



2024 Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan Chickasaw County, Iowa

Adopted By: Chickasaw County, Iowa (XX/XX/2024)

Including: City of Alta Vista (XX/XX/2024), City of Bassett (XX/XX/2024), City of Fredericksburg (XX/XX/2024), City of Ionia (XX/XX/2024), City of Lawler (XX/XX/2024), City of Nashua (XX/XX/2024), City of New Hampton (XX/XX/2024), City of North Washington (XX/XX/2024), City of Protivin (XX/XX/2024), New Hampton Community School District (XX/XX/2024), Sumner-Fredericksburg Community School District (XX/XX/2024), and Nashua-Plainfield Community School District (XX/XX/2024)

Adopted By FEMA: Month, Date, 2024

Funded by:

CHICKASAW
COUNTY • IOWA

Prepared by



INRCOG
Iowa Northland Regional
Council of Governments

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2024 Chickasaw County
Hazard Mitigation Plan

(Page Held for FEMA Approval Letter)



2024 Chickasaw County
Hazard Mitigation Plan

ACKNOWLEDGMENTS

CHICKASAW COUNTY HAZARD MITIGATION PLANNING COMMITTEE

Over the course of the planning process, many individuals donated their time and efforts toward providing information, attending meetings, and providing input for the successful completion of the plan. The following is a list of people who participated in the development of this Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan, in no particular order:

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City of Fredericksburg	James Mitchell, Mayor Ray Armbrrecht, Fire Chief
City of Lawler	Mark Muetherthies, Mayor Jeremy Marklenburg, Fire Chief
City of Ionia	Randy Taylor, Mayor Derek Day, Fire Chief
City of Nashua	Samantha Johnson, City Council Member
City of Protivin	Brad Moudry, Fire Chief
City of New Hampton	Tim Pederson, Police Chief Karen Clemens, City Clerk Casey Mai, Public Works Director/Zoning Administrator
City of North Washington	Megan Baltes, City Council Member
City of Bassett	James Ashley, Mayor

New Hampton Community School District Jay Jurrens, Superintendent

Sumner-Fredericksburg Community School District Fred Matlage, Superintendent

Nashua-Plainfield Community School District Megan Baltes, Todd Liechty

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RESERVED FOR

Adopting Resolution by Chickasaw County Board of Supervisors

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Section I: Introduction



About

Natural disasters are an ever-present hazard for many communities throughout the world. This Multi-Jurisdictional Hazard Mitigation Plan (MJ-HMP) was developed as a broad-based planning effort involving numerous incorporated communities, school districts, and County agencies. This Plan is a comprehensive county wide strategy to mitigate losses due to natural or man-made hazards. The jurisdictions included in this Plan had representatives that served as participants Chickasaw County's Hazard Mitigation Planning Committee. Representatives from each jurisdiction attended four publicly held meetings and submitted materials that provided necessary information to formulate their local hazard mitigation plans. Those Plans can be found in the Appendices of this Plan.

This Plan is an update to the 2019 Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan. This Plan was written and developed to meet the requirements in FEMA's Local Mitigation Policy Guide updated in April 2023, Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), and the regulations in Title 44 CFR § 201.6 relating to Mitigation Planning.

What is Hazard Mitigation?

Hazard mitigation encompasses any proactive measure undertaken to diminish or eradicate the enduring threats posed to both human life and property by hazardous events. It embodies a collective set of actions, policies, or programs to be implemented at the community-level. This whole effort is aimed at fostering a sustained reduction in vulnerability to hazards.

This approach is not only proactive in preparation for natural disasters, but this overall reduces enormous costs associated with damage to property and community way of life that incur following being impacted by a natural disaster.

A FEMA approved Plan makes each participating jurisdiction eligible for federal grant funding that becomes available to communities in order to complete hazard mitigation activities or programs. This grant program is a major part of developing this Plan in accordance with FEMA's Hazard Mitigation requirements and federal regulations.

The implementation of this Plan signifies a strategic, risk-informed strategy aimed at curbing long-term risks associated with the wellbeing of individuals, the protection of property, and the preservation of community cohesion across all areas within Chickasaw County.

Figure 1: Emergency Management Cycle



Source: FEMA

Purposes of Hazard Mitigation Planning

The following list identifies reasons to conduct hazard mitigation planning:

- To facilitate the protection of the health, safety, and economic security of residents, workers, visitors, and property owners by mitigating the impacts of natural and man-made hazards.
- Influence decision-making in both the public and private sectors.
- Fulfill statutory requirements of Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act such that Chickasaw County and participating jurisdictions remain eligible for federal programs such as the Flood Mitigation Assistance Grant program (FMA), Hazard Mitigation Grant Program (HMGP), Hazard Mitigation Grant Program Post-Fire (HMGP Post Fire) and Building Resilient Infrastructure and Communities (BRIC) program.

For this plan, Chickasaw County’s jurisdictions that participated in the process collected data and their approach for their local hazard mitigation plan with assistance from the County EMA and INRCOG. Each jurisdiction fulfilled all requirements in the process for the development of their mitigation strategy.

A Multi-Jurisdictional Approach

This comprehensive document has components informed by the planning committee. Those include mitigation goals, selected mitigation activities/actions/programs, policies and regulations set by each jurisdiction, needs, fiscal level, and local planning implementation capacity. INRCOG served as the coordinator of this Plan by coordinating meetings with the planning committee,

collecting information by each jurisdiction in order to assemble data gathering assignments into a strategic body with details, priorities, and funding sources called out for each associated action item.

The City of Protivin and Sumner-Fredericksburg Community School District were new participants in this update. The City of Protivin lies along the northern boundary with city limits that encompass both Chickasaw (partially) and Howard County (primarily).

Benefits of Multi-Jurisdictional Mitigation Planning

- ✓ A comprehensive approach to hazard mitigation may have greater positive impacts for participants and others. This process imposes external specialty on the topic of hazard mitigation which is available for rural communities through COGs throughout Iowa.
- ✓ Taking an opportunity to create more sustainable and disaster-resistant communities.
- ✓ Benefiting from a collaborative intergovernmental effort that qualifies participants for pre-disaster mitigation grants.
- ✓ Using limited resources on hazards that have the biggest impacts on a community.
- ✓ Reducing or preventing damage to existing structures, subsequently reducing repair costs.
- ✓ Identifying vulnerable populations to establish socially equitable outcomes.
- ✓ Setting long-term goals that will be compatible with existing community plans such as a comprehensive land use plan.

See Table 2 for committee members and participation details.

The Planning Process



OUR APPROACH

1 Gathering Data and Getting Updates on Previous Hazard Mitigation Activities

Representatives from each of the participating jurisdictions attended the first planning committee meeting in which provided community data, information, and shared updates on previous mitigation efforts done by their communities were discussed.

Meetings were held between March 19th to April 23rd at the Chickasaw County Community Center in New Hampton, Iowa. Public notices were issued and published in the New Hampton Tribute, the largest and most read local newspaper for the county.

All meetings were open to the public and community members were welcome to attend and observe the committee. We had no guests or members of the public attend these meetings. Copies of notices are located in Appendix N.

For Protivin, previous mitigation activities were drawn from the 2012 Howard County MJ-6 Multi Hazard Mitigation Plan. Protivin lies in both Howard County and Chickasaw County.

Next, updates took place based upon the previous Plan and with input from plan participants. This focused on helping each jurisdiction be reflective of what they have achieved, what they have still yet to achieve, and what has not worked for better or worse.

Responses are located in Appendix N.

2 HAZARD IDENTIFICATION & ASSESSMENTS

Identify Hazards

Through the planning process, the hazards that posed a risk to the entire planning area, as well as unique hazards for each jurisdiction, were reviewed and updated. The committee agreed on including all 13 hazards identified in the State of Iowa’s 2023 Hazard Mitigation Plan. Hazard profiles were prepared by the plan coordinator and shared with the committee participants during the hazard risk assessment.

Assessing: Vulnerability, Capability, and Risk

Committee participants evaluated their community’s vulnerabilities by listing critical facilities, vulnerable populations, repetitive loss property history, and any properties located in flood risk zones based on the latest effective flood study.

Next, participants conducted a capability assessment on their community’s abilities to carry out hazard mitigation activities. An inventory of existing policies, practices, programs, regulations, and activities was listed in tables. Responses for the capability assessments are located in Section 4.

A risk assessment was conducted for each hazard based on four risk factors. Historical occurrence, probability of a hazard event occurring in the area, magnitude of a hazard event, and the warning time of an event occurring.

Responses by participants were put on score sheets with each factor given a rating between 1 and 4. Using a hazard risk formula based on the values of the numbered rating given to each factor, a composite score was calculated for each hazard and the list of hazards were organized from highest to lowest risk for each community. The results of this assessment and hazard profiles are in Section 3.



ESTABLISH

1 Mitigation Goals and New Activities

Each community's team or representative in the planning committee consulted with their local government and local planning committees to determine the goals for their local hazard mitigation plan. Those goals were developed from problems statements submitted by committee participants about a specific issue.

Participants were able to list mitigation activities they could accomplish as a community that would help them achieve their goals. Those new mitigation activities were assembled with their updated list of previous mitigation activities, then arranged into five different mitigation action types. These components make up a new strategy by each community to implement their hazard mitigation activities over the next 5 years.

ASSEMBLE

4 Implementation Strategy

A strategic guide for use in the mitigation efforts is presented for each mitigation plan. Each action or activity item in the strategy focuses on hazard mitigation and consists of a time frame, designated person to lead, estimated cost, and funding sources to pursue.

The Plan concludes with recommendations to consider. Efforts to keep the public involved, and how to make any future updates or make changes can take place.

When implemented appropriately, mitigation projects can save lives, reduce property damage, be cost-effective, and environmentally sound. This, in turn, can reduce the enormous cost of disasters to property owners and all levels of government. In addition to the approach from this plan, hazard mitigation can

protect critical community facilities, ensure equitable outcomes, reduce exposure to liability, and minimize community disruption.

ADOPT

3 Public Hearing and Adopting Resolution Approving the Updated Hazard Mitigation Plan

Each community produced drafts of their local hazard mitigation plans using the work sheets and assignments from each of the committee meetings. Then participants shared the Plan with their local officials, emergency responders, board members, etc. for feedback. All feedback was addressed, incorporated, and a final plan was sent out for a public hearing at a city council meeting. A coordinator from the plan development team (INRCOG or Chickasaw County EMA) was present during public hearings when feasible (non-conflicting meeting times) and presented the planning process, pointed out any changes from existing hazard mitigation plan (if applicable), and the overall benefits of an approved plan for the community (i.e. funding, reduction of risks). All city councils and/or school district boards voted unanimously to adopt their updated hazard mitigation plan. See Appendix L for signed resolutions.

Planning Committee

Those that participated were administrators or elected officials. County staff included those from the county public health department, engineering department, ambulance services, auditor's office, conservation board and board of supervisors. These participants helped form county-wide input for hazard mitigation that would focus on unincorporated county areas. The committee members are listed in Table 2.

Representatives from nine incorporated cities located in Chickasaw County included: Alta Vista, Bassett, Fredericksburg, Ionia, Lawler, Nashua, New Hampton, North Washington, and Protivin. All the cities that participated in the 2019 Chickasaw County MJ-HMP participated in this 2024 plan update. However, the City of Protivin

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was a new participant in the Chickasaw County Hazard Mitigation Plan. Protivin's previous mitigation actions and strategies are located in Howard County's 2012 Multi-Jurisdictional Hazard Mitigation Plan. Protivin participants updated their previous mitigation activities based on the list from the Howard County 2012 Plan.

Requirement 44 CFR §201.6(b)(2): 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 must include 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

All school districts with areas within Chickasaw County were invited to participate in the plan development process and serve on the committee. New Hampton Community School District (CSD), Nashua-Plainsfield CSD, and Sumner-Fredericksburg CSD each participated in the planning process by attending meetings and/or completing necessary data by meeting with plan coordinator to receive meeting materials. NHMCSD was a previous participant in the 2019 Chickasaw County MJ-HMP.

Committee Participation

Each respective jurisdiction had at least one representative attend the series of required planning meetings and completed all necessary information for this hazard mitigation plan. If jurisdiction participants were not able to make the meetings due to scheduling conflicts, they were given meeting materials and learned about hazard mitigation topics from our handouts that will help them form their local strategies. See Table 2 for a summary of each committee member's participation.

Data from the information gathering phase of the process included listing critical facilities/sites, local capabilities, identifying critical buildings, updating their 2019 strategies (if they were a previous participant), filled out worksheets with problem statements, and selected new mitigation activities/actions for their updated strategy. During the risk assessment, committee participants scored factors that would calculate their community's overall risk to each hazard in their local hazard mitigation plans.

Other stakeholders including organizations and/or individuals were invited to attend committee meetings to be informed about the process and provide an opportunity to join the committee such as:

- New Hampton Community School District
- Sumner Fredericksburg Community School District
- Nashua Plainfield Community School District

INRCOG organized the meetings in conjunction with the Chickasaw County Emergency Management Coordinator. INRCOG was also responsible for compiling information and writing the final document.

Each participant on the planning committee completed worksheets that would provide the content used to write their local hazard mitigation plan in accordance with requirements for approval by Iowa Department of Homeland Security and FEMA. Changes or updates are documented in the responses by participants (See Appendix N).

Public Participation

The public was invited to planning committee meetings by public notices published in the weekly local newspaper publication the *New Hampton Tribune*. Outreach efforts by Chickasaw County invited neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties and residents of the planning process and to invite all interested parties to attend and contribute to the development of the plan.

Public notices and public involvement materials can be found in Appendix O. All public notices for each public hearing held for each jurisdiction’s local hazard mitigation plan are found in Appendix O.

Committee Meetings

Four public meetings were held at the Chickasaw County Community Services building at 260 E. Prospect Street, New Hampton, IA. Each meeting was open to all. Attendance for each meeting was documented and can be found in Appendix N. Table 1 provides a list of the public meetings. Public notices were published in the main newspapers for 3 of the 4 meetings. Notices for meetings #1 and #2 did not meet the newspaper notice deadline to publish in the biweekly newspapers.

Table 1: Summary of All Public Meetings for the 2024 Chickasaw County M-J HMP

Mtg #	Date	Description of Meeting and Outcomes of Meetings
Meeting 1	Tuesday March 19, 2024	Review the scope of the planning process and schedule meetings for the next committee meetings. Complete worksheets to update community data. Completed worksheets to provide updates to previous mitigation activities.
Meeting 2	Tuesday March 26, 2024	Reviewed hazard profiles to be assessed in this planning process for Chickasaw County's communities. Discussed additional hazards to consider. Completed a hazard assessment using a scoring rubric developed in the plan.
Meeting 3	Tuesday April 2, 2024	Complete vulnerability assessment and completed problem statement work sheet with new mitigation activities. Return previous work items if available.
Meeting 4	Tuesday April 23, 2024	Review drafts of their hazard mitigation plans and send out to boards for review before posting online and at city halls for public hearing.

Requirement 44 CFR §201.6(b)(2): 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 must include 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 nonprofit interests to be involved in the planning process.

2024 Chickasaw County
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Table 2: Chickasaw County MJ-HMP Planning Committee Members and Participation

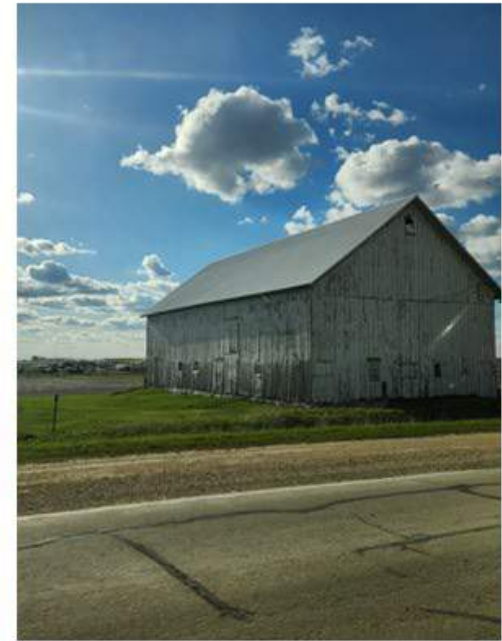
Name	Jurisdiction or Dept.	Position	Attended Meeting?			
			#1	#2	#3	#4
Burt Ostert	City of Alta Vista	Mayor	X	X	X	X
Amy Laures	City of Alta Vista	City Council Member	X	X		
Larry Laures	Alta Vista Fire Dept.	Fire Chief		X		
James Ashley	City of Bassett	Mayor	X	X		
James Mitchell	City of Fredericksburg	Mayor	X		X	X
Roy Armbrecht	Fredericksburg Fire Dept.	Fire Fighter	X	X	X	X
Sheriton Detther	Fredericksburg Fire Dept.	Fire Fighter		X	X	X
Randy Taylor	City of Ionia	Mayor	X	X	X	X
Derek Day	Ionia Fire Dept.	Fire Fighter	X	X	X	X
Mark Muetertshies	City of Lawler	Mayor	X	X	X	X
Jeremy Matlenburg	Lawler Fire Department	Fire Fighter	X	X	X	X
Samantha Johnson	City of Nashua	City Council Member	X	X	X	X
Tom Johnson	Nashua Fire Dept.	Fire Fighter		X	X	X
Karen Clemens	City of New Hampton	City Clerk	X	X		
Tim Pederson	New Hampton Police	Police Chief	X	X	X	X
Toby Schwickerath	New Hampton Fire			X	X	X
Casey Mai	City of New Hampton		X	X	X	X
Megan Baltes	City of North Washington	City Council Member	X	X	X	X
Milan Mohn	City of Protivin	Mayor		X		
Brad Moudry	Protivin Fire Department		X	X	X	X
Scott Cerwinske	Chickasaw County	District 2 Supervisor	X			
Matt Kuhn	Chickasaw County	District 4 Supervisor	X	X		
Lisa Welter	Chickasaw County	Public Health Administrator	X			
Jeff Bernatz	Chickasaw County	Emergency Management Agency Coordinator	X	X		
Fred Matlage	Sumner-Fredericksburg CSD	Superintendent	X		X	X
Ryan Shawver	Chickasaw County	Sheriff		X	X	X
Toby Liechty	Nashua-Plainsfield CSD	Superintendent		X		
Jay Jurrens	New Hampton CSD	Superintendent			X	X

Current & Previous Planning Documents Used

In addition to information obtained through the series of Committee Meetings, INRCOG reviewed existing reports, plans, studies, reports, and historical data. Relevant information and resources were shared with each jurisdiction. These documents and data include:

- 2023 Iowa Hazard Mitigation Plan.
- Plans, studies, reports, maps, and technical information, including updated Flood Insurance Rate Maps (FIRM) and data.
- Documentation of communities' status in the National Flood Insurance Program (NFIP).
- Repetitive Loss Properties and /or Severe Repetitive Loss Properties information from FEMA.
- 2040 RTA Long Range Transportation Plan.
- 2018 National Climate Assessment

Section II: County Profile



Chickasaw County, Iowa

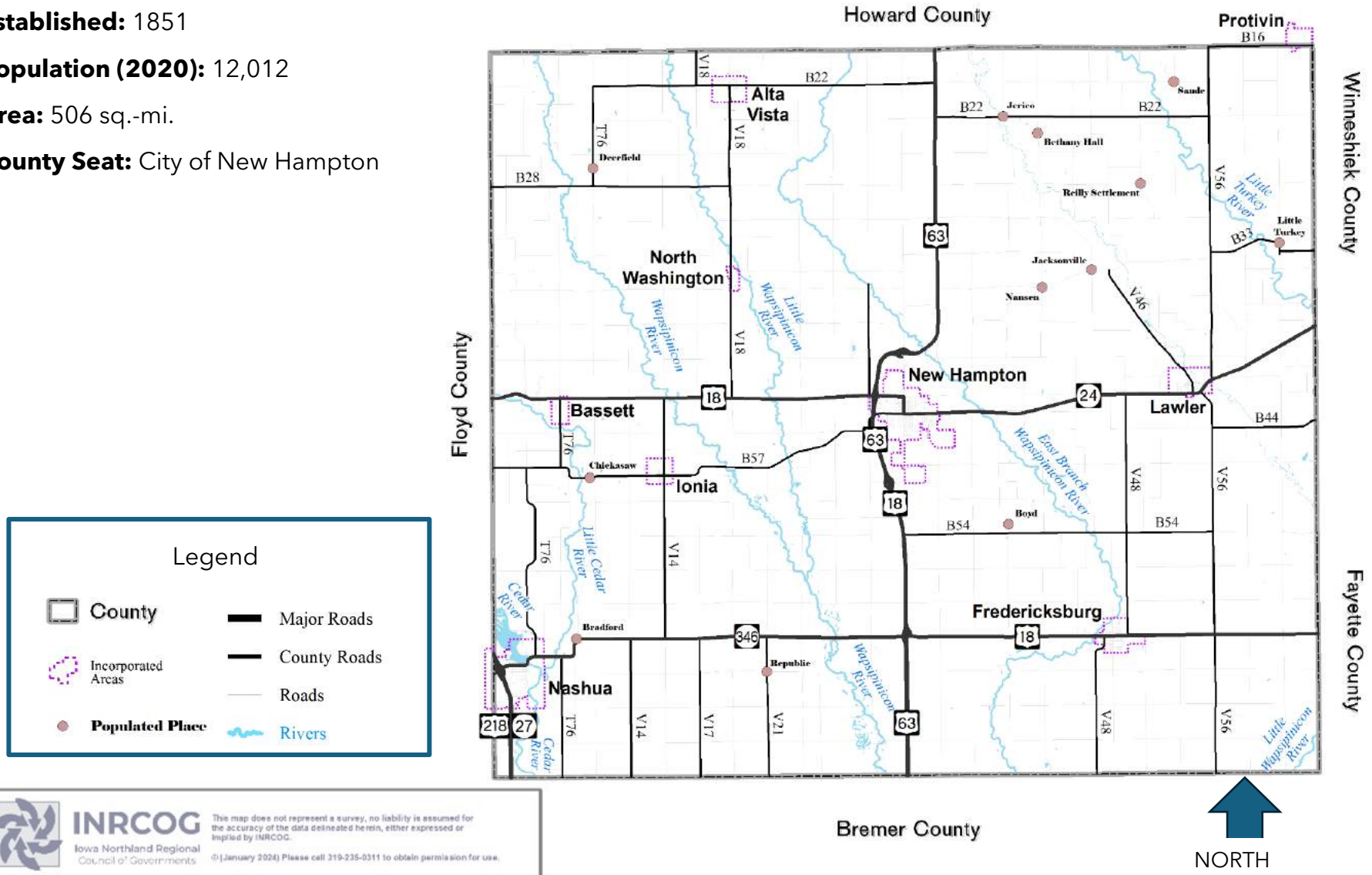
Established: 1851


Population (2020): 12,012

Area: 506 sq.-mi.

County Seat: City of New Hampton

Figure 2: Map and Location of Chickasaw County



 **INRCOG**
Iowa Northland Regional
Council of Governments
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This map does not represent a survey, no liability is assumed for the accuracy of the data delineated herein, either expressed or implied by INRCOG.

Location

Chickasaw County is located in northeastern Iowa. Situated along the stretches of corn fields and cropland, the land is broken up by many rivers and waterways that flow through it providing a glistening stream through bountiful croplands and flowing through most of the 10 rural communities located in Chickasaw County.

Located in the geographic center of the county, the city of New Hampton serves as the county seat. Based on 2020 Census data, New Hampton is also the most populated with 3,494 people. Two cities are partially located in Chickasaw County and adjacent counties. The cities of Nashua and Protivin are both partially in Floyd and Howard County, respectively. For this Plan, the communities are evaluated as a whole and not split at the county lines. The city of Bassett is the smallest town in the county with 45 residents.

Ranking	City	Population (2020 Census)
1	New Hampton	3,494
2	Nashua (partially)	1,551
3	Fredericksburg	987
4	Lawler	406
5	Ionia	226
6	Protivin (partially)	269
7	Alta Vista	227
8	North Washington	112
9	Bassett	45

US Highways -18 and -63 converge in New Hampton and the center of the county. Other major highways in Chickasaw County include US-218 and US-63. The County has a land mass of 505 sq-mi.

There are six rivers that run south-eastwardly throughout the county. The Cedar River and Little Cedar River converge in Nashua near the southwestern part of the county. East of those rivers are the Wapsipinicon River and Little Wapsipinicon River. These also converge in the lower west quadrant of the county. Further east of the Wapsipinicon River, the East Branch tributary of said river nearly bisects the county. Finally, further east of all the other waterways flows the Little Turkey River.

Counties Floyd, Howard, Winneshiek, Fayette, and Bremer lie adjacent to Chickasaw County.

History

Before the arrival of European settlers, Chickasaw County was a marshy prairie cultivated by the loway tribe until a period of continental emigration occurred in the 1800s. This period started a time that saw several other tribal groups resettle in the area because of faraway land acquisitions and conflict to the east as the U.S. continent started to colonize.

Chickasaw County was named after the Chickasaw tribe who may have inhabited the area. The Chickasaw tribe were primarily from regions in the southern U.S. in present day Mississippi, Tennessee, Kentucky, and Missouri.

