

City of Fredericksburg, Iowa

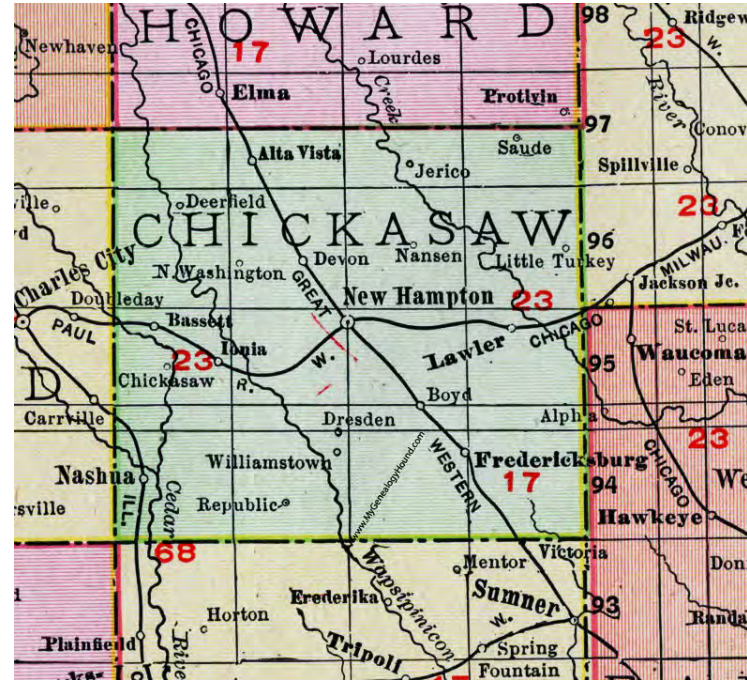
Hazard Mitigation Plan 2024 Update

Appendix C of Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan

Funded by the Chickasaw County Emergency
Management Agency

Prepared by Iowa Northland Regional Council
of Governments (INRCOG)

April 2024



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Page Reserved for Resolution Adopting Plan by City Council

Table of Contents	
About.....	2
The Planning Process.....	3
City Profile.....	5
Highway Traffic and Crash Data.....	7
Housing Data.....	7
Vulnerable Assets.....	9
Critical Facilities.....	10
Future Development.....	15
National Flood Insurance Program.....	17
Hazard Risk Assessment.....	18
Hazard Mitigation Goals.....	22
Previous Mitigation Activities by Type.....	23
Components of the Strategy.....	26
Implementation Strategy by Type of Hazard Mitigation Activity	27

Table Index

Table 1: Population Data	6
Table 2: Employment Data	6
Table 3: Industry Data	6
Table 4: Crash Data in Fredericksburg (2019-2023)	7
Table 5: Housing Data	8
Table 6: Utility Providers	8
Table 7: Valuation of All Parcels in Fredericksburg (2023)	12
Table 8: Potential Property Losses from a 1% Annual Chance Flood	12
Table 9: National Flood Insurance Program Information	17
Table 10: Hazard Risk Assessment	21
Table 11: Local Capability Assessment	25
Table 12: <i>Education and Awareness Programs</i> Mitigation Activities	27
Table 13: Emergency Services Mitigation Activities	28
Table 14: <i>Structure and Infrastructure Projects</i> Mitigation Activities	29
Table 15: <i>Local Plans and Regulations</i> Mitigation Activities	30
Table 16: <i>Natural System Protection/Nature-Based Solutions</i> Mitigation Activities	31

Figure Index

Figure 1: County Map	5
Figure 2: Iowa Crash Analysis for All Traffic Incidents (2019-2023)	7
Figure 3: Critical Facilities Map	11
Figure 4: Flood Plain Map	13
Figure 5: Flood Scenario Map	14
Figure 6: Historical Precipitation Data and Trend for Chickasaw County, Iowa	15
Figure 7: Historical Temperature Data and Trend for Chickasaw County, Iowa	16

About

The City of Fredericksburg developed this local Hazard Mitigation Plan to update their previous plan. That Plan was part of the 2019 Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan. The 2024 Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan is a sequential 5-year update to the previous hazard mitigation document. Federal hazard mitigation grant programs require an updated hazard mitigation plan approved by FEMA to be in good standing and remain eligible for grant funding. The Plan was developed to meet the requirements in Title 44 CFR § 201.6.

Elected officials, city clerks, planners, first responders, and other stakeholders were invited to attend planning committee meetings as participants while they completed worksheets that were returned to the Chickasaw County's Emergency Management Agency (EMA) and INRCOG. Chickasaw County's EMA initiated and funded this effort for all participating communities and contracted INRCOG to coordinate a multi-jurisdictional approach to this plan development process.

Participating communities included all nine (9) incorporated jurisdictions in Chickasaw County. Other participating members were representing their respective County departments. The school district superintendents of three public school districts participated and represented their jurisdictions. Four (4) committee meetings were held between March 19th and April 23rd wherein each participant provided data and completed work sheets to develop their hazard mitigation plans.

FEMA's Emergency Management Cycle



What is Hazard Mitigation?

Hazard Mitigation is any *sustained* action taken to reduce or eliminate long-term risk to life and property from hazards.

The emergency management cycle has 4 phases:

- **Preparedness** is the assessment of potential risks, hazards, and vulnerabilities that a community may face. The development and updating of activities, programs, and systems before an event occurs is included in this phase of the cycle.
- **Response** is the immediate effects after a disaster.
- **Recovery** is a long-term phase that focuses on returning the community to normal after a disaster.
- **Mitigation** is an action that can occur at any phase.

The Benefits of Hazard Mitigation

For local governments, there are benefits in knowing hazards, their risks, and planning for mitigation strategies.

Those include:

- ✓ An increased understanding of natural, technical, and man-made hazards faced by communities.
- ✓ Taking an opportunity to create more sustainable and disaster-resistant communities.
- ✓ Participating in this collaborative intergovernmental effort is cost effective for all participants.
- ✓ 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 equitable outcomes.
- ✓ Setting long-term goals that can be compatible with city policies or planning documents.

The Planning Process

In emergency management planning, reducing the community's risk to natural hazards is a multi-step process which involves collaboration among stakeholders, assessing risk and vulnerabilities of hazards facing the community, establishing actions or activities to reduce risk, and assembling an organized strategy to carry out all mitigation activities.

Participants in the Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan Planning Committee provided the information in this plan including community profile information, hazard mitigation goals, mitigation activities/action, updates to existing mitigation activities, and elements included in the strategy such as priorities, designated agencies, estimated costs, and overall strategic direction of this plan.

Participants in the Plan Followed This 5 Step Process



Community Data Sources

Population data is based on 2020 decennial Census data. The 2022 American Community Survey 5-year estimates are the latest and most reliable survey data sets to understand what is taking place in the county and each city. Most counties, cities, and towns rely on 5-year estimates. Employment, workforce, and industry figures in this Plan are estimates that have a margin of error.

