

City of Protivin

Hazard Mitigation Plan 2024 Update

Appendix I of the Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan



Funded by the Chickasaw County Emergency
Management Agency

Prepared by Iowa Northland Regional Council
of Governments (INRCOG)



INRCOG
Iowa Northland Regional
Council of Governments

May 2024

Photo Source: <https://www.howard-county.com/communities/protivin>

Page left intentionally blank

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.....	8
Critical Facilities.....	10
Measuring Vulnerability to Selected Hazards.....	11
Future Development.....	14
National Flood Insurance Program.....	16
Hazard Risk Assessment.....	17
Hazard Mitigation Goals.....	20
Previous Mitigation Activities.....	21
Implementation Guides (by Mitigation Type) for Hazard Mitigation Activities in Protivin.....	Error! Bookmark not defined.

Table Index	
Table 1: Population Data	6
Table 2: Employment Data	6
Table 3: Industry Data	6
Table 4: Utility Providers	7
Table 5: Housing Data	8
Table 6: Vulnerable Populations	9
Table 7: Vulnerability to Selected Hazards	11
Table 8: National Flood Insurance Program Information	16
Table 9: Hazard Risk Assessment	17
Table 10: Local Regulatory Capability Assessment	23
Table 11: <i>Education and Awareness Programs</i>	26
Mitigation Activities	
Table 12: Emergency Services Mitigation Activities	27
Table 13: Natural System Protection Mitigation Activities	27
Table 14: <i>Structure and Infrastructure Projects</i> Mitigation Activities	28
Table 15: <i>Local Plans and Regulations</i> Mitigation Activities	29

Figure Index	
Figure 1: Chickasaw County Map	5
Figure 2: Iowa Crash Analysis for All Traffic Incidents (2019-2023)	7
Figure 3: Critical Facilities Map	10
Figure 4: Flood Plain Map	12
Figure 5: Flood Scenario Map	13
Figure 6: Historical Precipitation Data and Trend for Chickasaw County, Iowa	14
Figure 7: Historical Temperature Data and Trend for Chickasaw County, Iowa	15

About

The City of Protivin Hazard Mitigation Plan 2024 update was formed as an appendix to a county-wide planning effort by multiple communities, school districts, and Chickasaw County departments. The 2024 Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan is a sequential update to the previous hazard mitigation plan. FEMA requires a 5-year update for approved hazard mitigation plans to be in good standing and eligible for grant funding. The Plan was developed to meet the requirements in 44 CFR § 201.6. The Plan was submitted to the Iowa Homeland Security and Emergency Management Department (IHSEMD) office and then submitted to FEMA for approval. Chickasaw County's Emergency Management Agency initiated and funded this effort for all participating communities and contracted INRCOG to coordinate this multi-jurisdictional planning process. An approved and adopted hazard mitigation plan qualifies participating jurisdictions with pre-disaster grant programs that may fund projects for the entire community.

Participating communities included all nine incorporated communities in the County, Chickasaw County's departments, and three public school districts. Four committee meetings were held between March 19th and April 23rd wherein each jurisdiction provided data and completed work sheets to develop their hazard mitigation plans.

What is Hazard Mitigation?

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



FEMA's Emergency Management Cycle

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

Benefits of mitigation planning for local governments include:

- ✓ An increased understanding of natural hazard and human-caused hazards.
- ✓ 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 hazard 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.



The former Bohemian Savings Bank building was constructed in 1910 and operated as an independent savings bank. The Bohemian Savings Bank operated in this building until it was purchased in 1986 by Decorah State Bank. The building was converted to a branch office and used until 1989.

Photo source: Brian McMillin

<https://iowabackroads.com/former-bohemian-savings-bank-protivin-iowa/>

City Profile

Jurisdiction: City of Protivin

County: Chickasaw County and Howard County

Population (2020): 269

The City of Protivin is located on the northern boundary of Chickasaw County. Partially in Howard County and Chickasaw County, the city of Protivin is a community of 269 residents. County Highway B16 and V64 intersect at Protivin.

The following data presented in the upcoming tables 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 269 and 89% identified as White. The median age was 42. Working aged residents (15-60 years) made up 57% of the population. Children and teens (younger than 15 years) made up 20% of Protivin's population while older adults (older than 65 years) made up 23%.

The median household income in 2022 was \$58,375. The unemployment rate was nearly 3%. Most people commute to work, and 23 people or 13% of the workforce work from home. The top three largest industry sectors in Protivin are as follows (in order from highest to lowest): 1) Education Services, and health care, and social assistance; 2) Manufacturing, and 3) Construction.