Based on historical documents, the Ioway, Sauk and Fox, Sisseton Band of Dakota Sioux, Mdewakanton, Missouri, Omaha, Oto, and Wahpekute were tribes that had claims to the land and eventually signed rights away to it in treaty documents. The Treaty with the Confederated Tribes of the Sacs & Foxes in 1830 was signed in Prairie Du Chien, Michigan. The tribes that signed included the Sac and Fox tribe (Meskwaki), the Medawah-Kanton Wahpacoota, Wahpeton, and Sisseton Band of Dakota Sioux, the Omahas,

Figure 3: Map of Lands Ceded in the Treaty with Confederated Tribes of the Sacs and Foxes of 1830



Ioways, Otoes, and Missourians. These tribes signed this treaty that ceded lands located in Cession 153 and 152. See map for location of land cessions.

This fate of resettlement occurred over the first half of the 19th century from 1832 to 1857 when several tribal groups resettled in and around Chickasaw County. All were eventually relocated to Kansas, Oklahoma, and Mississippi following the passing of the Indian Removal Act

What followed was a history rooted in its rapid growth and settlement. In 1851, Chickasaw County was established. New Hampton was named by settler Osgood Gowan in homage to his former residence of the same name originally located in New Hampshire. The county quickly became a hub for emigration and community development. Within two years of its inception, Chickasaw County's population soared from 600 to over 2,651.

Initially comprising seven townships, Chickasaw County's territorial boundaries expanded over time, eventually encompassing twelve townships. Despite its promising beginnings, the county faced administrative challenges early on. Initially attached to Fayette County for electoral, revenue, and judicial matters, Chickasaw County soon sought independence. A pivotal moment occurred on January 12, 1853, when a petition led to the county's detachment from Fayette County, culminating in the election of officials in the town of Bradford. However, despite their election, administrative complexities hindered the officials' ability to fully execute their duties, highlighting the early hurdles faced in establishing governance.

Nevertheless, Chickasaw County persevered, overcoming its initial setbacks to become a thriving community in Iowa. Its

journey from a fledgling political subdivision to a flourishing county underscores the resilience and determination of its early settlers and leaders. Today, Chickasaw County stands as a testament to the enduring spirit of those who shaped its history and continues to evolve as a vibrant community in the heart of Iowa.

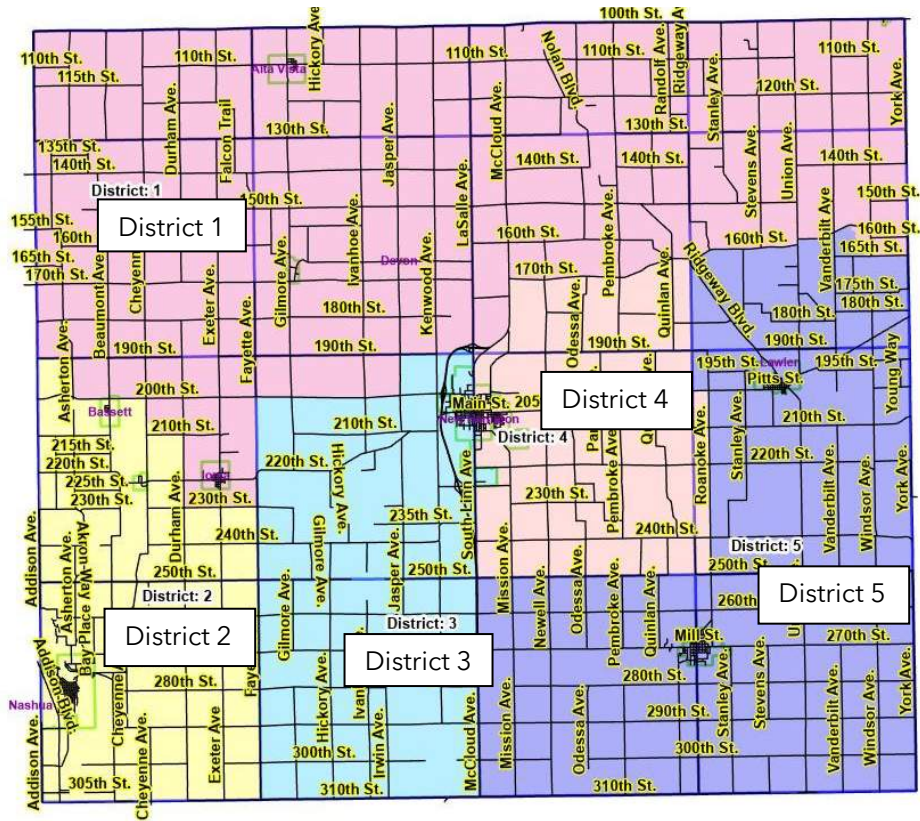
The tales of Iowa's courthouse history are not left to the imagination with the meticulous chronicles of county seat contention, exemplified poignantly by Chickasaw County's saga. Dating back to its inception in 1851, the establishment of the inaugural courthouse, modestly priced at \$1,840, laid the cornerstone of Chickasaw County's legal apparatus. Subsequently, in 1857, the county seat transitioned to New Hampton, strategically positioned at the geographic heart of the burgeoning county, setting the stage for decades of steadfast administration.



Throughout the ensuing years, neighboring townships, including Fredericksburg, Bradford, and Forest City, ardently vied for the coveted status of county seat, yet all attempts were met with resolute defense by New Hampton. The architectural evolution of Chickasaw County's courthouses mirrors the resilience of its civic identity. Tragically, the original courthouse in New Hampton, completed in 1865, succumbed to a devastating fire in 1880, resulting in irreparable document loss. Undeterred, the community rallied to construct a new courthouse by 1881, costing \$10,500, with subsequent expansions in 1905 and 1906 further solidifying its stature as a bastion of legal integrity.

Finally, in 1929, Chickasaw County unveiled its present courthouse, a testament to architectural sophistication, designed by Ralston and Ralston of Waterloo and erected by Tarazar Construction Co. of Albert Lea, Minnesota. This grand edifice, adorned with Moderne and Art Deco influences, stands as an enduring symbol of Chickasaw County's unwavering commitment to jurisprudential excellence, embodying the culmination of centuries of civic evolution and institutional fortitude.

Figure 4: County District Map



Source: Chickasaw County Assessor and GIS Services

Government Structure

A five-member board of supervisors comprise the governing body of the County. The board of supervisors is the policy making body of the County, under the laws of Iowa. A map of district boundaries represented by each supervisor is shown here.

- District 1 Supervisor - Stephen Breitbach.
- District 2 Supervisor - Scott Cerwinske.
- District 3 Supervisor - Jacob Hackman.
- District 4 Supervisor - Matthew Kuhn.
- District 5 Supervisor - Travis Suckow.

Each of Chickasaw County's incorporated municipalities has a Mayor-Council government structure. Pursuant to Iowa Code 376.2 city council members may serve either 2- or 4-year terms. Mayors and city council members are each elected to serve a 2-year term.

By state law, city councils appoint a city clerk to fulfill duties that include publishing meeting minutes, completing budget forms, managing city finances, and responding to resident requests, among other duties. For this plan, city clerks, mayors, and first responders were involved to provide information and gather input from their respective communities.

Natural Environment

Topographically, Chickasaw County is a land of relatively flat or long rolling slopes. This is ideal for agricultural production and drives a strong agricultural and farming sector for Chickasaw’s economy.

Soils

According to the Chickasaw County Soil Survey, which was issued in July 1996, the soil composition reveals a remarkable and valuable natural to support a thriving agriculturally based economy. According to the Survey, the soils in the County are grouped into eight (8) soils associations, each of which has different characteristics. The associations, including a brief description of each, are located in Figure 5.

Surface Water Systems

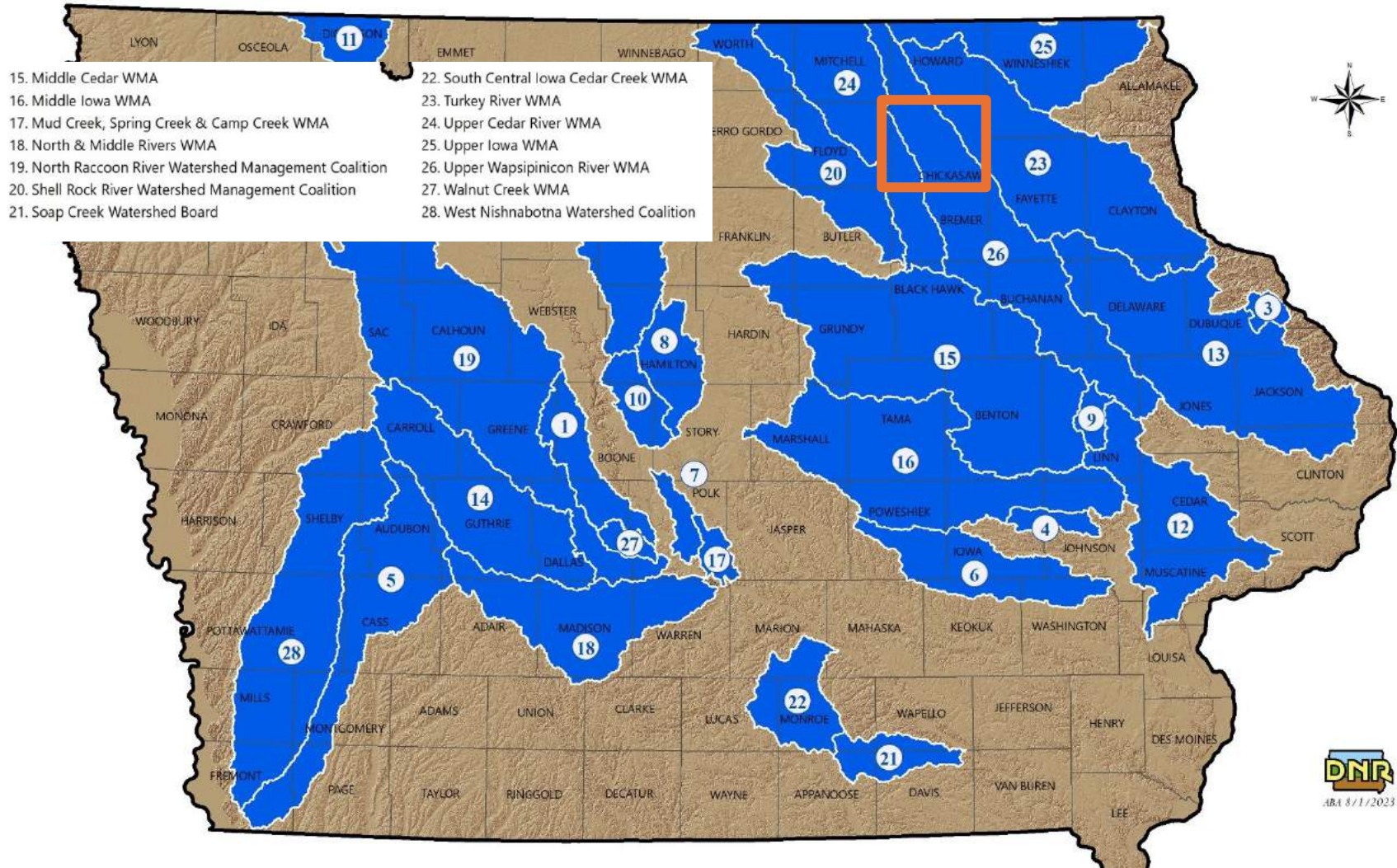
The County lies within the boundaries of three watersheds authorities in Northeast Iowa: #24-Upper Cedar River, #26-Upper Wapsipinicon River, and #23-Turkey River. See the map of watershed management authorities below.

The highest point in the county is located in the rural areas north of New Hampton and lies at approximately 1,316 feet above sea level. The lowest point in the county is located south of Nashua and lies at approximately 934 feet above sea level.

Figure 5: Chickasaw County Soil Associations

Readlyn-Tripoli Association	• Nearly level, somewhat poorly drained to poorly drained soils formed in loamy erosional sediments and underlying firm, loamy glacial till; on uplands.
Oran-Bassett-Clyde Association	• Nearly level to moderately sloping, moderately well drained to poorly drained, moderately dark and dark soils formed in loamy
Kenyon-Clyde-Floyd Association	• Nearly level and moderately sloping, moderately well drained to poorly drained, dark soils formed in loamy erosional sediments and the underlying firm, loamy glacial till; on uplands.
Ostrander-Lilah Association	• Gently sloping to strongly sloping, excessively drained and well drained soils formed in loamy erosional sediments and the underlying friable, loamy glacial till and the underlying gravelly and sandy glacial outwash; on uplands and high benches.
Dickinson-Rockton Association	• Gently sloping and moderately sloping, somewhat excessively drained and well drained soils formed in loamy eolian or erosional sediments over sand or the underlying residuum and limestone; on uplands.
Cresco-Protovin-Jamestown Association	• Nearly level to moderately sloping, moderately well drained to poorly drained soils formed in loamy erosional sediments and the underlying firm, loamy glacial till; on uplands.
Coland-Marshan-Hayfield Association	• Nearly level, poorly drained and somewhat poorly drained soils formed in loamy alluvial deposits and in the underlying sandy and gravelly glacial outwash; on floodplains and stream terraces.
Spillville-Wapsie Association	• Nearly level to gently sloping, somewhat poorly drained and well-drained soils formed in loamy alluvium; on floodplains and stream terraces.

Figure 6: Map of Watershed Management Authorities in Iowa



Source: Iowa DNR

Climate

Chickasaw County experiences a temperate climate with significant seasonal contrasts. Winters bring occasional heavy snow, ice, and frequent cloudiness, with about four winter storms per season. True blizzards are uncommon, but arctic cold snaps can cause extreme cold and hazardous wind chills. Spring and summer see 30 to 50 thunderstorms annually, some of which may spawn tornadoes, large hail, or damaging winds. The area is also prone to river and flash flooding. Heat waves and high humidity occur sporadically during the summer months. Autumn typically brings calmer weather, though high winds can arise in spring and fall.

Historical climate data for New Hampton, Iowa is summarized in the tables below. Using the 30-year average, the maximum, mean, and minimum temperatures are shown for each month and then the annual averages are computed by taking the average of all 12 months.

Precipitation and snowfall average are shown monthly based on the 30-year average. Precipitation and snow fall is shown in inches. Annual precipitation and snowfall seasonal averages are shown as well.

30-year Average Monthly Temperatures and Annual Average (in degrees F)													
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Max Temp.	24.1	28.7	42.1	56.9	68.8	78.8	81.5	79.5	74.1	60.2	44.3	30.2	55.3
Mean Temp.	15.9	19.8	32.9	45.8	58	68.4	71.3	69.2	62.3	49.2	34.8	22.3	45.4
Min. Temp.	-16	-10	2	21	33	45	51	49	36	23	8	-7	-19

Source: NOAA Online Weather Data (NOWData) from the La Crosse, WI Weather Forecast Office.

30-year Average Monthly Precipitation and Snow Fall (in inches)													
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Precipitation (in.)	0.04	0.05	0.07	0.13	0.17	0.23	0.15	0.15	0.12	0.08	0.06	0.05	0.11
													Seasonally
Snowfall (in.)	11	9.5	5.2	1.8	-	-	-	-	-	0.1	2	7.9	35.8

Source: NOAA Online Weather Data (NOWData) from the La Crosse, WI Weather Forecast Office.

Forest and Vegetation

According to the Iowa Dept. of Natural Resources, Chickasaw County has approximately 7,136 of forested acres. This is nearly 2.32% of the county's land mass. Chickasaw County ranks 79th in Iowa's counties in remaining forested areas. Chickasaw County was a glaciated region. Glaciers once covered the region and scrapped up the earth as it melted and retreated northward during the thawing of the last Ice Age. Forests are sparse and this has been good topography for agriculture.

The Chickasaw County Conservation Board manages 37 areas including parks, boat launches, easements, and habitats.

Infrastructure

U.S. Highways 63 and 218 traverse the County north and south. Chickasaw County also has access to highways from US 63 and 18, as well as from Iowa Highway 24 and 346. A distribution of roadway lane miles in Chickasaw County is shown below. Most of the roadways in the county are local street classifications. Local roads serve local trip purposes and connect to higher

order roadways. Local road classification type roadways cover 65% of Chickasaw County's road system. Of those local roads, most of the surface type for them are asphalt and PCC concrete.

Railway throughout the county includes routes owned by Canadian Pacific Railroad. The route runs east and west through New Hampton, Ionia, and Lawler.

Air service is available to Chickasaw County residents at a number of local, regional, and international airports. Locally, the New Hampton Airport serves the county, while other out-of-county regional air service is offered by the Waterloo, Cedar Rapids, and Dubuque Airports.

International air service is available in Rochester, Minnesota; Minneapolis-St. Paul, Minnesota; and Des Moines, Iowa.

In Iowa, there are 13,033 miles of gas and liquid pipelines and 45 pipeline suppliers. Iowa's pipeline system provides the state with liquid petroleum, natural gas, and anhydrous ammonia. In Chickasaw County, there are 67 miles of gas pipelines and 29 miles of liquid pipelines. This only represents 0.7% of all pipeline mileage in the state.

There are no major commercial watercraft routes in Chickasaw County. The Cedar and Wapsipinicon Rivers offer a location for recreational watercraft use by the public.

The Iowa Northland Regional Transit Commission (RTC) offers transit service to residents of Chickasaw County. Demand response service, which requires 24-hour notice, is offered. The remainder of the County is served by RTC on a case-by-case basis depending on space and service timing considerations.

Roadway Lane Miles by Federal Functional Classification							
Location	Road Type Classification Miles						Total
	Interstate	Principle Arterial	Minor Collector	Major Collector	Minor Collector	Local	
Chickasaw County	0	200.7	75.1	372.7	316.9	1,804.7	2,770

Source: Iowa DOT, Open Data Portal, Road Network Info

Secondary Road Centerline Mileage, by Surface Type						
Location	Surface Type					Total
	Earth	Gravel	Bituminous	Asphalt	PCC	
Chickasaw County	0	200.7	75.1	372.7	316.9	1,804

Source: Iowa DOT, Iowa Miles of Secondary Roads as of January 1, 2019

Table 3: Utility Providers							
Jurisdiction	<i>Electric</i>	<i>Natural Gas</i>	<i>Telephone/ Internet</i>	<i>Cable TV</i>	<i>Water Services</i>	<i>Sewer Services</i>	<i>Sanitation</i>
City of Alta Vista	Alta Vista Municipal	None	Windstream	None	City of Alta Vista	City of Alta Vista	Jendro Sanitation
City of Fredericksburg	Fredericksburg Municipal	Black Hills	Windstream	Mediacom	City of Fredericksburg	City of Fredericks- burg	City of Fredericksburg/ Jendro Sanitation
City of Ionia	Alliant Energy	Black Hills	Windstream	None	City of Ionia	City of Ionia	Jendro Sanitation
City of Lawler	Lawler Municipal	Black Hills	Iowa Telecom	None	City of Lawler	City of Lawler	Jendro Sanitation
City of Nashua	MidAmerican Energy	MidAmerican Energy	Quest	Butler-Bremer Communications	City of Nashua	People- Service, Inc (Contracted)	Jendro Sanitation
City of New Hampton	New Hampton Municipal Light Plant	Black Hills Energy	Windstream	Mediacom Communications	City of New Hampton	City of New Hampton	Jendro Sanitation
City of North Washington	Alliant Energy	None	Windstream	None	Well (Private)	Septic	Jendro Sanitation
Nashua-Plainsfield Community School District	MidAmerican Energy	MidAmerican Energy	Quest	Butler-Bremer Communications	City of Nashua	People- Service, Inc	Jendro Sanitation
New Hampton Community School District	New Hampton Municipal Utilities	Black Hills Energy	Windstream	Mediacom	City of New Hampton	City of New Hampton	Jendro Sanitation
Sumner-Fredericksburg Community School District	City of Fredericksburg	Black Hills Energy	Windstream/ ICN	Mediacom	City of Fredericksburg	City of Fredericks- burg	City of Fredericksburg/ Jendro Sanitation

Utilities

Chickasaw County is serviced by multiple utility providers. The table on the previous page shows the utility providers for each jurisdiction’s utilities.

Potable Water Systems

In Chickasaw County there are over 1,200 wells that draw water from aquifers that serve residential, commercial, and industrial uses. These wells draw from the Cambrian-Ordovician and Devonian aquifers.

There are 6 water towers in Chickasaw County.

	Storage Capacity (gallons)
Nashua Water Tower	300,000
Fredericksburg Water Tower	250,000
Ionia Storage Tank	75,000
New Hampton’s Water Towers (2)	800,000
Lawler Storage Capacity	50,000
Chickasaw County	
TOTAL STORAGE CAPACITY	1,475,000

Protivin is located partly in Howard County and has 1 water tower. The storage capacity of that tower is unknown.

Wastewater Treatment Systems

In Chickasaw County, there are 8 wastewater treatment facilities with lagoons. In rural, unincorporated areas, the disposal of wastewater and sewage is done primarily through individual, on-site septic systems. Septic systems consist of tanks and

septic fields. The County Public Health Department regulates on-site sewage systems through ordinances, inspections, and its Board of Health.

Demographics

Population

In the table below, population changes across the last decade from 2010 to 2020 are shown for Chickasaw County and the county’s municipalities. These population trends show a pattern of population decline across most cities. Overall, Chickasaw County had a population loss of 2%. The city with the highest change in population was Nashua with a population loss of 110 people. Fredericksburg was the only city that gained a population of 56 (or 6%).

City	2010	2020	Change in Persons	% Change
Alta Vista	266	227	-39	-15%
Bassett	66	45	-21	-32%
Fredericksburg	931	987	56	6%
Ionia	291	226	-65	-22%
Lawler	439	406	-33	-8%
Nashua (pt.)	1,661	1,551	-110	-7%
New Hampton	3,571	3,494	-77	-2%
North Washington	117	112	-5	-4%
Protivin (pt.)	21	9	-12	-57%
Chickasaw County	5,076	4,955	-121	-2%

Source: U.S. Census Bureau

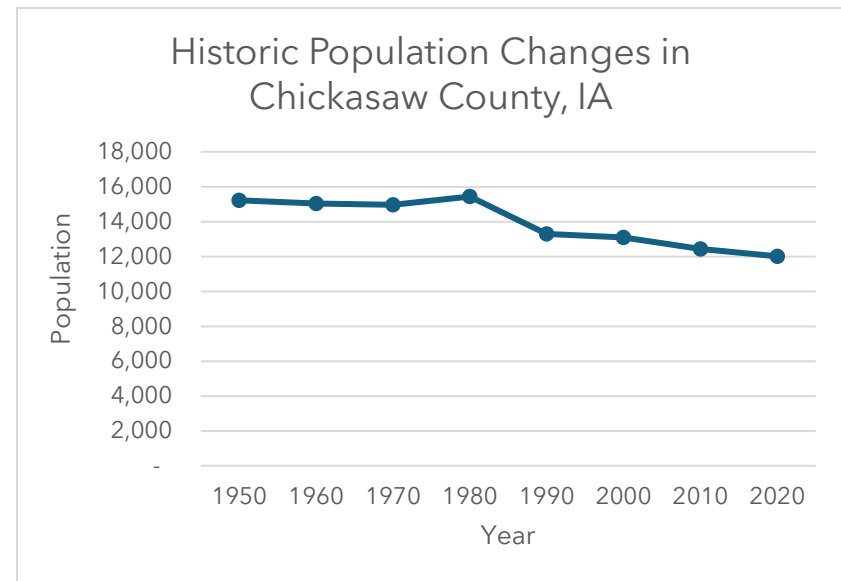
Year	Chickasaw County	State of Iowa
2030	12,000	3,328,308
2040	11,988	3,487,942

Source: U.S. Census Bureau and Woods & Poole Economics

Historically, the population in Chickasaw County has been on a steady decline over the last 70 years. In 1980, it peaked at over

Year	Population	% Change from 10 years
1950	15,228	-
1960	15,034	-1.3%
1970	14,969	-0.4%
1980	15,437	3.0%
1990	13,295	-16.1%
2000	13,095	-1.5%
2010	12,439	-5.3%
2020	12,012	-3.6%

15,400 people.



Population Projections

Projections are only estimates of future population and many factors have an effect on the future population, such as employment, housing, and educational opportunities. While some projections use some of this data in order to estimate future population, they cannot plan for unknown events, such as drastic changes in employment opportunities or the perilous effects of natural disasters.

In the Population Projections for Chickasaw County, Iowa, projections are based on linear and geometric methods, which assume that future population will continue to change based on past trends. The linear method adds or subtracts from the population the average number from each ten-year period since 1950, while the geometric method uses an average growth or decline rate. The table shows the actual number change and the growth or decline rate for each decade and their averages.

Vulnerable populations

Some of the vulnerable populations are listed for the County in the following table. Nearly 9% of households in Chickasaw County live below the poverty line. About 27% of households have at least 1 person with a disability. About 4.7% of households receive SNAP food benefits.

