Hancock County Multi - Jurisdictional Hazard Mitigation Plan

HANCOCK COUNTY MULTI-JURISIDICTIONAL HAZARD MITIGATION PLAN

County Board of Supervisors

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Hancock County Courthouse
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CHAPTER 1: INTRODUCTION & BACKGROUND

The Hancock County Multi-Jurisdictional hazard mitigation plan, which includes the cities of Britt, Corwith, Crystal Lake, Garner, Goodell, Kanawha, Klemme, Woden, Garner Hayfield Ventura School District, West Hancock School District and unincorporated areas of Hancock County, was prepared by the Hancock County Emergency Management Agency.

Citizens and public organizations have participated in the process. This effort will be sustainable over the long term because it enjoys grassroots support that stems from a sense of local and individual ownership. Once this plan is approved, the Cities and County of Hancock will be eligible for future mitigation assistance from FEMA and will be able to more effectively carry out mitigation activities to lessen the adverse impact of future hazards within the county.

Basis for Planning Authority

The basis for authority to create a natural hazard mitigation plan lies in Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. 5165. This act was enacted under Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000), P.L. 106-390. Section 104 is the legal basis for FEMA's Interim Final Rule for 44 CFR Parts 201 and 206, published in the Federal Register.

Plan Purpose

The purpose of the Hancock County Multi-Jurisdictional Hazard Mitigation Plan is to substantially and permanently reduce the county's vulnerability to natural hazards. The plan is intended to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property and the natural environment. This can be achieved by increasing public awareness, documenting resources for risk reduction and loss-prevention, and identifying activities to guide the community towards the development of a safer, more sustainable community.

Plan Organization and Process

The Hancock Multi-Jurisdictional Hazard Mitigation plan is developed and organized within the rules and regulations established under the 44 CFR 201.6. The plan contains a mitigation action listing, a discussion on the purpose and methodology used to develop the plan, a profile on the cities and county of Hancock, as well as, the hazard identification and vulnerability assessment of natural and manmade hazards. In addition, the plan offers a discussion of the community's current capability to implement the goals, objectives and strategies identified herein. To assist in the explanation of the above-identified contents there are several appendices included which provide more detail on specific subjects. This plan is intended to improve the ability of the County and Cities to handle hazards and will document valuable local knowledge on the most efficient and effective ways to reduce loss.

The Hancock plan was developed by the Hancock County Emergency Management Agency in cooperation with the citizens and elected officials in all 8 communities, 2 school districts and the unincorporated areas of the County. Plan development on the local level was spearheaded by Andrew Buffington, Hancock County Emergency Management Coordinator. Hancock County Emergency Management was tasked with leading the planning meetings and preparing the plan. Members of the planning committees were tasked with giving information that was critical to the

plan development, e.g. hazards, mitigation actions, scores, historical information, etc. The jurisdictions that fall under this plan are unincorporated Hancock County, City of Britt, City of Corwith, City of Crystal Lake, City of Garner, City of Goodell, City of Kanawha, City of Klemme, City of Woden, Garner Hayfield Ventura School District and West Hancock School District.. The following resources were used to compile data and complete this plan include: State of Iowa Hazard Mitigation Plan (2010), National Climatic Data Center (NCDC), SHELDUS, US Census data, Hancock County Assessor's Office, FEMA floodplain maps, zoning ordinances and comprehensive plan, and critical facilities in participating jurisdictions. These resources were used to compile information on community background information, vulnerability analysis, development of mitigation goals, critical facilities, hazard identification and profiles and historical weather events.

The unincorporated areas of the county were represented by the county supervisors since they are elected from those areas to represent the people living in the unincorporated areas of Hancock County. The Hancock County EMA also represented the people living in the unincorporated areas of the county. There were two meetings held in each city to assess each city's information. The second meeting reviewed information gathered through the first meeting. Each community was required to select at least one mitigation action. Meetings were held on the following dates, times and places.

- April 22, 2024 Woden City Hall (HARA)
- April 23, 2024 Britt City Hall (HARA)
- May 6, 2024 Crystal Lake City Hall (HARA)
- May 14, 2024 Kanawha City Hall (HARA)
- May 15, 2024 Hancock Co Fire Assn – Woden (HARA)
- May 20, 2024 West Hancock District Offices (HARA)
- May 28, 2024 Garner City Hall (HARA)
- June 3, 2028 Klemme City Hall (HARA)
- June 11, 2024 Corwith Lake City Hall (HARA)
- August 12, 2024 Goodell Community Center (HARA)
- August 12, 2024 GHV Library (HARA)
- February 3, 2025 Woden City Hall (Mitigation Measures/Projects)
- March 3, 2025 Crystal Lake City Hall (Mitigation Measures/Projects)
- March 18, 2025 Britt City Hall (Mitigation Measures/Projects)
- March 25, 2025 Garner City Hall (Mitigation Measures/Projects)
- April 7, 2025 Klemme City Hall (Mitigation Measures/Projects)
- April 8, 2025 Corwith City Hall (Mitigation Measures/Projects)
- April 14, 2025 Goodell Community Center (Mitigation Measures/Projects)
- April 15, 2025 Kanawha City Hall (Mitigation Measures/Projects)
- May 12, 2025 GHV Library (Mitigation Measures/Projects)
- May 19, 2025 West Hancock School Cafeteria (Mitigation Measures/Projects)
- May 27, 2025 Hancock County Board of Supervisors Chambers (Mitigation Measures/Projects)

Appendix B contains the meetings' agendas and minutes. The discussion during the initial/ update meetings planning meetings for each community included the following:

- Overall Planning Process
- Explanation of the Hazard Analysis and Risk Assessment (HARA)
- Identification/review of hazards
- Comparison of identified hazards to hazards identified to by Hancock County's Planning Committee
- Ranking of hazards (update included review of previous rankings)
- Discussion of current mitigation measures (update also included discussion on proposed measures from previous plans) • Prioritization of mitigation measures

During the prioritization of the mitigation measures, each committee member gave a score of 0 to 3 to the measures. The weighted score for each mitigation measure was calculated by averaging the weighted scores. This is discussed further on pg. 110.