Location of Jurisdiction

Figure 1: Map of Chickasaw County

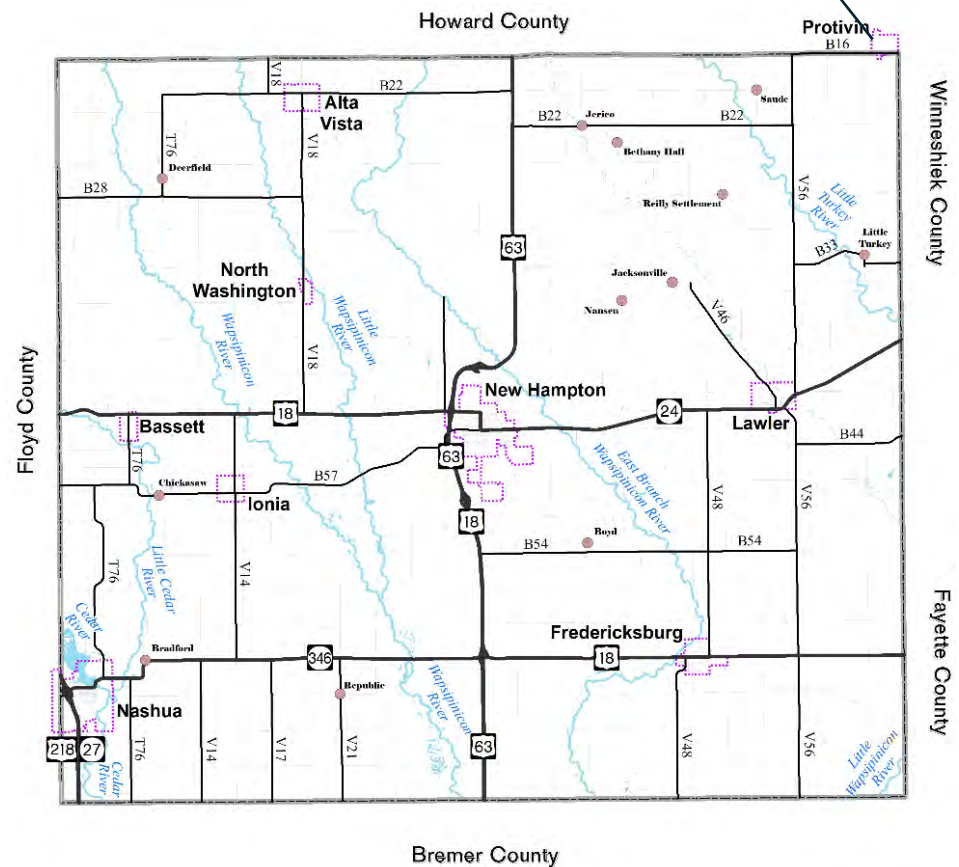


Table 1: Population Data (2020)		
City of Protivin		
	Total	% of Pop.
Total population	269	100%
AGE		
Under 5 years	15	6%
5 to 9 years	21	8%
10 to 14 years	18	7%
15 to 19 years	4	2%
20 to 24 years	4	2%
25 to 29 years	31	12%
30 to 34 years	15	6%
35 to 39 years	21	8%
40 to 44 years	13	5%
45 to 49 years	8	3%
50 to 54 years	11	4%
55 to 59 years	14	5%
60 to 64 years	32	12%
65 to 69 years	178	6%
70 to 74 years	10	4%
75 to 79 years	11	4%
80 to 84 years	6	2%
85 years and over	18	7%
Median Age	42	-
RACE		
White	239	89%
Black or African American	0	0%
Hispanic or Latino (of any race)	23	7%
American Indian and Alaska Native	4	2%
Asian	0	0%
Native Hawaiian/Other Pacific Islander	0	0%
Some Other Race	19	7%
Two or More Races	8	3%
<i>Source: 2020 Census</i>		

Table 2: Employment Data (2022)		
City of Protivin		
	Value	% of Population
Median Household Income	\$58,375	-
Unemployment Rate (2022)	2.4%	-
Workers that commute to work	135	76%
Workforce that works from home	23	13%
<i>Source: 2022 American Community Survey 5-Yr Estimates</i>		

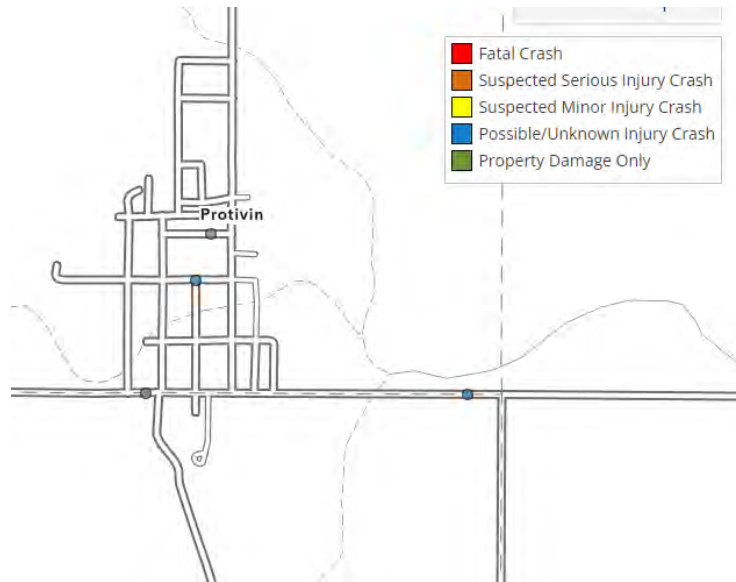
Table 3: Employment Industry Data (2022)		
City of Protivin		
Workforce Industry	# of Workers	% of Workforce
Workforce	178	100%
Agriculture, forestry, fishing and hunting, and mining	16	9%
Construction	24	14%
Manufacturing	35	20%
Wholesale trade	4	2%
Retail trade	24	14%
Transportation -warehousing, utilities	5	3%
Information	0	0%
Finance and insurance, and real estate and rental and leasing	4	2%
Professional, scientific, and management, and administrative and waste management services	1	1%
Educational services, and health care and social assistance	54	30%
Arts, entertainment, and recreation, and accommodation and food services	0	0%
Other services, except public administration	4	2%
Public administration	7	4%
<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 4 incidents totaling \$66,656 in property damage.