It is important to note that the ACS estimates used for rural communities will have a degree of uncertainty associated with them, called sampling error, because they are based on a sample. In general, the larger the sample, the smaller the level of sampling error. Rural communities tend to have smaller samples than larger cities, so the “margin of error”—a measure of the precision of an estimate at a given level of confidence—likely will be larger for rural areas.

Crash data along roadways within each jurisdiction is collected between the period of 2019 and 2023. Using a map tool interface, the data was taken at a city level and presented to understand incident severity, casualties, and property damage from reported accidents. Accident data is added to the site daily and accessible through an online website, <https://icat.iowadot.gov/>.

In the risk analysis section of this Plan, estimates of property loss are measured using mapping of hazardous zones. For the vulnerability risk assessment, flood prone homes were determined using the boundaries of the 100 year (1%) annual chance flood zone. The value of potential property loss was derived from the 2023 assessed dollar value of

structures and dwellings on affected parcels provided by the Chickasaw County Assessor’s Office.



City Profile

Jurisdiction: City of Fredericksburg

County: Chickasaw County

Population (2020): 987

The City of Fredericksburg is in the lower east quadrant of Chickasaw County. State Highway 18 and County Highway V48 intersect in Fredericksburg. The east branch of the Wapsipinicon River is west of Fredericksburg.

The following data presented in tables on the following page include population, employment, and industry sector data for the community based on 2020 Census data and 2022 American Community Survey 5-year estimates.

In 2020, the city's population was 987 and 93% White with a median age is 44. Working aged residents (15-65 years) made up 55% of the population. Children and teens (younger than 15 years) made up 20% of Fredericksburg's population while older adults (older than 65 years) made up 25%.

The median household income in 2022 was \$62,583. The unemployment rate was very low at 1%. Most people (93%) commuted to work and 38 people or 7% of the workforce worked from home. The top three largest industry sectors in Fredericksburg are as follows (in order from highest to lowest): 1) Manufacturing; 2) Educational Services, and health care, and social assistance, and 3) Retail Trade.

Figure 1: Map of Chickasaw County

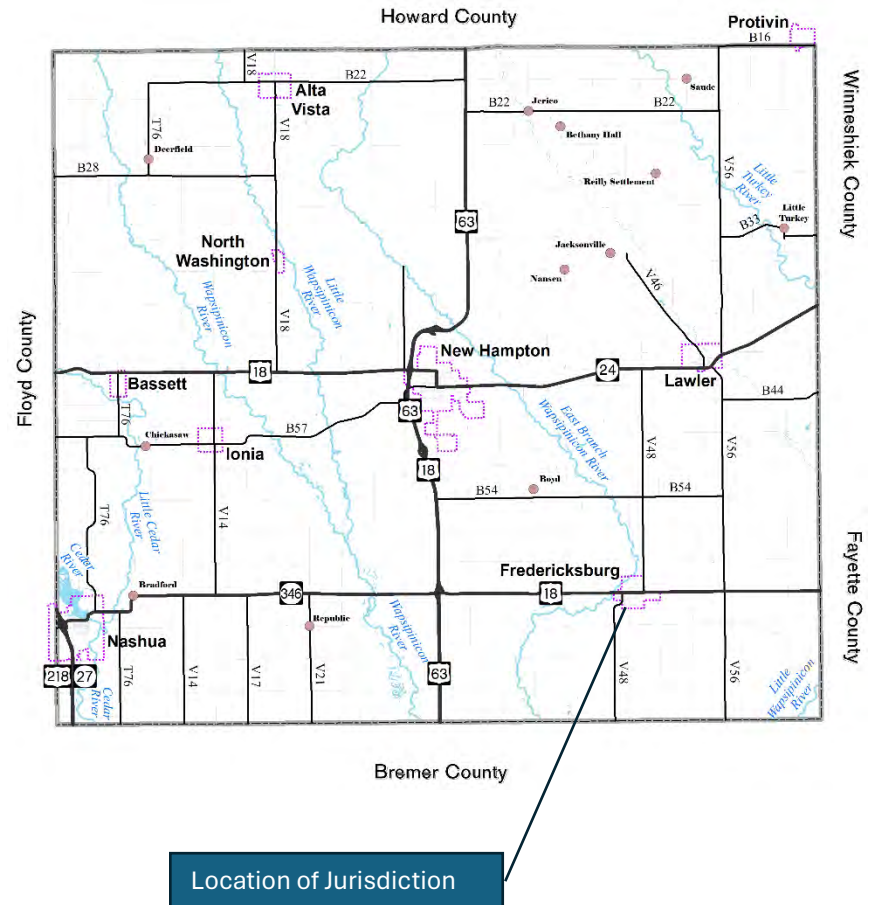


Table 1: Population Data (2020)		
City of Fredericksburg		
	Total	% of Pop.
Total population	987	100%
AGE		
Under 5 years	57	6%
5 to 9 years	76	8%
10 to 14 years	69	7%
15 to 19 years	49	5%
20 to 24 years	32	3%
25 to 29 years	40	4%
30 to 34 years	47	5%
35 to 39 years	82	8%
40 to 44 years	50	5%
45 to 49 years	43	4%
50 to 54 years	54	6%
55 to 59 years	65	7%
60 to 64 years	78	8%
65 to 69 years	60	6%
70 to 74 years	49	5%
75 to 79 years	59	6%
80 to 84 years	38	4%
85 years and over	39	4%
Median Age	43.7	-
RACE		
White	918	93%
Black or African American	9	1%
Hispanic or Latino (of any race)	39	4%
American Indian and Alaska Native	3	0%
Asian	3	0%
Native Hawaiian/Other Pacific Islander	0	0%
Some Other Race	18	2%
Two or More Races	36	4%
<i>Source: 2020 Census</i>		

Table 2: Employment Data (2022)		
City of Fredericksburg		
	Value	% of Population
Median Household Income	\$62,583	-
Unemployment Rate (2022)	1%	-
Workers that commute to work	474	93%
Workforce that works from home	38	7.40%
<i>Source: 2022 American Community Survey 5-Yr Estimates</i>		

Table 3: Employment Industry Data (2022)		
City of Fredericksburg		
Workforce Industry	# of Workers	% of Workforce
Workforce	512	100%
Agriculture, forestry, fishing and hunting, and mining	22	4%
Construction	10	2%
Manufacturing	154	30%
Wholesale trade	27	5%
Retail trade	57	11%
Transportation -warehousing, utilities	4	1%
Information	0	0%
Finance and insurance, and real estate and rental and leasing	32	6%
Professional, scientific, and management, and administrative and waste management services	13	3%
Educational services, and health care and social assistance	111	22%
Arts, entertainment, and recreation, and accommodation and food services	17	3%
Other services, except public administration	39	8%
Public administration	26	5%
<i>Source: 2022 American Community Survey 5-Yr Estimates</i>		

Highway Traffic and Crash Data

Based on Iowa DOT crash data, between 2019 and 2023 there have been 18 incidents. There were 13 accidents involving property damage totaling \$264,700.