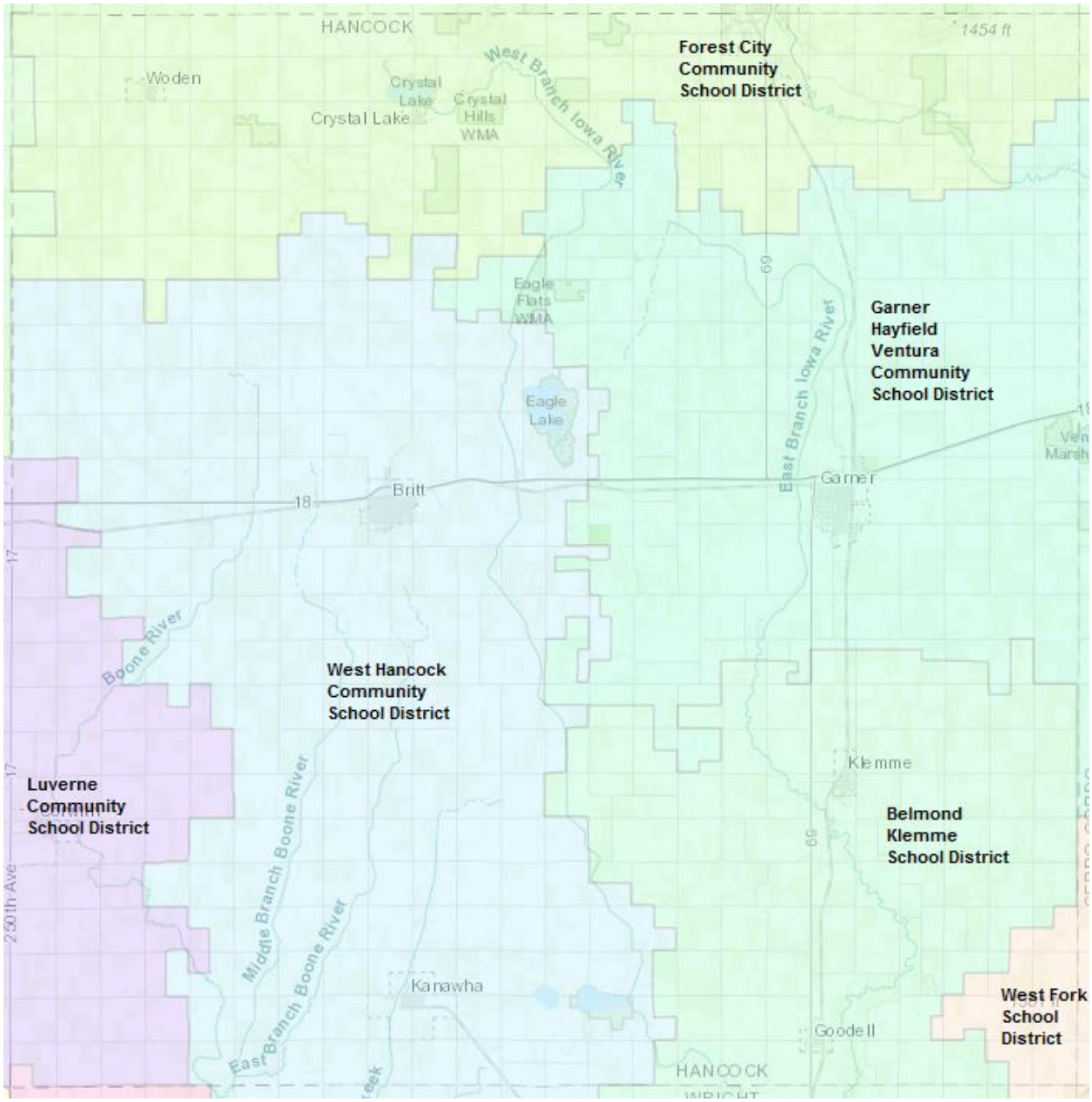
Public was involved in the planning process by being invited to the planning meetings with postings at the city halls and or in local newspapers. Meetings were held in each community that participated in the planning process. This garnered a lot more involvement and provided an opportunity for public comment. There was a 30 day public comment period after a review meeting for each community. There were no comments received by the county, or during the Supervisors meeting when the plan was approved.

CHAPTER 2: COMMUNITY PROFILE

The planning area for this Multi-Jurisdictional Hazard Mitigation plan for Hancock County includes the unincorporated areas of the county and the cities of Britt, Corwith, Crystal Lake, Garner, Klemme, Kanawha, Goodell, Woden, Garner Hayfield Ventura Community School District and the West Hancock Community School District. **Figure 1** provides a map of the jurisdictions within Hancock County. Forest City is partially within Hancock County; however, it is included in the Winnebago Multi-Jurisdictional Hazard Mitigation Plan. A map of Hancock County in relation to surrounding counties is provided in **Figure 2.**

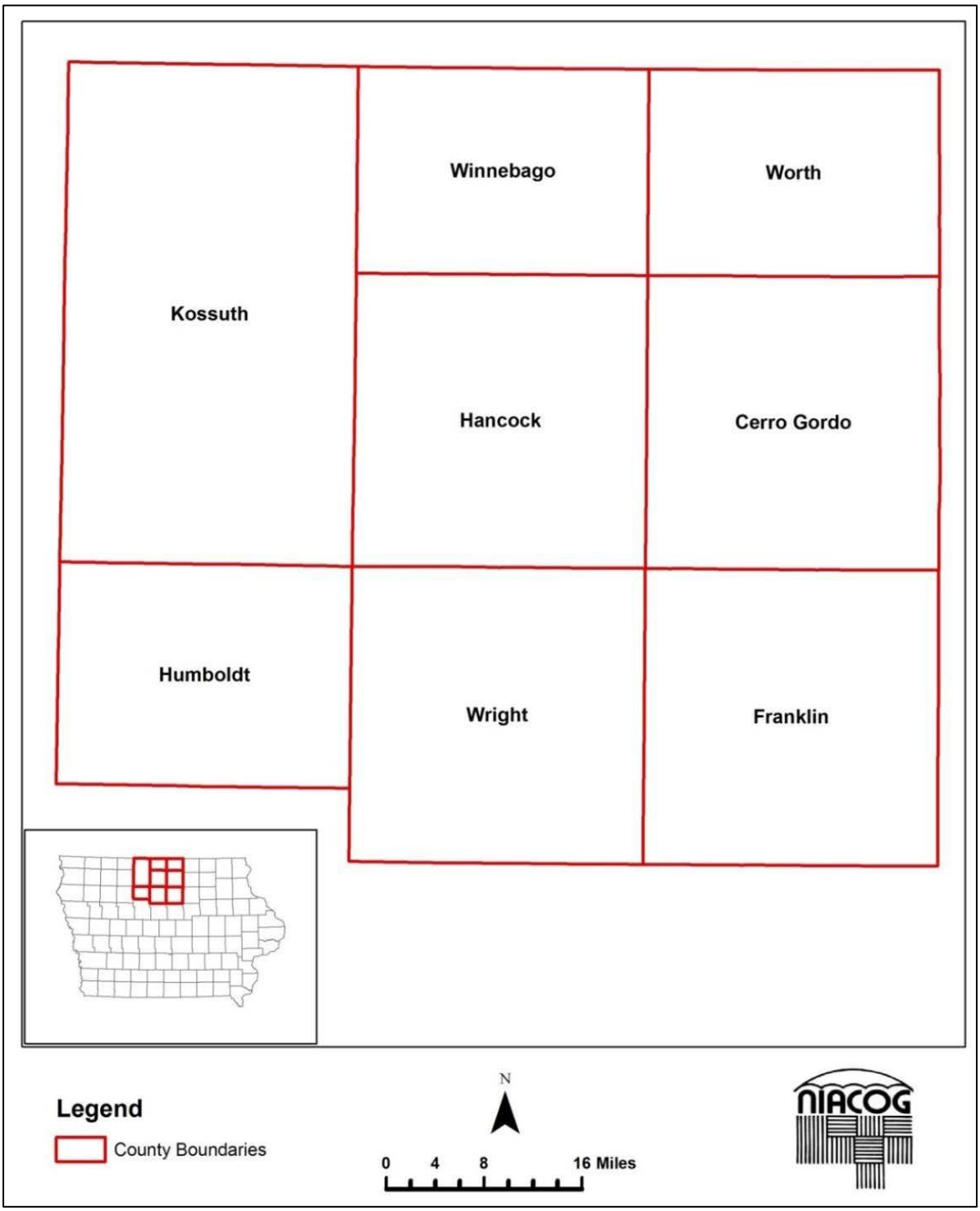
The school districts that are primarily within Hancock County are Garner-Hayfield and West Hancock. Both of these districts have participated in this plan. School districts located partially within the county are Forest City, and Belmond-Klemme. Belmond-Klemme School District's headquarters and schools are all located in Wright County. West Fork School District's schools are located in Cerro Gordo and Franklin Counties.

Figure 1 - Hancock County Jurisdictions



Map created by NIACOG 7/31/13. Data Source: NRGIS, 2012

Figure 2 - Hancock County Location



Map created by NIACOG 7/31/13. Data Source: NRGIS, 2012

History

Hancock County was officially formed in 1858 with an election held on June 28 of that year. The name for the county originated from honoring John Hancock, president of the continental Congress. At the time the county was founded, the townships of Avery and Madison were the only two township's established for the election of the county.

The location of the county seat and courthouse has changed localities more than once since the county's establishment. Initially, the first site declared for county government was within the Amsterdam Township located in the south central part of the county. However, the county seat was short lived in Amsterdam when one month later a new administration voided the contract for construction of the a courthouse. For several years after that, the county government was administered from the Amsterdam school until 1865, when the administration decided a courthouse was needed.

As stated in the *History of County Governments in Iowa,* published in 1922 by the Iowa Association of Counties, Des Moines, Iowa; land was donated by the Semour family of New York and was designated the place of the first actual county courthouse . The site would later be named Concord. Shortly after, two small buildings were constructed on the site of the courthouse square from the administrative offices to move in. By 1867, interest in a brick courthouse began to grow across the county. After a petition was passed and voted on, the brick structure passed with the voters consent and construction of the building began in 1868. Mr. Grover Maben was in charge of the construction of the courthouse. He used both brick and timber of which came from his farm. The bricks were fired at his farmstead and the trees were cut from within his grove.