Vehicle Crash Data within Protivin, Iowa (2019-2023)	
Total Crashes	4
Crash Severity	
Fatal	0
Suspected Serious Injury	0
Suspected Minor Injury	0
Unknown	2
Property Damage Only	2
Property Damage Total	\$66,656

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



Source: Iowa DOT

Housing Data

The City of Protivin has 154 occupied housing units. Nearly 95% (146) of them are single-family housing types. There are 5 multifamily housing and approximately 3 housing units are mobile homes.

A large portion of the housing stock was built between the years 1960-79 (78%). About 22% of the housing stock is under 60 years old. Most homes heat their units with bottled tank, or LP gas (76%).

Community Utility Providers

Alliant Energy provide utility electric services. LP gas and fuel oil are supplied by private companies. Windstream telephone services and broadband internet services. Residents receive water and sewer utility services from the city. Sanitation is contracted by Hawkeye Sanitation.

Table 4: Utility Providers	
	City of Protivin
<i>Electric</i>	Alliant Energy
<i>Natural Gas</i>	Private Companies
<i>Telephone/Internet</i>	Windstream
<i>Cable TV</i>	Windstream
<i>Water Services</i>	City of Protivin
<i>Sewer Services</i>	City of Protivin
<i>Sanitation</i>	Hawkeye Sanitation

Table 5: Housing Data (2022)		
City of Protivin		
	Total	% of Occupied Units
Occupied housing units	154	100.0%
Housing Unit Type	Total	% of Occupied Units
1, detached	146	95%
1, attached	0	0%
Duplex (2)	0	0%
More than 2 apartments	5	3%
Mobile home or other type of housing	3	2%
Year Structure Built	Total	% of Occupied Units
2020 or later	0	0%
2010 to 2019	0	0%
2000 to 2009	10	7%
1980 to 1999	24	116%
1960 to 1979	37	24%
1940 to 1959	26	16%
1939 or earlier	57	37%
House Heating Fuel	Total	% of Occupied Units
Utility gas	0	0%
Bottled, tank, or LP gas	117	76%
Electricity	15	10%
Fuel oil, kerosene, etc.	3	2%
Coal or coke	0	0%
All other fuels	19	12%
No fuel used	0	0%
<i>Source: 2022 American Community Survey 5-Year Estimates</i>		

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 impact of costly repairs to property from a tornado or heating/cooling electricity costs from extreme weather is greater for low-income families.

Protivin's Vulnerable Populations

Based on 2022 American Community Survey 5-Year estimates, the largest and more common vulnerable group in Protivin are older adults. About 46% of occupied households have elderly occupants (60 years and over). About 15% have elderly residents (65 years and over) living alone.

Nearly all residents have access to a vehicle. About 22% of households have a person living with a disability. This is broadly defined from the data estimates for Protivin. 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 for more sturdy buildings on permanent foundations. An alternative shelter should be identified prior to a tornado watch or warning. There are estimated to be 1 or 2 mobile homes in Protivin. With an average household size of 2.4, that potentially puts 2-5 people with a higher risk of becoming a fatality during a tornado.

Table 6: Vulnerable Populations (2022)

	Estimate	%
Households	154	100%
Average Household Size	2.4	
With one or more people in the household 60 years and over	71	46%
With householder 65+ years old and living alone	23	15%
Below poverty level	4	2.6%
With one or more people with a disability	33	22%
receiving food stamps/SNAP	1	1%
w/o access to a vehicle	0	-
living in mobile homes or other type of housing	1	1%

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.

The City of Protivin has a municipal water system with a 20,000-gallon storage capacity. The community's water is taken from two local wells, and supplies water to approximately 250 users. The system has an average use of approximately 2,500 gallons per day with a peak demand of 3,500 gallons. It provides water for fire protection within the

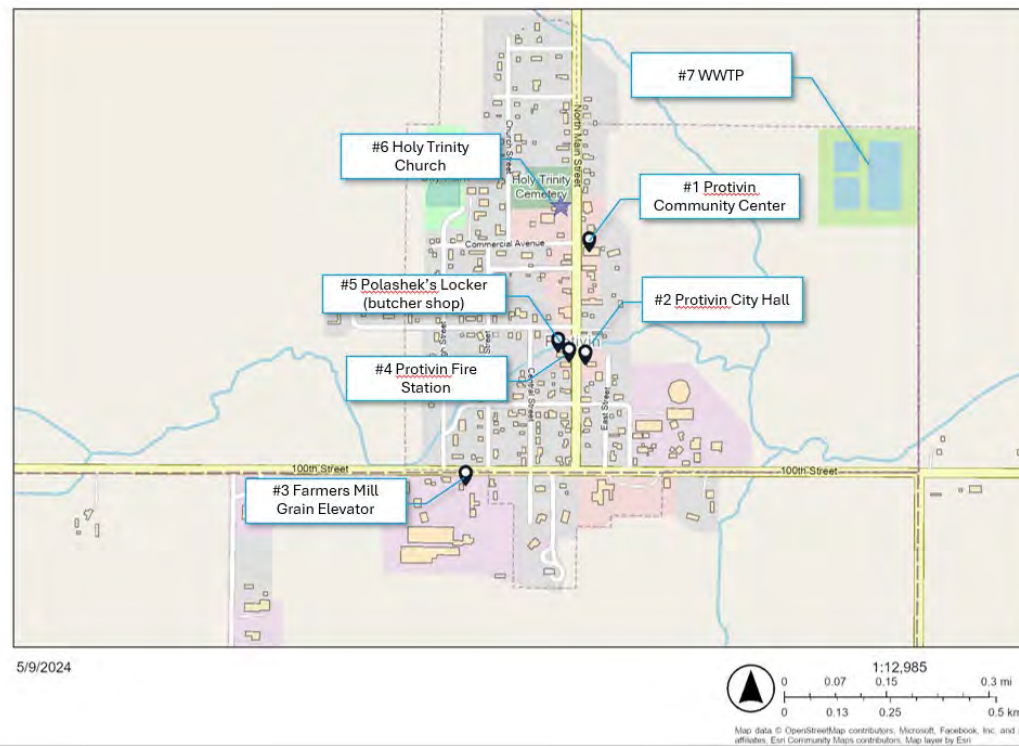
City of Protivin and surrounding rural areas. The City of Protivin wastewater is treated through a lagoon system.

