schools may lack adequate insulation or backup power sources, making them susceptible to dangerously low indoor temperatures during prolonged power outages caused by ice storms. These impacts could disrupt the educational services provided by school district and impact the

schooling to staff and students. Additionally, severe winter storms pose a public safety and health risk from ice and extreme cold temperatures.

4.10.4.4 Structures and Systems

During severe winter storms, electrical system failures could impact school buildings, occasionally causing secondary effects to school structures like burst water pipes.

4.10.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.11 TERRORISM

For detailed information on terrorism in Wright County, please refer to the base plan. This annex only includes information that is specific to the school districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.11.1 LOCATION AND EXTENT

The entire planning area, including all three School Districts, has a low potential for terrorist activity. However, there are areas with increased risk such as large events, schools, religious organizations, and government facilities. For more information on the location and extent of terrorism, please refer to the base plan.

4.11.2 PREVIOUS OCCURRENCES

There have not been any large-scale enemy attacks or acts of radiological terrorism in Iowa. There have been biological and chemical agent threats, animal rights activists' vandalism and many bomb threats. For more information on previous occurrences in Wright County, please refer to the base plan.

4.11.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for terrorism affecting the three school districts is **Unlikely**.

4.11.4 VULNERABILITY ASSESSMENT

Across all three school districts, terrorism poses a **Medium** risk due to limited previous occurrences and the potential magnitude of such events. This section provides further contextualization for the anticipated vulnerability of school districts to terrorism. The school districts' vulnerability to terrorism does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for terrorism, please refer to the base plan.

4.11.4.1 Critical Facilities

There are no previous occurrences of terrorism impacting school district facilities in Wright County, but essentially all critical facilities are at some level of risk of damage or disruption of services from terrorism. Terrorism can disrupt and damage critical facilities and cause a variety of public safety and public health concerns.

4.11.4.2 Cultural, Historic, and Natural Resources

There are no significant historic or natural resources on school district property. Terrorist activity could potentially target major district events like sports games.

4.11.4.3 People

Terrorist attacks can cause injuries and fatalities, as well as long-term psychological trauma. Depending on the nature of the attack, the broader community can be impacted and its societal and economic functioning disrupted. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

Some acts of terrorism are hate-based and therefore individuals and communities from certain religions, nationalities, race, ethnicism, sexuality, and gender are at increased risk of attacks, injury, or death. Additionally, use of destructive weapons and explosives may pollute the air and create toxins for unsafe air, soil, and water.

4.11.4.4 Structures and Systems

Terrorist attacks may focus on damaging or disrupting school buildings and surrounding County systems. Such impacts may significantly disrupt education and cause damages to the school buildings themselves.

4.11.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.12 THUNDERSTORM/LIGHTNING/HAIL

For detailed information on thunderstorm, lightning, and hail in Wright County, please refer to the base plan. This annex only includes information that is specific to the school districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.12.1 LOCATION AND EXTENT

Thunderstorms and the associated hail and lightning impact the entire County with relatively similar frequency. Although these events often occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur in more densely developed urban areas as well as to cropland. Iowa experiences 40 storms per year in the northwest portion of the state and 60 per year in the southeast portion. For more information on the location and extent of thunderstorm, lightning, and hail, please refer to the base plan.

4.12.2 PREVIOUS OCCURRENCES

The NCDC reported 233 severe thunderstorm events for the Wright County planning area from 1965 through October 2025. For more information on previous occurrences in Wright County, please reference the base plan.

4.12.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for thunderstorm, lightning, and hail in all three of the School Districts is **Highly Likely**.

4.12.4 VULNERABILITY ASSESSMENT

Within the three School Districts, thunderstorms, lightning, and hail pose a **Medium** risk due to a high likelihood of future occurrences. This section provides further contextualization for the anticipated vulnerability of the three school districts, which does not vary significantly from the overall risk to Wright County. For more information on the vulnerability assessment for thunderstorm/lightning/hail, please refer to the base plan.

4.12.4.1 Critical Facilities

All critical facilities are at risk of impact from thunderstorms, lightning, and hail. Hail and lightning could directly damage school facilities. Other essential infrastructure, including power grids, water treatment plants, transportation systems, and communication networks, is highly susceptible to disruption during severe storm events. In rural areas such as Wright County, this vulnerability is compounded by limited system redundancy and constrained emergency response capabilities, making recovery slower and impacts more severe. Disruption and damage to critical facilities can cause secondary impacts to the districts in the form of service disruption.

4.12.4.2 Cultural, Historic, and Natural Resources

There are no significant historic or natural resources on school district property. Severe storms can impact school sports schedules and student safety.

4.12.4.3 People

All staff and students within the School Districts may be at risk of impact from thunderstorm, lightning, and hail. Severe storms pose significant vulnerability to people, especially in Iowa, where atmospheric conditions frequently support the development of hazardous weather. Students with limited access to safe housing, emergency services, or reliable communication systems are especially at risk.

4.12.4.4 Structures and Systems

All school buildings within the three School Districts may be at risk of impact from thunderstorms, lightning, and hail. Most lightning damages occur to electronic equipment located inside buildings. Structural damage can also occur when a lightning strike causes a building fire.