The Hancock County Courthouse remained in Concord for nearly thirty years, until the residents of Britt decided to launch a massive campaign to relocate the courthouse to Britt. The community had plans drawn up, land ready for construction, and most importantly the community had $25,000.

The City of Garner countered this plan by Britt with a rather clever idea. This City of Garner annexed Concord, located just on mile north of Garner. Garner had also contributed $30,000 for the purchase of land and an new courthouse. After many legal battles in feuding, construction began on a new courthouse in Garner designed by architect F.W. Kinney. The new courthouse was completed and dedicated to the County on November 15, 1899.

However, the residents of Britt did not conceded defeat because the administrative offices were still in Concord. It wasn't until 1903 that the County Board of Supervisors voted to officially declare Garner the county seat and ordered all administrative offices into the new building. The Hancock County Courthouse has been in Garner ever since that time.

Water Systems

Rural homes and businesses use primarily private wells or rural water service. This system usually provides adequate and safe water, although limited fire protection for the rural areas. The cities of Woden, Crystal Lake, Garner, Britt, Klemme, Corwith, Kanawha, Goodell are known to have municipal water utilities. They use elevated or surface storage for treated water.

Unincorporated Hancock County is served by Drainage Districts for the drainage of surface waters from agricultural and other lands for the protections of said lands from overflow when

said protection is a public benefit or is conducive to public health, convenience, and welfare. Drainage districts are established by the Drainage District Trustees at the request of the land owners within the proposed district.

The residents of unincorporated Hancock County are served by individual and privately owner septic systems for wastewater disposal. The systems are dependent upon filtration fields that are adequately sized. The cities also provide waste water systems that are either treatment plants or open air lagoons that drain into rivers/creeks in the county as allowed through rules and regulations by the Iowa Department of Natural Resources.

Climate

The climate is sub-humid and continental. The winters are cold and blustery, summers are warm and humid, and the growing season provides adequate time for complete crop maturation. Winds prevail northerly and westerly in the winter months drawing down cold northern Arctic air. Summer winds more often prevail southerly and westerly drawing up warm and moist air from the Gulf of Mexico and the Pacific providing necessary amounts of rainfall for the proper growing seasons.

Soils

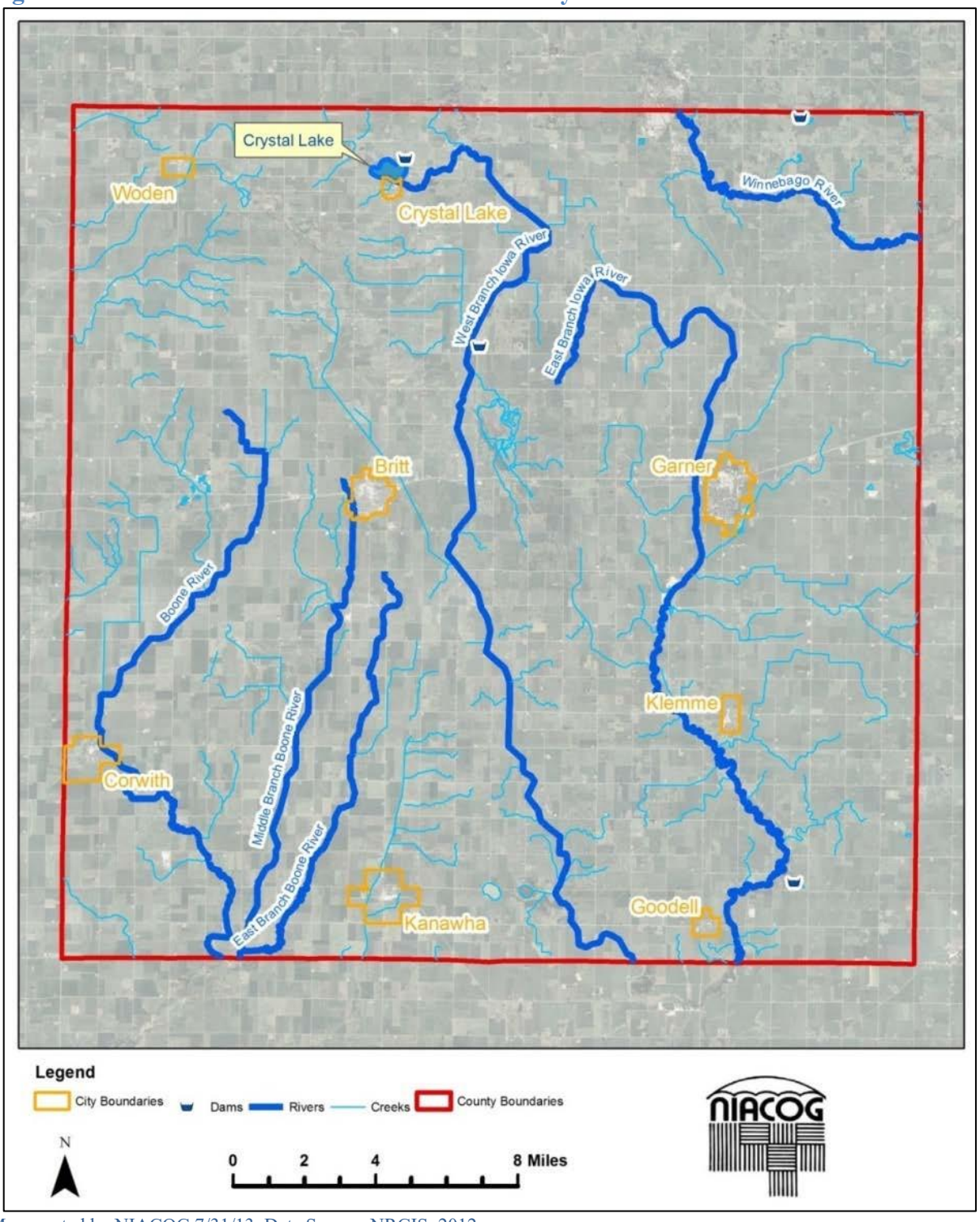
The county has been influenced by four district geological characteristics. The Altamont End Moraine dominates the central and south central portions of the county. It is characterized by nearly level to steep terrain, and contains areas, especially in the south central part of the county, that have the strongest relief and roughest land surface in the county. In the north central part of the county, glacial outwash is characterized by level to gently sloping terrain that has numerous small depressions and potholes and a few large depressions of muck. The Algona End Moraine, extending across the northwestern portion of the county, has a physiographic pattern much like that in the south central part of the county. The rest, and majority, of the county is dominated by a ground moraine that has many small depressions and potholes and a level to strongly sloping landscape pattern.

Soil erosion is one of the most prolific resource problems on cropland acres. It is estimated that 150,410 acres of cropland in Hancock County are eroded above tolerable levels (88,712 acres by wind erosion and 61, 698 by water erosion). About 41% of Hancock County's erodible cropland is adequately protected from erosion, however, only 25% of the land erodible by water is adequately protected. In the next fifteen years, approximately 3,000 acres of cropland eroding in excess of tolerable limits must be treated annually in order to keep the soil resource at productive levels.