These treatment lagoons are located east of the city. According to the City, the existing system can handle a population of approximately 700 persons. The 2020 Census showed that Protivin had a population of 269 people.

In the next 20 years, Protivin is likely to see small population changes and the existing water plant and wastewater treatment lagoons have capacity to manage existing demands or steady growth.

Figure 3: Critical Facilities Map

Label #	Critical Facilities
1	Community Center
2	Protivin City Hall
3	Farmers Mill Grain Elevator
4	Protivin Fire Station
5	Polashek's Locker (Butcher Shop)
6	Holy Trinity Church
7	WWTP Lagoon



Measuring Vulnerability to Selected Hazards

100-Year Annual Chance Flood Scenario

Assessing the community's vulnerability to losses from tornado and flood hazards is determined with county assessor data. 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 Figure 4, the flood plain map shows the 1% annual chance of flooding in and around the City of Protivin. The river basin is depicted in the topography shown on the map.

No parcels are affected by the 1% annual chance flood hazard zone. Therefore, there is no potential losses of properties prone to flooding in Protivin.

Tornado Scenario

Protivin's vulnerability to a tornado hazard is determined with a summation of all structures susceptible to damage from a tornado. Since all buildings have this risk of being damaged by a tornado, the valuation of all structures on each parcel within the city's limits will provide the potential losses for this hazard. Based on the valuations from the Chickasaw County assessor, there are 171 parcels in Protivin and all buildings and dwellings in Protivin have a summation in value of \$6,750,400. Therefore, Protivin is vulnerable to potential property losses of \$6,750,400 in 2023 dollars from a tornado hazard.

Table 7: Vulnerability to Selected Hazards

Hazard	% of City at Risk to Hazard	# of Parcels	Total Value (Buildings and Dwellings)
Tornado	100%	171	\$6,750,400
100-Year Annual Chance Flood	0%	0	\$0

Source: Chickasaw County Assessor Data (2023 dollars)