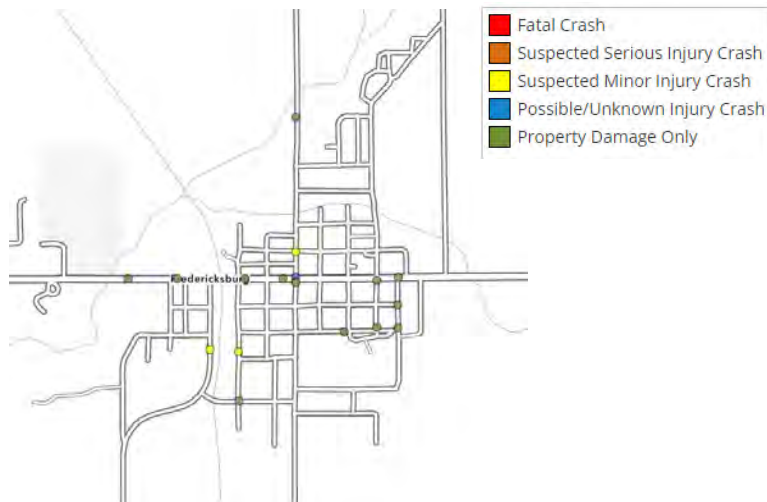
Total Crashes	18
Crash Severity	
Fatal	0
Suspected Serious Injury	1
Suspected Minor Injury	3
Unknown	1
Property Damage Only	13
Property Damage Total	\$264,700

Housing Data

The City of Fredericksburg has 451 occupied housing units. Nearly 91% of them are single family detaching housing. An estimated 5 housing units are mobile homes.

A large portion of the housing stock was built between 1960-79 (27%). About 65% of the housing stock is under 60 years old and was built after 1960. Most homes heat their units with gas (73%).

Figure 2: Iowa Crash Analysis for All Traffic Incidents (2019-2023)



Source: Iowa DOT

Table 5: Housing Data (2022)		
City of Fredericksburg		
	Total	% of Occupied Units
Occupied housing units	451	100%
Housing Unit Type	Total	% of Occupied Units
1, detached	408	91%
1, attached	0	0%
2 apartments	3	1%
3 or 4 apartments	35	7%
Mobile home or other type of housing	5	1%
Year Structure Built	Total	% of Occupied Units
2020 or later	0	0%
2010 to 2019	14	3%
2000 to 2009	81	18%
1980 to 1999	80	18%
1960 to 1979	120	27%
1940 to 1959	70	16%
1939 or earlier	86	19%
House Heating Fuel	Total	% of Occupied Units
Utility gas	327	73%
Bottled, tank, or LP gas	8	2%
Electricity	116	26%
Fuel oil, kerosene, etc.	0	0%
Coal or coke	0	0%
All other fuels	0	0%
No fuel used	0	0%
<i>Source: 2022 American Community Survey 5-Year Estimates</i>		

Community Utility Providers

Fredericksburg Municipal provides utility electric services. Black Hills Energy is the natural gas service provider. Windstream telephone services and broadband internet services. Residents receive water, sewer, and waste/recycling collection services from the city.

Table 6: Utility Providers	
City of Fredericksburg	
<i>Electric</i>	Fredericksburg Municipal
<i>Natural Gas</i>	Black Hills Energy
<i>Telephone/Internet</i>	Windstream
<i>Cable TV</i>	Mediacom
<i>Water Services</i>	City of Fredericksburg
<i>Sewer Services</i>	City of Fredericksburg
<i>Waste Collection</i>	City of Fredericksburg
<i>Recycling</i>	Jendro Sanitation

Vulnerable Assets

People

Vulnerability to hazard losses increases where there are larger concentrations of people. In towns where population density increases, the number of people that can be harmed during a hazard event (tornado, flood, etc.) increases. In addition, there are segments of the population that may be more susceptible to impacts and/or harm from a hazard depending on their location within the area (i.e. flood zone or near industrial plants with hazardous materials). This includes underserved or socially vulnerable populations.

Vulnerable Age Groups

Both younger and older aged groups are likely to require assistance with physically moving to shelters or finding safety. Elderly residents may not have a personal vehicle to move away from a hazard quickly. Cognitive impairments among older adults may cause some to get easily confused.

Households Facing Poverty or With Limited Income

Families or older adults living at, near, or below poverty are more likely to be impacted by hazards than other households with higher incomes. The costly repairs from a tornado or derecho for a low-income households may be more adversely affected than another household that has the same damage but may be able to afford the repairs without much change to their lifestyles or needs. That disparity is also different during extreme weather events such as a heat wave. Low-income households may not be able to afford the electricity to run air conditioning and many may face

complications that involve heat stroke, fatigue, or death due to their age (infants or the infirm) and health conditions (obesity, heart conditions, diabetes).

Fredericksburg's Vulnerable Populations

In Fredericksburg, 7% (30 of 451) of occupied households are below the poverty level. About 255 (57%) of occupied households have elderly occupants (60 years and over). About 124 (29%) households have elderly residents (65 years and over) living alone.

Most residents have access to a vehicle, however an estimate of 11 households have no access to a vehicle. Nearly 184 (41%) households have a person living with a disability. This is broadly defined from the data estimates for Fredericksburg. However, persons with mobility disabilities may be at a higher risk than others especially during unexpected natural disasters where accessibility is not always guaranteed to shelter.

Manufactured homes are unsafe in a tornado. Fatality rates are significantly higher than sturdy buildings. An alternative shelter should be identified prior to a tornado watch or warning. There are 5 mobile homes estimated in Fredericksburg. With an average household size of 2.1, that potentially puts 10 people at a greater fatality risk than others.

Critical Facilities

Identifying structures that may be affected from a hazard event and also serve a critical function for the community are shown in the table on the following page.

There are 400 housing units that are connected to the municipal water service, while the remaining 13 used privately drilled wells. The City's water is supplied by local wells, with an elevated storage capacity of 250,000 gallons. The capacity of the water plant is 230,000 gallons. Average consumption is 85,000 gallons per day (gpd), while the peak consumption is 110,000 gpd. The capacity of the municipal water system currently exceeds peak demands. Therefore, the system has the capacity to accommodate additional residential development.