Water Bodies

The county has several creeks and rivers that flow through its towns and unincorporated areas. The rivers are the Boone, Middle Branch Boone, East Branch Boone, West Branch Iowa, East Branch Iowa River, and Winnebago River. The creeks are Bear, Buffalo, Galls, Lindsey, Plum, and West Otter. North of the town of Crystal Lake is a 264 acre lake that shares its name with the town. The map of the lake and creeks and rivers is provided in **Figure 2.3.**

Figure 3 - Water Bodies & Dams in Hancock County

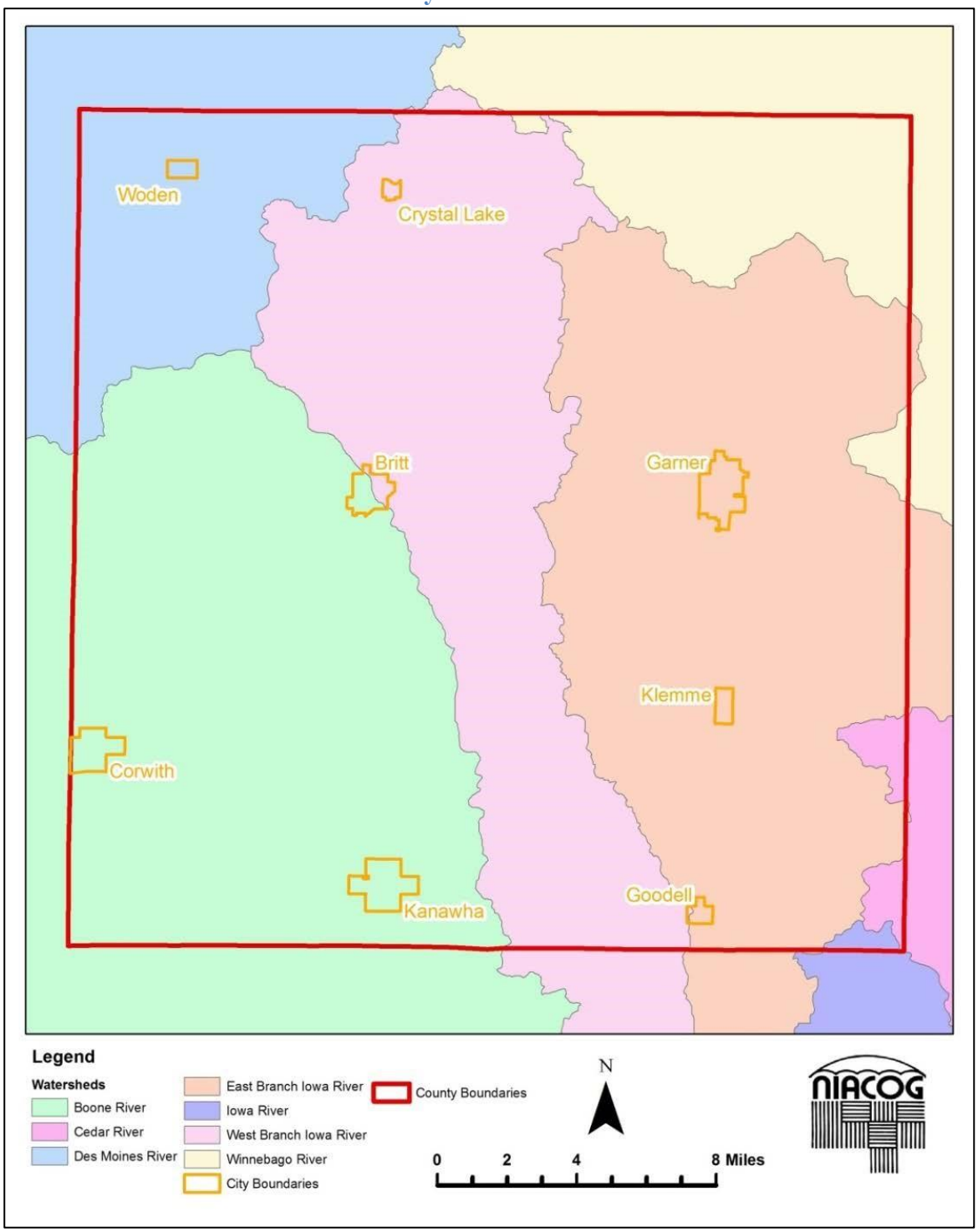


Map created by NIACOG 7/31/13. Data Source: NRGIS, 2012

Watersheds

The land area that drains water to a river, lake or ocean is called a watershed. Lakes, rivers and wells often affect the flow, water level and level of pollutants in the watershed. The Environmental Protection Agency's Office of Water, along with state agencies and local groups have been stressing the importance of water quality and improving watershed health. Addressing the whole health of the watershed instead of focusing on point source pollution tends to be more successful at maintaining good health of the watershed. Pollution from a sewage treatment plant might be reduced significantly after a new technology is installed, yet the local river and watershed still suffer from runoff pollution. Watershed management offers a stronger organization that is able to uncover the many problems that plague a watershed. Watershed management is able to determine what actions and resources are needed to protect and restore the watershed. Hancock County primarily contains the following watersheds: Boone River, West Branch Iowa River, Des Moines River, East Branch Iowa River, and Winnebago River. These watersheds are shown in **Figure 4**.

Figure 4 - Watersheds in Hancock County



Map created by NIACOG 7/31/13. Data Source: NRGIS, 2012

Zoning Regulations & Future Development

Two tools used by Hancock County to manage development and growth are the county's Comprehensive Development Plan and zoning ordinance. These two working documents function in conjunction with one another. Hancock County is able to update the comprehensive plan to meet the changing needs of the community and support the zoning ordinance. The zoning ordinance provides the citizens of Hancock County with a set of land use controls for protecting their health, safety, and welfare. This document and accompanying maps also designate and allow different types of development to occur throughout various sections of the community. These designations are based on several factors such as past development, placement of infrastructure, anticipated future needs, barriers to development such as flood plains, rivers, creeks, and other topographical conditions, and areas that are more suitable for development. Hancock County is divided into 8 Zoning Districts as follows:

1. Agricultural
2. Agricultural Preservation
3. Residential
4. Commercial
5. Industrial
6. Protected Wetland
7. National Environmental Recreation
8. Landfill

The zoning ordinance is administered and interpreted by the zoning administrator and planning and zoning board. It also provides the Board of Supervisors with rules related to zoning changes and development issues raised by citizens of the community. The Board of Supervisors must review all recommendations and then make a decision either for or against the recommendation. Citizens wishing to have their property rezoned can do so by following procedures set by the county. Once P&Z Board approval is obtained, the rezoning issue must be approved by the Board of Supervisors. Persons wishing to build new structures in the County must obtain a building permit from the Planning and Zoning office. This permit must also be approved by the Zoning Administrator. There is also a zoning board of adjustment that authorizes variances to the strict interpretation of the zoning ordinance, hears appeals of decisions of the zoning administrator, and approves special exceptions/conditional use permits.

There are few constraints to development and growth in Hancock County. Most of the land in the County is farm land and, if acquired from the owner, can be used for development. New development will proceed according to the comprehensive development plan and zoning restrictions and will proceed in an orderly and rational manner. However, development for agricultural purposes is exempt from the county's zoning/building regulations. The county's flood plain and subdivision regulations will continue to apply towards agricultural development. The other jurisdictions within the Hancock County have the potential to enforce zoning ordinances where applicable.

Hancock County will thoroughly consider applying the recommendations of this plan towards future development. Future development within flood zones, including SFHA, will be strictly regulated by the Iowa Department of Natural Resources and the county. SFHA development will not occur in the county or in the cities without serious discussion and deliberation.

Future development will also be governed by the comprehensive plans and the zoning ordinances by the county and cities. An updated comprehensive plan for each jurisdiction will include the

goals and actions presented in this plan. The cities of Garner, Britt, and Kanawha are known to utilize zoning ordinances. The cities of Goodell, Corwith, Klemme, Woden, and Crystal Lake currently do not enforce zoning.

National Flood Insurance Program (NFIP)

Hancock County has identified special flood hazard areas by the Federal Emergency Management Agency (FEMA). Unincorporated Hancock County does have a FEMA issued Flood Insurance Rate Maps (FIRM) with an effective date of 04/042018. Hancock County's community ID number issued by FEMA is #1900873A. Copies of selected FIRMS are located in Appendix A of this plan. The recommendation of this plan is to for the jurisdictions to continue or begin participation in the NFIP whle regularly reviewing and updating the zoning codes when necessary. The current NFIP statuses are shown in **Table 1** below.