For people in group quarters, this may include older adults in a nursing home, over 1% of the population are in group quarters housing units.

Households with 1 or children under 18 make up 27% of occupied households. Nearly 14% of households have householders living alone that are 65 years and over. There are 109 mobile homes estimated in Chickasaw County (2.0% of occupied households).

Table 7: Vulnerable Population Characteristics for Chickasaw County

	Total	%
Total Households in Chickasaw County	4,920	100%
Below poverty level	420	8.5%
1 or more persons with a disability	1,318	26.8%
Receiving SNAP food benefits	231	4.7%
Median household Income	\$72,734	-
Population in group quarters	153	1.3%

Table 8: Housing Characteristics for Occupied Houses in Chickasaw County (2022)

	Value	%
Occupied housing units	4,920	100%
Average Household Size	2.36 persons	-
Owner Occupied Units	4,034	82%
Renter-Occupied Units	886	18%
UNITS IN STRUCTURE		
1, detached	4,399	89%
1, attached	89	2%
2 apartments	55	1%
3 or 4 apartments	125	3%
5 to 9 apartments	70	1%
10 or more apartments	73	2%
Mobile home or other type of housing	109	2%
VEHICLES AVAILABLE		
No vehicle available	164	3.3%
1 vehicle available	1,207	24.5%
2 vehicles available	1,814	36.9%
3 or more vehicles available	1,735	35.3%
TELEPHONE SERVICE AVAILABLE		
With telephone service	4,861	98.8%
HOUSE HEATING FUEL		
Utility gas	2,507	51.0%
Bottled, tank, or LP gas	1,531	31.1%
Electricity	717	14.6%
Fuel oil, kerosene, etc.	44	0.9%
Coal or coke	0	0.0%
All other fuels	117	2.4%
No fuel used	4	0.1%

Housing Trends

According to 2022 American Community Survey 5-year estimates, there are approximately 4,920 occupied housing units in Chickasaw County. Of these housing units, 4,034 are owner-occupied and 886 are renter-occupied. The average household size for Chickasaw County is 2.36 people.

About 89% of homes are single family type houses. There is very little multi-family housing (7%) in Chickasaw County. About 2% of the housing stock in Chickasaw County includes mobile homes (or other types of housing).

Table 9: Median Value of Existing Housing Supply (in 2022 dollars)

Jurisdiction	Median Value of Homes (2022 dollars)
Alta Vista, Iowa	\$62,700
Bassett, Iowa	\$83,000
Fredericksburg, Iowa	\$154,600
Ionia, Iowa	\$97,200
Lawler, Iowa	\$90,000
Nashua, Iowa	\$105,800
New Hampton, Iowa	\$146,800
North Washington, Iowa	\$100,000
Protivin, Iowa	\$91,400
Chickasaw County, Iowa	\$151,700
State of Iowa	\$181,600

The median value of homes in Chickasaw County is estimated at \$151.7K which is less than the average value of homes for the state of Iowa at \$181.6K. Fredericksburg has the highest median value of homes at \$154.6K. Alta Vista has the lowest median value at \$62.7K.

Over the last decade from 2010 to 2020, Chickasaw County’s housing supply reduced by 182 units from 2010 to 2020. This trend follows the state of Iowa’s decline in housing units for the same period. Almost all municipalities saw a loss in the number of housing units in their communities. Nashua lost the most with 48 units. Only two communities gained housing units (+2 each) which were North Washington and Lawler.

In 2020, most owner-occupied homes were valued at and above \$100K. About 25% (475) of homes in the county were between \$50K and \$99K.

Most of the county’s housing stock are pre-war (WWII) structures. About 31% of houses were built before 1940. In the 60s and 70s, 28% of the housing stock was built. Since 2000, only 10% of the housing stock has been built since then.

Figure 8: Age of Chickasaw County’s Housing Supply

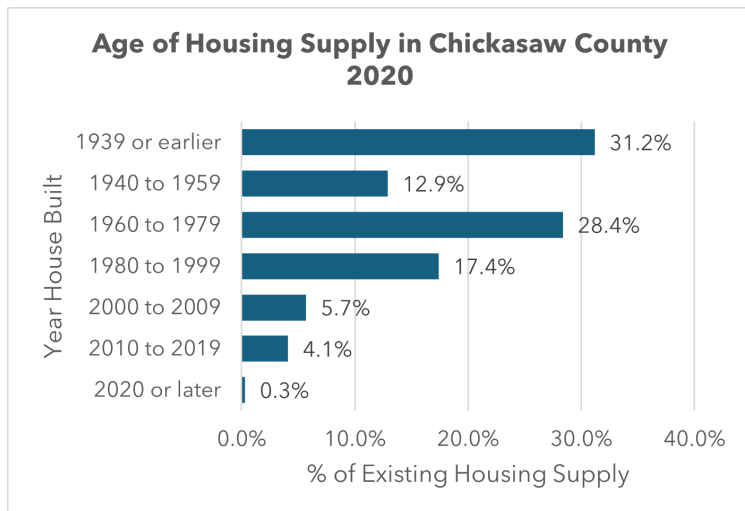


Figure 9: Housing Supply Shrinks Across Chickasaw County

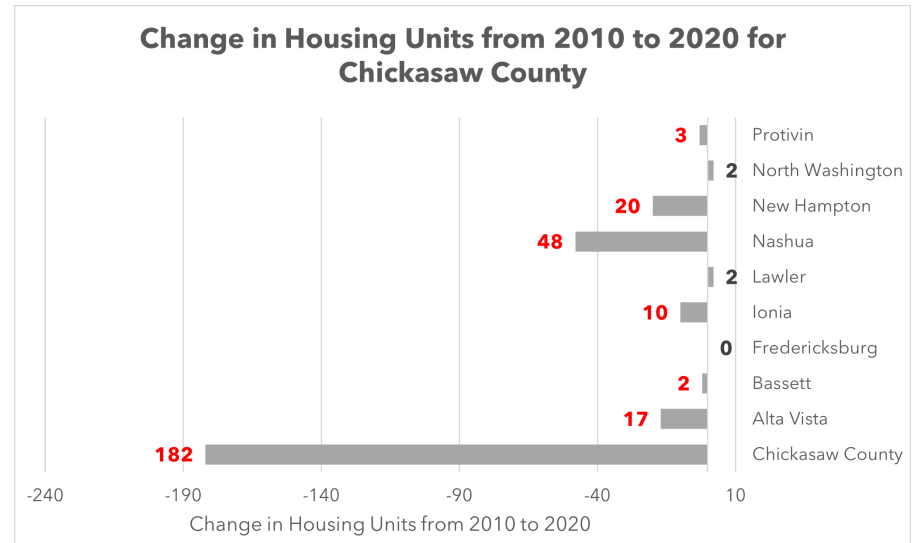
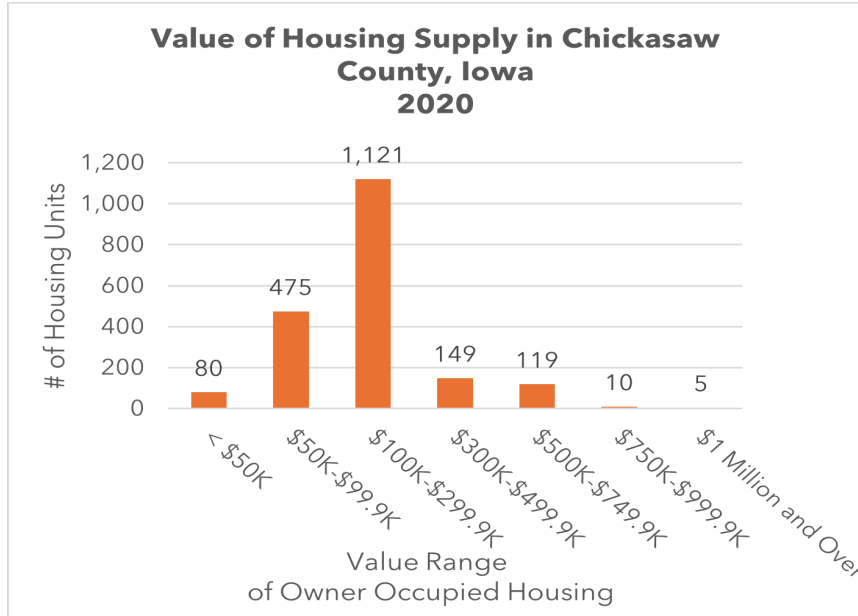


Figure 10: Price Range of Home Values for Chickasaw County



About 2% of the housing units in Chickasaw County are mobile homes. Most of these mobile homes are in the unincorporated county area. Besides the unincorporated area, the cities of Nashua and New Hampton have the greatest number of mobile homes within their jurisdiction (Table 10).

	#	% of local housing supply
State of Iowa		
Chickasaw County	91	2.0%
Alta Vista	3	4.3%
Bassett	0	0%
Fredericksburg	5	1.1%
Ionia	2	1.4%
Lawler	1	1.1%
Nashua	23	2.9%
New Hampton	23	2.3%
North Washington	1	2.0%
Protivin	1	1.9%
Unincorp. County	33	

Source: 2022 American Community Survey 5-year estimates

Economy

The median income for the county and its communities is listed in Table 11. The values in Table 11 are adjusted for inflation and shown in 2022 dollars. The median household income for the entire county, in 2022, was \$72,734. The City of North Washington had the highest median income of \$83,333; and the City of Lawler had the lowest median household income, \$54,688.

Jurisdiction	Median income (dollars)
Alta Vista	\$56,458
Bassett	\$58,250
Fredericksburg	\$62,583
Ionia	\$69,107
Lawler	\$54,688
Nashua	\$60,000
New Hampton	\$60,052
North Washington	\$83,333
Protivin (Howard County)	\$59,375
Chickasaw County	\$72,734
State of Iowa	

A summary of 2022 data for employment for Chickasaw County:

INDUSTRY	Workers	% of Workforce
Civilian employed population 16 years and over	6,239	100%
Agriculture, forestry, fishing and hunting, and mining	532	8.5%
Construction	440	7.1%
Manufacturing	1,742	27.9%
Wholesale trade	166	2.7%
Retail trade	550	8.8%
Transportation and warehousing, and utilities	382	6.1%
Information	7	0.1%
Finance and insurance, and real estate and rental and leasing	248	4.0%
Professional, scientific, and management, and administrative and waste management services	365	5.9%
Educational services, and health care and social assistance	1,230	19.7%
Arts, entertainment, and recreation, and accommodation and food services	175	2.8%
Other services, except public administration	261	4.2%
Public administration	141	2.3%

The top three economic sectors with the largest share of the county’s workforce are 1) manufacturing, 2) educational services, and health care and social assistance, and 3) retail trade.

Section III: Risk Assessment & Hazard Profiles

For this section, the risk assessment draws from the requirements in Requirement §201.6(c)(2)(i). The 3 components of this section are as follows:

1. Hazard Identification

- Hazard selection process
- Disaster Declaration History

2. Hazard Profiles

- Description, historical occurrence, probability, magnitude, warning time, and duration of hazards.

3. Vulnerability Assessment

- Risk Assessment
- Risk Score Summary
- Inventory of critical facilities and other community assets at risk

Hazards that vary geographically across the planning area are addressed in greater detail. If the hazard is not explicitly identified for a localized specific area only, hazards are assumed to potentially occur in the entire county area.

Hazard Identification

There are two hazard types in this plan: natural hazards and human-caused hazards.

Natural hazards are defined as environmental phenomena that have the potential to impact societies and the human environment. These are meteorological or geological events that occur in nature. For example, widespread flooding due to natural changes in the river flow due to snow melt or heavy rains is a natural hazard.

Human-caused hazards are events that may be unexpected events that cause harm to the environment due to technological failure in materials that make up our infrastructure systems. For example, widespread flooding from a sudden change in the river flow due to a dam failure is a human caused hazard.

Biological hazards, such as disease, are not classified as natural hazards. This plan assumes this hazard occurred due to conditions that were human-caused such as contamination in industrial food processing or diseases among herds of livestock kept in close containment by farmers.

Hazards listed in the 2023 Iowa Hazard Mitigation Plan in the Iowa Comprehensive Emergency Plan Part B section were considered by the planning committee and adopted into the plan development process.

Disaster Declaration History

Table 13 :Iowa Governor’s Disaster Proclamation History for Chickasaw County, Iowa

Declaration Date	Incident	Proclamation #
December 1, 2021	Severe Storm System	2021-28
October 30, 2021	Severe Storm System	2021-17
March 09, 2020- February 03, 2022	State Public Health Emergency Declaration for COVID-19 Virus	2020-01 & 2022-03

Table 14: Major Presidential Disaster Declarations for Chickasaw County, Iowa

Declaration Date	Incident	Proclamation #
August 10, 2020	Severe storms	DR-4557-IA
March 17, 2020	COVID-19 Pandemic	DR-4483-IA
March 23, 2019	Severe Storms / flooding	DR-4421-IA
August 27, 2017	Severe storms, tornados, straight line winds, and flooding	
October 31, 2016	Severe storms / flooding	DR-4289-IA
July 24, 2014	Severe storms / flooding	DR-4184-IA
July 02, 2013	Severe storms / flooding	DR-4126-IA
May 27, 2008	Severe storms/ flooding	DR-1763-IA
March 14, 2007	Winter Storms	DR-1688-IA
May 25, 2004	Severe storms / flooding	DR-1518-IA
July 22, 1999	Severe storms / flooding	DR-1282-IA

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. Disaster assistance is supplemental and sequential.

When the local government’s capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state governments’ capacities are exceeded; a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and without the long-term federal recovery programs of major disaster declarations. The amount and types of damage are the determining factors.

There have been three Iowa Governor disaster state declarations since 2019. Two were for severe storms and one was the COVID-19 pandemic.

Since 1999, Chickasaw County has had 11 major presidential disaster declarations. Most of these disaster declarations were due to severe storms and flooding. Chickasaw County has many waterways that traverse county lands that flow southeasterly. This allows more probable ways for river flooding.

range from 1 (at least 24 hours) to 4 (minimal or no warning time).

For many of the climate hazards, there is a considerable amount of warning time as opposed to the human-caused hazards (transportation and hazardous materials incidents) that occur instantaneously or without any significant warning time.

Hazard Profiles

The identified hazards are discussed at length on the following pages and arranged in alphabetical order. Each hazard profile is summarized by the following parts:

1. Definition and Description
2. Historical Occurrence
3. Probability
4. Magnitude
5. Warning Time
6. Duration

The hazard description for each profile in this plan features an overall summary including a definition. Each summary features notable impacts on Chickasaw County with past events from 1990 to 2022.

Requirement 44 CFR §201.6(c)(2)(i): [The risk assessment must include a] description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan must include information on previous occurrences of hazard events and on the probability of future hazard events.

Natural Hazards

- Animal/ Plant/ Crop Disease
- Dam/ Levee Failure
- Drought
- Earthquake
- Expansive Soils
- Extreme Heat
- Flash Flooding
- River Flooding
- Grass or Wildland Fire
- Landslides
- Severe Winter Storms
- Thunderstorm with Hail and Lighting
- Tornado/ Windstorm

Human-Caused Hazards

- Hazardous Materials Incident
- Sinkholes
- Terrorism
- Transportation Incident
- Radiological Incident
- Pandemic/ Endemic Human Disease
- Infrastructure Failure

Methodology of Hazard Risk Assessment

Factors of Hazard Risk

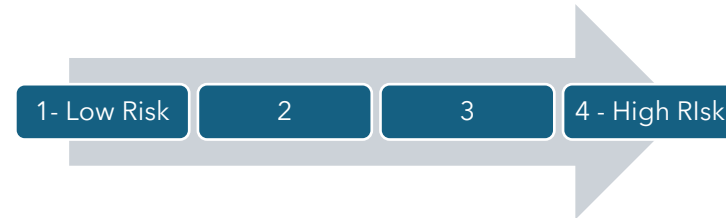
Risks to a hazard event may differ across geographical locations or even differ based on certain times of year. For example, tornado season in Iowa is usually in May and tornados have the highest risk during this time due to change in weather patterns from the western and central Gulf of Mexico causing higher chances of extreme weather.

For this analysis, four risk factors are rated on a scale between 1 and 4 by committee participants after reviewing hazard profiles. Information on each hazard included its description, occurrences within Chickasaw County from recent history, potential negative impacts, duration of a hazard event, and potential warning time. Participants used this information to strengthen their understanding to rate each hazard factor.

Hazard Risk Score Formula

$$\begin{aligned}
 &[\text{Probability}] \times 45\% + [\text{Magnitude or Severity}] \times 30\% \\
 &+ [\text{Warning Time}] \times 15\% + [\text{Duration}] \times 10\% \\
 &= \text{Final Hazard Assessment [1 to 4]}
 \end{aligned}$$

What does a hazard risk score mean?



Score	Hazard Risk	Description
1	<u>Low Risk</u>	Hazard is not likely to affect people or property because the likelihood is minimal.
2	<u>Moderate Risk</u>	Hazard may occur infrequently. Impacts to property is limited because the magnitude or severity is typically low.
3	<u>Elevated Risk</u>	Hazard may occur more frequently than in recent history. Negative impacts on property are higher than normal because the magnitude or severity is higher.
4	<u>High Risk</u>	The hazard has significant negative impacts on people and property. Magnitude or severity may be higher than normal and/or occur slightly more frequently in urban areas.

Probability

The probability score reflects the likelihood of the hazard occurring soon. Historical data of the hazard event occurring in Chickasaw County or Iowa informed the likelihood of future occurrence.

Table 15: Probability Score Definitions		
Score	Description	
1	Unlikely	< 10% probability in any given year (up to 1 in 10 chances of occurring)
2	Occasional	10% - 20% prob. in any given year (up to 1 in 5 chances of occurring),
3	Likely	20% - 33% prob. in any given year (up to 1 in 3 chances of occurring)
4	Highly Likely	> 33% probability in any given year (1 in 1 chance of occurring)

Magnitude or Severity

The magnitude or severity of the hazard event is measured by the level of impact on the human environment. Property damage is assessed by the whole planning area.

Table 16: Magnitude or Severity Score Definitions		
Score	Description	
1	Negligible	< 10% of property severely damaged, facilities and services shutdown 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 service 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 two 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.

Duration

The duration is the time of a typical or expected hazard event to occur. For an earthquake or traffic accident that is a score of 1. For infrastructure failure, it is likely a 4.

Table 17 displays rated risk scores for each associated hazard. This assessment was completed by the county.

Table 17: Duration Score Definitions	
Score	Description
1	Less than 6 hours
2	Less than 1 day
3	Less than 1 week
4	More than 1 week

Warning Time

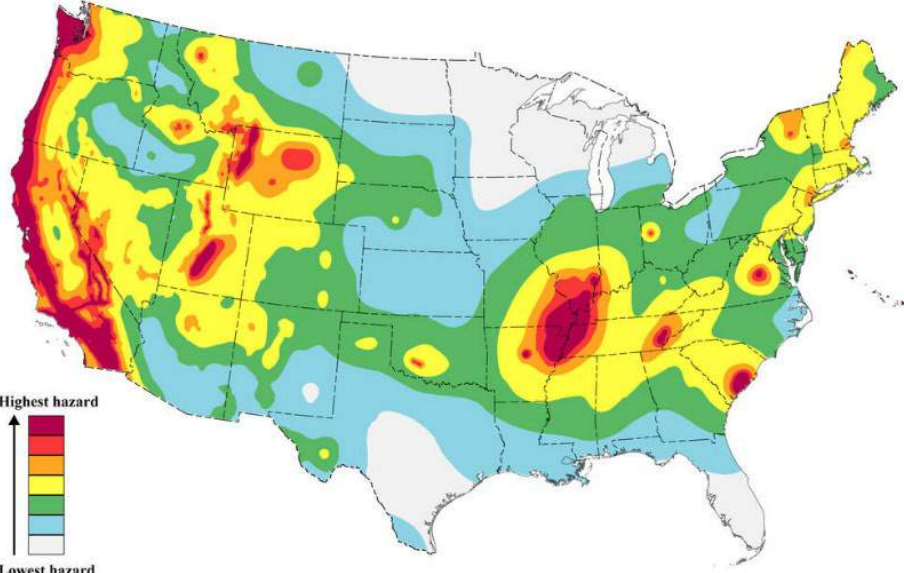
This should be taken as an anticipated warning time.

The warning time score assesses the ability to warn a population before the hazard occurs. The values of the score range from 1 (at least 24 hours) to 4 (minimal or no warning time).

For many of the climate hazards, there is a considerable amount of warning time as opposed to the human-caused hazards (transportation and hazardous materials incidents)

Table 18: Warning Time Score Definitions		
Score	Description	
1	Forecasted	More than 24 hours warning time.
2	Likely	12 to 24 hours warning time.
3	High Chance	6 to 12 hours warning time
4	Imminent	Minimal or no warning time (up to 6 hours warning)

<p>Table 19: Drought</p>	<p>Definition: a period of prolonged abnormally low precipitation producing severe dry conditions.</p>
<p>Historical Occurrences in Chickasaw County</p>	<p>The last drought in Chickasaw County was 2012 when the USDA declared a drought disaster. The National Integrated Drought Information System reports no prolonged (> 6 month) drought event for Chickasaw County (or even Iowa) within the last decade.</p>
<p>Probability and Extent</p>	<p>It is probable to see moderate drought conditions within the next 5 years. It is also doubtful to see extreme drought conditions in Northeast Iowa.</p>
<p>Droughts are observed by its impacts on agriculture, food production, energy production when there is a lack of soil moisture due to low precipitation levels. Chickasaw County is not susceptible to severe drought that has had impacts on agriculture, response, or the local economy. Droughts directly affect agricultural crops, livestock, wildlife, and stream habitats (fish). Economic and environmental impacts are more critical for agricultural economies like Chickasaw County's own.</p>	
<p>Duration</p>	<p>Droughts occur over prolonged, consecutive time periods (days, week, months)</p>
<p>Warning Time</p>	<p>Conditions predicting a drought are often not known. Most droughts are declared until a period of low precipitation has occurred, and the effects are significant on agriculture, wildlife, and farming economies. No warning time, but forecasts are tracked daily and often change by the day.</p>

<p>Table 20: Earthquake</p>	<p>Definition: Sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. This shaking can cause buildings and bridges to collapse; disrupt gas, electric, and phone service; it sometimes triggers other hazards including landslides, flash floods, and fires. The three (3) general classes of earthquakes are, tectonic, volcanic, and induced.</p>	
<p>Historical Occurrences in Chickasaw County</p>	<p><i>None in Chickasaw County</i></p> <p>Iowa has experienced the effects of only three earthquakes in the past 175 years. The most recent occurrence was a 2.7 magnitude earthquake located east of Rembrandt, Iowa in June 2021.</p>	
<p>Probability and Extent</p>	<p>There is minimal possibility of an earthquake occurring in Chickasaw County within the next 50 years that could be of damaging magnitude.</p>	
		<p>The National Seismic Hazard Map is a U.S. Geological Survey hazard planning tool. To the left is the probabilistic map which illustrates the probability of a damaging earthquake occurring in Iowa within the next 50 years.</p>
<p>Magnitude</p>	<p>Relatively low damage based on historical data. The entire county is likely to feel an earthquake.</p>	
<p>Duration</p>	<p>A couple seconds to a minute. Smaller intensity aftershocks occur sparingly over the next few hours.</p>	
<p>Warning Time</p>	<p>Minimal or no warning time</p>	