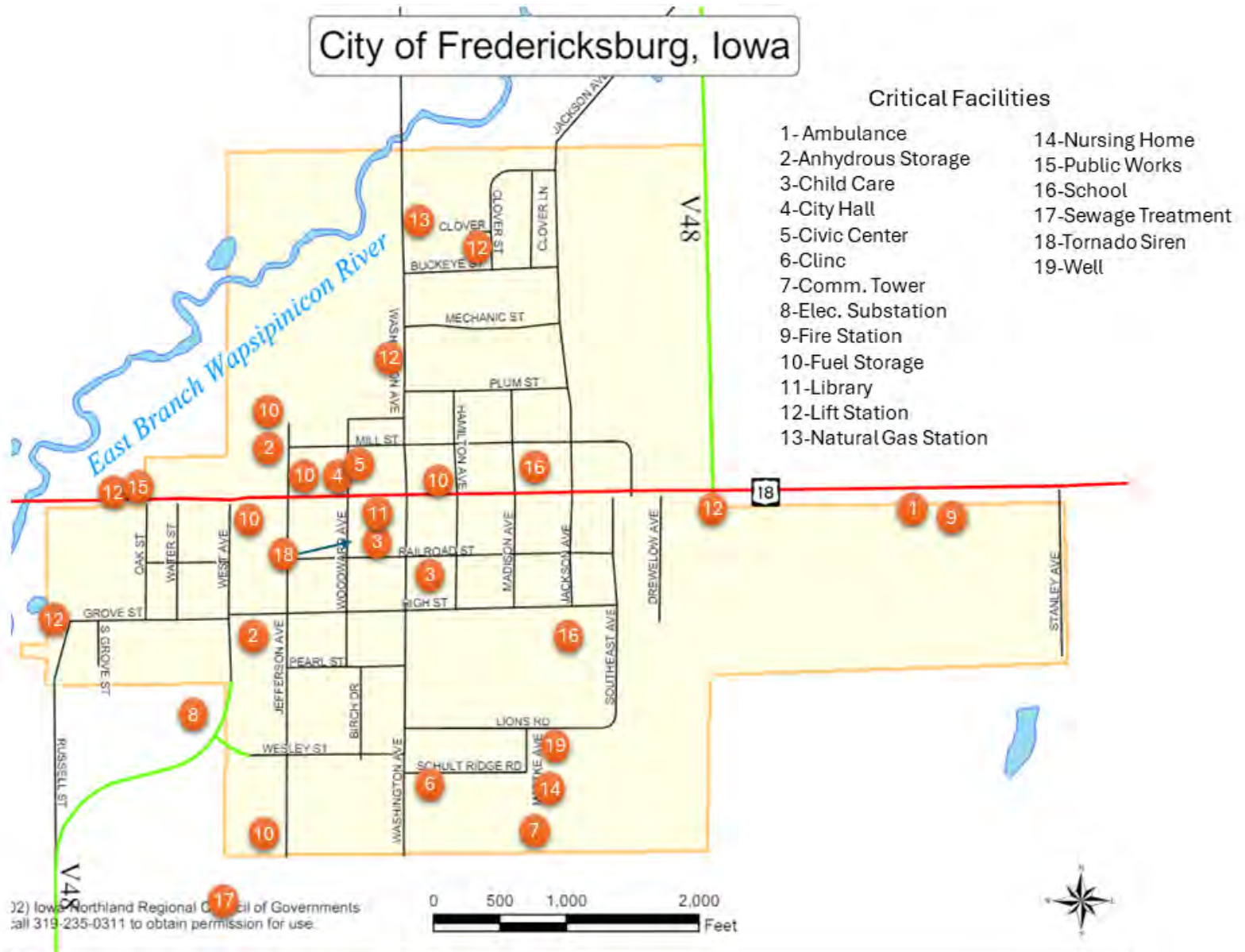
The City of Fredericksburg is served by a primary sewage treatment plant. The average load is 180,000 gpd, with a

peak load of 260,000 gpd. The design capacity of the facility is 337,000 gpd.

The existing wastewater treatment facility consists of wastewater treatment ponds located west of the city's limits. Wastewater is transported to the ponds with the assistance of five wastewater lift stations strategically located throughout the city. The locations of these wastewater stations are shown on the Critical Sites Map (See Figure 3).

In the next 20 years, Fredericksburg is likely to see population growth and the existing water plant and wastewater treatment lagoons have the capacity to manage slow steady growth. Future hazard mitigation efforts will note additional facilities related to the assets here shown within the vulnerability assessment.

Figure 3: Critical Facilities Map



Measuring Vulnerability to Selected Hazards

Tornado Hazard

Since 2000, there have been 2 recorded tornados in and around Fredericksburg. On June 13, 2000, an EF0 touched down and caused \$15,000 worth of property damage. On August 19, 2009, an EF0 caused \$20,000 worth of property damage and \$10,000 worth of crop damage.

All buildings in Fredericksburg are prone to being damaged by a tornado. Therefore, the vulnerability of the community was determined by the assessed valuation of all buildings and dwellings on all parcels within the city’s limits.

Using the assessed value from December 2023, the valuation of all 550 parcels in the City of Fredericksburg is \$37,620,810 based on Chickasaw County assessor data. The City of Fredericksburg has a potential property loss of \$37,620,810 from a tornado disaster.

Table 7: Valuation of All Parcels in City of Fredericksburg (2023)

Percent of City at Risk of a Tornado	100%
# of Parcels	550
Total Value (Buildings and Dwellings)	\$37,620,810
Source: Chickasaw County Assessor’s Values in 2023	

Flood Prone Areas

The potential property losses of structures prone to flooding was calculated using the effective flood insurance rate map (FIRM) flood hazard zones for a 100-year (1%) annual chance flood.

In Figures 4 and 5, the maps show the flood hazard zone in and around the City of Fredericksburg. The river basin is depicted in the topography shown in Figure 4. The parcels that are impacted by the 1% annual chance of flood are highlighted in Figure 5. There are 61 parcels within Fredericksburg potentially affected. The value of all buildings and dwellings on the affected parcels is \$5,099,525 based on the latest Chickasaw County assessor information. This covers 13.5 % of the city’s total parcels.

Table 8: Potential Property Losses from the 1% Annual Chance Flood

Percent of City Affected	13.6%
# of Parcels	61
Total Value (Building and Dwelling)	\$5,099,525
Source: Chickasaw County Assessor’s Values in 2023	