Table 1 - NFIP Status of Jurisdictions

Requirement: §201.6(c)(3)(ii): *[The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.*

Jurisdictions	CID #	Effective Map Date	NFIP Participating
Unincorporated Hancock County	1900873B	10/27/2022	Yes
City of Corwith	190407B	04/04/2018	Yes
City of Kanawha	190408B	04/04/2018	Yes
City Woden	190410	-	No
City of Crystal Lake	190724	-	No
City of Britt	190558	-	No
City of Garner	190581B	04/04/2018	Yes
City of Goodell	190733	-	No
City of Klemme	190409	-	No

Source: FEMA, 2022

Population

The population in Hancock County in 1990 was 12,638; by the 2000 Census, the population had declined by 4.3% to 12,100. For the 2010 Census, the population in Hancock County dropped by 6.3% to 11,341. The 2020 Census indicated a county-wide population of 10,795, a decrease of 3.23%. Rural areas of the state are losing population even though the State of Iowa in general is gaining population. The trend is reflective of a migration from rural agricultural areas to larger urban areas, with smaller communities near large urban areas experiencing growth. Hancock County has an aging population with a median age of 44.4 years. Summaries of the population are shown in **Tables 2-4**.

Table 2 - General Population Characteristics

	Number	Percent	U.S.
Total Population	10,837	-	331,464,948
Male	5,488	50.6%	49.9%
Female	5,349	49.4%	50.1%
Median Age (years)	44.4	-	38.1
Under 5 years	624	5.74%	-
20 years and over	7,800	72%	-
65 years and over	2,413	22.26%	-
One Race	10,904	95.6%	-
White	9,959	87.3%	-
Black	76	0.7%	-
American Indian and Alaska Native	39	0.3%	-
Asian	25	0.2%	-
Native Hawaiian and Pacific Islanders	5	0.0%	-
Some other race	186	1.6%	-
Two or more races	505	4.4%	-
Hispanic or Latino	614	5.4%	-

Source: 2021 ACS 5-Year Estimates Subject Table

Table 3 - Population of Unincorporated Areas

	Number	Percent
Total Population	3,740	34.6%

Source: 2020 U.S. Census Unincorporated Data

Table 4 - Population Statistics of Cities

Jurisdiction	Population
Garner	3,065
Britt	2,044
Corwith	266
Crystal Lake	253
Goodell	140
Kanawha	658
Klemme	441
Woden	188

Source: US Census 2020

Age distribution is an important factor to future projects because county officials must know the diversity of the population that they are trying to protect from future hazards. **Table 5** below shows the age distribution of Hancock County in the year 2020.

Table 5 - Population Age Distribution

Age Group	# Of Persons	Percent
Under 5	624	5.7%
5-14 years	1,323	12.2%
15-24 years	1,175	10.8%
25-34 years	1,138	10.5%
35-44 years	1,278	11.8%
45-54 years	1,186	10.9%
55-64 years	1,700	15.7%
65 to 74 years	1,332	12.3%
75 to 84 years	692	6.4%
85 and over	412	3.8%

Source: 2020 U.S. Census Unincorporated and Incorporated Data

Residents sometimes travel outside the county to earn an income. There are many income opportunities within Hancock County as well. The median income of all households in Hancock County was $67,865 according to the American Community Survey 2018-2022 5 year estimates. This means one-half of all households earned more than $67,865 and one-half earned less. **Table 6** below summarizes the income distribution for households in the County, Cities and State.

Table 6 - Household Income Distribution

	County	State	Britt	Corwith	Crystal Lake	Garner	Goodell	Kanawha	Klemme	Wooden
Less than $10,000	4.7%	4.2%	9.6%	0.9%	3.7%	6.4%	0.0%	3.1%	1.4%	7.0%
$10,000 to $14,999	5.0%	3.6%	3.0%	25.6%	0.9%	5.9%	2.9%	4.6%	4.9%	4.2%
$15,000 to $24,999	6.2%	7.4%	5.3%	7.7%	11.1%	7.8%	21.4%	6.7%	8.0%	7.0%
$25,000 to $34,999	5.8%	7.8%	7.5%	5.1%	8.3%	6.0%	1.4%	4.6%	22.7%	12.7%
$35,000 to $49,999	14.7%	11.9%	17.8%	14.5%	13.9%	11.5%	5.7%	19.7%	13.3%	28.2%
$50,000 to $74,999	20.5%	17.9%	20.5%	27.4%	13.9%	15.4%	20.0%	19.5%	22.7%	14.1%
$75,000 to $99,999	15.5%	14.3%	17.3%	6.8%	15.7%	19.4%	37.1%	7.2%	11.2%	14.1%
$100,00 to $149,999	17.2%	18.2%	9.3%	6.8%	32.4%	15.8%	10.0%	30.0%	15.4%	9.9%
$150,000 to $199,999	5.3%	7.6%	4.7%	4.3%	0.0%	6.8%	1.4%	4.65%	0.3%	2.8%
$200,000 or more	4.9%	7.1%	5.1%	0.9%	0.0%	5.1%	0.0%	0.0%	0.0%	0.0%
Total	4,582	1,290,139	831	117	108	1,287	70	390	286	71
Median Income	$67,865	$70,571	$59,805	$48,125	$71,250	$69,056	$69,500	$63,889	$49,375	$44,519

Source: US Census Bureau-American Community Survey (ACS) 5yr estimates-2018-2022

Housing

Housing is a basic, fundamental and critical infrastructure needs to a community. Housing is vital to the strength, survival and prosperity to the community. The largest investment residents of a community undertake is in their housing and is an important component when establishing a style which the community uses to display to the outside world. Housing ought to be affordable, located in non-hazardous areas, needs to be maintained and support those on fixed incomes, e.g. elderly. Renter and owner occupied housing must be maintained to properly protect the residents within during inclement weather. Occupancy is summarized in **Table 7.**

The 2020 U.S. Census reported 5,127 total housing units in Hancock County. The average household size is 2.32 persons within the county; the State of Iowa 2.52 persons per household; and the United States, 2.67 persons per household.

The following table shows housing occupancy in Hancock County, according to the ACS 5-year estimates – 2018-2022.

Table 7 - Housing Occupancy

Subject	Hancock County	Iowa	United States
Total Units	5,127	1,417,064	143,772,895
Occupancy Rate	89.4%	91.0%	90.3%
Vacancy Rate	10.6%	9.0%	9.7%
Owner Occupancy Rate	81.4%	71.5%	65.2%
Renter Occupancy Rate	18.6%	28.5%	34.8%

Source: US Census Bureau-American Community Survey (ACS) 5yr estimates-2018-2022

The reported, 2018-2022ACS, median value of owner-occupied housing units in Hancock County is $116,000. One-half of the homes in Hancock County were valued above $116,000 and the other one-half were valued under that amount. The median value for the State of Iowa is $181,600. The United States Median Value is $340,200. The increase over the past ten year time period can be attributed to declining interest rates and the large number of low down payment mortgage options that began appearing during the first part of the decade. These financial factors had a positive effect on demand for real estate which resulted in climbing house values.

Valuations

The county uses the assessor's valuations to form an estimate for the potential financial losses during a disaster. The Hancock County planning committee recognized that some hazards would cause more damage than others. An average valuation is calculated for each structure identified by the Hancock County Assessor's Office. Large and small area potential hazard damages can be determined by this method. **Tables 8-12** below summarize the valuations of Hancock County. Religious and Non-Profit Valuation does not have a separate table due to no breakdown by cities and unincorporated areas in the Hancock County Tax Abstract Assessment.