Figure 4: Flood Plain Map

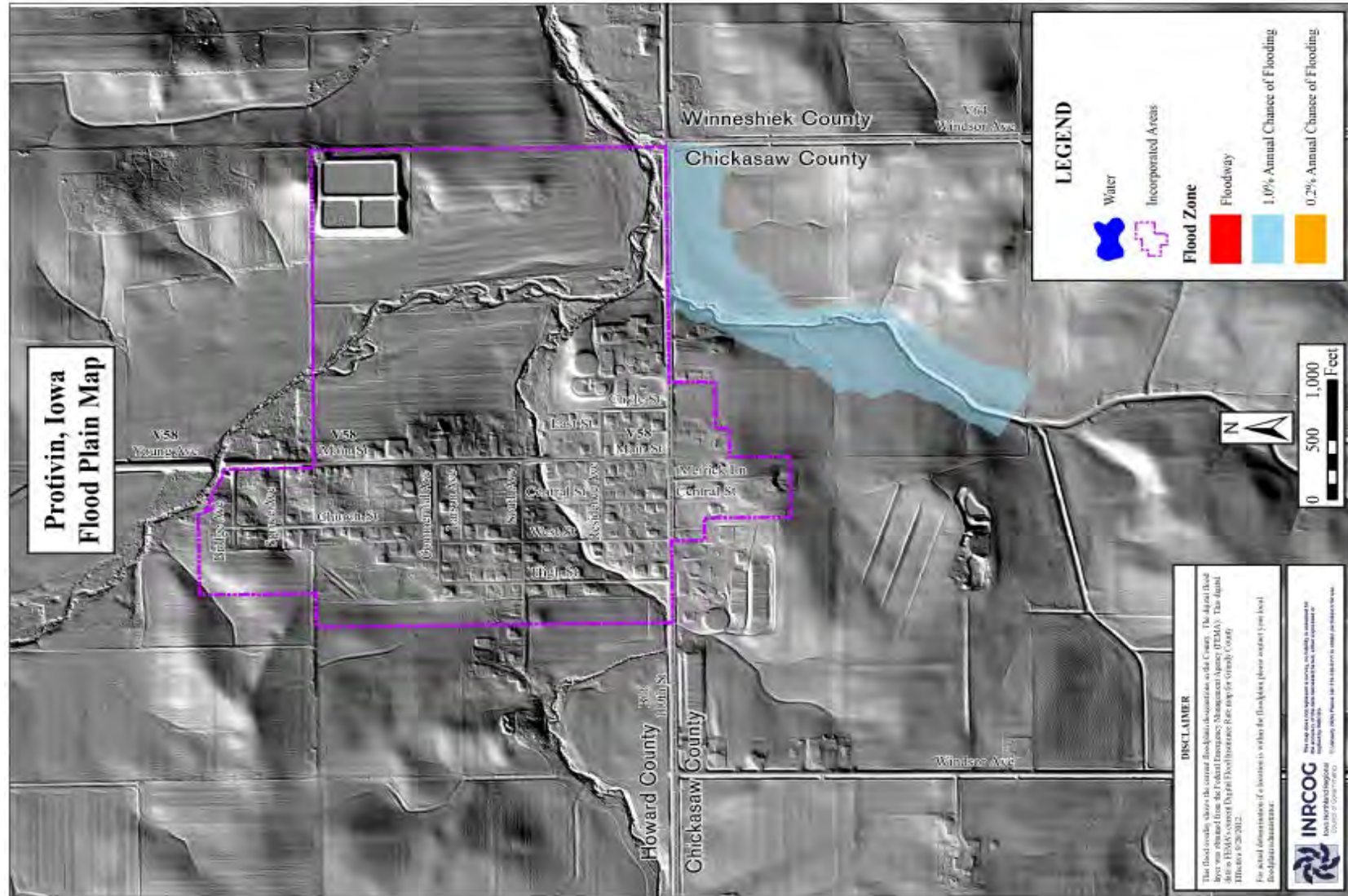
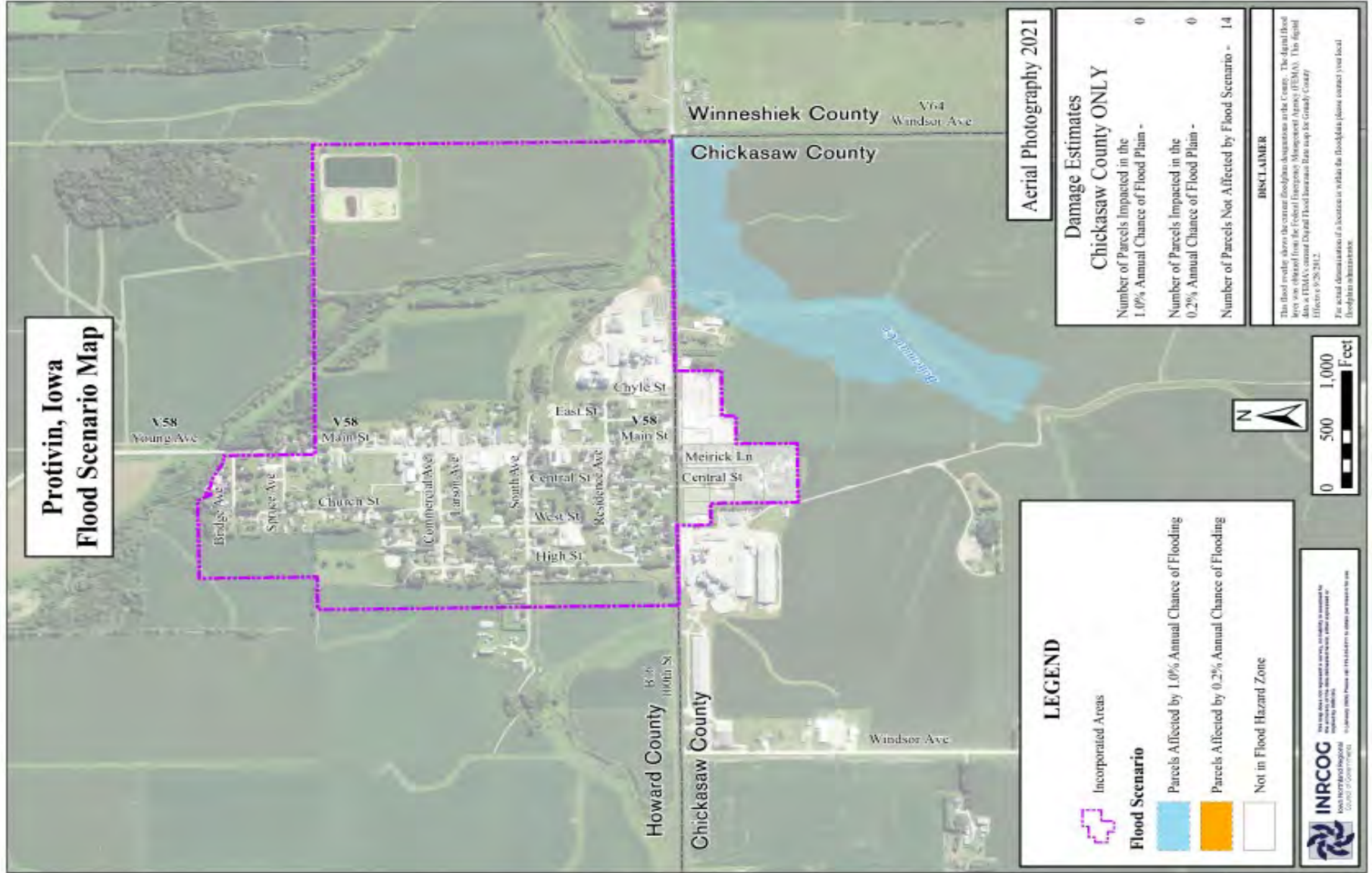


Figure 5: Flood Scenario Map



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 provide trends that may help determine future intensities of climate systems.