Figure 4: Flood Plain Map

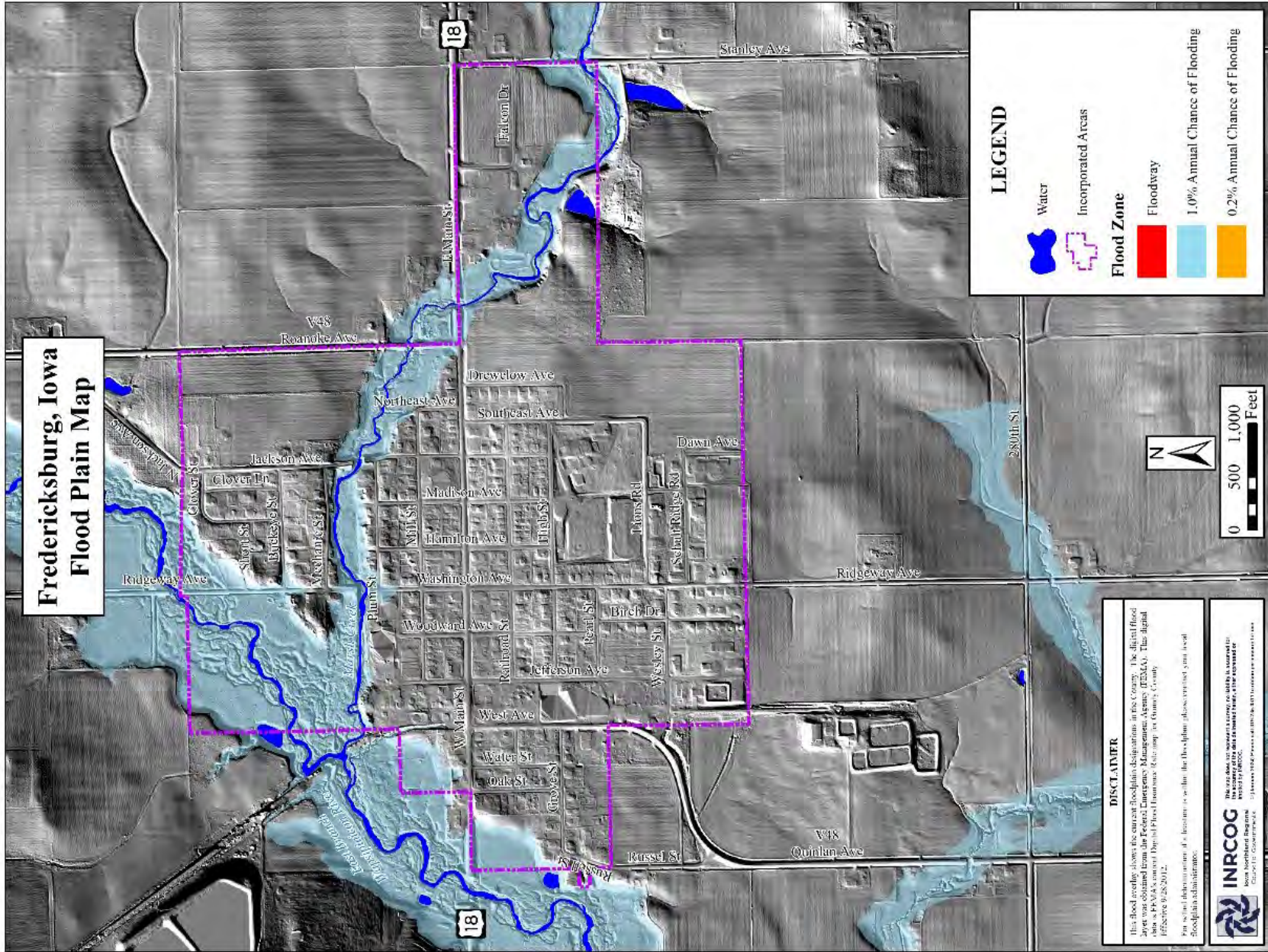
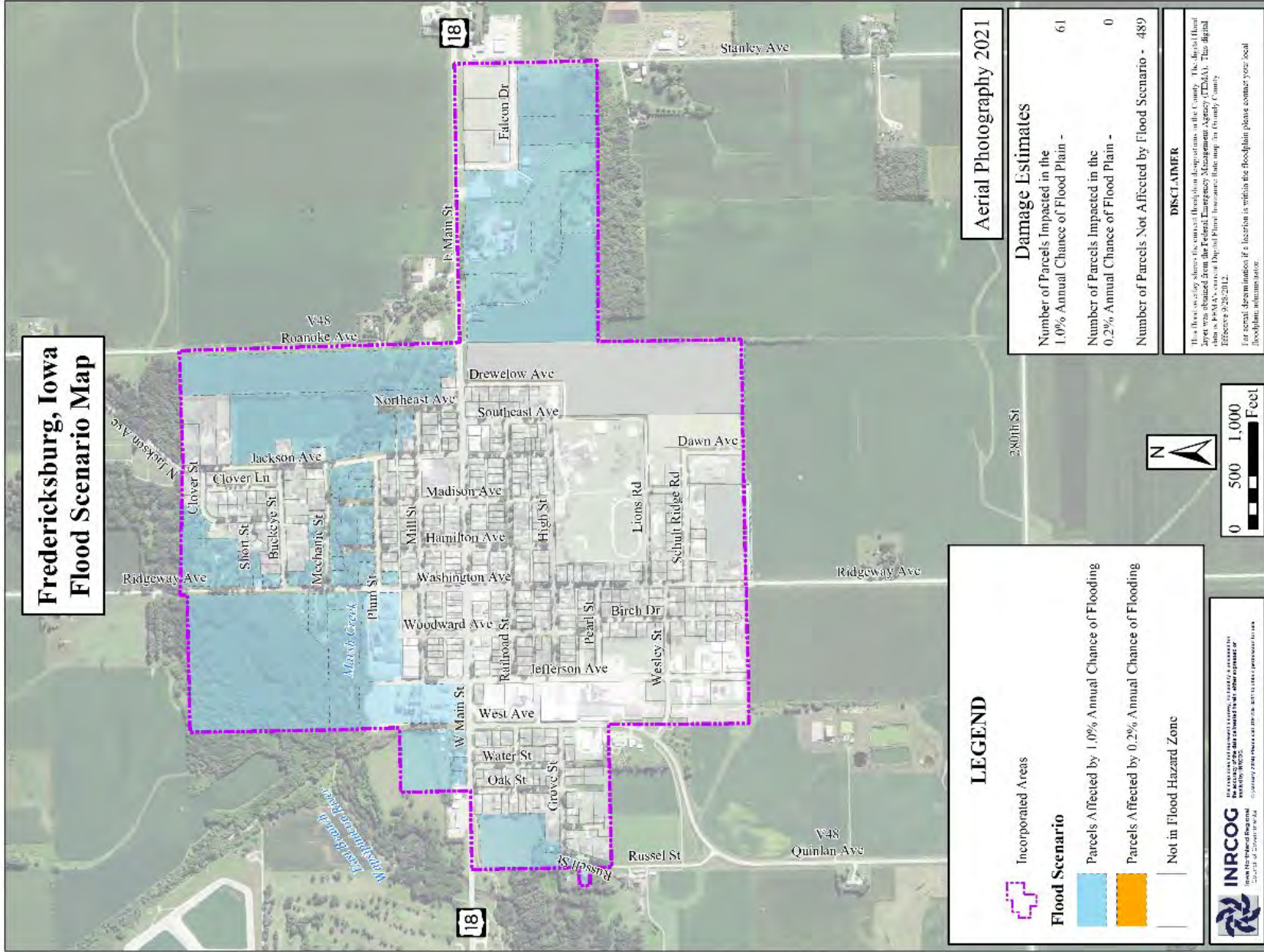


Figure 5: Flood Scenario Map



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.