Table 8 - 2018 Valuation of Hancock County

Type	Land Valuations $	Buildings/Dwellings Valuations $	Average Valuation $
Residential (non-Ag. & Ag.)	$91,151,660	$624,115,379	$135,589/dwelling
Commercial	$17,628,963	$141,186,411	$246,399/building
Industrial	$5,724,040	$158,270,120	$2,552,743/building
Agricultural Land	$584,953,670	$84,147,290 (structures only)	$1,735/acre
Religious and Non-Profit	$149,836,790	-	-
Total Valuation	$849,295,123	$1,007,719,200	-

Source: Hancock County Assessor's Office, 2024 Incorporated and Unincorporated Data

Table 9 - Residential Valuation (non-Ag. and Ag. dwellings only)

Jurisdiction	Residential Valuation $	Number of Dwellings $	Average Valuation $
Garner	$208,229,588	1,182	$176,167
Britt	$86,865,999	836	$103,907
Forest City	$19,942,058	74	$269,487
Crystal Lake	$7,394,510	121	$61,112
Woden	$5,179,300	114	$45,432
Corwith	$5,407,000	126	$42,913
Kanawha	$20,318,419	298	$68,183
Klemme	$13,793,399	222	$62,132
Goodell	$2,943,970	73	$40,328
Unincorporated Hancock	$124,853,866	811	$153,951

Source: Hancock County Assessor's Office, 2027

Table 10 - Commercial Valuation (Buildings Only)

Jurisdiction	Commercial Valuation	Number of Buildings	Average Valuation
Garner	$39,170,432	145	$270,141
Britt	$18,329,041	112	$163,652
Forest City	$16,251,902	32	$507,872
Crystal Lake	$742,260	29	$25,595
Woden	$6,320,390	23	$274,800
Corwith	$9,193,990	39	$235,743
Kanawha	$9,888,841	37	$267,266
Klemme	$5,121,731	37	$138,425
Goodell	$252,200	20	$12,610
Unincorporated Hancock	$35,920,624	99	$362,835

Source: Hancock County Assessor's Office, 2024

Table 11 - Industrial Valuation (Buildings Only)

Jurisdiction	Industrial Valuation	Number of Buildings	Average Valuation
Garner	$20,151,960	13	$1,550,151
Britt	$1,621,640	3	$540,547
Forest City	23,897,220	4	$5,974,305
Crystal Lake	0	0	-
Woden	0	0	-
Corwith	0	0	-
Kanawha	$1,185,260	2	$592,630
Klemme	$1,580,240	4	$395,060
Goodell	0	0	-
Unincorporated Hancock	$109,833,800	36	$3,050,939

Source: Hancock County Assessor's Office, 2024

Table 12 - Agricultural Value (Acres Only)

Jurisdiction	Agricultural Valuation	Acres	Average Valuation
Garner	$349,980	211.850	$1,652/acre
Britt	$210,920	118.690	$1,777/acre
Forest City	$107,050	80.920	$1,323/acre
Crystal Lake	$75,830	41.790	$1,815/acre
Woden	$376,180	211.330	$1,780/acre
Corwith	$1,358,630	709.630	$1,915/acre
Kanawha	$1,922,290	962.420	$1,998/acre
Klemme	$221,050	124.310	$1,778/acre
Goodell	$356,680	185.650	$1,921/acre
Unincorporated Hancock	$579,975,060	334,598.72	$1,733/acre

Source: Hancock County Assessor's Office, 2024

Transportation

Hancock County has several highways and county roads. The major highways include 69, 18 and 17. Highway 18 runs east to west through Garner and Britt. Hwy 17 runs along the county's western boundary. Highway 69 runs north to south through Goodell and Garner. County highways that run north and south include R-16, R-18, R-20, R-26, R-30, R-34, R-35, R-38, R-44, R-56, R-64, R-66 R-68, R-70, and R-74. County highways that run east and west include B-14, B-16, B-20, B-30, B-36, B-40, B-46, B55, B-60, B-62, and B-63. A map of the major highways is shown in **Figure 5**.

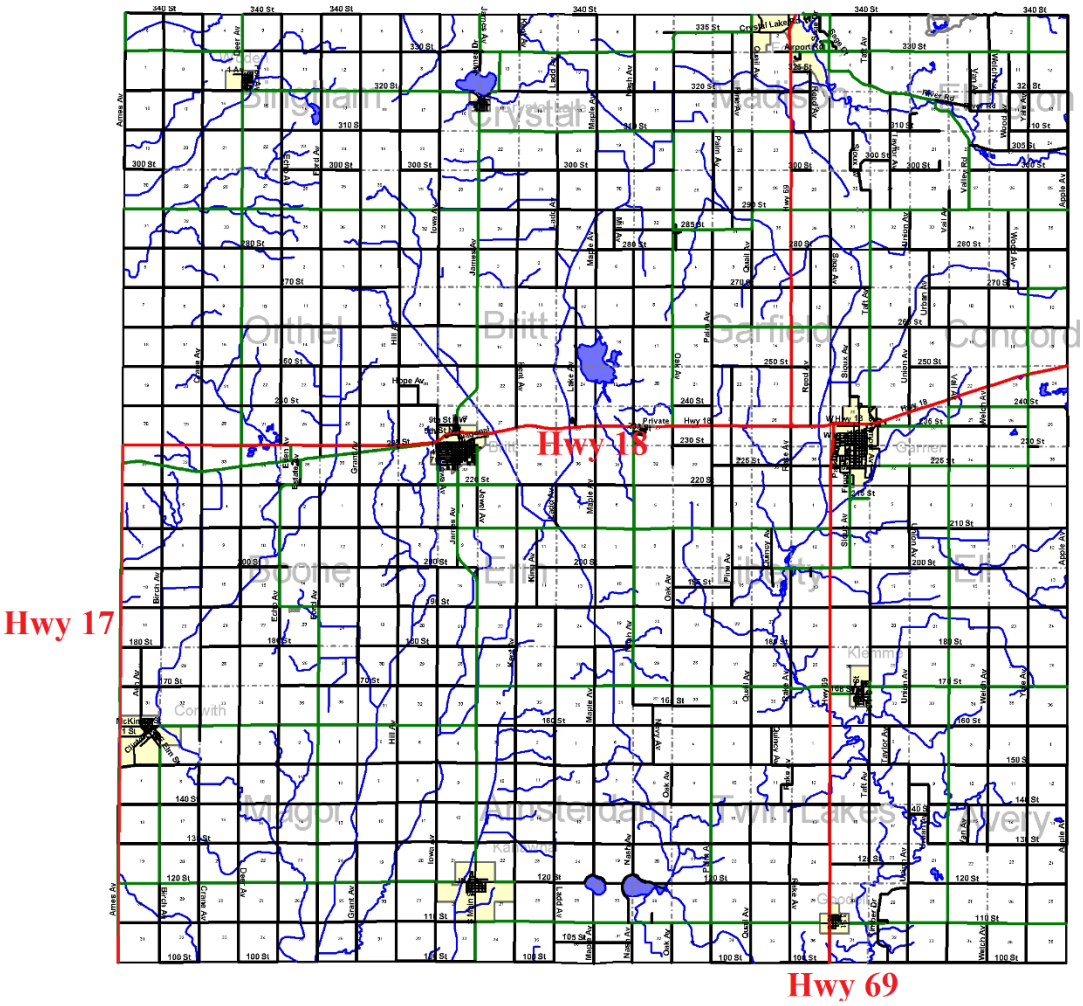
The railways that run through Hancock County are owned by North Central Iowa Rail Corridor and Canadian Pacific. The North Central Iowa Rail Corridor railway runs north and south through the county with trackage rights to Iowa Northern Railway. The Canadian Pacific Railroad runs east to west. These railways provide services to haul grain, chemicals, farm equipment and ethanol from the producers of these materials in Hancock County. **Figure 6** provides a map of the railways.

The Mason City Municipal Airport in Cerro Gordo County is located approximately 35 miles from Garner. The 6,500 feet of hard surfaced runways allows commercial and freight service to land. National and International air travel can be obtained by going south to Des Moines or north to Minneapolis.