4.12.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.13 TORNADO/WINDSTORM

For detailed information on tornado and windstorm in Wright County, please refer to the base plan. This annex only includes information that is specific to the school districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.13.1 LOCATION AND EXTENT

Iowa is located in a part of the United States where tornadoes are a common occurrence. Most tornadoes occur in May and June (but can occur during any month) and are most likely to occur between mid-afternoon and sunset. Tornadoes can occur anywhere throughout the County, including Rowan. For more information on the location and extent of tornado and windstorms, please refer to the base plan.

All of Wright County and the three school districts is susceptible to high wind events. The County is in Wind Zone IV, which is susceptible to winds up to 250 mph.

4.13.2 PREVIOUS OCCURRENCES

According to the NCDC database, there were 49 high wind events in Wright County from 1996 to October 2025. These events did not cause any reported deaths or injuries, but caused an estimated $1,395,210 in property damages. For more information on previous occurrences in Wright County, please refer to the base plan.

4.13.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for tornado and windstorm across all three school districts is **Highly Likely**.

4.13.4 VULNERABILITY ASSESSMENT

Within all three School Districts, tornadoes and windstorms pose a **High** risk due to probability of future occurrences and high potential magnitude. This section provides further contextualization for the anticipated vulnerability of the three school districts to tornado/windstorm, which does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for tornado/windstorm, please refer to the base plan.

4.13.4.1 Critical Facilities

All critical facilities are at risk of direct impact and damage from tornadoes and high wind events.

4.13.4.2 Cultural, Historic, and Natural Resources

There are no significant historic or natural resources on school district property. Tornadoes and windstorms could impact the districts' ability to provide opportunities to participate in extracurricular activities.

4.13.4.3 People

Tornadoes and windstorms post direct health and safety risks to students and staff. This risk is more pronounced for students at older schools, or those who live in mobile and manufactured homes.

4.13.4.4 Structures and Systems

The infrastructure that allows the school districts to provide services is at significant direct risk from tornadoes and windstorms. These events can damage power lines, water treatment plants, transportation systems, and communication networks that the districts rely on to provide education to students.

4.13.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

4.14 TRANSPORTATION INCIDENTS

For detailed information on transportation incidents in Wright County, please refer to the base plan. This annex only includes information that is specific to the School Districts for all profiled hazards. The information in this section applies to all three school districts except where specified.

4.14.1 LOCATION AND EXTENT

A transportation incident could take place on any of the roads in Wright County, the majority of which serve as transportation routes to school for students. Main conduits of transport include U.S. Highway 69, Iowa Highway 3, Iowa Highway 17, and Interstate 35. For more information on the location and extent of transportation incidents, please refer to the base plan.

Rail Transport

The Union Pacific Railroad (UP), the sole rail operator in Wright County runs northeast-southwest through Belmond, Clarion, and Eagle Gove, and an incident anywhere in the county could affect the school districts and their students.

Air Freight

There are three airports in Wright County: Belmond, Clarion, and Eagle Grove. Air transportation incidents occurring anywhere in the county could impact the school districts and their students.

4.14.2 PREVIOUS OCCURRENCES

Within Wright County, there have been 75 reported train-vehicle accidents and 18 reported air transportation incidents, in addition to hundreds of vehicle crashes per year. None of these reported incidents have occurred on school district property.

4.14.3 PROBABILITY OF FUTURE OCCURRENCES

Based on previous occurrences, the probability of future occurrences for transportation incident across all three School Districts is **Highly Likely**.

4.14.4 VULNERABILITY ASSESSMENT

Within three School Districts, transportation incident pose a **High** risk due to the commonality of road traffic accidents and the substantive impact of transportation incidents on the ability of students to travel to school. This section provides further contextualization for the anticipated vulnerability of the districts to transportation incidents, which does not vary significantly from the risk to the county as a whole. For more information on the vulnerability assessment for transportation incidents, please refer to the base plan.

4.14.4.1 Critical Facilities

All critical facilities could potentially be damaged by an automobile accident, airplane crash, or other transportation incident. Utility and communications systems are most likely to be impacted, as an isolated incident in one area could potentially affect these systems more broadly.

4.14.4.2 Cultural, Historic, and Natural Resources

Transportation incidents are not expected to impact cultural, historic, or natural resources relevant to the school districts.

4.14.4.3 People

Transportation-related incidents involving passenger vehicles pose significant risks to public safety and infrastructure. The likelihood and severity of such accidents are influenced by factors including traffic volume, infrastructure condition, weather, and human error. Many students in Wright County utilize district-provided transportation to travel to and from school, and a transportation incident involving school busses could potentially impact students directly, although no such incidents have been reported.

4.14.4.4 Structures and Systems

All structures and systems are at some level of risk of damage and disruption from transportation incidents, due to their proximity to roadways.

4.14.4.5 Changes in Development

Changes in development since the last plan have not altered the school districts' risk from this hazard.