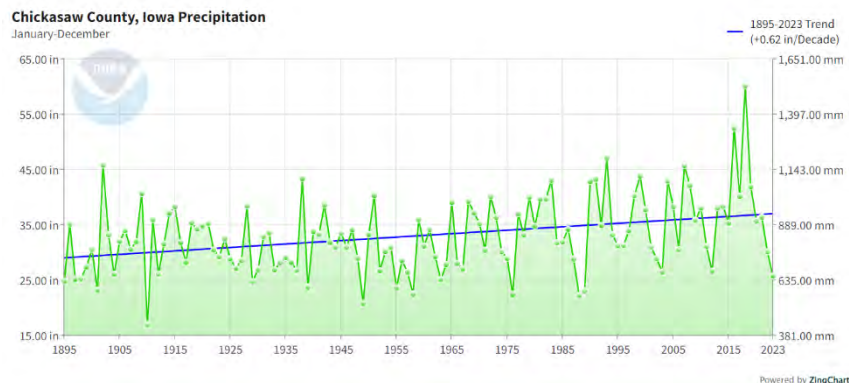
Long term trends of climate patterns for the region were summarized in the Fourth National Climate Assessment Midwest Section.¹ The National Climate Report is mandated to be updated every 4 years and deliver results to Congress and President on the effects to agriculture, energy productions, land use, 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 6. 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 6. 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 6: Historical Precipitation Data and Trend for Chickasaw County, Iowa²



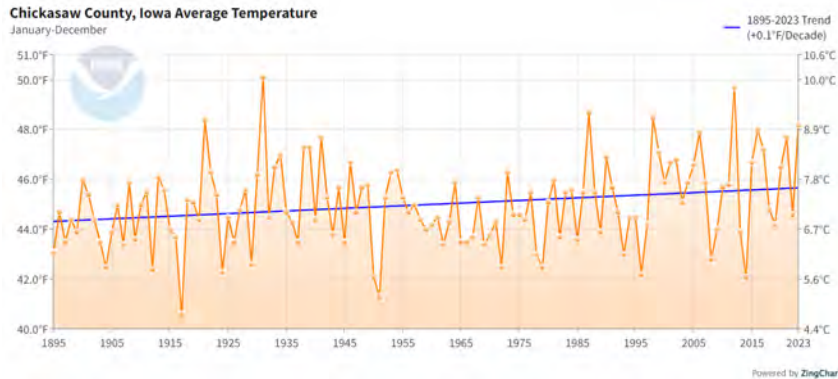
Average Annual Temperatures in Chickasaw County

The monthly average temperature is plotted over a 12-month period from 1885 to 2023 in Figure 7. The annual average temperature is also shown with a linear trend in Figure 7. This trend shows the average temperature in Chickasaw County increasing at a rate of +0.1° F every 10 years.

¹ USGCRP, 2018: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.

² NOAA National Centers for Environmental information, Climate at a Glance: County Time Series, published February 2024, retrieved on April 15, 2024 from <https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series>

Figure 7: 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 is probably 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.

National Flood Insurance Program

The City of Fredericksburg participates in the National Flood Insurance Program. The current effective FIRM map date is September 28, 2012.³ There are 3 policies within the community with a total coverage of \$1,305,000. There was 1 loss reported with a net of \$1,666 paid.

FEMA defines a repetitive loss property as an insurable building that has experienced two losses in a 10-year period in which each loss is \$1,000 or more. There are no reported repetitive loss properties.

Table 9: National Flood Insurance Program Information	
Community Name	City of Fredericksburg
NFIP Participant (Yes/No)	Yes
Designee / Agency to implement NFIP Requirements	City Clerk
Participant in CRS (Yes/No)	No
Current Effective Map Date	09/28/2012(M)
Regular-Emergency Program Entry Date	09/29/1986
Total Policy Count	3
Total Coverage	\$1,305,000
Total Losses	1
Total Net Dollars Paid	\$1,666
<i>(M) = No flood elevations determined - All Zone A, C, and X</i>	
<i>Source: Source: FEMA National Flood Insurance Program, Data and Analytics, HUDEX Report.</i>	
https://nfipservices.floodsmart.gov/reports-flood-insurance-data	

³ FEMA Community Status Book Report, 04/16/2024
<https://www.fema.gov/cis/IA.pdf>

Hazard Risk Assessment

The top three hazards from the risk assessment are:

1. River Flooding
2. Flash Flooding
3. Tornadoes/ Windstorm



Methodology

This risk assessment identifies how people, property, and structures would be harmed or damaged by one of the listed hazard events. Iowa Homeland Security and Emergency Management Department (Iowa H.E.S.M.D.) provided the hazard risk score formula for determining the level of risk used in this analysis.

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 tornadoes 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 hazard risk factors are rated on a scale between 1 and 4 by committee participants after reviewing profiles of each hazard with the planning coordinator. Information was shared with the committee which described the hazard, historical occurrences, impact, duration, and

warning time. Participants used this information to strengthen their understanding to rate each hazard factor.

Hazard Risk Score Formula

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

Source: Provided by Iowa H.S.E.M.D.

Hazard scores were collected during the 2nd county committee meeting. INRCOG planners calculated the hazard risk score for each hazard based on the formula in this section. Results for Fredericksburg are on page 21.

Score Value vs. Hazard Risk Level	Description of hazard with this rating
Scores with a value closer to 1: <u>Low risk hazard</u>	Hazard is not likely to affect people or property because the likelihood is minimal.
Scores with a value closer to 4: <u>High risk hazard</u>	The hazard has historically occurred and may have significant impacts to people and property.

Probability

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

Probability Score Definitions		
Score	Description	
1	Unlikely	<i>Less than 10%</i> probability in any given year (up to 1 in 10 chance of occurring), a history of events is less than 10% likely or the event is unlikely but there is a possibility of its occurrence.
2	Occasional	<i>Between 10% and 20%</i> probability in any given year (up to 1 in 5 chance of occurring), history of events is greater than 10% but less than 20% or the event could possibly occur.
3	Likely	<i>Between 20% and 33%</i> probability in any given year (up to 1 in 3 chance of occurring), history of events if greater than 20% but less than 33% or the event is likely to occur.
4	Highly Likely	<i>More than 33%</i> probability in any given year (event has up to a 1 in 1 chance of occurring), history of events is greater than 33% likely or the event is highly likely to occur.

Magnitude 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.

Magnitude or Severity Score Definitions		
Score	Description	
1	Negligible	Less than 10% of property severely damaged, the shutdown of facilities and services for less than 24 hours, and/or injuries/illnesses treatable with first aid
2	Limited	10% to 25% of property severely damaged, shutdown of facilities and 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.

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) that occur instantaneously or without any significant warning time.

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)

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.

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

Conclusion for Hazard Risk Assessment

Table 10 displays rated risk scores for each associated hazard. This assessment was completed by city representatives based on hazard profiles prepared for the planning committee. Fredericksburg's representatives did not feel that radiological incidents should have placed high on their risk assessment. After consideration of top hazards from their risk assessment score sheets, the top three hazards for Fredericksburg were re-evaluated to include 1) River Flooding 2) Flash Flooding 3) Tornado/Windstorm.