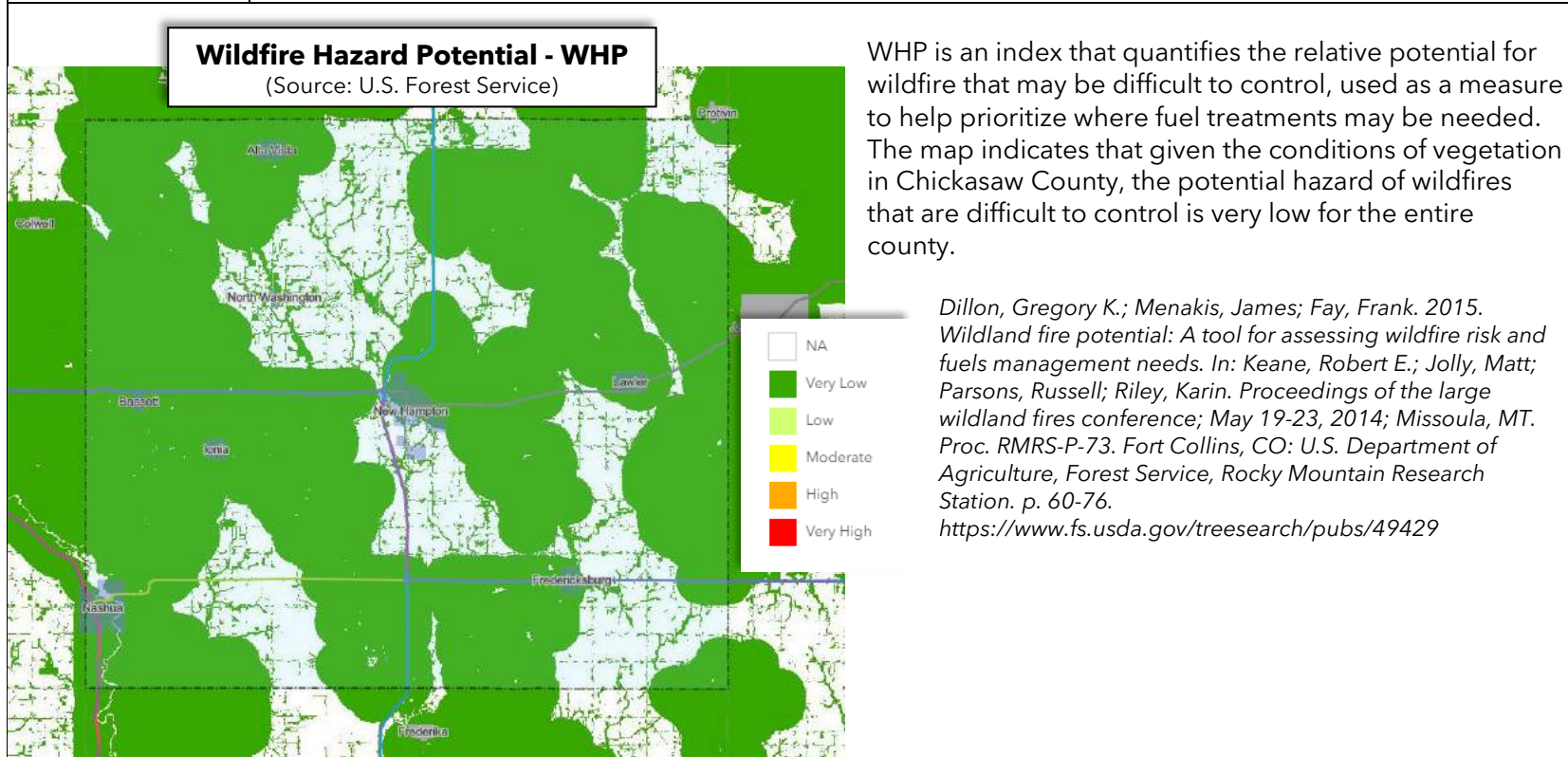
<p>Table 21: Expansive Soils</p>	<p>Definition: Expansive clay soils, also known as shrink-swell soils or swelling clays, are types of soil that undergo significant changes in volume as their moisture content varies. May cause damage to infrastructure, roadways, and costly repairs</p>	
<p>Historical Occurrences in Chickasaw County</p>	<p>No record keeping of this hazard in Chickasaw County</p> <p>There have been no recorded disaster declarations or major incidences of this hazard occurring in Iowa. Expansive soils are still a significant concern, particularly in regions where clay-rich soils are prevalent. Expansive soils in Iowa pose challenges for construction, agriculture, and infrastructure development.</p>	
<p>Probability and Extent</p>	<p>Improbable</p>	
		<p>Based on part of a swelling clays map produced by the U.S. Geological Survey, most of Chickasaw County has soils that have little or no swelling clay or soils with a composition of less than 50% with swelling potential.</p>
<p>Warning Time</p>	<p>Varies/Unknown</p> <p>Expansive soils occur on a geologic time scale. This means that the consistent duration to observe the effects of expansive soils occurring is unknown.</p>	
<p>Duration</p>	<p>Varies, the specific duration required to observe the effects of expansive soils varies depending on various factors such as climate, soil composition, and geological conditions.</p>	

<p>Table 22: Extreme Heat (Heat Wave)</p>	<p>Definition: Conditions for extreme heat are defined by summertime weather that is substantially hotter and/or more humid than average for a location at that time of year.</p>																																																															
<p>Historical Occurrences in Chickasaw County</p>	<p>Chickasaw County issued an excessive heat warning on August 22-24, 2023, for heat indices exceeding 100 degrees F each day.</p>																																																															
	<p>No deaths or injuries or crop damage reported.</p>																																																															
<p>Probability and Extent</p>	<p>Based on historical occurrence it may last for a few days and most people are getting more familiar with heat exhaustion, heat stroke, and remaining hydrated/indoors.</p>																																																															
<p>Table 2.3. Heat index values (°F)^{3,4}</p> <table border="1" data-bbox="222 724 1062 1013"> <thead> <tr> <th rowspan="2">Temperature (°F)</th> <th colspan="6">Relative Humidity (%)</th> </tr> <tr> <th>90</th> <th>80</th> <th>70</th> <th>60</th> <th>50</th> <th>40</th> </tr> </thead> <tbody> <tr> <td>80</td> <td>85</td> <td>84</td> <td>82</td> <td>81</td> <td>80</td> <td>79</td> </tr> <tr> <td>85</td> <td>101</td> <td>96</td> <td>92</td> <td>90</td> <td>86</td> <td>84</td> </tr> <tr> <td>90</td> <td>121</td> <td>113</td> <td>105</td> <td>99</td> <td>94</td> <td>90</td> </tr> <tr> <td>95</td> <td></td> <td>133</td> <td>122</td> <td>113</td> <td>105</td> <td>98</td> </tr> <tr> <td>100</td> <td></td> <td></td> <td>142</td> <td>129</td> <td>118</td> <td>109</td> </tr> <tr> <td>105</td> <td></td> <td></td> <td></td> <td>148</td> <td>133</td> <td>121</td> </tr> <tr> <td>110</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>135</td> </tr> </tbody> </table> <p><small>3. Heat index values were not given for the temperature and relative humidity combinations that have blank cells. 4. Heat index values can be up to 15°F higher with exposure to direct sunlight. Heat index values assume calm wind conditions; hot dry winds can also increase heat index values. Source: NWS Forecast Office, Pueblo, Colorado, 2004.</small></p>	Temperature (°F)	Relative Humidity (%)						90	80	70	60	50	40	80	85	84	82	81	80	79	85	101	96	92	90	86	84	90	121	113	105	99	94	90	95		133	122	113	105	98	100			142	129	118	109	105				148	133	121	110						135	<p>The heat index is a number in degrees Fahrenheit that tells how hot it really feels when relative humidity is factored into actual air temperature.</p> <p>Heat index is the temperature felt rather than the atmospheric temperature when there is humidity.</p>	
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<p>Warning Time</p>	<p>The National Weather Service can issue a Heat Advisory or Excessive Heat Warning roughly 10-14 days in advance.</p>																																																															
<p>Duration</p>	<p>Multiple days but usually excessive heat events occur when the temperatures are over the 95th percentile of the region’s historical weather data for at least 2 days.</p>																																																															

<p>Table 23: Flash Flood</p>	<p>Definition: A flash flood is an event that occurs with little or no warning where water levels rise at an extremely fast rate. Flash flooding results from intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area.</p>																																																																																																
<p>Historical Occurrences in Chickasaw County</p>	<p>The table presents historical flash flooding events since 2010 from the National Climatic Data Center. There have been 13 flash flood events resulting in 1 fatality with a combined property and crop damage of \$6.5 million.</p>																																																																																																
<p>Historical Occurrences of Flash Flooding in Chickasaw County 2010-2023</p> <p>Source: NOAA National Centers for Environmental Information</p>	<table border="1"> <thead> <tr> <th><i>Location</i></th> <th><i>Date</i></th> <th><i>Deaths</i></th> <th><i>Injury</i></th> <th><i>Property Damage</i></th> <th><i>Crop Damage</i></th> </tr> </thead> <tbody> <tr> <td><i>Saude</i></td> <td><i>5/29/2013</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$20,000</i></td> <td><i>\$0</i></td> </tr> <tr> <td><i>Nashua</i></td> <td><i>6/26/2013</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$120,000</i></td> <td><i>\$0</i></td> </tr> <tr> <td><i>Deerfield</i></td> <td><i>6/19/2014</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$5,000</i></td> <td><i>\$0</i></td> </tr> <tr> <td><i>Lawler</i></td> <td><i>7/23/2016</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$0</i></td> <td><i>\$0</i></td> </tr> <tr> <td><i>Little Turkey</i></td> <td><i>8/24/2016</i></td> <td><i>1</i></td> <td><i>0</i></td> <td><i>\$10,000</i></td> <td><i>\$0</i></td> </tr> <tr> <td><i>Lawler</i></td> <td><i>9/9/2016</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$35,000</i></td> <td><i>\$0</i></td> </tr> <tr> <td><i>Nashua</i></td> <td><i>9/22/2016</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$48,000</i></td> <td><i>\$5,000</i></td> </tr> <tr> <td><i>Williamstown</i></td> <td><i>7/21/2017</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$20,000</i></td> <td><i>\$0</i></td> </tr> <tr> <td><i>Bassett</i></td> <td><i>7/22/2017</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$350,000</i></td> <td><i>\$5,700,000</i></td> </tr> <tr> <td><i>New Hampton</i></td> <td><i>5/18/2019</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$40,000</i></td> <td><i>\$0</i></td> </tr> <tr> <td><i>Fredericksburg</i></td> <td><i>6/9/2020</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$5,000</i></td> <td><i>\$135,000</i></td> </tr> <tr> <td><i>New Hampton</i></td> <td><i>8/8/2021</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$0</i></td> <td><i>\$0</i></td> </tr> <tr> <td><i>Deerfield</i></td> <td><i>8/28/2021</i></td> <td><i>0</i></td> <td><i>0</i></td> <td><i>\$0</i></td> <td><i>\$0</i></td> </tr> <tr> <td>Total</td> <td></td> <td>1</td> <td>0</td> <td>\$653,000</td> <td>\$5,840,000</td> </tr> <tr> <td></td> <td></td> <td colspan="2">Combined Total</td> <td colspan="2">\$6,493,000</td> </tr> </tbody> </table>	<i>Location</i>	<i>Date</i>	<i>Deaths</i>	<i>Injury</i>	<i>Property Damage</i>	<i>Crop Damage</i>	<i>Saude</i>	<i>5/29/2013</i>	<i>0</i>	<i>0</i>	<i>\$20,000</i>	<i>\$0</i>	<i>Nashua</i>	<i>6/26/2013</i>	<i>0</i>	<i>0</i>	<i>\$120,000</i>	<i>\$0</i>	<i>Deerfield</i>	<i>6/19/2014</i>	<i>0</i>	<i>0</i>	<i>\$5,000</i>	<i>\$0</i>	<i>Lawler</i>	<i>7/23/2016</i>	<i>0</i>	<i>0</i>	<i>\$0</i>	<i>\$0</i>	<i>Little Turkey</i>	<i>8/24/2016</i>	<i>1</i>	<i>0</i>	<i>\$10,000</i>	<i>\$0</i>	<i>Lawler</i>	<i>9/9/2016</i>	<i>0</i>	<i>0</i>	<i>\$35,000</i>	<i>\$0</i>	<i>Nashua</i>	<i>9/22/2016</i>	<i>0</i>	<i>0</i>	<i>\$48,000</i>	<i>\$5,000</i>	<i>Williamstown</i>	<i>7/21/2017</i>	<i>0</i>	<i>0</i>	<i>\$20,000</i>	<i>\$0</i>	<i>Bassett</i>	<i>7/22/2017</i>	<i>0</i>	<i>0</i>	<i>\$350,000</i>	<i>\$5,700,000</i>	<i>New Hampton</i>	<i>5/18/2019</i>	<i>0</i>	<i>0</i>	<i>\$40,000</i>	<i>\$0</i>	<i>Fredericksburg</i>	<i>6/9/2020</i>	<i>0</i>	<i>0</i>	<i>\$5,000</i>	<i>\$135,000</i>	<i>New Hampton</i>	<i>8/8/2021</i>	<i>0</i>	<i>0</i>	<i>\$0</i>	<i>\$0</i>	<i>Deerfield</i>	<i>8/28/2021</i>	<i>0</i>	<i>0</i>	<i>\$0</i>	<i>\$0</i>	Total		1	0	\$653,000	\$5,840,000			Combined Total		\$6,493,000	
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<p>Probability and Extent</p>	<p>June is the most common month for flash floods, but they can occur from May through September.</p>																																																																																																
<p>Warning Time</p>	<p>Usually a sudden event during an unusually heavy rainfall. No warning time.</p>																																																																																																
<p>Duration</p>	<p>They are most common in the evening hours, between 8-10 p.m., but can occur at other times and typically last from 3-6 hours.</p>																																																																																																

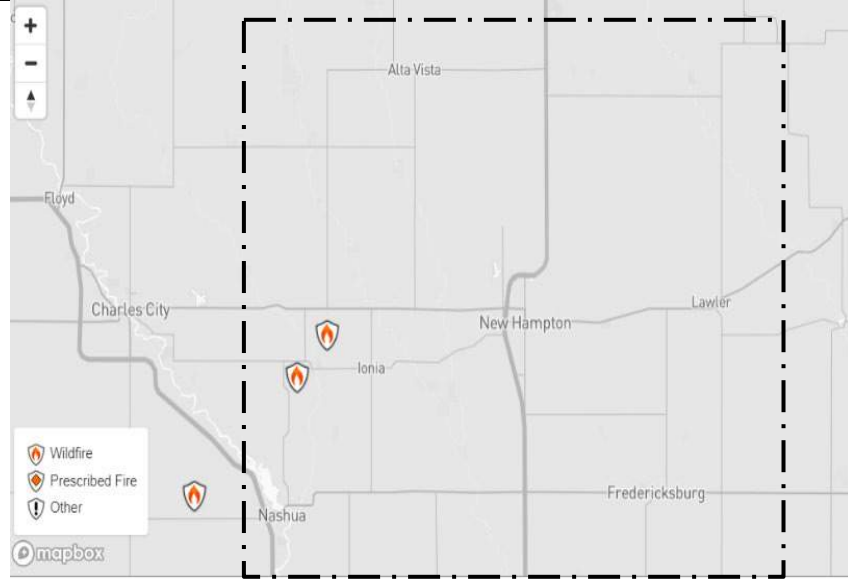
Table 24: River Flooding	Definition: Waterways such as streams and rivers exceed the capacity of their natural or constructed channels to accommodate a sudden increase in flow before the river overflows the banks, spilling out into adjacent low-lying, dry land.																																																																														
Historical Occurrences in Chickasaw County	According to data from the National Climatic Data Center, there have been 11 reported flood events in Chickasaw County between 2000 and 2023. The table below displays the date, general location, and impact of storms that caused damage.																																																																														
	One injury was reported in 2010. Estimates of property damage are \$1.179 million and \$3.5 million for crop damage.																																																																														
Probability and Extent	Based on historical data of the last 25 years, the annualized frequency is 1.25 flooding events occurring each year.																																																																														
Historical Occurrences of River Floods that have caused damage in Chickasaw County 2000-2023 <i>Source: NOAA National Centers for Environmental Information</i>	<table border="1"> <thead> <tr> <th>Location</th> <th>Date</th> <th>Deaths</th> <th>Injuries</th> <th>Property Damage</th> <th>Crop Damage</th> </tr> </thead> <tbody> <tr> <td>HORN FLD ARPT</td> <td>4/25/2008</td> <td>0</td> <td>0</td> <td>\$50,000</td> <td>\$0</td> </tr> <tr> <td>HORN FLD ARPT</td> <td>6/7/2008</td> <td>0</td> <td>0</td> <td>\$600,000</td> <td>\$1,000,000</td> </tr> <tr> <td>DEERFIELD</td> <td>3/10/2010</td> <td>0</td> <td>1</td> <td>\$7,000</td> <td>\$0</td> </tr> <tr> <td>BASSETT</td> <td>3/11/2010</td> <td>0</td> <td>0</td> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>NEW HAMPTON</td> <td>6/23/2010</td> <td>0</td> <td>0</td> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>DEERFIELD</td> <td>6/14/2016</td> <td>0</td> <td>0</td> <td>\$2,000</td> <td>\$0</td> </tr> <tr> <td>DEERFIELD</td> <td>8/23/2016</td> <td>0</td> <td>0</td> <td>\$20,000</td> <td>\$0</td> </tr> <tr> <td>BASSETT</td> <td>8/23/2016</td> <td>0</td> <td>0</td> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>DEERFIELD</td> <td>8/28/2021</td> <td>0</td> <td>0</td> <td>\$500,000</td> <td>\$2,500,000</td> </tr> <tr> <td>CHICKASAW</td> <td>5/15/2023</td> <td>0</td> <td>0</td> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>NASHUA</td> <td>5/16/2023</td> <td>0</td> <td>0</td> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>TOTAL</td> <td></td> <td>0</td> <td>1</td> <td>\$1,179,000</td> <td>\$3,500,000</td> </tr> </tbody> </table>	Location	Date	Deaths	Injuries	Property Damage	Crop Damage	HORN FLD ARPT	4/25/2008	0	0	\$50,000	\$0	HORN FLD ARPT	6/7/2008	0	0	\$600,000	\$1,000,000	DEERFIELD	3/10/2010	0	1	\$7,000	\$0	BASSETT	3/11/2010	0	0	\$0	\$0	NEW HAMPTON	6/23/2010	0	0	\$0	\$0	DEERFIELD	6/14/2016	0	0	\$2,000	\$0	DEERFIELD	8/23/2016	0	0	\$20,000	\$0	BASSETT	8/23/2016	0	0	\$0	\$0	DEERFIELD	8/28/2021	0	0	\$500,000	\$2,500,000	CHICKASAW	5/15/2023	0	0	\$0	\$0	NASHUA	5/16/2023	0	0	\$0	\$0	TOTAL		0	1	\$1,179,000	\$3,500,000
	Location	Date	Deaths	Injuries	Property Damage	Crop Damage																																																																									
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TOTAL		0	1	\$1,179,000	\$3,500,000																																																																										
Warning Time	River flooding can be forecasted to allow for at least 24 hours or more.																																																																														
Duration	The duration of a flooding event varies based on the severity and location of the flooding event. Duration can range from a few hours to several days or longer.																																																																														
Chickasaw County's Risk Index Score for Hazard:	61.63 out of 100 (Relatively Moderate)																																																																														
Annualized Frequency of Hazard Occurring	1.25 events																																																																														
Expected Annualized Loss:	\$840,340 (Relatively Low)																																																																														
<i>Source: FEMA Risk Index by County (2024)</i>																																																																															

<p>Table 25: Grass/Wild Land Fire</p>	<p>Definition: A grass or wild-land fire is an uncontrolled fire that threatens life and property in a rural or a wooded area. Dry weather can also lead to a wildfire threat, especially in the spring before foliage has emerged (i.e. before green up) or in the fall after vegetation has started to die off.</p>
<p>Historical Occurrences in Chickasaw County</p>	<p>A grass fire or wildland fire is an uncontrolled fire that threatens life and property in a rural or wooded area. This is not the same as a cropland fire. Damage to crops from fire is often covered by insurance and occurs in human-made environments. Wildland or grassfires occur in natural, wild areas.</p>
<p>Probability and Extent</p>	<p>Wildland fires are more likely to occur when conditions are favorable, such as during periods of drought when natural vegetation is drier and more combustible.</p>



Since 2017, there have been 2 wildfires reported:
 1) April 3, 2019 - Human caused wildfire burned 50 acres.
 2) April 20, 2019 - Human caused wildfire burned 25 acres.

Source: <https://datacentral.press-citizen.com/wildfire-history/?page=1&query=lowa&anc=active#ftbl>




Warning Time	The wildfire history map indicates that Iowa possesses few areas with significant wildfire potential, with the majority classified as "Non-burnable Lands," primarily agricultural fields. Furthermore, the vast majority of the state exhibits a "Very Low" wildfire hazard potential, indicating minimal risk of extreme fire behavior. Consequently, wildfires in Iowa tend to be limited in scope and severity due to the absence of areas conducive to significant fire spread or extreme behavior.
Duration	Usually contained in a few hours. Less than 24 hours.
Chickasaw County's Risk Index Score for Hazard: Expected Annualized Loss: <i>Source: FEMA Risk Index by County (2024)</i>	15.24 out of 100 (Very Low) \$5,729

<p>Table 26: Hazardous Materials Incident</p>	<p>Definition: A HAZMAT (hazardous materials) incident is the accidental release of chemical substances or mixtures which presents a danger to the public health or safety during production or handling at a fixed facility. Fixed hazardous material incidents usually affect a localized area, and the use of planning and zoning can minimize the area of impact.</p> <p>This hazard includes fixed hazardous materials, pipeline transportation, and transportation of hazardous materials. A HAZMAT or Radiological Transportation Incident is the accidental release of chemical substances or mixtures that presents danger to the public health or safety during transportation. A hazardous substance is one that may cause damage to persons, property, or the environment when released to soil, water, or air. Chemicals that are manufactured and used in ever increasing types and quantities. As many as 500,000 products pose physical or health hazards and can be defined as “hazardous chemicals.” Each year, over 1,000 new synthetic chemicals are introduced and transported across the country via semi-trucks and trains. Hazardous substances are categorized as toxic, corrosive, flammable, irritant, or explosive.</p> <p>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. A pipeline incident can be caused by environmental disruption, accidental damage, or sabotage. Incidents can range from a small, slow leak to a large rupture where an explosion is possible. 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.</p>
<p>Historical Occurrences in Chickasaw County</p>	<p>According to the Iowa Department of Natural Resources, there were 22 incidents of hazardous material spills in Chickasaw county from 2014-2023 (see below for a list of occurrences). There are no known occurrences of transportation incidents involving radiological materials. There are 2 rail incidents.</p>
<p>Probability and Extent</p>	<p>Large quantities of hazardous materials are transported daily throughout the county on their various highways. Freight transportation transports hazardous materials across these roadways across the county. The U.S. Department of Transportation regulates U.S. routes and speed limits are used by carriers and monitors the types of hazardous materials crossing state lines. Despite increasing safeguards, more and more potentially hazardous materials are being used in commercial, agricultural, and domestic uses and are being transported on neighboring roads, highways, and railways. Based on the information, the likelihood of this occurring is more than 33% probability in any given year, making it highly likely.</p>

Historical Occurrences of Hazardous Incidents that have caused occurred in Chickasaw County 2014-2023	<i>Location</i>	<i>Date</i>	<i>Incident Report #</i>	<i>Hazardous Substance</i>	<i>Amount</i>	<i>Responsible Party</i>
<p>Source: Iowa DNR Hazardous Material Release Database (5/21/2024)</p>	<i>Nashua</i>	01/04/14	010414-CDB-1641	Gasoline	6 Gal	Kwik Star
	<i>New Hampton</i>	06/12/14	061214-DJA-1829	Liquid Fertilizer	1500 Gal	Leon Zeien
	<i>Nashua</i>	01/27/15	012715-MAS-0940	Diesel Fuel	40 Gal	Swift Transportation
	<i>New Hampton</i>	02/18/16	021816-ALS-1223	#2 Diesel Ful	200 Gal	North Cedar Trucking
	<i>Ionia</i>	09/01/16	090116-BDJ-1250	Diesel Fuel	20 Gal	Ervin Martin
	<i>Fredericksburg</i>	09/22/16	092216-BCM-0900	Manure	1000 Gal	Adam Kleiss
	<i>Fredericksburg</i>	05/02/17	0505217-MRH-0213	Fiber Aluminum Rust Coating	2 Gal	Cura Emergency Services
	<i>New Hampton</i>	07/26/17	072617-AJP-0028	Headline Fungicide/Nitrogen	120/100 Gal	Unknown
	<i>Unincorporated</i>	10/31/17	103117-JSO-1300	Manure	300 Gal	Reicks View Farms
	<i>New Hampton</i>	01/12/18	011218-BCM-0850	#2 Diesel Fuel	90 Gal	Chickasaw County
	<i>Lawler</i>	12/06/18	120618-BCM-1520	Corn Oil	20,000 lbs	Reicks View Farms
	<i>New Hampton</i>	04/06/20	040620-JFP-1832	#2 Diesel Fuel	500 Gal	Roger Reis
	<i>Lawler</i>	04/19/20	041920-BCM-1540	Manure	1500 Gal	Reicks View Farms
	<i>Nashua</i>	05/24/20	052420-CWO-2200	Anhydrous Ammonia	20 lbs	Five Star Cooperative
	<i>Protivin</i>	07/23/20	072320-JMR-1130	Unknown	-	Unknown
	<i>Unincorporated</i>	04/16/21	041621-DAK-1659	Engine Oil	50 Gal	Canadian Pacific RR
<i>Ionia</i>	08/27/21	082721-CSG-2215	Transformer Oil	21 Gal	Alliant Energy	
<i>Unincorporated</i>	08/28/21	082821-CSG-1854	Anhydrous Ammonia/Diesel Fuel	77 ton/ 28,000 Gal	Canadian Pacific RR	
<i>New Hampton</i>	12/21/21	122121-TEM-0841	Diesel Fuel	80 Gal	Kwik Trip/Star	
<i>Lawler</i>	06/23/22	062322-ALS-1715	32% Liquid Nitrogen Fertilizer	100 Gal	Dustin Reicks	
<i>Lawler</i>	04/10/23	041023-CSG-2320	Hog Manure	1500 Gal	Trevor Reicks	
<i>New Hampton</i>	06/07/23	060723-JPR-0755	Diesel Fuel	100 Gal	J&J Trucking	