5. MITIGATION STRATEGY

The Mitigation Strategy section of the base plan provides an overall blueprint for all participating jurisdictions in Wright County to become less vulnerable to identified hazards. As established in the base plan, the overall goals of the Wright County mitigation strategy are consistent across all participating jurisdictions.

This section provides community-specific strategies for each district, including the status of actions that were included in the previous plan and actions to be considered or pursued over the next five years. As noted in the base plan, participants are not committing to undertaking every action suggested in this list but rather proposing an extensive list of *potential* actions that they may wish to pursue, depending on the availability of funding. **Tables 9 through 12** detail the mitigation actions identified for the school districts.

ANNEX I: SCHOOL DISTRICTS

TABLE 9. UPDATED 2026 BELMOND-KLEMME PUBLIC SCHOOL DISTRICT MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTINGP ARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Belmond-Klemme CSD - 1	Identify a safe room and emergency shelter	Thunderstorm/ Lightning/Hail; Tornado/Winds torm	Continue In-Progress	School Board & Administration	City, County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), local district funds, In-Kind, Private Non-Profit	Over $1,000,000	2-3 years	H

TABLE 10. UPDATED 2026 CLARION-GOLDFIELD-DOWS PUBLIC SCHOOL DISTRICT MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTINGP ARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Clarion-Goldfield-Dows CSD - 1	Identify a safe room and emergency shelter	Thunderstorm/ Lightning/Hail, Tornado/Winds torm	Continue In-Progress	School Board & Administration	Cities, County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), Local district funds, In-Kind, Private Non-Profit	Over $1,000,000	2-3 years	H

TABLE 11. UPDATED 2026 EAGLE GROVE PUBLIC SCHOOL DISTRICT MITIGATION ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTINGP ARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
Eagle Grove CSD - 1	Identify and build wind-resistant safe rooms	Thunderstorm/ Lightning/Hail, Tornado/Winds torm	Continue In-Progress	School Administration and Board	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), Local district funds	$10,000 to $50,000	1 year	H

TABLE 12. 2026 COUNTYWIDE ACTIONS

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA - 1	Encourage residents to purchase weather radios to stay informed on emergency information.	All Hazards	Continue In-Progress	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA)	Less than $10,000	1 year	M
CWA - 2	Increase coordination with regional and state agencies for early warning and monitoring of animal, plant, and crop disease	Animal/plant/crop disease	New	Environmental Health	County EMA	FEMA HMA Grant (HMGP, BRIC, or FMA), USDA	Little or no cost	Ongoing	H
CWA - 3	Educate residents on water saving techniques and water conservation	Drought	New	County EMA , Participating Jurisdictions	Public Media	General Funds	Little or No Cost	1 year	L

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA – 4	Promote tree planting in areas with low vegetation to increase shade coverage.	Extreme Heat	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	Ongoing	M
CWA – 5	Improve drainage infrastructure in areas where flash flooding frequently occurs.	Flash Flood	New	County EMA	Participating Jurisdictions	General Funds	$100,000 to $500,000	Ongoing	H
CWA – 6	Promote defensible landscape for homes, businesses and entities within WUI areas.	Grass and Wildland Fire	New	County EMA	Participating Jurisdictions	General Funds	Little to No Cost	Ongoing	H
CWA – 7	Promote wetland restoration to reduce flooding impacts across the County.	River Flooding	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	$100,000 to $500,000	Ongoing	H
CWA – 8	Promote snow safety to residents on how to prevent pipe breaks in their homes (e.g., insulating outdoor faucets, drip warm water from an indoor faucet) and what to do if a pipe breaks.	Severe Winter Storm	New	County EMA	Participating Jurisdictions	FEMA HMA Grant (HMGP, BRIC, or FMA), General Funds	Little to No Cost	Ongoing	H
CWA – 9	Conduct Countywide trainings to practice responding to radiological incidents.	Hazardous Materials	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M

ACTION ID	ISSUE/BACKGROUND	HAZARDS ADDRESSED	2026 STATUS	RESPONSIBLE OFFICE	SUPPORTING PARTNERS	POTENTIAL FUNDING SOURCES	COST ESTIMATE	TIMELINE	PRIORITY
CWA -10	Promote flu clinics across the County	Human Disease	New	County EMA , Participating Jurisdictions	County Public Health	CDC Grants, General Funds	$10,000 to $50,000	Ongoing	M
CWA – 11	Promote Tree Trimming across the County to prevent fallen trees on infrastructure.	Infrastructure Failure	New	County EMA	Participating Jurisdictions	General Funds	Little or No Cost	2-3 years	M
CWA – 12	Conduct Countywide trainings to practice responding to terrorist incidents.	Terrorism	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA – 13	Conduct Countywide trainings to practice responding to transportation incidents.	Transportation Incident	New	County EMA	Participating Jurisdictions	FEMA HSGP, General Funds	$10,000 to $50,000	Ongoing	M
CWA - 14	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Thunderstorm/Lightning/Hail	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M
CWA – 15	Encourage the use of impact-resistant glazing and other wind-resistant building materials in new construction.	Tornado/Windstorm	New	County EMA	Participating Jurisdictions	FEMA HMGP Grants, General Funds	Little or No Cost	2-3 Years	M