Table 10: Hazard Risk Assessment					
Hazards	Probability	Magnitude	Warning Time	Duration	Score
Flooding - Riverine	2	3	4	4	2.8
Flooding - Flash	3	2	3	3	2.7
Tornado/Windstorm	1	4	4	4	2.7
Thunderstorm/ Lighting/ Hail	3	2	3	2	2.6
Extreme Heat	3	2	1	4	2.5
Radiological	2	3	4	1	2.5
Drought	2	3	1	4	2.4
Animal/ Crop/ Plant Disease	2	3	1	4	2.4
Pandemic/ Endemic Human Disease	2	3	1	4	2.4
Grass/Wildland Fire	2	2	4	1	2.2
Hazardous Materials	2	2	4	1	2.2
Transportation Incidents	2	2	4	1	2.2
Severe Winter Storm	2	2	1	3	2.0
Infrastructure Failure	1	2	4	3	2.0
Terrorism	1	2	4	2	1.9
Landslide	1	1	3	4	1.6
Sinkholes	1	1	4	2	1.6
Earthquake	1	1	4	1	1.5
Expansive Soils	1	1	1	4	1.3
Levee/Dam Failure	1	1	1	4	1.3

Source: Completed by City Representative. Calculated score completed by INRCOG

Hazard Mitigation Goals

for Hazard Mitigation in Fredericksburg, Iowa

The following list of goals was developed by planning committee participants from the associated jurisdiction. Goals 1 through 7 were developed in the previous 2019 Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan. The planning committee participants chose to adopt the same goals and add additional goals. Goals 8 and 9 were added by community representatives on the planning committee.

Goal #1 Reduce the chance of and impact of flooding in the community.

Goal #2 Take measures to minimize the occurrence of injuries and loss of life due to hazards.

Goal #3 Take measures to minimize or eliminate damage that may occur as a result of hazards.

Goal #4 Increase the city's ability to respond to natural disasters and man-made hazards.

Goal #5 Return to the community to similar or improved pre-event conditions as quickly as possible following a disaster event.

Goal #6 Incorporate the City Plan into the proposed Multi-Jurisdictional Plan.

Goal #7 Continually re-assess and re-evaluate the plan and mitigation activities.

Goal #8 Increase safety throughout the community with tree trimming and vegetation management by utility companies.

Goal #9 Protect low lying, vulnerable areas from runoff and flooding damage.

Goal #10 Replace tornado siren to make residents aware of threats.

Previous Mitigation Activities by Type

Mitigation actions and activities in this Plan will be organized according to 5 categories: Emergency Services, Education and Outreach Projects, Natural Resource Protection or Natural Based Solutions, Structural Projects, or Local Plans and Regulations.

Emergency Services in Fredericksburg

Chickasaw County Emergency Management Agency

Fredericksburg works with the Chickasaw County Emergency Management Coordinator, based out of the City of New Hampton, on various safety and emergency events. 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 Chickasaw County Emergency Management Coordinator is Jeff Bernatz.

Law Enforcement

The community has a 28E agreement in place with Chickasaw County Sheriff's Department that will provide law enforcement services. Services include patrol in the city. The Sheriff's dept. provides law enforcement services 80 hours/week. The sheriff deputies provide a response time to the city up to 30 minutes and will provide extra people power when notified by the city.

Fire Protection and EMS Services

Fire protection for the City of Fredericksburg is provided by the Fredericksburg Fire Department. The station is located at

100 Falcon Drive Fredericksburg, IA. There are 27 volunteer fire fighters that serve in the department currently. Each of the volunteers is HAZMAT certified, with 24 at Firefighter I status. The members of the department meet monthly and take training in fire suppression, hazardous materials, and emergency medical services. Dispatch is provided via a paging system through the Chickasaw County Sheriff's office.

The Fredericksburg Fire Department maintains 28E agreements with the following communities: Sumner, Frederika, Waucoma, Alta Vista, Bassett, Ionia, Lawler, Nashua, New Hampton, and North Washington

Equipment used by the Fredericksburg Fire Department includes the following:

- 1991 Pumper Truck
- 1998 Rescue Truck
- 2023 UTV
- 1995 Tanker Truck
- 2018 Freightliner Tanker w/ pump
- 1999 Pickup/ Brush Truck
- 2012 Freightliner Pumper
- 2024 Brush/Rescue Truck
- 3 Drones for Search and Rescue with night vision

EMS Services

Chickasaw County EMS provides ambulance service to area hospitals. Chickasaw County EMS is managed by the county and located at 204 East Prospect, Net Hampton. The county-run department started in January 2023. There is one ambulance stationed in Fredericksburg at the Fire Station.

Medical Facilities

Fredericksburg Medical Clinic is located at 115 Schult Ridge Road in Fredericksburg. The facility is open 8am to 5pm M-Th and 8am to 12pm on Fridays only.

The closest ER facility is the MercyOne New Hampton Medical Center in New Hampton, IA. This is the only medical facility with an ER unit located in the county. MercyOne has 11 private inpatient rooms and cares for over 20,000 outpatients each year.

MercyOne New Hampton offers a full range of services in an inpatient and outpatient setting as well as 24-hour emergency care, surgical services, primary care clinic, therapy and rehabilitation, diagnostic services, speech and occupational therapy, Senior Life Solutions, and specialty clinics.

HAZMAT Response Teams

Fredericksburg contracts 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. Not only is this a training center, but it also 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 jurisdiction also partners with 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 in Fredericksburg

1. Tornado Sirens

Fredericksburg has 1 operating tornado warning siren for the community.

The activation systems of warning systems are activated and operated by a central command system operated by the Chickasaw County Rescue Squad in New Hampton, IA.

2) Alert Iowa Mass Communication System

Chickasaw County has implemented the use of Alert Iowa, a mass communication notification system. The system features are controlled through the Chickasaw County Emergency Management Agency. 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 the following events: blizzards, flash flooding, severe thunderstorms, and tornadoes.

Public Works/Street Department

The Public Works Department is located at 151 West Main Street in Fredericksburg.

Previous Education and Outreach Projects in Fredericksburg

The city has a public awareness plan for natural gas. Citizens receive a detailed letter regarding what to do in case of a gas emergency. The city also informs citizens of Iowa One Call.

Previous Natural Resource Protection in Fredericksburg

Fredericksburg does not have any natural resource protection mitigation actions.

Previous Structural Projects in Fredericksburg

Fredericksburg does not have any structural projects mitigation actions.

Local Plans and Regulations in Fredericksburg

Fredericksburg completed a local plan and regulation assessment. The results are shown in the following table.