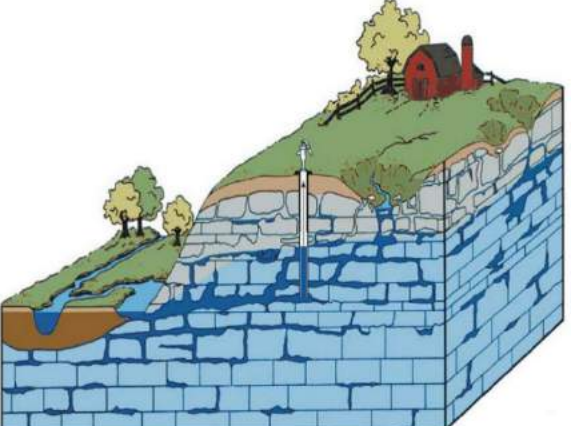
Magnitude or Severity	<p>Most of the hazardous materials are localized and contained by trained first responders that work with hazardous materials teams. Depending on the type of hazardous material or the volume spill in the incident, an affected area is likely to include a 5-mile radius.</p> <p>Immediate 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 contamination. Contamination of air, ground, or water may result in harm to fish, wildlife, livestock, and crops. The occurrence of a hazmat incident often shuts down transportation corridors for hours at a time while the scene is stabilized.</p>
Warning Time	<p>The warning time is minimal. When accidents do occur, response time is crucial since hazardous materials can pose a significant risk to the population. Hazardous material incidents usually occur very rapidly with little or no warning.</p>
Duration	<p>The duration of a hazardous materials event will vary upon the amount of hazardous material released and location of the incident. Typical incidents last under a day but could last for days or weeks.</p>

<p>Table 27: Landslide</p>	<p>Definition: Occur when susceptible rock, earth, or debris moves down a slope under the force of gravity and water. Landslides may be very small or very large and can move at slow to very high speeds. A natural phenomenon, landslides have been occurring in slide-prone areas of Iowa since long before the state was created. Landslides can occur due to rainstorms, fires, or human activities that modify slope and drainage</p>
<p>Historical Occurrences in Chickasaw County</p>	<p>There have been no occurrences of landslides in Chickasaw County.</p>
<p>Probability and Extent</p>	<p>There are no large slopes in Chickasaw County.</p>
<p>Map of Landslide Potential Red = Very High Potential; Yellow = High Potential; Green = Moderate Potential; Black = Low Potential Source: US Geological Survey</p>	
<p>Warning Time</p>	
<p>Duration</p>	<p>Usually contained landslides are typically over within hours of occurring. Less than 24 hours.</p>
<p>Chickasaw County's Risk Index Score for Hazard: Expected Annualized Loss:</p>	<p>17.19 out of 100 (Relatively Low) \$20,987 Source: FEMA Risk Index by County (2024)</p>

<p>Table 28: Levee/Dam Failure</p>	<p>Definition: Dam/Levee failure is the uncontrolled release of water resulting from a structural failure in a dam, wall, dike, berm, or area of elevated soil that causes flooding. Possible causes of the breach could include flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, terrorism, erosion, piping, saturation, or under seepage.</p>
<p>Historical Occurrences in Chickasaw County</p>	<p>1916- Nashua Dam constructed for power generation for the Cedar Valley Electric Power Plant. May 1963 - Flood damages the plant and shuts down. 1980s- Farm Debt Crisis causes mass migration out of rural lowan communities. 1982 - last control gate breaks and old Nashua dam can no longer function correctly. 1989- Construction begins on the Cedar Lake Dam funded by the City of Nashua, surrounding communities, and State of Iowa legislature. March 1990 - Construction completed. Summer 1990 - First Annual “Water Over the Dam Days” celebration in Nashua. 2016 - FEMA awards a \$300,000 hazard mitigation grant to the City of Nashua to repair and rehabilitate the Cedar Lake Dam. Oct. 2020 - Minnowa Construction Inc., a Decorah construction company, completes rehabilitation work on the apron scour of the Cedar Lake Dam. Summer 2021 - large concrete section below the water surface begins to become visible. Oct. 18, 2021 - Structural engineering firm Origin Design reports to Nashua city council that an underwater inspection performed at the dam revealed extensive damage to the repair work that was performed in 2020. Nov 2021 - Origin Design sends initial notice to Minnowa about deficiency requiring immediate repair and replacement. Minnowa does not respond. Dec 7, 2021 - Origin Design engineer sends 10-day notice of deficiency and notice to correct. Minnowa took no action and did not submit a formal response, plan, or cure. May 15, 2023 - City of Nashua v Minnowa Construction Inc. and United Fire & Casualty Co. civil case. No deaths or injuries reported.</p>

<p>Probability and Extent</p>	<p>The probability of a dam failure due to a breach in the structural integrity of the system is also minimal. The hazard risk for the dams in unincorporated Chickasaw County was removed due to no dams or levees being in the county. The probability of a catastrophic dam failure or other dam-related hazard was determined to be unlikely.</p>
<p>Blue = Satisfactory Green = Fair Orange = Poor Red = Unsatisfactory Grey = Not Rated White = Unavailable</p> <p>Chickasaw County has 5 dams that are all state regulated. The average age of dams are 56 years. 4 - Not rated 1 - Satisfactory</p> <p>All rated with low hazard potential classification. (Source: US Dam Safety Inspection)</p>	
<p>Warning Time</p>	<p>A sudden failure of a portion of the levee may send floodwaters gushing from this break within seconds. Normally, occupants of the floodplain can be warned about potential levee breaches or breaks when high water encroaches upon the levee.</p>
<p>Duration</p>	<p>The length of time that a dam or levee failure would impact the surrounding area depends largely on the amount of water the specific dam or levee held back. The duration of a failure's impact could feasibly range from hours to months.</p>

<p>Table 30: Severe Winter Storm</p>	<p>Severe winter weather conditions that can affect day-to-day activities include blizzard conditions, heavy snow, blowing snow, freezing rain, heavy sleet, and extreme cold. Winter storms are common during the months of October through April in Iowa.</p>					
<p>Historical Occurrences in Chickasaw County</p>	<p>According to data from the National Climatic Data Center, there have been 35 reported winter storm events in Chickasaw County between 2000 and 2023. The table below displays the date, general location, and impact of storms that caused damage.</p>					
<p>Probability and Extent</p>	<p>No fatalities or injuries reported. Estimates of property damage are \$110,000 and none for crop damage.</p>					
<p>Historical Occurrences of Winter Storms that have caused damage in Chickasaw County 2000-2023</p> <p><i>Source: NOAA National Centers for Environmental Information</i></p>	<p>Location</p>	<p>Date</p>	<p>Deaths</p>	<p>Injury</p>	<p>Property Damage</p>	<p>Crop Damage</p>
	<p>Chickasaw County</p>	<p>02/23/2007</p>	<p>0</p>	<p>0</p>	<p>\$100,000</p>	<p>\$0</p>
	<p>Chickasaw County</p>	<p>03/23/2016</p>	<p>0</p>	<p>0</p>	<p>\$10,000</p>	<p>\$0</p>
	<p>Total</p>		<p>0</p>	<p>0</p>	<p>\$110,000</p>	<p>\$0</p>
<p>Warning Time</p>	<p>The National Weather Service has developed effective weather advisories, which are promptly and widely distributed. There are several notifications made by the National Weather Service. These include winter storm watch, winter storm warning, blizzard warning, winter weather advisory, and a frost/freeze advisory.</p>					
<p>Duration</p>	<p>Depending on the type, duration, and the size of the event the entire population could feel the effect of a winter storm. Generally, due to existing snow removal services and other community services the effects of winter storms on incorporated communities in Chickasaw County are short term; however, the more rural, unincorporated areas tend to be impacted longer due to rural nature of the county. Although more of an inconvenience, and somewhat more dangerous, travel and communication are usually an option in less than 24 hours of any given event.</p>					
<p>Chickasaw County's Risk Index Score for Hazard: Expected Annualized Loss:</p>	<p>67.23 out of 100 (Relatively Moderate)</p> <p>\$120,101</p> <p><i>Source: FEMA Risk Index by County (2024)</i></p>					

<p>Table 31: Sinkholes</p>	<p>Definition: A sinkhole is the loss of surface elevation due to the removal of subsurface support. Sinkholes range from broad, regional lowering of the land surface to abrupt localized collapse. The primary causes of most subsidence are human activities such as underground mining of coal, groundwater/petroleum withdraw, or drainage of organic soils. Sinkholes can aggravate flooding potential, collapse of an abandoned mine may destroy buildings, roads, and utilities.</p>	
<p>Historical Occurrences in Chickasaw County</p>	<p>According to Iowa DNR AFO siting maps, there are approximately 10-15 sinkholes located within Chickasaw County. These mainly occur over Karst formations in the ground.</p>	
<p>Probability and Extent</p>	<p>This hazard affects less than 2% of land in the County.</p>	
	<p>The dark blue areas denote groundwater stored within the bedrock's crevices, constituting the shallow aquifer and accessible to the depicted well. The diagram illustrates the porous nature of the bedrock, facilitating groundwater storage and movement. It also shows how the land surface and visible stream directly interface with the bedrock-stored water. In Karst systems, soil infiltration, surface runoff, and streams can directly feed into the shallow bedrock, contributing to the shallow groundwater and aquifer, potentially carrying contaminants from the surface to wells drawing from this source.</p>	
<p>Warning Time</p>	<p>Sink holes growing in mass is a slow yet gradual process. Land use practices in the area, soil type in addition to a number of other factors will impact the speed of onset. By identifying these areas city agencies and property owners will be able to implement the necessary precautions to slow and potentially eliminate the development of a sink hole. Catastrophic sinkholes can provide little visible warning, setting in in as little as a few minutes.</p>	
<p>Duration</p>	<p>A sinkhole can affect the location in which it occurred for weeks.</p>	
<p>No data on historic/annual losses. Not in FEMA Risk Index.</p>		


<p>Table 32: Thunderstorm with Lighting or Hail</p>	<p>Definition: Thunderstorms are created from a combination of moisture, rapidly raising warm air, and the lifting mechanism such as that caused when warm and cold air masses collide. Thunderstorms occur in the community on an annual basis. Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. Hailstorms are a product of a severe thunderstorm in which pellets or lumps of ice (of most concern when greater than 1 inch in diameter) fall with rain.</p>																													
<p>Historical Occurrences in Chickasaw County</p>	<p>According to the NOAA Storm Events Database, there have been 38 thunderstorm wind events reported causing an estimated \$309.6K in property damage and \$1.5 million in crop damage. There has been 1 reported lightning strike causing property damage in Ionia in 2021 estimated at \$10,000. There 36 hailstorm events causing \$127.6K in property damage and \$3.3 million in crop damage.</p> <p>No fatalities or injuries reported for either of these hazards.</p>																													
<p>Probability and Extent</p>	<p>Hail and thunderstorms have the potential to impact all of Chickasaw County.</p>																													
<p>Historical Occurrences of Lighting and Hail Hazards during a Thunderstorm in Chickasaw County 2000-2023</p> <p>Source: NOAA Storm Events Database</p>	<table border="1"> <thead> <tr> <th data-bbox="737 634 1045 756">Hazard</th> <th data-bbox="1045 634 1241 756">Occurrence</th> <th data-bbox="1241 634 1388 756">Deaths</th> <th data-bbox="1388 634 1545 756">Injury</th> <th data-bbox="1545 634 1772 756">Property Damage</th> <th data-bbox="1772 634 1999 756">Crop Damage</th> </tr> </thead> <tbody> <tr> <td data-bbox="737 756 1045 812">Hail</td> <td data-bbox="1045 756 1241 812">36</td> <td data-bbox="1241 756 1388 812">0</td> <td data-bbox="1388 756 1545 812">0</td> <td data-bbox="1545 756 1772 812">\$127,500</td> <td data-bbox="1772 756 1999 812">\$3,334,000</td> </tr> <tr> <td data-bbox="737 812 1045 867">Lightning</td> <td data-bbox="1045 812 1241 867">1</td> <td data-bbox="1241 812 1388 867">0</td> <td data-bbox="1388 812 1545 867">0</td> <td data-bbox="1545 812 1772 867">\$10,000</td> <td data-bbox="1772 812 1999 867">\$0</td> </tr> <tr> <td data-bbox="737 867 1045 971">Thunderstorm Wind</td> <td data-bbox="1045 867 1241 971">38</td> <td data-bbox="1241 867 1388 971">0</td> <td data-bbox="1388 867 1545 971">0</td> <td data-bbox="1545 867 1772 971">\$309,600</td> <td data-bbox="1772 867 1999 971">\$1,532,000</td> </tr> </tbody> </table>						Hazard	Occurrence	Deaths	Injury	Property Damage	Crop Damage	Hail	36	0	0	\$127,500	\$3,334,000	Lightning	1	0	0	\$10,000	\$0	Thunderstorm Wind	38	0	0	\$309,600	\$1,532,000
Hazard	Occurrence	Deaths	Injury	Property Damage	Crop Damage																									
Hail	36	0	0	\$127,500	\$3,334,000																									
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Thunderstorm Wind	38	0	0	\$309,600	\$1,532,000																									
<p>Warning Time</p>	<p>The National Weather Service has developed effective weather advisories, which are promptly and widely distributed.</p>																													
<p>Duration</p>	<p>Less than 24 hours.</p>																													
<p>Risk Score for Hail: Expected Annualized Loss:</p>	<p>41.27 out of 100 (relatively low) \$52,393</p>																													
<p>Chickasaw County's Risk Index Score for Hazard: Expected Annualized Loss:</p>	<p>15.03 out of 100 (Very Low) \$27,479 <i>Source: FEMA Risk Index by County (2024)</i></p>																													

<p>Table 33: Tornado</p>	<p>Definition: A tornado is a violent whirling wind characteristically accompanied by a funnel shaped cloud extending down from a cumulonimbus cloud that progresses in a narrow, erratic path. a severe thunderstorm in which pellets or lumps of ice (of most concern when greater than 1 inch in diameter) fall with rain.</p>																																																																			
<p>Historical Occurrences in Chickasaw County</p>	<p>According to the NOAA Storm Events Database, there have been 8 tornados reported causing an estimated \$625,000 in property damage and \$16,000 in crop damage.</p> <p>No fatalities or injuries were reported for this hazard.</p>																																																																			
<p>Probability and Extent</p>	<p>Tornados have occurred 4 times within the last decade. Greater than 25% likelihood.</p>																																																																			
<p>Historical Occurrences of Hazard in Chickasaw County 2000-2023</p> <p>Source: NOAA Storm Events Database</p>		<table border="1"> <thead> <tr> <th>Location</th> <th>Date</th> <th>EF Rating</th> <th>Deaths/ Injury</th> <th>Property Damage</th> <th>Crop Damage</th> </tr> </thead> <tbody> <tr> <td>Ionia</td> <td>5/8/2002</td> <td>F0</td> <td>0</td> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>Ionia</td> <td>6/21/2002</td> <td>F0</td> <td>0</td> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>New Hampton</td> <td>7/7/2003</td> <td>F0</td> <td>0</td> <td>\$20,000</td> <td>\$5,000</td> </tr> <tr> <td>Fredericksburg</td> <td>8/19/2009</td> <td>EF0</td> <td>0</td> <td>\$20,000</td> <td>\$10,000</td> </tr> <tr> <td>Bassett</td> <td>8/31/2014</td> <td>EF0</td> <td>0</td> <td>\$0</td> <td>\$1,000</td> </tr> <tr> <td>Deerfield</td> <td>5/27/2019</td> <td>EF0</td> <td>0</td> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>Bassett</td> <td>12/15/2021</td> <td>EF1</td> <td>0</td> <td>\$255,000</td> <td>\$0</td> </tr> <tr> <td>Deerfield</td> <td>12/15/2021</td> <td>EF0</td> <td>0</td> <td>\$330,000</td> <td>\$0</td> </tr> <tr> <td></td> <td></td> <td></td> <td>TOTAL</td> <td>\$626,000</td> <td>\$16,000</td> </tr> </tbody> </table>	Location	Date	EF Rating	Deaths/ Injury	Property Damage	Crop Damage	Ionia	5/8/2002	F0	0	\$0	\$0	Ionia	6/21/2002	F0	0	\$0	\$0	New Hampton	7/7/2003	F0	0	\$20,000	\$5,000	Fredericksburg	8/19/2009	EF0	0	\$20,000	\$10,000	Bassett	8/31/2014	EF0	0	\$0	\$1,000	Deerfield	5/27/2019	EF0	0	\$0	\$0	Bassett	12/15/2021	EF1	0	\$255,000	\$0	Deerfield	12/15/2021	EF0	0	\$330,000	\$0				TOTAL	\$626,000	\$16,000						
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<p>Warning Time</p>	<p>Tornado and thunderstorm watches can warn of likely conditions hours in advance of an upcoming storm. Although an imminent tornado warning may occur with 95% accuracy and those can be issued at least 15 minutes.</p>																																																																			
<p>Duration</p>	<p>Less than 24 hours.</p>																																																																			
<p>Chickasaw County's Risk Index Score for Hazard:</p> <p>Expected Annualized Loss:</p>	<p>58.29 out of 100 (relatively low)</p> <p>\$1,626,027 (Relatively Low)</p> <p>Source: FEMA Risk Index by County (2024)</p>																																																																			

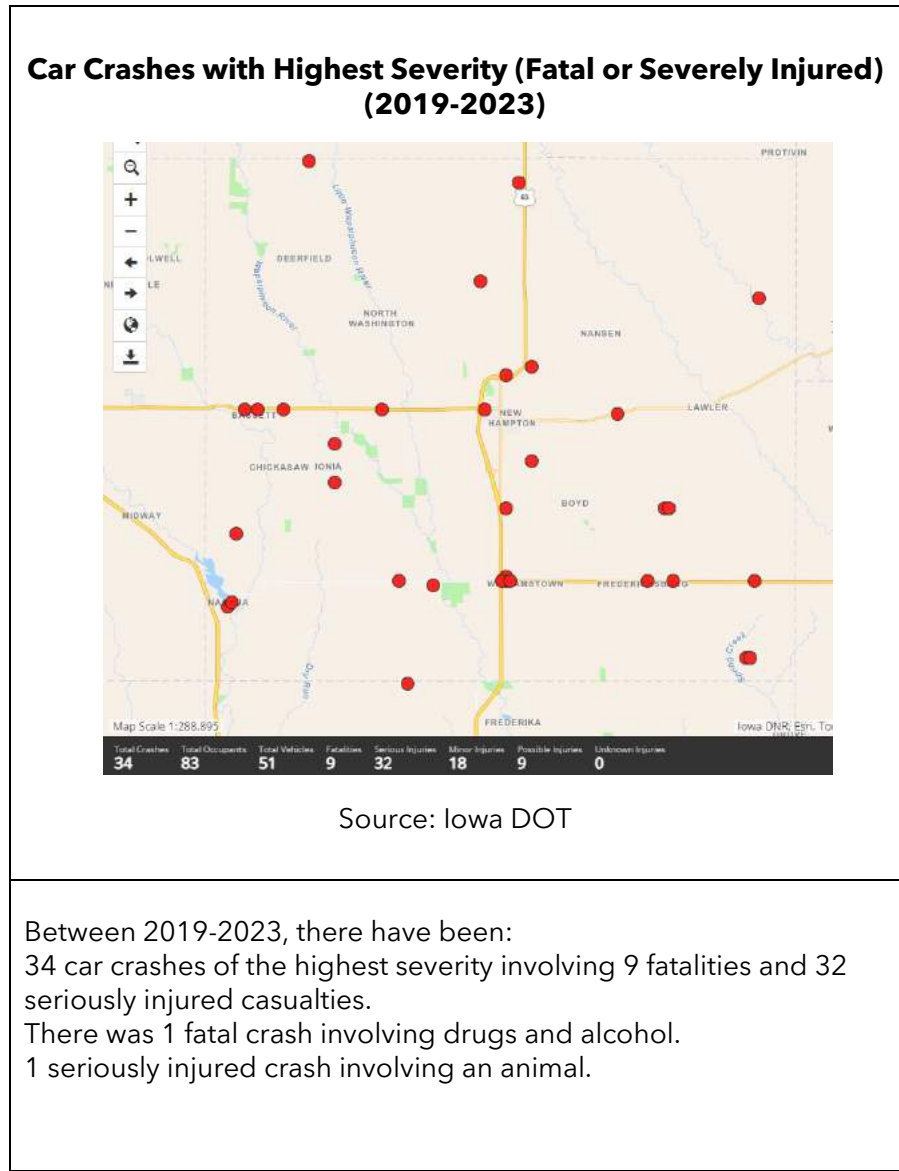
<p>Table 34: Animal/Plant/Crop Disease</p>	<p>Definition: A pathogen that may cause stress, infection, illness, and death. Communicable among livestock flocks, interactions with wild animals, crops, and bug infestations. Naturally occurring but hazard is not in the natural hazard section because of human induced causes such as tiling in agriculture, rising temperatures from climate change, etc. may induce more of a hazard.</p>
<p>Historical Occurrences in Chickasaw County</p>	<p>Instances of plant, crop, or animal disease are common across Iowa and Chickasaw County. However, according to available data and input, there have been no widespread recorded occurrences of plant, crop, or animal diseases having a long-term significant impact in the planning area.</p>
<p>Probability and Extent</p>	<p>No fatalities or injuries reported for this hazard.</p> <p>Plant and livestock diseases occur regularly. Iowa DNR tracks and notifies the public of any new or confirmed cases of a pathogen. Chickasaw County has an agricultural crop value of \$347,450,456. This is all potentially at risk of an infestation and loss.</p>
<p>In the past decade, there have been confirmed infestations of tar spot in corn crops in the County (2018). Emerald Ash borer insects infested the region in 2014 and have caused the widespread decline of ash trees. Tree removal of dying trees with falling limb hazards has been a top concern for many rural Iowa communities. Highly pathogenic avian flu cases have been confirmed in Chickasaw Co among wild geese (migratory flocks). (2023). Previously: In 2022, the Iowa Farm Bureau reports that the pathogen may have caused Iowa's egg and poultry farms to have their lowest flock numbers reported since a 2015 avian flu outbreak but has since returned to normal. Hog numbers remained relatively stable without major outbreaks of swine flu reported.</p>	
<p>Warning Time</p>	<p>With the reporting systems set up among agricultural stakeholders, the warning time is likely a few days ahead of time, but this is set to change and varies depending on the specific contagion. Quarantines are often too late to contain pest and insect infestations or migratory bird diseases.</p>
<p>Duration</p>	<p>Weeks or months. Impacts can be years.</p>

<p>Table 35: Pandemic/Endemic Human Disease</p>	<p>Definition: An epidemic as an unexpected increase in the number of disease cases in a specific geographical area. Yellow fever, smallpox, measles, and polio are prime examples of epidemics. A pandemic is an unexpected increase in disease across multiple continents where the contagion is often a virus. Often for new diseases, populations have no immunity and severity of the disease is dependent on the virus characteristics, spreading factors, and efficacy of any existing vaccines to control the spread.</p>
<p>Historical Occurrences in Chickasaw County</p>	<p>Pandemic human disease has long been a known threat, but it was catapulted to the forefront of public thought in 2020 as the multi-year, COVID-19 pandemic caused by the novel SARS-COV2 virus swept across the globe, causing massive disruptions to public health and healthcare systems, public life and society, and economies at every scale. The reverberations from this pandemic are ongoing. Endemics of flu are regular and occur on an annual basis. Rates of infection have remained normal. Lyme Disease, Cryptosporidiosis, E-Coli, Latent tuberculosis are typical infections tracked by County public health officials that occur mostly from an environmental source (contaminated meats, water).</p> <p>Total reported deaths from COVID-19 in Chickasaw County were 37. Most occurring during the 2020 outbreak.</p>
<p>Probability and Extent</p>	<p>Population of Chickasaw County was 12,012 (2020 Census) As of Dec 2023, 55% fully vaccinated for COVID 19. Rise in COVID-19 cases occur annually in the colder months making this an endemic that is likely to stay in the population.</p>
<p>In the last 20 years, 10 events occurred where contagions have occurred as pandemics or major endemics (H1N1, SARS, MERS, Polio, Ebola (2), Malaria, Zika, COVID-19). The scale and impact of each one was dependent on the contagion characteristics, vaccine efficacy, and cooperation of worldwide systems to contain these outbreaks. Based on past events, the probability is likely greater than 20% of major endemics or pandemics occurring within 10 years. However, the scale and magnitude can vary depending upon multiple factors primarily in the early weeks of appearance.</p>	
<p>Warning Time</p>	<p>Typically, a few weeks ahead of time.</p>
<p>Duration</p>	<p>Weeks or months. If not contained, pandemics can become endemics and stay in the human population indefinitely.</p>