Annual Precipitation Levels in Chickasaw County

Chickasaw County's monthly precipitation records from 1895 are shown in Figure 6.

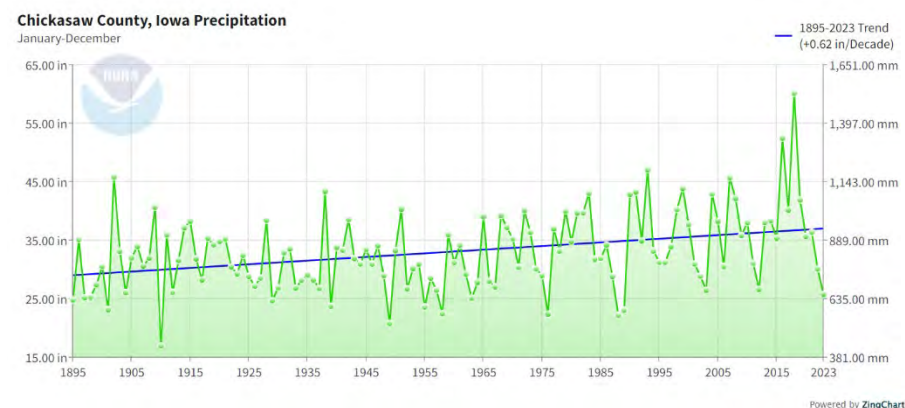
Yearly precipitation has been increasing at a rate of +0.62 every decade. Based on this historical trend, precipitation is likely to continue to increase in the coming years.

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.

Managing this projected change in climate may increase more hazard mitigation efforts to reduce property damage and soil erosion from frequent flooding.

City infrastructure may become overwhelmed and require repairs, renovation, upgrades, or replacement such as the storm water systems and berms, dikes, or dams.

Figure 6: Historical Precipitation Data and Trend for Chickasaw County, Iowa²



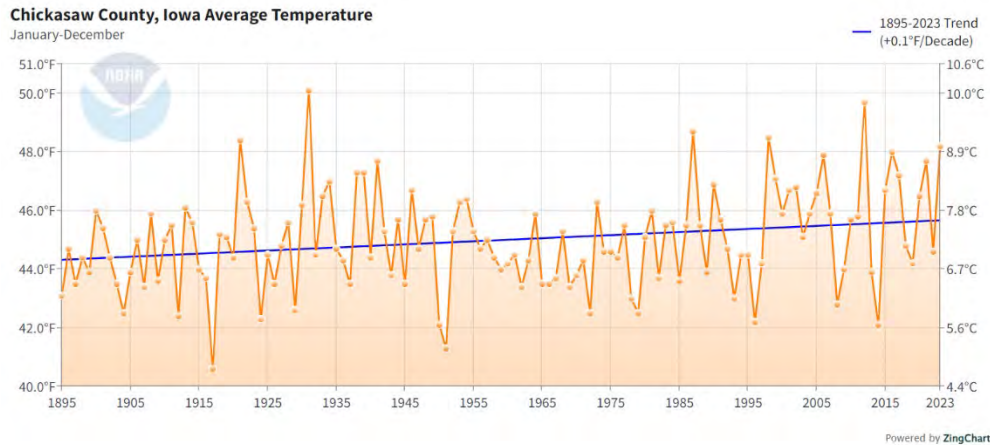
Average Annual Temperatures in Chickasaw County

The annual average temperature is plotted over a 12-month period from 1885 to 2023 in Figure 7. This trend shows the

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>

average temperature in Chickasaw County increasing at a rate of +0.1° F every 10 years.

Figure 7: Historical Temperature Data and Trend for Chickasaw County, Iowa²



Climate Patterns from Higher Average Temperatures

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.

Daily minimum temperatures may increase across all seasons due to an increase in humidity.

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.

Climate Patterns from Increasing Precipitation and Higher Temperatures

The relationship between increasing precipitation, temperature, and drought is complex and often counterintuitive. 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.

Projected Trends of Natural Hazards in Chickasaw County

- Drought is likely to occur more frequently 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 Protivin participates in the National Flood Insurance Program. The current effective map date is Sept. 16, 2011. No baseline elevations were determined for the flood hazard zones in the latest FIRM map.

Protivin has 1 policy. The policy provides \$239,000 in coverage. There have been 0 claims for losses that had a net payout of \$0.

FEMA defines a repetitive loss property as an insurable building that has experienced zero losses in a 10-year period in which each loss is \$1,000 or more. Protivin has 0 repetitive loss properties.

Table 8: National Flood Insurance Program Information

Community Name	City of Protivin
NFIP Participant (Yes/No)	Yes
Designee / Agency to implement NFIP Requirements	City Clerk
Participant in CRS (Yes/No)	No
Current Effective Map Date	09/16/2011(M)
Regular-Emergency Program Entry Date	August 19, 1986
Total Policy Count	1
Total Coverage	\$239,000
Total Losses	0
Total Net Dollars Paid	\$0
<i>(M) = No flood elevations determined - All Zone A, C, and X</i>	
Source: FEMA Community Status Book Report, 04/16/2024 https://www.fema.gov/cis/IA.pdf	
Source: Source: FEMA National Flood Insurance Program, Data and Analytics, HUDEX Report. https://nfipservices.floodsmart.gov/reports-flood-insurance-data	

Hazard Risk Assessment

The top three hazards from the risk assessment are:

1. Severe Winter Storm
2. Flooding - Flash
3. Extreme Heat

Risk Score Summary for Protivin

Table 9 displays rated risk scores for each associated hazard. This assessment was completed by city representatives based on hazard profiles prepared for the planning committee.