Within Hancock County one public airport located in the northern part of the county within the boundaries of Forest City. It is owned and operated by the City of Forest City. The municipal airport is for general services and supports small to mid-size business jets. It serves the aviation

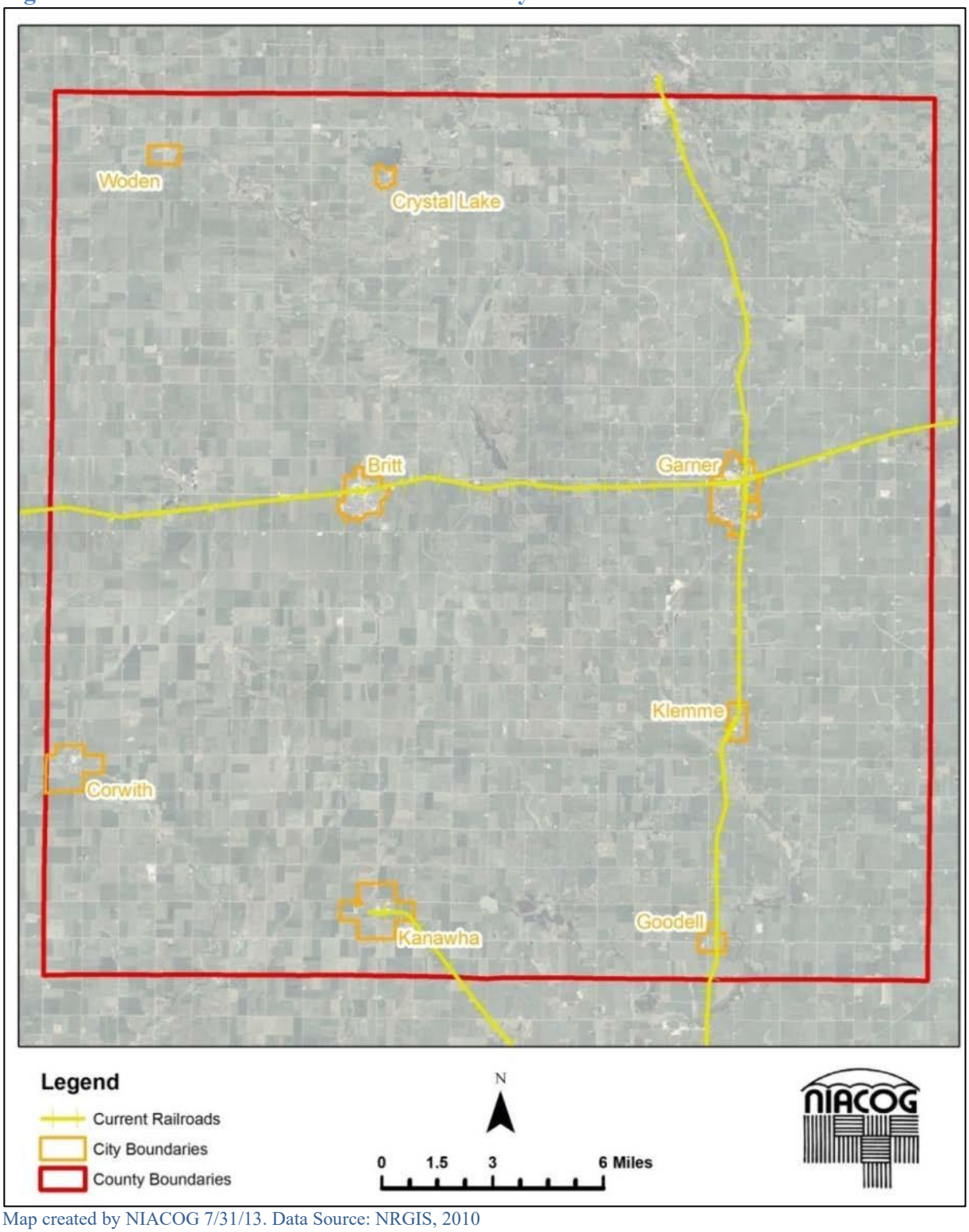
needs of Forest City, Winnebago and northern Hancock Counties. The two runways are 5,806 ft. and 2,708 ft. long respectively. The airports within the county are shown in Figure 7.

Figure 5 - Major Highways in Hancock County



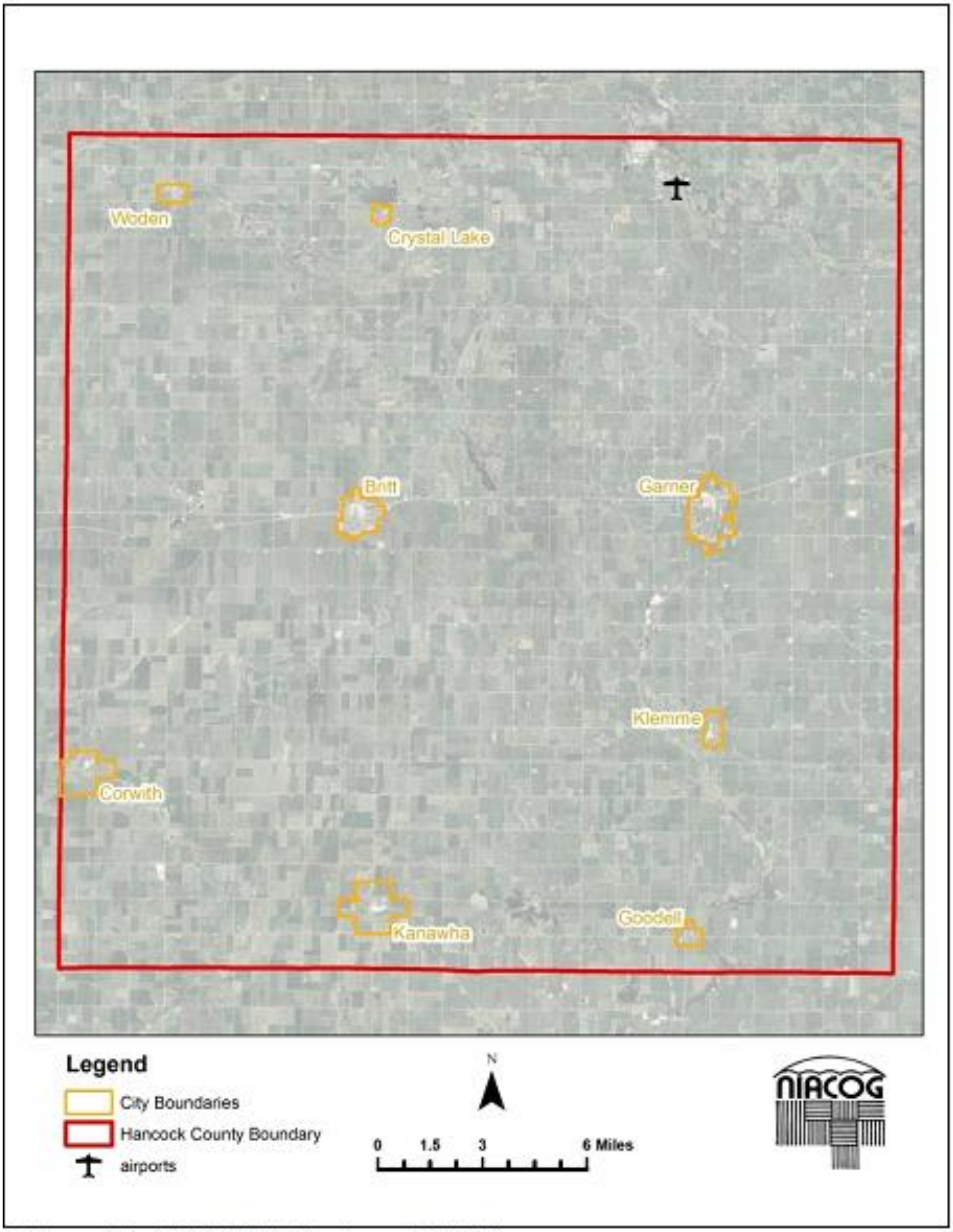
US Highways 18 & 69 and Iowa 17 are in Red

Figure 6 - Current Railroads in Hancock County



Map created by NIACOG 7/31/13. Data Source: NRGIS, 2010

Figure 7 - Airports in Hancock County



Map created by NIACOG 7/31/15. Data Source: NRGIS 2010

A transit service is available through the Region 2 – North Iowa Area Council of Governments serving as the regional transit authority. Transit service is available for use by anyone in the area, and each service is tailored to the needs of the local users. Region 2 transit operates from a base of approximately 92 vehicles. Service is purchased from local governments, private operators, human service agencies, or municipal providers. Providers include: Mosaic in North Central Iowa, Opportunity Village, Access Inc., Osage Senior Citizens, Comprehensive Systems, Charles City Transit, Worth County Public Health Nursing, Foster Grandparents Program, and the cities of Algona, Lake Mills and Northwood.