<p>Table 36: Terrorism</p>	<p>Definition: Domestic terrorism is the focus on terrorism in this assessment. This is defined as violent, criminal acts committed by individuals and/or groups to further ideological goals stemming from domestic influences, such as those of a political, religious, social, racial, or environmental nature.</p>
<p>Historical Occurrences in Chickasaw County</p>	<p>None in Chickasaw County.</p>
<p>Probability and Extent</p>	<p>No injuries or deaths reported.</p>
<p>Probability and Extent</p>	<p>Population of Chickasaw County was 12,012 (2020 Census) The 2024 Homeland Threat Assessment expects domestic terrorism to remain unchanged in the coming years.</p>
<p>Warning Time</p>	<p>Rural areas are not prone to foreign born terrorism attacks. Domestic terrorism is far more likely for rural areas and the likelihood increases with a variety of factors. Radicalization online and the availability of accessing weapons can make any spot prone to attack. Attacks have largely targeted schools, churches, and mass gatherings such as shopping centers.</p>
<p>Duration</p>	<p>None.</p>
<p>Duration</p>	<p>Usually occurs in less than an hour. Depending on the attack.</p>

<p>Table 37: Radiological Incident</p>	<p>Definition: A radiological incident is an occurrence resulting in a release of radiological material at a fixed facility or in transit. An incident resulting in a release of radiological material at a fixed facility includes, but is not limited to, power plants, hospitals, and laboratories. Although the term "nuclear accident" has no strict technical definition, it generally refers to events involving the release of significant levels of radiation.</p>
<p>Historical Occurrences in Chickasaw County</p>	<p>No occurrences recorded in Chickasaw County No deaths or injuries reported due to this hazard in County.</p>
<p>Probability and Extent</p>	<p>Chickasaw County is located far beyond the 50-mile hazard radius from a nuclear powerplant. Beyond a nuclear bomb attack which would likely impact only large metro areas, Chickasaw County has no vulnerability to radiological hazard.</p>
<p>There are two nuclear power plants that operate close to Iowa’s borders: the Quad Cities Generating Station near Cordova, Illinois, and the Cooper Nuclear Station near Brownsville, Nebraska. The map below identifies the location of each facility as well as the 10-mile and 50-mile planning buffers.</p>	<p>Nuclear Power Plants Impacting Iowa (2021).</p>  <p>Source: Iowa HSEMD</p>
<p>Warning Time</p>	<p>Usually no warning time.</p>
<p>Duration</p>	<p>A nuclear event is likely over in a few seconds. The fallout is likely to last for decades. For a meltdown at a power plant, this can occur over a period of hours or days. If left uncontained, the radioactivity would devastate the region and winds could carry the fallout and drop hazardous fallout a vast area for hundreds of miles.</p>

<p>Table 38: Transportation Incidents</p>	<p>Definition: This hazard encompasses air transportation, highway transportation, railway transportation, and waterway incidents. A transportation incident is described as an accident involving any mode of transportation that directly threatens life, property damage, injury, or adversely impacts a community's capabilities to provide emergency services.</p>
<p>Historical Occurrences in Chickasaw County</p>	<p>There have been 34 car crashes over the last 5 years that have resulted in 9 deaths and 32 serious injuries throughout the county.</p> <p>From 2011-2021, there have been 6 railway accidents involving collisions with cars at crossings resulting in 1 death and 3 injuries. Total property damage is estimated at \$327,300.</p> <p>1 aviation incident based on NTSB data since 2000 involving an aerial application spray run with a helicopter that struck wires due to incorrect action performance by the pilot (reason: inattentive). Substantial damage to helicopter during hard landing. The pilot survived.</p> <p>10 fatalities and 35 seriously injured from vehicle, rail, and airplane crashes over the last 5-10 years.</p>
<p>Probability and Extent</p>	<p>Car crashes are likely to occur. Based on historical data, 15% probability of serious car accidents each year (not many confirmed involving drugs or alcohol). Most accidents involve 2 vehicles.</p> <p>Railway and aviation accidents are not likely and there is less than 10% chance of occurring annually. Property damage from the most severe accidents involving a fatality or seriously injured person was \$863,190.</p>
<p>Warning Time</p>	<p>None</p>
<p>Duration</p>	<p>Most transportation incidents are of short duration and limited impact.</p>



Vulnerability Assessment

Hazard Risk for Urban Areas of Chickasaw County

This risk assessment identifies how people, property, and structures would be harmed or damaged by one of the listed hazard events. Potential impacts from hazard events will be different between rural and urban areas of the county.

Urban areas are likely to experience greater structural damage/losses because there are more buildings, houses, infrastructure, etc.

The values under each hazard’s risk factor (probability, magnitude, etc.) were determined by averaging the scores provided by all the teams representing each municipality within Chickasaw County. The final risk score is calculated according to the hazard risk score formula. See methodology.

Top 3 Hazards for Cities in Chickasaw County



Tornados/
Windstorms



Thunderstorms
with
Lighting/Hail



Severe Winter
Storms

Table 39: Hazard Risk Assessment Results for Urban Areas of Chickasaw County						
Rank	Hazard	Averaged Probability Score	Averaged Magnitude Score	Averaged Warning Time Score	Averaged Duration Score	Risk Score for Urban Areas
1	Tornado/Windstorm	3.11	2.61	3.22	1.67	2.83
2	Thunderstorm w/ Lighting or Hail	3.44	1.67	2.22	1.56	2.54
3	Severe Winter Storm	3.22	1.78	1.44	2.89	2.49
4	Extreme Heat	3.11	1.67	1.22	3.67	2.45
5	Grass/Wildland Fire	2.56	1.56	3.67	1.11	2.28
6	Flooding - Flash	2.28	1.78	3.22	1.72	2.21
7	Pandemic/ Endemic Human Disease	1.67	2.56	1.56	3.33	2.08
8	Drought	2.33	1.61	1.00	3.78	2.06
9	Hazardous Materials	1.67	1.89	3.67	1.89	2.06
10	Flooding - Riverine	1.89	1.78	2.44	2.56	2.01
11	Transportation Incidents	1.89	1.44	3.22	1.44	1.91
12	Animal/ Crop/ Plant Disease	1.67	1.56	1.78	3.33	1.82
13	Infrastructure Failure	1.33	1.56	3.11	2.00	1.73
14	Earthquake	1.00	1.89	3.00	1.44	1.61
15	Terrorism	1.00	1.33	3.00	2.00	1.50
16	Radiological	1.00	1.44	2.67	2.11	1.49
17	Sinkholes	1.11	1.00	3.00	1.67	1.42
18	Levee/Dam Failure	1.11	1.22	2.22	1.89	1.39
19	Expansive Soils	1.11	1.11	1.11	2.89	1.29
20	Landslide	1.00	1.00	2.44	1.67	1.28

Hazard Risk for Rural Areas of Chickasaw County

Top 3 Hazards for Farming and Rural Areas in Chickasaw County



River Flooding



Flash Flooding



Thunderstorms with
Lighting/Hail

Planning committee participants from county departments or agencies contributed to the scores used in this assessment. County departments/agencies included emergency management, public health, and administration.

This risk assessment will be used in a risk informed approach to deciding which hazard mitigation activities or tasks the County will include in this Plan.

Table 40: Hazard Risk Assessment Results for Rural Areas of Chickasaw County

Rank	Hazard	Probability Score (County)	Magnitude Score (County)	Warning Time Score (County)	Duration Score (County)	Risk Score for Rural Areas
1	Flooding - Riverine	4	4	3	4	3.9
2	Flooding - Flash	4	3	3	4	3.6
3	Thunderstorm/ Lighting/ Hail	4	2	4	4	3.4
4	Tornado/Windstorm	3	3	4	4	3.3
5	Extreme Heat	4	2	1	4	3.0
6	Drought	3	3	1	4	2.8
7	Transportation Incidents	3	1	4	2	2.5
8	Severe Winter Storm	2	3	1	4	2.4
9	Terrorism	1	3	4	3	2.3
10	Grass/Wildland Fire	2	2	4	1	2.2
11	Hazardous Materials	1	2	4	3	2.0
12	Earthquake	1	1	4	4	1.8
13	Infrastructure Failure	1	1	4	3	1.7
14	Animal/ Crop/ Plant Disease	1	2	1	4	1.6
15	Pandemic/ Endemic Human Disease	1	2	1	4	1.6
16	Levee/Dam Failure	1	1	4	1	1.5
17	Sinkholes	1	1	4	1	1.5
18	Expansive Soils	1	1	1	4	1.3
19	Radiological	1	1	1	3	1.2
20	Landslide	1	1	1	1	1.0

Critical Facilities

Incorporated Areas - Urban

The critical facilities for each community are listed in the table on the next page. See appendices for maps of critical facilities in each jurisdiction's local hazard mitigation plan.

It is important to know the threats that each hazard poses to the built environment. The facilities were chosen based on their importance to the operation of local government, community way of life, and disaster recovery.

- Critical facilities may include buildings that would be used for emergency shelters, planned locations for post disaster operations, and buildings with auxiliary power supply such as emergency power generators.
- Public infrastructure and utilities which are crucial to provide necessities included public potable water wells, water towers, communication towers, WWTP lagoons, sewer lift stations, fuel stations, and electrical substations.
- Facilities needed for post disaster recovery and emergency responses services include hospitals, police stations, fire, and ambulance stations.
- Critical sites include important historical cultural sites which provide value to the community. Those included in this Plan are churches and historical sites.
- Buildings where concentrations of vulnerable populations are located are included in the list of critical facilities. Those include schools, daycares, and nursing homes.

Unincorporated Areas - Rural

A map of all the critical sites located in unincorporated county land is shown in Figure 11. The map illustrates an inventory of facilities such as electrical substations or fuel storage facilities so that strategies to implement mitigation activities are risk informed. The map can help visualize important corridors, locations where there are concentrations of hazardous storage facilities, and critical areas for emergency planning.

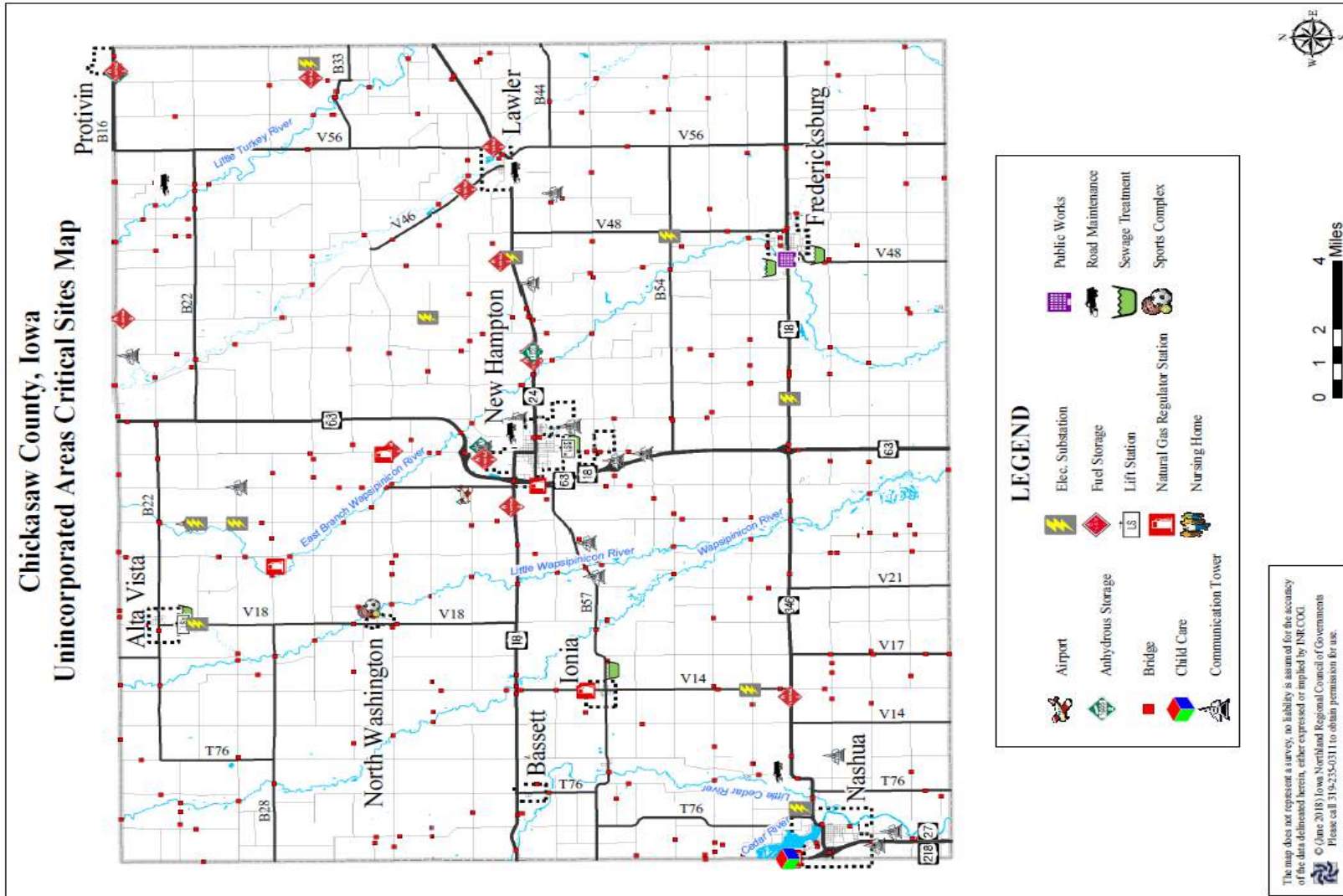
Requirement 44 CFR §201.6(c)(2)(ii): The plan should describe vulnerability in terms of (A) the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Table 41: Critical Facilities in Select Communities for Chickasaw County

Critical Facilities in Alta Vista	Critical Facilities in Fredericksburg	Critical Facilities in New Hampton	Critical Facilities in Nashua
Alta Vista V.F.W.	Ambulance station	1-Ambulance	Welcome Center (tornado shelter)
Alta Vista Maintenance Shop	Anhydrous storage tanks	2 Anhydrous Storage	Fire Station
Alta Vista Express - Gas Station	Child care facility	3 Childcare	City Hall
Communication's Tower	City Hall	4 City Hall	City Shed
City Library	Civil Center	5 Civic Center	Lift Stations (2)
City Well	Clinic	6 County Sheriff	Wastewater Treatment Plant (WWTP)
WWTP Lagoon	Communication's Tower	7 County Courthouse	Potable Water Wells (3)
Terminal Lift Station #1	Electrical substation	8 Elec. Substation	Water tower
Lift Station #2	Fire Station	9 Fire Station	Mid-American substation
Mennonite Church	Fuel Storage	10 Fuel Storage	Dam Power House
Alta Vista City Hall and Fire Station	Library	11 Lift Station (4)	Nashua Clinic
St. Bernard Catholic Church	Lift Station	12- Library	Assisted Living Center
Schucky's Bar and Grill	Natural Gas Station	13- Natural Gas Station	Nashua Plainsfield Elementary
Critical Facilities in North Washington	Nursing Home	14- Nursing Home	Nashua Plainsfield Middle/HS
Fire Station/ City Hall	Public works	15- Police	Taylor Therapy
Critical Facilities in Protivin	School	16- Public Works	Little Brown Church
Community Center	Sewer treatment plant	17- Road Maintenance	United Methodist Church
Protivin City Hall	Tornado siren	18- School	Saint John Lutheran Church
Farmers Mill Grain Elevator	Public Well	19- Sewage Treatment	Saint Michaels Catholic Church
Protivin Fire Station	Critical Facilities in Ionia	20- Siren	Cedar Point Church
Polashek's Locker (Butcher Shop)	Fire Station	21- Sports Complex	Tornado Sirens (3)
Holy Trinity Church	City Hall	22- Telephone Company	Critical Facilities in Lawler
	City maintenance shop	23- Water Tower	Lawler Municipal Hall/ Library
	Public library	24- Well (2)	Lawler Fire Station
	Ionia Locker	25- Bailey Avenue Industrial "Park"	Fire Star Co-op Grain Elevator
	Fire Star Co-op Grain Elevator	26- New Hampton Industrial Park South	Bank of Iowa
	WWTP lagoons	27- MercyOne Medical Center	Mt. Carmel Church
	Water Tower		Mt Carmell CCD Building
	Tornado Siren		

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

Figure 11: Map of Critical Sites in Chickasaw County



Measuring Vulnerability to Selected Hazards

Property Valuation for Chickasaw County

Property valuation is a metric of measuring the potential losses that may occur in a hazard event. Table 65 summarizes the values of property in Chickasaw County by land type. This data is used in the vulnerability analysis to determine the potential losses.

For residential, \$376,720,898 is the total assessed value for a potential for loss. Agricultural land is assessed at \$367,270,097 and commercial land is assessed at \$74,217,765. All industrial land is assessed at \$51,380,876. Utilities without gas or electric valuations are assessed at \$51,343,617. The entire county’s valuation without gas and electric valuations is approximately \$955,153,388. If we consider gas and electric valuations, the county is valued at a total assessed dollar value of \$983,634,028. This is the total vulnerability in terms of cost for Chickasaw County.

Land Type	Assessed Value (2022)
Residential	\$376,720,898
Agricultural Land	\$367,270,097
Agricultural Buildings	\$30,060,406
Commercial	\$74,217,765
Industrial	\$51,380,876
Utilities W/O Gas & Electric (G&E)	\$51,343,617
Total Valuation W/O G&E Utilities	\$955,153,388
Gas & Electric Utility Valuation	\$28,480,640
Total Valuation With G&E Utilities	\$983,634,028

Source: Iowa Dept. of Management

Requirement 44 CFR §201.6(c)(2)(ii): The plan should describe vulnerability in terms of...(B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.

Estimating Potential Property Losses from a 100-Year Flooding Scenario

A flood scenario was modeled across the county using the 1% annual chance flood hazard zone from FEMA’s flood insurance rate maps (FIRM). For this analysis, the impact of flooding for the planning area was calculated with parcel valuation data from the county assessor’s office and effective FIRM data. See Appendix Q for the flood scenario maps of each city and the affected parcels in that city from a 100-year annual chance flood event.

The effective FIRM data is dated 09/28/2012. Since the 2019 Chickasaw County MJ-HMP there have been no major changes in flood boundaries nor development within city boundaries. No levees or dams or changes in water ways have impacted the planning area nor have any infrastructure projects out of the county changed waterways throughout the County. Assuming a similar impact from the 2019 analysis, the values from the 2019 Chickasaw County’s MJ-HMP were adjusted for inflation to 2023 dollars. Cumulative inflation was calculated at 34.6%.

The total cost of a 100-year annual chance flood occurring is summarized in Table 44. Table 44 lists the number properties in the entire county that are located within the 100-year floodplain.

For rural areas of Chickasaw County (unincorporated), Table 46 displays the value of 5,732 parcels within the 100-year floodplain. Land values make up nearly 27% of this value. For city parcels, Table 45 shows a total cost for all cities in 2024 dollars for a 100-year annual chance flood event occurring.

Table 44: Chickasaw County - Entire Planning Area: 100-Year Flood Impacted Properties (2019 and 2023)

	2013	2024
Number of Parcels	9,804	9,804
Total Value of Land Building, and Dwelling	\$1,238,709,320	\$1,667,238,288

Source: INRCOG & Chickasaw County Assessor 2013
Note: 2023 Dollars calculated with 34.6% cumulative rate of inflation.

Table 45: Chickasaw County -Incorporated Planning Area: 100-Year Floodplain Properties

	2013	2023
Number of Parcels	4,072	4,072
Total Value of Land Building, and Dwelling	\$328,629,970	\$442,318,839

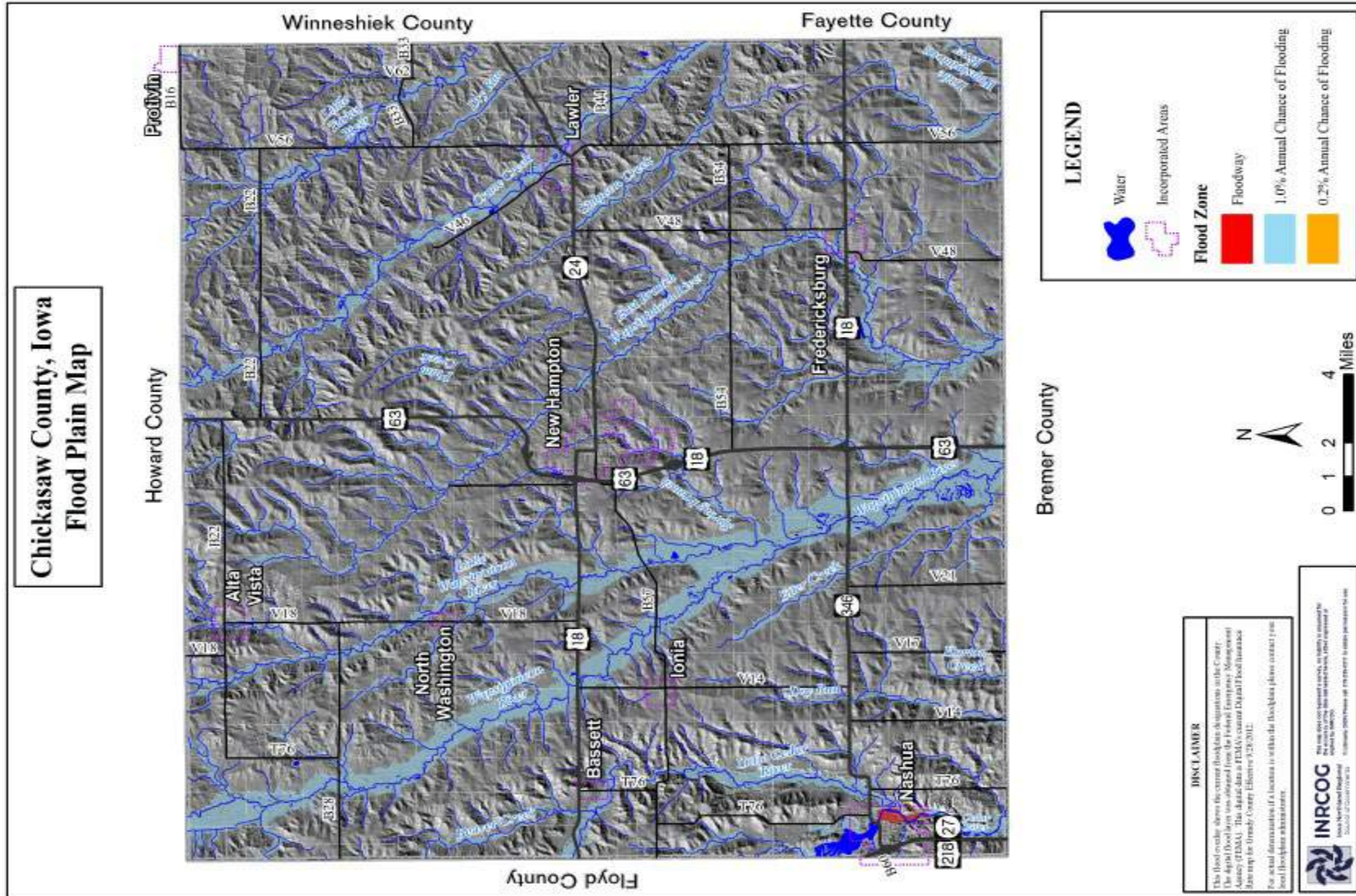
Source: INRCOG & Chickasaw County Assessor 2013
Note: 2023 Dollars calculated with 34.6% cumulative rate of inflation.