The top three risks rated for the City of Protivin are 1) Severe Winter Storm, 2) Flash Flooding, and 3) Extreme Heat. This risk assessment will be used in a risk informed approach to deciding which hazard mitigation activities or tasks the city will include in this Plan.

Methodology

This risk assessment identifies how people, property, and structures would be harmed or damaged by one of the listed hazard events. IHESMD provided the formula below.

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

Table 9: Hazard Risk Assessment					
Hazards	Probability	Magnitude	Warning Time	Duration	Score
Severe Winter Storm	3	2	1	4	2.5
Flooding - Flash	2	3	3	2	2.5
Extreme Heat	2	3	1	4	2.4
Grass/Wildland Fire	2	2	4	1	2.2
Thunderstorm/ Lighting/ Hail	3	1	2	2	2.2
Tornado/Windstorm	2	2	3	2	2.2
Flooding - Riverine	2	2	2	3	2.1
Drought	2	2	1	4	2.1
Hazardous Materials	2	1	4	2	2.0
Transportation Incidents	2	1	4	2	2.0
Radiological	1	1	4	3	1.7
Sinkholes	1	1	4	2	1.6
Terrorism	1	1	4	2	1.6
Infrastructure Failure	1	1	3	3	1.5
Earthquake	1	1	4	1	1.5
Levee/Dam Failure	1	1	3	2	1.4
Expansive Soils	1	1	1	4	1.3
Landslide	1	1	3	1	1.3
Animal/ Crop/ Plant Disease	1	1	1	4	1.3
Pandemic/ Endemic Human Disease	1	1	1	4	1.3

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 HSEMD during scope of work

Hazard scores were collected during the second committee meeting. INRCOG planners calculated the hazard risk score for each hazard based on the formula in this section.

Score Value	Hazard Risk Level	Description of hazard with this rating
1	<u>Low risk hazard</u>	Hazard is not likely to affect people or property because the likelihood is minimal.
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

Hazard Mitigation Goals

For Protivin, 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 2012 Howard County Multi-Jurisdictional Hazard Mitigation Plan. The planning committee participants chose to adopt the same goals and add additional goals. Goals 8 through 12 were developed by planning committee members including Protivin representatives.

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 Create a hazard mitigation strategy for flood plain properties.

Goal #9 Enhance local transportation safety by installing or replacing railroad crossing systems/signage in Protivin.

Goal #10 Enhance the safety of Protivin residents with a modern warning system, including updated

tornado sirens and register for Alert Iowa notifications through the online registration portals.

Goal #11 Ensure safe construction of all buildings in Protivin by adopting State Building Codes per Iowa Code Chapter 103A as the local construction standards for all building improvements: newly constructed, renovated, repaired work that may need a permit.

Goal #12 Ensure mutual aid agreements for all emergency response services are renewed and up to date.

Previous Mitigation Activities

Mitigation actions and activities in this Plan will be organized according to these 5 categories:

1) *Emergency Services*, 2) *Education and Outreach*, 3) *Structural Projects*, 4) *Natural Resource Protection and Nature Based Solutions*, and 5) *Local Plans and Regulations*.

Emergency Services in Protivin

Chickasaw County Emergency Management Agency

Protivin 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 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 is provided by Protivin's Fire Department located at 229 S Main Street in Protivin, Iowa. There are 24

volunteer firefighters that have fire, first response, HAZMAT, and emergency management training.

Equipment used by the Protivin Fire Department include the following:

- 2012 Alexis Freightliner Pumper (1500 Gallon capacity w/ 1,500 gpm Pump)
- 1994 International Tanker (2,500 Gallons)
- 1998 International Tanker (2,000 Gallons)
- 1988 Chevrolet Pumper (1,000 Gallons w/ 750 gpm Pump)
- 1994 Freightliner E1 Chassis Rescue Truck
- 2012 Polaris Ranger 900

EMS Services

Chickasaw Ambulance Service provides ambulance service to area hospitals. Chickasaw Ambulance Service is a private company that contracts service with local entities. The company is based out of New Hampton, approximately 22 miles southwest of Protivin.

Chickasaw County Rescue Squad also provides service in Protivin. There are 42 EMT certified individuals who volunteer to respond to emergency calls on a needed basis in the county.

Medical Facilities

There are no medical facilities in Protivin. The closest facility is 13 miles north of Protivin at the Regional Health Services of Howard County (RHSHC) general hospital in Cresco, Iowa. This is the only medical facility with an ER unit located in the

county. RHSHC offers acute and skilled medical/surgical care, obstetrical, rehabilitative, and diagnostic services in a 19-bed Critical Access hospital.

HAZMAT Response Teams

Protivin 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 Protivin

1. *Tornado Sirens*

The outdoor early warning system consists of one siren that is activated either by the Sheriff's Department or the Emergency Management Office. The existing siren was installed in 2019 and has a battery backup.