Table 11: Local Capability Assessment	
Community	City of Fredericksburg
Previous HMP Participant?	Yes
Comprehensive Plan?	Yes
Building Code?	No
Zoning Ordinance? RR=restricted residential	Yes
Subdivision Regulations?	No
Floodplain Management Ordinance?	Yes
Tree-Trimming Ordinance?	Yes
Storm Water Ordinance?	Yes
Snow Removal Ordinance?	Yes

Components of the Strategy

Presented below are tables prepared in consultation with the Fredericksburg’s planning committee’s representative and INRCOG. This is a guide for a strategic approach when implementing the city’s efforts in hazard mitigation. The tasks in these tables are drawn from the city’s capabilities, goals, and hazard risks presented in previous sections of this Plan.

The designated agency or staff presented with each line item was written by Fredericksburg’s planning committee.

Notes about the tasks (listed as line items) in each table.

- Each task (line item) stands on its own so it can be completed whenever possible.
- Each action item is not limited to the details presented below and may change based on future conditions.
- The tasks were categorized based on mitigation type. The mitigation types are not shown in any order (no priority over the other). This is presented to help with the general understanding of how hazard mitigation may feed into the City’s existing or future priorities.

Priority Level

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. *Committee representatives considered a cost-benefit approach.*

Timeframe

Timeframe	Description
Immediate	1-6 months
Short Term	1-5 years
Mid-Term	5-10 Years
Long-Term	More than 10 Years

Estimated Costs

Cost estimates are based on the associated costs of additional staffing that may or may not be needed, time for planning/meetings/coordinating, and cost of the proposed action/program/ project.

Cost	Estimated Cost Range
Minimal	Less than \$10,000
Low	\$10K to \$99K
Moderate	\$100K to \$299K
High	Greater than \$300K

Implementation Strategy by Type of Hazard Mitigation Activity

Table 12: 'Education and Awareness' Type Mitigation Activities						
Description: These types of actions keep residents informed about potential natural disasters.						
Priority	Tasks	Hazard(s)	Primary Agency Responsible for Implementation	Time Frame to Complete	Estimated Cost (s)	Funding Source
High	Prepare outreach materials (video, online social media flyers, city website) to inform residents to register online for Alert Iowa mass emergency notification system	ALL	County Emergency Management, Library, City Clerk, Red Cross, Schools,	Mid-term (3-5 Years)	Minimal \$0 - \$10K	City general fund
Medium	Ensure all new city clerks know how to remain an active participant in the National Flood Insurance Program.	Flooding	City Clerk	Immediate 1 - 6 months	Minimal \$0-\$10K	None needed
Low	Continue to fund annual HAZMAT training for fire dept personnel, law enforcement personnel, and ambulance crews. Training by Northeast Iowa Response Group	All	Fire Dept, City Council, County EMA	Short term 1-3 years	Medium \$100K to \$299K	City general fund

Table 13: 'Emergency Services' Type Mitigation Activities

Description: Actions that protect people and property during and immediately after a disaster or hazard event.						
<i>Priority</i>	<i>Tasks</i>	<i>Hazard(s)</i>	<i>Primary Agency Responsible for Implementation</i>	<i>Time Frame to Complete</i>	<i>Estimated Cost (s)</i>	<i>Funding Source</i>
High	Purchase and install early warning siren to be a replacement or an additional siren in the community	Tornado/ windstorm	City Council, County EMA	Immediate (1 month - 6 months)	Minimal \$0 - \$10K	City general fund, Hazard Mitigation Grant Program
Low	Maintain firefighting equipment and purchase needed equipment	All	Fire Department, City Council	Midterm 3-5 years	Moderate \$100K to \$299K	City general fund, Hazard Mitigation Grant Program
Medium	Maintain existing 28E agreements with surrounding communities for mutual aid assistance	All	City Council, County Board of Supervisors, County Fire Association, County Sheriff, Ambulance Service, Fire Dept	Short term 1-3 years	Moderate \$100K to \$299K	City General fund
Medium	Consider forming 28E agreement among County cities to leverage price of affordable translation services for emergency personnel	All	City Council, City Clerk, Fire Dept, County EMA	Short Term 1-3 years	Moderate \$100 to \$299K	City General Fund
Low	Purchase Geiger counters for first responders for HAZMAT and radiological incidents	Transportation Incidents, Radiological	City Council, Fire Dept, County EMA	Mid term 3-5 Years	Moderate \$100K to \$299K	City general fund, hazard mitigation grant program

Table 14: Structure and Infrastructure Project Type Mitigation Activities

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

Priority	Action/Activity	Hazard(s) Addressed by Action	Primary Agency Responsible for Implementation	Time Frame to Complete Action	Estimated Cost(s) to Implement	Funding Source
High	Bury overhead power lines	Severe Winter Storm, Hailstorm, Thunderstorm and Lightning, Tornado, Windstorm, Infrastructure Failure	City Council, Municipal Utility	Short-Term (6 months - 3 years)	Low \$10K-\$99K	City General Fund, Utility provider
Medium	Develop community based initiative to mitigate heat and reduce energy consumption from extreme heat by applying for Black Hills tree planting program grant	Extreme Heat	City Council, Municipal Utility	Short Term 1-3 years	Low \$10K - \$99 K	Black Hills tree planning program grant

Table 15: Local Plans and Regulations Mitigation Activities

Description: 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.

Priority	Action/Activity	Hazard(s) Addressed by Action	Primary Agency Responsible for Implementation	Time Frame to Complete Action	Estimated Cost(s) to Implement	Funding Source
Medium	Ensure all new city clerks know how to remain an active participant in the National Flood Insurance Program.	Flooding	City Clerk	Immediate 1 - 6 months	Minimal \$0-\$10K	None needed
Medium	Ensure hazardous materials are reported (Tier II reports) in accordance with applicable laws	Hazardous Materials	City Council	Immediate 1-6 months	Minimal \$0-\$10K	None needed
Low	Continue implementing storm fee to fund storm water management program	Flash Flooding, Landslides	Public works	Long Term 5-10 years	Minimal \$0-\$10K	City general fund
Low	Continue enforcement of open burning laws and coordinate public safety notices with Alert Iowa capabilities	Grass/Wildfire	Fire Department, County EMA, city council	Immediate 1-6 months	Minimal \$0-\$10K	City general fund
Low	Incentivize commercial and industrial businesses to maintain updated, regular building fire inspection certification by the city	Infrastructure Failure, Grass/ Wildfire	Fire Department, City Council	Short Term 1-3 months	Low \$10K-\$99K	City general fund
Medium	Ensure enforcement of tree ordinance to prevent overgrowth of electrical lines.	All	City Clerk	Immediate 1 - 6 months	Minimal \$0-\$10K	None needed

Table 16: Natural System Protection and Nature-Based Mitigation Type

Description: 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	Action/Activity	Hazard(s) Addressed by Action	Primary Agency Responsible for Implementation	Time Frame to Complete	Estimated Cost (\$)	Funding Source
Medium	Improve field runoff water by improving natural watersheds to prevent storm runoff in lower portions of town.	Flash Flooding, Landslides	Public works	Long Term 5-10 years	Low \$10K- \$99K	City general fund