Table 46: Chickasaw County- Rural Unincorporated Planning Area: 100-Year Flood Impacted Properties

	2013	2023
Number of Parcels	5,732	5,732
Total Value of Land Building, and Dwelling	\$910,079,350	\$1,224,919,448

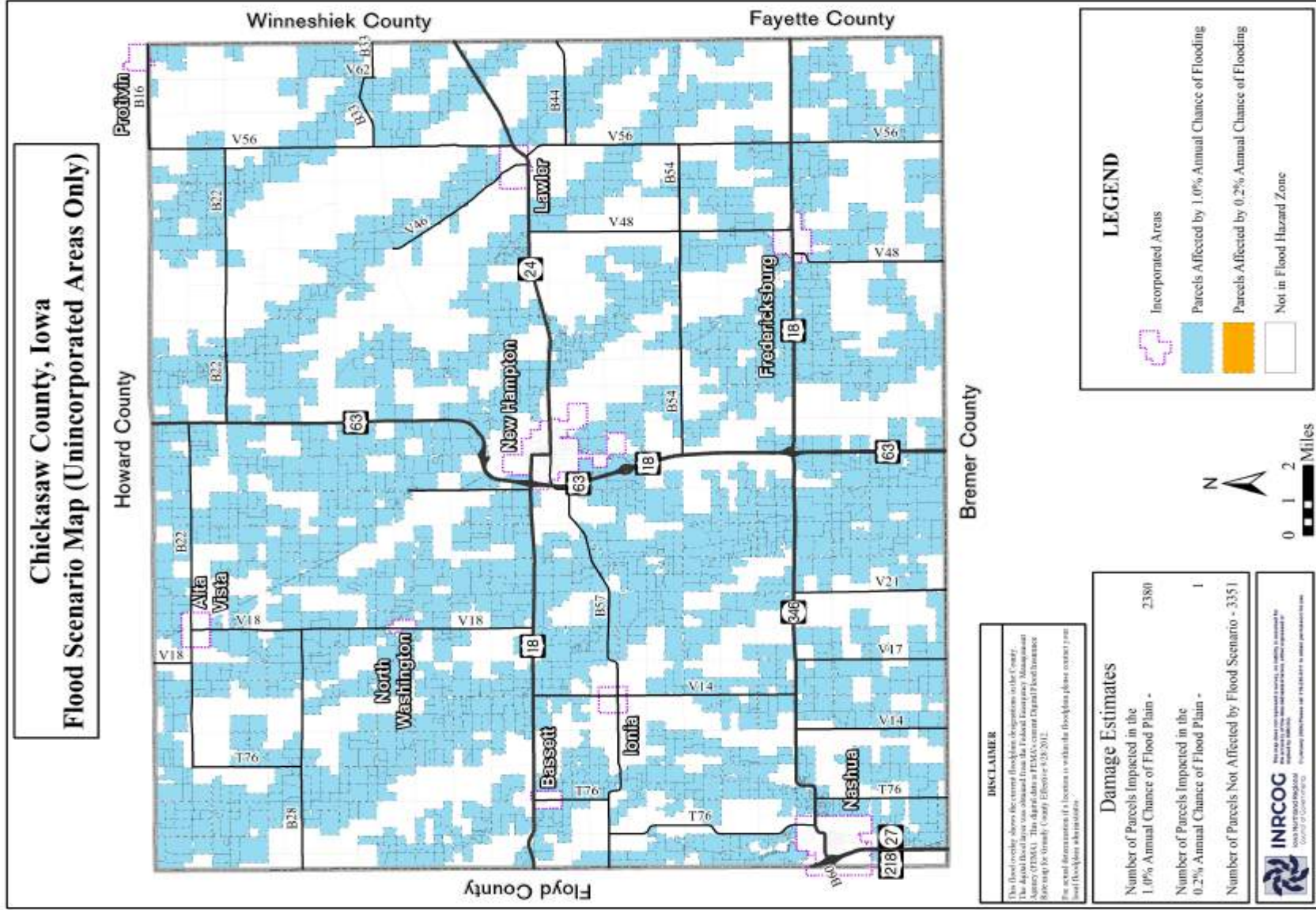
Source: INRCOG & Chickasaw County Assessor 2013
Note: 2023 Dollars calculated with 34.6% cumulative rate of inflation.

Figure 12: FIRM Data Flood Risk Areas in Chickasaw County



Source: FEMA FIRM Panels Effective 12/20/2019

Figure 13: Flood Impacted Parcels in Chickasaw County



Tornado Scenario

In a 1989 study¹ of deaths and injuries due to tornados, risk factors for injury and death were identified. Poor building anchoring, locations without a basement, people outdoors, and those over the age of 70. The findings in this study are supported by later studies that point to sheltering in buildings with adequate anchoring in an interior building or basement offer better protection during a tornado.

Vulnerable structures in a tornado are mobile homes. Although a mobile home may be structurally “tied down” to withstand strong winds, a mobile home will offer less protection from tornadoes than conventional wood frame structures on concrete footing.

According to data from the 2020 ACS data, there are an estimated 109 mobile homes in the county. The average household size is 2.39 people. An estimated 382 people reside in mobile homes in the county. A potential tornado may affect the entire county. This puts 261 people at a greater risk than others during a tornado event.

Vulnerable populations in a tornado are those over 70 years of age. For the elderly population, there are an estimated 2,682 adults greater than 65 years old which is 22% of the population in the county. Nearly 14% of the population are older adults (65 years or older) living alone. This is estimated at 375.

From this assessment, nearly 3,064 people in the county are at greater risk than others in a tornado. This accounts for older adults 65 years and older and people living in mobile homes. Both these measures account for nearly 25% of the population.

Currently, Nashua’s Welcome Center, Nashua-Plainfield Elementary, are locations where there is a FEMA certified tornado safe room that is known to exist in the planning area.

The maps below show a historical map of tornados for Chickasaw County. See Appendix Q for individual community’s tornado scenario maps.

Future Development

Future development within identified hazard areas can change the threat level of an area by placing critical facilities, businesses, transportation networks, utilities, and populations within areas prone to risk from hazards such as floods. Such patterns in city development are curbed to mitigate predicted future hazards using mitigation tools such as state building codes and local land use regulations (zoning, subdivision, floodplain management, etc.). These tools will help to mitigate the impacts of hazards on new and future development.

Recent updates in Title 44 CFR §201.6 (c)(2)(i) require this risk assessment include a section with future conditions on the type, location, and range of anticipated intensities of natural hazards.

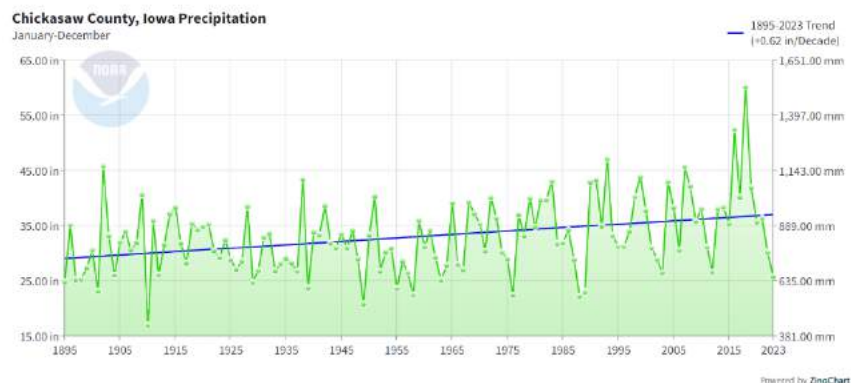
Long term trends of climate patterns for the region were summarized in the Fourth National Climate Assessment Midwest Section. The National Climate Report is mandated to be updated every 4 years and deliver results to Congress and President on the effects to agriculture, energy productions, land use, transportation, and human health.

Yearly precipitation levels and annual average temperatures offer insights into future conditions of our climate system.

Annual Precipitation Levels in Chickasaw County

Taking the monthly precipitation records from January to December between 1895 and 2023 is shown in Figure 15. The values hover between 25 - 35 inches of precipitation levels recorded. The average precipitation level for the year is plotted and a linear trend of those values is shown in Figure 15. The trend shows a growing level of annual precipitation on average of 0.62 in more than the decade before. Based on this historical trend, precipitation is likely to continue to increase in the coming years.

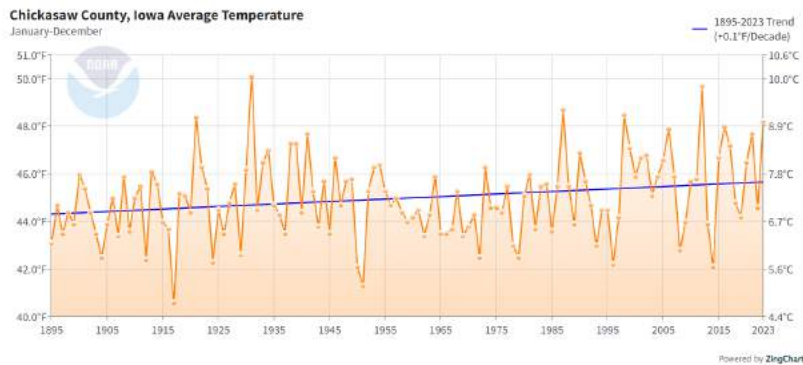
Figure 15: Historical Precipitation Data and Trend for Chickasaw County, Iowa²



Average Annual Temperatures in Chickasaw County

The monthly average temperature is plotted over a 12-month period from 1885 to 2023 in Figure 16. The annual average temperature is also shown with a linear trend in Figure 16. This trend shows the average temperature in Chickasaw County increasing at a rate of +0.1° F every 10 years.

Figure 16: Historical Temperature Data and Trend for Chickasaw County, Iowa²



Climate Patterns from Increasing Precipitation and Higher Temperatures

Drought

The relationship between increasing precipitation, temperature, and drought is complex, and often counterintuitive at first thinking about it. While increasing precipitation may seem like it would mitigate drought conditions, higher temperatures can exacerbate the situation in several ways:

1. Evapotranspiration: Higher temperatures lead to increased evaporation rates from soil, bodies of water, and plants. This means that even if there is more precipitation, it may quickly evaporate before it can effectively replenish soil moisture or water sources.
2. Changes in precipitation patterns: Increasing temperatures can alter precipitation patterns, leading to more intense rainfall events but also longer periods of drought between these events. This pattern can result in rapid runoff and soil erosion during heavy rain, followed by extended dry periods that contribute to drought conditions.

Overall, while increasing precipitation may provide temporary relief from drought, the combined effects of rising temperatures can outweigh this benefit, leading to more frequent and severe drought events in certain regions.

Pest Infestation

With more humidity, the daily minimum temperature may increase across all seasons. Warming winters can increase the survival and reproduction of existing insect pests which allow new insect pests and crop pathogens to move into the Midwest region.

Extreme Heat Domes

A heat dome is a weather phenomenon characterized by a high-pressure system that traps hot air beneath it, leading to prolonged periods of extremely high temperatures and often causing heatwaves. Extreme heat events during the summers may occur with more frequency in the Midwest.

The human impacts of extreme heat affect socially and economically vulnerable populations the most. The higher costs of energy during heat waves disproportionately impact cost-burdened households. Heat related illness may be more severe among infants, elderly populations, and those with chronic health conditions.

Projected Trends of Natural Hazards in Chickasaw County

- Prologued drought may occur as the atmosphere holds more moisture (even pulling moisture from plants) as the temperature increases. Longer periods between weather events means there are dryer and longer periods in between these events.
- Floods (flash or major types) will increase in intensity as the atmosphere holds more moisture to drive stronger storms and drop heavier rainfall over a shorter period during an event.
- Extreme heat may occur more frequently. The human health impacts are higher among socially vulnerable populations (the elderly, infants, those with chronic health issues, cost burdened households).
- Agricultural pests and pathogens may increase in growing plants and stored grain. Warming temperatures in the spring and summer have led to rising humidity. Higher dew and moisture conditions may increase the presence of these pests or crop diseases.

NFIP and Repetitive Loss Properties

This hazard mitigation plan is an attempt to reduce loss by identifying potential natural or man-made hazards. Following a natural disaster or hazard event, rebuilding the impacted area without making or addressing necessary changes or improvements to reduce future impacts from future events is not a sustainable or reasonable method for rebuilding communities. Returning to pre-disaster conditions will not improve or reduce the hazard risk for the area.

FEMA defines a repetitive loss structure as an NFIP-insured building that has experienced two paid flood losses in a 10-year period in which each loss is \$1,000 or more. Reconstructing a

structure to its pre-disaster condition sets the building to the same risk of damage as before. Investments in rebuilding communities after the disaster will consider this history of damage and loss. There was no repetitive loss property in Chickasaw County.

Planning with hazard mitigation activities breaks this cycle of continuous and costly reinvestment for an area facing the same or greater risk to damage and losses. Redevelopment ensures investments can reduce future losses that protect life, property, and community life. Table 46 shows which jurisdictions participate in the National Flood Insurance Program (NFIP).

Table 46: NFIP Status of Jurisdictions in Chickasaw County (2023)

Jurisdiction	NFIP?	Initial FHBM Identified	Current Effective Map Date	Total Policy Count	Total Coverage	Total Loss	Total New Dollars Paid
Chickasaw County	Yes	05/01/2011	12/20/2019	23	\$4,651,000	17	\$255,607
Alta Vista	Yes	08/01/1986	12/20/2019	-	-	-	-
Bassett	No	09/28/2013	12/20/2019	-	-	-	-
Lawler	Yes	08/01/1986	12/20/2019	2	\$149,000	2	\$8,999
Ionia	No	-	12/20/2019	-	-	-	-
Fredericksburg	Yes	09/29/1986	12/20/2019	3	\$1,305,000	1	\$1,666
Nashua	Yes	09/29/1978	12/20/2019	11	\$1,210,000	14	\$224,598
New Hampton	Yes	09/01/1987	-	8	\$1,522,000	7	\$7,718
North Washington	Yes	06/19/2014	12/20/2019	1	\$78,000	0	-
Protivin	Yes	08/19/1986	12/20/2019	1	\$239,000	0	-

Section IV: Mitigation Strategy



Goals for Reducing Hazard Risk

The planning committee reviewed the County’s Hazard Mitigation Plan Goals from the 2019 plan. The planning committee elected to continue forward with the same set of goals from the plan update (Goals 1 through 7). Goals 1 through 7 were approved by Chickasaw County’s Board of Supervisors in 2019. Additional goals included in this plan update are Goals 8 and 9.

Chickasaw County’s emergency management planning coordinator and the county hazard mitigation participants contributed to the formation of these goals. These goals focus on either eliminating or reducing county wide risk to hazards through actions, activities, or programs that will focus on lessening the impact of hazards on people, property, community life, and the local economy. These broad-based goals were developed to address a multitude of hazards and encompass a variety of mitigation activities.

This updated multi-jurisdictional hazard mitigation plan includes the following goals for Chickasaw County’s hazard mitigation efforts are:

- Goal 1:** Minimize to the greatest possible extent the number of injuries and/or loss of life associated with all identified hazards.
- Goal 2:** Reduce or eliminate property damage due to the occurrence of disasters.
- Goal 3:** Identify ways that response operations, in the event of a disaster, can be improved.
- Goal 4:** Return the community to either pre-disaster or improved conditions in a timely manner in the wake of a disaster.
- Goal 5:** Develop strategies that can be used to reduce the community’s overall risk to the negative effects of natural, technological, and man-made disasters.
- Goal 6:** Reconvene the planning committee on an annual basis to review plan documents, check for compliance with the plan goals, and track progress in achieving the mitigation strategies.
- Goal 7:** Maintain the Countywide Multi-Jurisdictional format for future plan updates.
- Goal 8:** Ensure public safety and welfare with updating planning and development documents.
- Goal 9:** Invest in updated county improvements to ensure functionality and sustainable use of public infrastructure.

Requirement 44 CFR §201.6(c)(3)(I) [The mitigation strategy] must include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Capability Assessment

The County Emergency Management Agency Coordinator and team completed a capability assessment of county resources. The assessment includes an inventory of available or existing documents, personnel, funding, or outreach activity.

The personnel, regulatory, administrative, technical, financial, and communication abilities which the county has at its disposal are shown below. Recommendations by the county staff and EMA coordinator are shown for the regulatory Using the definition of a mitigation action (i.e. any activity that is carried out to reduce risk to a hazard), the ability of the organization (County) to carry out an activity is divided into 5 different categories.

Requirement 44 CFR §201.6(c)(3): The plan must include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

Local Plans and Regulations

These are tools for the county to enact policy and enable the necessary powers to regulate development such that proposed or existing activities conform to adequate standards, procedures, or practices.

How can these capabilities be expanded and improved to reduce risk? The county's existing emergency plans are I.T. specific. The county may consider the development of a comprehensive Continuity of Operations Plan (COOP) as a mitigation activity to reduce risk and prepare. These capabilities may be expanded to include more comprehensive planning disaster response steps based on the type of disaster or damage to the county's capabilities (i.e.. offices, I.T. servers).

Document	In Place? (Yes, No, or In Progress)	Does the plan address hazards in this plan?	Can the plan be used to implement mitigation actions?	Last Update	Agency Responsible
<i>Previous Hazard Mitigation Plan</i>	Yes	Yes	Yes	2019	County EMA
<i>IT/ GIS Disaster Plan</i>	Yes	No	No	2023	County I.T. Dept.
<i>County Basic Plan and supporting Emergency Support Functions</i>	Yes	Yes	Yes	Revolving on a 5-year rotation	County EMA
<i>County Recovery Plan and supporting Recovery Support Functions</i>	In Progress	No	Yes, in a rebuilding capacity post disaster	In Development	County EMA

Administrative and Technical

Administrative and technical capabilities include staff and their skills. They also include tools that can help you carry out mitigation actions. Outside entities/organizations were considered during this assessment. Each administrative position was assessed whether the position was employed in-house at the county organization or outsourced to another agency. Next, the position was assessed whether the current person in this position has participated in hazard mitigation planning. Next, the positions in the assessment were rated on a Yes/No scale whether effective tools of communication exist with the department or agency that employs the administrative position.

Table 48: Administrative Capabilities

Position	Employed with County?	If not, position outsourced to whom?	Trained in Hazard Mitigation?	Primary Agency for Communication?
Chief Building Official	Yes		Yes	Zoning Dept
Civil Engineer	Yes		Yes	Engineering Dept.
Community Planner	No	INRCOG	Yes	INRCOG
Emergency Manager	Yes		Yes	County EMA
Floodplain Manager	Yes		Limited	Coordinates with Iowa DNR
GIS Coordinator	Yes		Yes	GIS Dept
Planning Commission	Yes		No	Zoning Dept.

Table 49: Technical Capabilities

Capability Type	In Place?	Resources Regularly Used or Updated by Technical Resource
Grant Writing	No	
Hazard Data and Information	Yes	Hazard Mitigation Plans, Safety Meetings, MSDS hazard training for employees
GIS Analysis	No	
Mutual Aid Agreements	Yes	Emergency service coverage maps, emergency response plans, county dispatch office

Financial Capabilities

This part of the capability assessment is where the county reviewed whether the organization utilizes funds available to them to implement hazard mitigation activities.

Emergency Management and Mitigation Funding Sources In Place	Description of Current Funds Utilized for Hazard Mitigation In County
Capital Improvement Project Funding	<ul style="list-style-type: none"> • Availability of funding is based on need or projects related to buildings, roads, land development, or trail improvement.
Non-FEMA Federal Funding Programs	<ul style="list-style-type: none"> • Secondary Road Department is a DOT agency that has access to limited bridge and road federal funds. • ARPA funds - security lighting/locked doors/cameras for county buildings, county law enforcement center building, radios for roadway crews in DOT • CDC Public Health Emergency Preparedness Program and Guidance - federal grant offered to Region 6 for preparedness planning, activities available to work with EMA on preparedness plans, updates, meetings, etc. CANNOT be used for emergency responses.
Local Public Health Services	<ul style="list-style-type: none"> • State grant to all county health departments to work with EMA on preparedness plans, updates, meetings, etc.

Education and Outreach Capabilities

In this capability, educational and outreach activities or programs were identified by jurisdiction. These education and outreach capabilities would be used to carry out mitigation activities and communicate information about hazards.

Program or Outreach Activity In Place	Description
County Newsletter	The county prepares and sends out a newsletter for all county employees and the general public. With prior notice, the newsletter is a good way to provide information for public events.
Awareness Campaigns	The county has two annual hazard awareness activities: Extreme Weather Week and Public Health Programming for Schools. These are highly successful events/campaigns. The County is looking into pursuing StormReady® recognition and implementing programming for Chickasaw County.

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Local News TV or Radio	Public Safety Radio Station for the County. This is used primarily to help friends and families of first responders to hear them responding to calls to better inform them and the public of response activities. Waterloo Area NOAA Weather Radio WXL94 - National Weather Service broadcasting serving Black Hawk, Bremer, Buchanan, Butler, Chickasaw, Franklin, Fayette, Floyd, Grundy, Howard, Mitchell, and Winneshiek counties. These are somewhat effective since news stations decide on what to broadcast. Submissions are considered but not promised or guaranteed.
Organizations that represent/advocate for/interact with underserved or vulnerable communities	Some organizations are reached out to on an as needed basis. The results are somewhat successful.
Social Media Pages	The county has a Facebook that is highly shared across multiple platforms. This is a successful resource to get out information.
Email List Servs	This is very successful at reaching a targeted audience and getting participation in county activities/events.

Current Hazard Mitigation Actions and Updates

For this plan, all the activities or actions to be implemented can be categorized into 5 broad types.

1. **Emergency services**
2. **Education and awareness programs**
3. **Natural system protection and nature-based solutions**
4. **Structure and infrastructure projects**
5. **Local plans and regulations**

See Table 50 for definitions and examples of each category. Detailed information for each incorporated community can be found in their respective Appendix.

Each category of hazard mitigation activities is in the associated sections which includes a summary of the county’s capabilities to implement these efforts such as existing departments or organizations, emergency response vehicles, and what kind of services they provide.

Table 50: Categories of Action Types in Hazard Mitigation Strategy

Mitigation Action Category	Description	Examples
EMERGENCY SERVICES	Actions that protect people and property during and immediately after a disaster or hazard event.	<ul style="list-style-type: none"> • <i>Warning Systems</i> • <i>Emergency response services</i> • <i>Protection of critical facilities</i>
EDUCATION AND AWARENESS PROGRAM	These types of actions keep residents informed about potential natural disasters.	<ul style="list-style-type: none"> • <i>Alert Iowa</i> • <i>Radio or television ads</i> • <i>Social media outreach</i> • <i>Websites</i> • <i>Real estate disclosures,</i> • <i>Outreach to underserved or vulnerable communities</i>
NATURAL SYSTEM PROTECTION AND NATURE-BASED SOLUTIONS	Actions that minimize damage and losses by preserving or restoring the functions of natural systems. This type of action can include green infrastructure and low impact development, nature-based solutions.	<ul style="list-style-type: none"> • <i>Sediment/erosion control</i> • <i>Stream restoration</i> • <i>Greenways</i> • <i>Source water protection plans</i> • <i>Wetland preservation</i> • <i>Prairie land-controlled burns</i>
STRUCTURES AND INFRASTRUCTURE PROJECTS	Actions that either modify existing buildings or structures to protect them from a hazard, or removal from a hazard area.	<ul style="list-style-type: none"> • <i>Acquisitions of flood prone properties</i> • <i>Installing utilities underground</i> • <i>Safe rooms</i> • <i>Storm drain infrastructure such as concrete culverts</i> • <i>Structural retrofits</i>
LOCAL PLANS AND REGULATIONS	Actions by administrative or regulatory processes which direct how land and buildings are developed and built. These actions include regulations by public entities to reduce hazard losses.	<ul style="list-style-type: none"> • <i>Comprehensive land use plans</i> • <i>Land use ordinances</i> • <i>Development review procedures a</i> • <i>Building codes and enforcement</i> • <i>Open space preservation</i> • <i>Storm water management regulations</i>

Emergency Services Activities

Emergency Management Agency

Chickasaw County’s Emergency Management Coordinator is based out of the city of New Hampton. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the community. The current Chickasaw County Emergency Management Coordinator and contact information is:

Jeff Bernatz, Emergency Management & E911 Coordinator
516 S Linn Ave., New Hampton, IA 50659
Phone: (641) 394-2406
Email: j.bernatz@chickasawcounty.iowa.gov

Law Enforcement

The Chickasaw County Sheriff’s Office provides law enforcement for all the unincorporated areas of the County along with providing assistance to the cities that have their own police force. The Chickasaw County Sheriff’s Office has service contracts to provide law enforcement patrols with a number of smaller communities in the County.

Fire Protection

There are eight independent fire departments (Alta Vista, Fredericksburg, Ionia, Lawler, Nashua, New Hampton, North Washington, and Protivin), as well as a township fire district (Chickasaw Township Fire District) in the county. Each department is responsible for providing fire protection services to a particular area within the county.

By law, every township must provide fire protection services to those citizens living within its borders. Every department within Chickasaw County has signed a mutual aid agreement with one another. This document is on file with Chickasaw County Emergency Management and can be viewed as a portion of the Chickasaw County Contingency Plan.

Ambulance Services

Chickasaw County Ambulance Service provides ambulance service to the county. It is a county management department and is located at 204 East Prospect St in New Hampton, IA. The department started in January 2023. The services can be activated by dialing the E-911 Emergency Response system.



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Medical Facilities

Chickasaw County is presently a regional health care center. In addition to numerous private clinics and practicing physicians, Chickasaw County has four medical facilities, all of which are located in either New Hampton or Nashua.

MercyOne Family Clinic in New Hampton, Iowa



These Facilities include:

- MercyOne Center and Mercy Family Clinic – New Hampton
- Nashua Medical Center – Nashua
- Fredericksburg Family Clinic – Fredericksburg
- Waverly Health Center - Nashua

In addition to the medical health field, Chickasaw County has services available to deal with those who require mental health assistance. Chickasaw – Pathways Behavioral Services Inc., out of Waverly, provides psychiatric and counseling services to citizens who need support.

HAZMAT

All Chickasaw County jurisdictions contract with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The Training Center provides training to fire departments and companies from around the state and country. This center serves as a hazardous materials quick response unit to Black Hawk County, surrounding counties, and many municipalities in a ten-county region. The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities of the local department. Contact information for the facility is as follows: Hazardous Materials Regional Training Center, 1925 Newell Street, Waterloo, Iowa 50707, Phone: (319) 291-4275, Toll Free: (800) 291-4682, Fax: (319) 291-4285.

The jurisdictions also partner the Northeast Iowa Response Group for assistance in responding to any methamphetamine labs located in the city limits. The Response Group assists the Police Departments in containment of the site and disposal of hazardous chemicals.