2. *NOAA Weather Radio* broadcasts are also available in the community. NOAA Radio's provide up to the minute weather related alerts. Other locations that warnings and watches can be found are television, Internet, and radio.

3. *AlertIowa notification system*

AlertIowa is a mass emergency notifications system for all residents through an online registration process. Chickasaw County's Alert Iowa system is managed by the Chickasaw County Emergency Management Agency. The County will use their emergency notification network for all of the following events: blizzards, flash flooding, severe thunderstorms, and tornadoes.

Previous Education and Outreach Projects in Protivin

The City of Protivin funds first responders' annual training for fire department personnel, law enforcement personnel, and ambulance crews to address all hazards.

Protivin developed a NOAA weather radio awareness program, tree inspection and trimming program for dead Ash trees from EAB infestation.

Previous Natural Resource Protection in Protivin

The City of Protivin is not regularly affected by flood events.

Previous Structural Projects in Protivin

The city recently completed the building of a new fire station.

Local Plans and Regulations in Protivin

Protivin completed a local plan and regulation assessment. The results are shown in the table below.

Local Capability Assessment

Presented in Table 10 is an assessment of the community's capabilities to carry out hazard mitigation activities through local plans and regulations. This was completed in consultation with the Protivin's planning committee's representative and INRCOG.

Table 10: Local Regulatory Capability Assessment	
Community	City of Protivin
Previous Hazard Mitigation Plan Participant?	Yes (Howard County, 2011)
Comprehensive Plan?	Yes
Building Code?	No
Zoning Ordinance? RR=restricted residential	RR
Subdivision Regulations?	No
Floodplain Management Ordinance?	Yes
Tree-Trimming Ordinance?	Yes
Storm Water Ordinance?	No
Snow Removal Ordinance?	Yes

Components of the Implementation Guide

Tables 12 through 15 are mitigation activities categorized by the mitigation action type. There are five categories: Local Plans and Regulations, Emergency Services, Education and Outreach, Natural Resource and Nature Based Solutions, and Structural Projects. Hazard mitigation activities are the tasks in the table which are shown with components for a strategic approach.

The 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 Protivin'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

Strategy for Implementing the Plan

Presented below are tables prepared in consultation with the Alta Vista’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 Alta Vista’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

Table 11: '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
Low	Distribute a monthly newsletter to Protivin residents for better communication and outreach.	All	City Clerk	Immediate: 1 month - 6 months	Minimal	City general fund
Low	Help residents register on Alert Iowa with outreach and education initiatives.	Tornado	City Council	Immediate 1 - 6 months	Minimal	County EMA, City General Fund
Medium	Ensure proper training and certification of floodplain manager.	River flooding, flash flooding	City Clerk	Short Term 1-3 years	Minimal	County EMA, City General Fund
High	Promote and education Howard and Chickasaw County Multi-Jurisdictional Hazard Mitigation Plans.	All	City Council	Immediate 1 - 6 months	Minimal	County EMA, City General Fund

Table 12: 'Emergency Services' Type Mitigation Activities						
Description: Actions that protect people and property during and immediately after a disaster or hazard event.						
Priority	Tasks	Hazard(s)	Primary Agency Responsible for Implementation	Time Frame to Complete	Estimated Cost (s)	Funding Source
High	Acquire funds to purchase new siren.	Tornado	City Council	Short term 1-3 years	High	Hazard Mitigation Grant Program
Medium	Establish and sock community shelter locations.	All	Fire Dept, EMA	Short term 1-3 years	Medium	City general fund
Medium	Train and recruit additional volunteer emergency response individuals.	All	Fire Dept, EMA	Short term 1-3 years	Medium	City general fund

Table 13: 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 (s)	Funding Source
Low	Reinstall wetlands that were previously in place to improve flash flooding.	Flash Flood,	City Council, Private Property Owners	Mid-term (3-5 Years)	High \$30K +	Stormwater BMP Loans with Iowa Dept of Ag & Land Stewardship

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
Medium	Prioritize dilapidated housing that poses the greatest threat to health, safety, and welfare and pursue one property acquisition through 657A.	Infrastructure failure, Tornado/ Windstorms, Thunderstorms with Strong Hail, Winter storm	City council	Long Term 5-10 years	High \$30K +	City general fund, CBDG funding, Revitalization grants, USDA rural development programs, Iowa Nuisance Property & Abandoned Building Remediation Loan Program
Medium	Harden utilities by promoting buried electrical utilities.	Windstorms, Thunderstorms with Strong Hail, Winter storm	City Council, Utility Provider	Moderate 5-10 years	High \$30K +	City general fund
Medium	Construct, stock, and implement FEMA compliant tornado safe room.	All	City Council	Moderate 5-10 years	High \$30K +	City general fund
Low	Install fiber optic internet.	All	City Council, County	Moderate 5-10 years	High \$30K +	City general fund

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
Low	Create an annual fire inspection program for commercial and industrial properties.	Fire, Infrastructural Failure	City Council and Protivin Fire	Short term 1-3 years	Medium \$10K - \$30K	City general fund
Medium	Work with local utility provider on how to prevent/prepare, respond, and recover from hazard events.	Windstorm/ Tornado, Thunderstorm with Heavy Hail and Lightning, Winter storms	City Council and Protivin Municipal	Long Term 5-10 Years	High \$30K	Utility Provider
Low	Implement building codes and enforcement.	All	City Council	Short term 1-3 years	Medium \$10K - \$30K	City general fund