Warning Systems

Alert Iowa

Chickasaw County uses the Alert Iowa notification system that is utilized statewide. Alert Iowa serves as the statewide mass notification and emergency messaging system and is operated by Iowa Homeland Security and Emergency Management. Alert Iowa's features are controlled through the Chickasaw County Emergency Management Agency and is available to all county residents. Residents can customize their alert settings including the type of alerts they would get.

Alert Iowa allows for emergency notifications via landline telephones, cell phones, email, text messages, and social media. This is useful for communities that may not have an operating warning siren or may not hear the sirens. The County will use its emergency notification network for all of the following events: **blizzards, flash flooding, severe thunderstorms, and tornadoes.** There is an optional way to receive the same alert for events such as: excessive heat warnings, hazardous materials warnings, heavy snow warning, high wind warnings, ice storm warnings, law enforcement warnings, shelter in place warnings, sleet warnings, wind chill warnings, and winter storm warnings.



Tornado Sirens

Each city in Chickasaw County has tornado sirens that are operated and maintained by a local committee/body of people who schedule monthly tests. The activation systems of warning systems vary by city. Some cities have a digital system that activates according to wind speeds and atmospheric readings in the area that detects strong conditions for tornadoes. Other cities operate from a single source by a user.

Education and Awareness Programs Activities

Information regarding how to protect oneself in the event of a tornado is largely publicized in the form of flyers, radio, newspaper, and television announcements. The County provides basic safety information for various hazard events (i.e., tornadoes) and what to do before, during, and after an event.

Structure and Infrastructure Projects Activities

County Engineer and Secondary Roads Department

The Chickasaw County Engineer's Office is tasked with the maintenance of all roads within Chickasaw County. The Code of Iowa requires that the Board of Supervisors appoint a Registered Professional Engineer as department head. The Engineer, along with the Assistant to the Engineer and Technician, Road Superintendent and Office Manager, directs both the construction and maintenance activities.

guidelines. The Federal Government completed new FIRM maps, as of September 2012 for Chickasaw County. Chickasaw County does not have or enforce Zoning Ordinances. They issue building permits for the unincorporated areas only.

Planning And Regulatory Documents

The cities in Chickasaw County also use several zoning and ordinance tools. Table 51 provides a compilation of the current planning regulatory documents in place for each city in Chickasaw County.

Requirement 44 CFR §201.6(c)(3): A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

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Table 51: Current Planning and Regulatory Documents for Selected Communities

	Jurisdiction									
Planning and Regulation Documents	Alta Vista	Fredericksburg	Ionia	Lawler	Nashua	New Hampton	North Washington	Protivin	Bassett	Unincorporated Chickasaw County
Previous Hazard Mitigation Plan Participant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
Comprehensive Plan	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Building Code	Yes	No	No	Yes	Yes	No	No	No	No	No
Zoning Ordinance	No	Yes	Yes	RR	RR	Yes	No	No	No	No
Subdivision Regulations	No	No	Yes	No	Yes	Yes	No	No	No	No
Floodplain Management Ordinance	No	No	Yes	No	Yes	Yes	No	No	No	Yes
Tree-Trimming Ordinance	Yes	Yes	Yes	No	Yes	Yes	No	No	No	No
Storm Water Ordinance	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No
Snow Removal Ordinance	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No

Source: Community Representatives

Hazard Mitigation Strategy for Chickasaw County

Each participating jurisdiction in this plan update created their own local hazard mitigation strategy when this plan was initially developed. The local hazard mitigation for each city and school district is in the appendices and each plan contains the associated action plan strategy for implementation.

The planning committee for this plan developed a strategy within this document which would prioritize mitigation actions based on the number of hazards address, estimated costs, timeline for completing or implementing the action or program, and priority level determined from a cost-benefit approach. Fire chiefs and ambulance services directors have a valuable understanding of existing capabilities of their local emergency response units in Chickasaw County. City leaders and staff responded to these contributing factors of their existing and new hazard mitigation activities.

Priority Level

Committee representatives determined the priority level of all mitigation actions within this strategy based on resources and capabilities. The priority level was informed through discussions among planning committee members who considered potential benefits of implementing the activity, some hurdles that the city may face in implementing the action step, and the drawbacks of implementation.

The priority ranking for each identified mitigation activity is:

- **High**
- **Medium**
- **Low**

Requirement 44 CFR §201.6(c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Timeline

The planning committee determined the length of time that it would take to carry out initiating the action, policy, or program. The timeframe designations describe the length of time to carry out implementing the mitigation activity. For mitigation actions that describe preparing a plan or deploying a program, the timeframe would describe the implementation process of writing the plan or starting the program such as planning, assembling staff, and gathering funding. The timeframe does not describe the length of time the program is to be administered. For example, the timeframe for developing a response plan to assist vulnerable populations needing evacuation during a flooding event would describe the time it would take to prepare an actual planning document and not carry out the specific response during said emergency.

Table 52: Mitigation Action Timeline	Timeframe Description
Short Term	1-5 years
Mid-Term	5-10 Years
Long-Term	More than 10 Years
Completed or Active	Action Item Has Been Completed (and/or implemented as a regular, ongoing service/program/policy)

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If the action item was updated as completed, then the action item has been implemented. This may be one time action item or a regular, ongoing service/program/policy. The implementation strategy in this plan is focused solely on implementing any necessary mitigation measures or implementing the program/policy, etc. to be maintained and regulated by the designated agency.

Estimated Cost

Although in the long-term hazard mitigation actions will save money by avoiding the loss of lives or property damages, in the short-term each action will have an associated cost. The County will rely heavily on local funding sources to fulfill most of the plan obligations; however, they will also seek funds from State and Federal agencies for both pre- and post-disaster mitigation activities.

The estimated cost(s) for each mitigation action, program, or project is either: Minimal, Low, Moderate, or High depending upon various factors.

Requirement 44 CFR §201.6(c)(3)(iii): An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization will include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Table 53: Estimated Cost Level	Description
Minimal	Cost estimate is \$10,000 or less based on using current staff, time commitment, continuous of current duties, proposed action/program/project, and funding sources.
Low	Cost estimate for the project range from \$10,001 - \$99,999 based on existing proposed treatment, time commitment, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.).
Moderate	Cost estimate for the project range from \$100,000 - \$299,999 based on existing conditions, time commitment, proposed action/program/project, any further study that is needed, and level of engineering, and project components (permits, acquisition, coordination, etc.), and funding sources.
High	Cost estimate for project range is \$300,000 or higher based on existing conditions, time commitment, proposed action/program/project, any further study that is needed, level of engineering, project components (permits, acquisition, coordination, etc.), and funding sources

Requirement 44 CFR §201.6(c)(3)(ii): A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

Hazard Mitigation Action Implementation Plan

Table 54: Hazard Mitigation Category Descriptions and Examples

Mitigation Category	Description	Examples
Emergency Services	Actions that protect people and property during and immediately after a disaster or hazard event.	Warning Systems, emergency response services, protection of critical facilities
Education and Awareness Program	These types of actions keep residents informed about potential natural disasters.	Alert Iowa, Radio or television ads, social media outreach, websites, real estate disclosures, outreach to underserved or vulnerable communities
Natural system protection and nature-based solutions	Actions that minimize damage and losses by preserving or restoring the functions of natural systems. This type of action can include green infrastructure and low impact development, nature-based solutions.	Sediment and erosion control, stream restoration, greenways, source water protection plans, wetland preservation, prairie land-controlled burns
Structures and Infrastructure Projects	Actions that either modify existing buildings or structures to protect them from a hazard, or removal from a hazard area.	Acquisitions of flood prone properties, undergrounding utilities, structural retrofits, safe rooms, storm drain infrastructure such as culverts
Local Plans and Regulations	Actions by administrative or regulatory processes which direct how land and buildings are developed and built. These actions include regulations by public entities to reduce hazard losses.	Comprehensive land use plans, land use ordinances, development review procedures, building codes and enforcement, open space preservation, storm water management regulations

Notes for Mitigation action Tables

- ALL** = All Hazards
- A/P/CD** = Animal/Plant/Crop Disease
- D/L** = Dam/Levee Failure
- D** = Drought
- E** = Earthquake
- ES** = Expansive Soils
- EH** = Extreme Heat
- GWF** = Grass/Wildland Fire
- HMI** = Hazard Materials Incident
- IF** = Infrastructure Failure
- FF** = Flash Flooding
- FR** = Flooding- River
- L** = Landslides
- PHD** = Pandemic Human Disease
- RI** = Radiological Incident
- S** = Sinkholes
- SWS** = Severe Winter Storm
- T** = Terrorism
- TI** = Transportation Incident
- T/H/L** = Thunderstorm/ Hai/ Lightning
- T/W** = Tornado/Windstorm
- * Denotes primary agency responsible

Requirement 44 CFR §201.6(c)(3)(ii): A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

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Table 55: Emergency Services Mitigation Actions						
Actions that protect people and property during and immediately after a disaster or hazard event.						
Priority	Mitigation Action/Program/Project	Assoc. Hazard	Primary Agency Responsible for Implementation	Timeline	Estimated Cost (s)	Hazard Mitigation Goal(s) #
High	Maintain Well-Trained Personnel (Fire, First Responders, Police, EMS, Weather Spotters, and other Critical Services – includes Multi-Jurisdictional Training and Cooperation for all Hazards)	FF, FR, T/H/L, T/W, HMI, T	Individual Departments*; County EMA, Ambulance Service, Police Departments,	Active; updated annually	Minimal	1, 2, 3, 4, 5, 7
High	Develop Plan / Procedures to Assist At-Risk Populations during an Event (Transport to Shelters, Home Visits, etc.)	EH, FF, FR, SWI, T/H/L, T/W, HMI, D/L	County EMA* and Public Health	Active	Minimal	1, 5
High	Establish and maintain Emergency Notification System and Conduct Drills	All	County EMA*	Ongoing	Minimal	1,2,3, 5, 7
Medium	Enhance emergency response time, communication, and coordination to prepare and respond to various hazards.	All	County EMA*	Ongoing	Minimal	1, 2, 4, 5, 6
High	Identify and Improve Security at Critical Facilities including IT Security and Data.	T	Board of Supervisors*	Active	Low	1, 5
Medium	Develop and Maintain an Emergency Response Plan that is not IT-Specific	All	County EMA*	Active; updated annually	Minimal	1, 2, 4, 5, 6
Medium	Coordinate flood control efforts.	FF, FR	County EMA	Active	Minimal	1, 2, 3, 5, 6
Medium	Maintain Bulk Supply and Storage of Critical Elements (Fuels, Water, Nonperishable Food, etc.)	EH, FF, FR, SWS, T/H/L, T/W, D/L, T	Board of Supervisors, County EMA*	Active	Moderate	4, 5
Low	NOAA Weather Radio Awareness Program	All	County EMA*	Active, repetitive	Minimal	1, 2, 5, 6, 7
Low	Develop a Water Rationing Plan	D	County EMA and Public Health	Short-Term	Low	4
Low	Monitor current and emerging diseases and developed strategies to mitigate/reduce their impact	All	County EMA*	Active, repetitive	Minimal	1, 2, 5, 6, 7

Table 56: Education and Awareness Programs Mitigation Actions

These types of actions keep residents informed about potential natural disasters.

Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Date for Completion	Estimated Cost (s)	Hazard Mitigation Goal(s) #
High	Create an email list serv for outreach and website postings.	All	Individual Depts.*	Short-Term	Minimal	1, 2, 4, 5, 6
High	Engage with the public and track social media site interactions/visits for measuring impact.	All	EMA	Short-Term	Minimal	1, 2, 4, 5, 6
High	Determine ad campaign costs/estimates at movie theater and billboards for outreach posts.	All	EMA*, Individual Depts.	Short-Term	Minimal	1, 2, 4, 5, 6
High	Establish & Conduct a Public Awareness & Education Program (Notices, Newsletters, Brochures, Website, Warnings, Shelter Information, Importance of Vaccinations, Hazard Information, At-Home Improvements - plant trees, rain barrels, etc.).	D, EH, FF, FR, GWF, PHD, SWS, T/H/L, T/W, HMI, IF, D/L	County EMA* and Public Health	Active	Minimal	1, 2, 4, 5, 6
Medium	Continue to educate public and encourage use of Iowa One Call.	All	EMA	Ongoing	Minimal	1, 2, 4, 5, 6
Medium	Coordinate, organize, plan and train local jurisdictions on hazard readiness including response drills, HAZMAT reporting, and First Responder Capacity.	All	EMA	Ongoing	Minimal	1, 2, 4, 5, 6
Low	Continue volunteer recruitment and training for storm spotters.	All	EMA	Ongoing	Minimal	1, 2, 4, 5, 6
Low	Continue conducting incident command system training.	All	EMA	Ongoing	Minimal	1, 2, 4, 5, 6

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Table 57: Natural System Protection and Nature-Based Solutions Mitigation Actions						
Actions that minimize damage and losses by preserving or restoring the functions of natural systems. This type of action can include green infrastructure and low impact development, nature-based solutions						
Priority	Mitigation Action/Program/Project	Associated Hazard	Primary Agency Responsible for Implementation	Timeline	Estimated Cost	Hazard Mitigation Goal(s) #
High	Develop Groundwater Protection Plan or Drinkable Water Distribution Plan (inspections, testing, security, etc.).	D, FF, FR, PHD, HMI, TI, T	County Environmental Health*	Active	Minimal	1, 5
High	Maintain Membership of National Flood Insurance Program.	FF, FR	Board of Supervisors*	Active	Minimal	5
High	Maintain a Community-Wide Household Hazardous Waste Disposal Site or Event.	HMI, PHD	Board of Supervisors*	Active	Moderate	4
Low	Maintain Roadside Vegetation Management Program.	L	County Engineer	Active	Low	5
High	Utilize filter strips, detention basins, wetland improvements, buffer zones to improve water quality and reduce water hazards.	HMI, PHD	Board of Supervisors*	Active	Moderate	1, 2, 4, 9

Table 58: Structure and Infrastructure Projects Mitigation Actions

Actions that either modify existing buildings or structures to protect them from a hazard, or removal from the hazard area.

Priority	Mitigation Action/ Program/ Project	Associated Hazard	Primary Agency Responsible for Implementation	Timeline	Estimated Cost (\$)	Hazard Mitigation Goal #
High	Install Signage at Critical Transportation Sites (i.e., RR, Dangerous Intersections, etc.).	FF, FR, GWR, SWW, T/H/L, T/W, HMI, D/L, TI,	County Engineer*	Active	Minimal	1, 5
High	Provide an Adequate Number of Safe Rooms/Tornado Rooms for General Public Use.	T/H/L, T/W, T	Board of Supervisors*	Active	Minimal	1
High	Determine a prioritized list of buildings that would need a redundant power supply in terms of need and investigate funding these projects.	T/H/L, T/W, T, RI	EMA	Short-Term	Minimal	3, 9
Low	Flood Proof Critical Facilities.	FF, FR, D/L	Board of Supervisors	Short-Term	Low	2
Low	Develop & Enforce an Inspection & Repair Program for Public Infrastructure.	E, EH, FF, FR, T/W, D/L	County Engineer	Active	Moderate	1, 2, 5
Low	Either Purchase & Remove Structures in 100-YR Floodplain or Elevate Structures to at Least 1-FT Above 100-YR Floodplain, or both.	FF, FR, D/L	County EMA, Board of Supervisors	Active	Moderate	1, 2, 5
Low	Continue flood buyouts as needed.	FF, FR, D/L	Board of Supervisors	Ongoing	Low	2
Low	Develop & Enforce an Inspection & Repair Program for Public Infrastructure.	E, EH, FF, FR, T/W, D/L	County Engineer	Active	Moderate	1, 2, 5
Low	Invest in mitigation infrastructure including flood control systems, utility hardening, generators, storm shelters, and warning sirens.	E, EH, FF, FR, T/W, D/L	County Engineer	Active	Moderate	1, 2, 5

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Table 59: Local Plans and Regulations Mitigation Actions						
Actions by administrative or regulatory processes which direct how land and buildings are developed and built. These actions also include regulations by public entities to reduce hazard losses.						
Priority	Mitigation Action/Program/Project	Assoc. Hazard	Primary Agency Responsible for Implementation	Timeline	Estimated Cost (s)	Hazard Mitigation Goal #
High	Organize and hold regular Chickasaw County Disaster Planning Committee Meetings.	All	EMA, Board of Supervisors	Short-Term	Minimal	1, 2, 3, 5, 6, 7, 8
High	Develop and Maintain Command Procedures & Center.	All	County EMA*	Active	Minimal	1, 5
High	Promote County Wellness Activities and Public Health Department efforts in wellness.	PHD	County Public Health*	Active, repetitive	Minimal	1
High	Develop a Clean Up/Recovery Procedure / Plan.	FF, FR, SWS, T/H/L, T/W, HMI, DL, T	County EMA*	Active, updated annually	Minimal	4
High	Ensure Schools and Other Buildings / Structures with Large Populations have Evacuation Plans.	FF, FR, T/H/L, T/W, HMI, T	County EMA*	Active	Minimal	1, 2
High	Maintain updated NFIP Membership, flood maps, and ordinances.	All	Board of Supervisors, EMA*	Ongoing	Low	4, 5
High	Develop and Maintain Continuity of Operations Plan (COOP).	PHD, T/H/L, T/W, HMI, T	Board of Supervisors*	Active	High	4, 6

Section V - Plan Maintenance



Future Amendments and Updates

This is an update to the 2019 Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan. A plan update is to occur every five (5) years. This 2024 plan is to be commenced upon FEMA Certification.

Future Amendments:

Any future amendments to the plan shall occur only after an official Public Notice has been posted in a local publication announcing a Public Hearing on the matter.

After the public has had the opportunity to review the proposed amendments the City Council, School Board, and/or Board of Supervisors may, by resolution, choose to accept any amendment to the plan. Once a City Council and/or Board of Supervisors has adopted the amendment, the remaining elected board of each participating municipality shall hold a public hearing to receive public input on the amendment prior to local adoption.

All amendments made to this plan should be shared with each participating jurisdiction, the Chickasaw County

Emergency Management Agency and the Iowa Department of Homeland Security and Emergency Management Division.

Future Updates:

At a minimum, this Plan will be evaluated for consistency with FEMA and IHSEMD requirements and formally updated every five (5) years. However, it is strongly encouraged that the mitigation strategies for each community be reviewed and revised (if necessary) following disasters to determine if the recommended actions are still appropriate given the impacts of an event.

The Implementation Process & Funding

Requirement 44 CFR §201.6(c)(4)(ii): [The plan content must include] a plan maintenance process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans,

their prospective strategies developed in this planning process. Using the capability assessments conducted for each jurisdiction. These recommendations are to support and inform city or county stakeholders with hazard mitigation planning.

Recommendations

This set of recommendations are intended to provide options for local governments to incorporate hazard mitigation actions from

1. Phasing Projects Over Budget Cycles

In the implementation strategies in this plan, the estimated costs varied from minimal to high costs for each action item created by the planning committee and their representatives. Phasing is a process by which the completion of a project occurs over several budget cycles. Distributing the estimated costs of each mitigation action will make each action item more attainable over time.

2. Capital Improvement Programs

It is recommended that this updated hazard mitigation plan be incorporated into the City's or County's annual Capital Improvements Program update procedure.

3. Local Match Commitments

For most grants, there are commitments required or encouraged by funders which may allow your grant applications/requests to be considered. For projects that

require a local match commitment, the Council or Board of Supervisors should begin setting aside appropriate resources to meet their match liability.

4. Strategic Planning and Prioritization

It is recommended that projects created by each city's and/or county's planning committee participants be shared with city clerks, managers, boards, and department heads so that projects or programs in each jurisdiction's implementation strategy may be prioritized for funding through the jurisdictions' budgeting process.

5. Hazard Mitigation Grant Program

The information presented in the Plan may be used as documentation for grant applications for FEMA's Hazard Mitigation Grant Program (HMGP). This grant funding is available after a presidentially declared disaster.

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In this program, homeowners and businesses cannot apply for a grant. However, a local community may apply for funding on their behalf. All participating jurisdictions must complete the development of each of their respective local hazard mitigation plans found in the Appendices of this plan and adopt hazard mitigation plans through resolutions to receive funding for a hazard mitigation project application. All resolutions are in the Appendices of this plan.

For more information on the HMGP application and program, visit <https://www.fema.gov/grants/mitigation/hazard-mitigation>

Evaluation & Review Process

The Chickasaw County Emergency Management Coordinator and governing bodies from all jurisdictions are responsible for the Hazard Mitigation Plan and implementation of the goals and actions contained herein and may seek assistance from other city or county staff, Council of Governments, and consultants to accomplish mitigation projects.

Requirement 44 CFR §201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Reconvene Annually

The plan should be reviewed annually to determine program effectiveness or at a minimum, shall be reviewed and updated within five years of the FEMA approval date. To assist in the review process, the Hazard Mitigation Committee may reconvene annually upon the request of the Chickasaw County Emergency Management Coordinator. The planning committee would be comprised of representatives from each participating jurisdiction as well as from neighboring communities, schools, businesses, nonprofits, agencies, and other interested parties. Together they will be charged with reviewing and evaluating implementation progress of the mitigation plan. A public notice should be posted at all city and county government buildings and in the local newspapers inviting the public to participate as members of the Committee and/or to review the Plan and provide comments. Following the committee's completion of the annual review process, the findings of the review and recommended changes, if applicable, will be presented during a City Council and Board of Supervisors meeting.

Evaluation Tools

The Chickasaw County Hazard Mitigation Plan Review Tool in Appendix R provides a public meeting evaluation form to assist in the review, evaluation, and updating process. In Appendix N, the details on the updates or progress by each jurisdiction are provided. The updates in that appendix were provided by participants from the previous plan before this updated plan. Previous participants of the 2019 Chickasaw County MJ-HMP participated and developed an updated to their local hazard mitigation plan per FEMA requirements to qualify for pre-disaster mitigation funding. Since many activities fall under the normal duties of most city governments (e.g. funding and maintaining emergency services), not many activities were deleted.

Several communities in Chickasaw County are limited both in size and capacity to implement mitigation programs. Under the confines of these limited resources, some jurisdictions chose to drop a variety of previously defined mitigation actions, as they were determined to longer be a priority or were not feasible.

Continued Public Participation

Chickasaw County's emergency management coordinator has been proactive in creating working relationships among all communities and the county's emergency management resources. Cities had not typically been tasked to initiate meetings with the public to discuss hazard mitigation issues. This has been the purview of the Emergency Management Office's activities among cities to conduct meetings whereby the cities and public are invited to cover disaster response and recovery issues. Common issues discussed included tornado sirens, tornado safe rooms, emergency generators, storm spotter training, and other training needs. The coordinator ensures each jurisdiction regularly refers to their HMP in their assistance to cities. The coordinator also encourages cities to actively participate in any HMP development meetings and continue or maintain the monitoring of implementation strategy created by their participating members to their respective hazard mitigation plans.

Cities can expect Chickasaw County's EMA coordinator to reach each jurisdiction for updates in the mail and email and to check for regular updates on the county website. To ensure that the public remains involved in the future implementation of this Plan, it shall remain available at all participating city halls, school districts, and

the county courthouse. An electronic PDF copy of this plan will be posted on the Iowa Northland Regional Council of Government's website as well, at www.inrcog.org/pub.

Requirement 44 CFR §201.6(c)(4)(iii): Discussion on how the community will continue public participation in the plan maintenance process.

This plan shall be made available to any party who requests to see it. In the event the Hazard Mitigation Committee is reconvened by the County Emergency Management Coordinator, the process of which has been previously discussed, the public will be notified and provided an opportunity to participate in planning meetings and submit comments. The public will be notified in accordance with Iowa's Open Meeting and Records Laws (Iowa Code Chapters 21 and 22), said meetings will be open to the public and all records shall be available for inspection. The coordinator will continue to work with each participating jurisdiction in ensuring the plan goals are followed and that these jurisdictions are properly prepared for any disaster that may come.

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Required Five (5) Year Update

All local jurisdictions seeking to remain eligible for mitigation project grant funding are required to review and revise their hazard mitigation plans to reflect changes in development and progress in their local mitigation efforts. All plans must be resubmitted to the State Hazard Mitigation Officer for initial review and coordination. Per the goals in this county hazard mitigation plan, future hazard mitigation plans should seek conformity to the multi-jurisdictional process. In this multi-jurisdictional hazard mitigation planning process, the Chickasaw County Emergency Management coordinator was the plan lead for effort. Designating the county EMA coordinator for future updates begins with the grant application.

Integrating the MJ-HMP Plan into other Planning Documents

Each jurisdiction should consider the findings from this document when updating or writing new planning documents. As deemed appropriate by the community government, this plan should be incorporated into existing or proposed development of Comprehensive Plans, Land-Use Plans and other appropriate plans or programs. Each jurisdiction should integrate and consider their goals as well as their current and future mitigation action steps with existing and future jurisdictional plans. INRCOG incorporates the hazard mitigation plans with each jurisdiction’s comprehensive land use plan, housing needs assessment, long term transportation plans, urban renewal plans, existing and future zoning, and subdivision ordinances, as well as building code.

Regulation 44 CFR §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 plans or capital improvement plans, when

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