CHAPTER 3: HAZARD ANALYSIS & RISK ASSESSMENT

The foundation for hazard mitigation is based on Hazard Analysis and Risk Assessment (HARA) that is comprehensive and multi-hazard. HARA was developed to provide an overview and analysis of the county's vulnerability to hazards. It begins with hazard identification for each community. Upon hazard identification completion, the hazards are profiled in-depth and planning committees assess the risks for each hazard. HARA ultimately assists communities in deciding what mitigation actions are required or should be undertaken and how to implement the selected actions.

Hazards Identification

Each Hazard Mitigation Planning Committee identified hazards from lists included in the State of Iowa Hazard Mitigation Plans. The committees removed the hazards that they judge to have not occurred or may not potentially occur within their community. The assessments and profiles were performed on the hazards that they chose. The following hazards were discussed by the committees for potential inclusion in the risk assessment:

- Animal/Plant/Crop Diseases
- Dam Failure
- Drought
- Earthquake
- Expansive Soils
- Extreme Heat
- Flash Flood
- Grass and Wild Land Fires
- Hailstorms
- Hazardous Materials
- Human Disease
- Infrastructure Failure
- Landslide
- Levee Failure
- Radiological
- River Flooding
- Severe Winter Weather
- Sink Holes
- Terrorism
- Thunderstorms and Lightning
- Tornadoes
- Transportation Incident
- Windstorms

The modifications made from the county's list by individual jurisdictions are as follows:

- Britt removed radiological incidents, levee failures, landslides, and dam failure.
- Crystal Lake removed dam failure, earthquakes, expansive soils, landslides, levee failures, radiological incident and Sinkholes.
- Garner removed earthquake and dam failure.
- Goodell removed dam failure, drought, earthquake, expansive soils, grass/wildland fire, hazardous materials incident, landslides, levee failure, radiological incident, river flooding, sinkholes, terrorism and transportation incident.
- Klemme removed Animal/Plant/Crop disease, dam failure, earthquake, landslides, levee failure, radiological incident, river flooding, sinkholes, terrorism and transportation incident..
- Woden removed dam failure, earthquake, expansive soils, landslides, levee failures and radiological incidents.
- Garner-Hayfield-Ventura School District removed dam failure, earthquakes, expansive soils, landslides, levee failures, radiological incidents and sinkholes.
- West Hancock School District removed landslides and levee failures.
- Hancock County removed dam failures, earthquakes, expansive soils, landslides, levee failures, radiological incidents, sinkholes and transportation incidents.

Hazards Profile

The hazards identified in one or more jurisdictions are assessed in this section. To assess the identified hazards, a methodology was established to account for how hazards impacted the communities or could potentially impact the communities. The HARA process measures the potential loss of life, personal injury, economic injury, and property damage resulting from hazards by assessing the four factors below:

Probability: reflects the likelihood of the hazard's occurring again in the future, considering both the hazard's historical occurrence and the projected likelihood of the hazard occurring in any given year.		
Score		**Description**
1	Unlikely	Less than 10% probability in any given year (up to 1 in 10 chance of occurring), history of events is less than 10% likely or the event is unlikely but there is possibility of its occurrence.
2	Occasional	Between 11% and 20% probability in any given year (up to 1 in 5 chance of occurring, history of events is greater than 10% but less than 20%, or the event that could possibly occur.
3	Likely	Between 21% and 33% 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	More than 33% probability in any given year (event has up to a 1 in 1 chance of occurring), history of events is greater than 33% likely, or the event is highly likely to occur.

Magnitude/ Severity: Assessment of severity in terms of injuries and fatalities, personal property, and infrastructure and the degree and extent with which the hazard affects the jurisdiction.		
Score		**Description**
1	Negligible	Less than 10% of property severely damaged, shutdown of facilities and services for less than 24 hours, and/or injuries/illnesses treatable with first aid.
2	Limited	11% to 25% of property severely damaged, shutdown of facilities and services for more than a week, and/or injuries/illnesses that do not result in permanent disability.
3	Critical	26% to 50% of property severely damaged, shutdown of facilities and services for at least 2 weeks, and/or injuries/illnesses that result in permanent disability.
4	Catastrophic	More than 50% of property severely damaged, shutdown of facilities and services for more than 30 days, and/or multiple deaths.

Warning Time: Rating of the potential amount of warning time that is available before the hazard occurs.	
Score	**Description**
1	More than 24 hours warning time
2	12 to 24 hours warning time
3	6 to 12 hours warning time
4	Minimal or no warning (Up to 6 hours warning)

Duration: A measure of the duration of time that the hazard will affect the jurisdiction.	
Score	**Description**
1	Less than 6 hours
2	Less than 1 day
3	Less than 1 week
4	More than 1 week

The hazard analysis and risk assessment process sought to strike a balance between evaluation criteria. An example would be the evaluation of low probability-high impact events versus high probability-low impact events. Each category of a particular hazard is rated on a scale of one through four based on the scoring guides above. These guides were used by the planning committees to help obtain a proper assessment for each of the hazards in a local and countywide context. A scale of one through four was used in all of the scoring guide tables because of the large variation in historical occurrences, probabilities, percentages of vulnerabilities, percentage of spatial extent, the number of casualties, or the value of property damaged. Often this data was not available or would have been impossible to extract from aggregate data. The scale provided the best option for comparison of vastly different types of hazards.

On the following pages, the hazards are defined and discussed at length. The hazards are listed for the entire county unless indicated in that hazard's profile. The results of the scoring are also included below in the Hancock County hazard mitigation planning committee's assessment. The source of the historical occurrence came from the National Climatic Data Center (NCDC) website that is hosted by the National Oceanic and Atmosphere Administration (NOAA). The scoring activity by the committee was based on each member's subject matter expertise, knowledge of the community, studies of previous events, historic information on damages, and other written resource materials. While available facts were presented to the hazard mitigation planning committees for Hancock County and the incorporated jurisdictions, the members ultimately scored the factors based on what they judged was most appropriate for their community at the time. This has the potential to contradict the available recorded data. Furthermore, the accuracy and/or validity of the available data are not guaranteed.

Animal/Plant/Crop Disease

An outbreak of disease that can be transmitted from animal to animal or plant to plant represents an animal/crop/plant disease. The disease outbreak will likely have a significant economic implication or public health impact. The crop/plant pest infestation will likely have severe economic implications, cause significant crop production losses, or significant environmental damage. The introductions of some high consequence diseases may severely limit or eliminate our ability to move, slaughter, and export animals and animal products. There would also be many indirect effects on our economy. No historical data is readily available for Hancock County. Planning committees will work to gather information from appropriate agencies for the next plan update.

Location	Countywide	**-**
Probability	Each year the Iowa Department of Agriculture and Land Stewardship (IDALS) conducts numerous animal disease investigations. IDALS, along with Iowa's universities and industries, conducts regular crop/plant pest surveillance. There are no recorded events of disease outbreak at significant levels in the county, but the Hancock HM Committee determined that an animal/plant/crop disease is very likely to occur at least at low levels and frequently will need to be closely monitored because of the ability of disease to easily spread from one area to another.	**4**

Magnitude/ Severity	The increase in the movement of animals, animal products, plants, crops, and crop products has the potential to spread or introduce disease and pests to previous non-infested areas. Diseases/pests can also be introduced naturally by weather patterns. New strains of viruses and diseases that are not currently present in the county have the potential to devastate the current population of animals, crops and plants due to low immunity. The impact will vary by disease/pest and the type of animal/crop/plant infected/infested. Should the disease/pest have public health implications, the economic and social impact would be even greater. The severity will vary by disease/pest. The types of animals, crops, or plants affected will also significantly influence the severity.	**2**
Warning Time	If the diseases/pests are highly infectious (many animals that are infected with disease can be transmitting disease before they show clinical signs), by the time they are discovered, they will likely have spread across the state or nation. This will put us at a severe disadvantage during response and recovery.	**1**
Duration	Response and recovery from serious infestation or disease are lengthy, with many producers likely to never be able to return to business, in addition, crop infestations/animal diseases can	**4**
	reoccur, causing repeated losses in subsequent years.	
Further Information/ Sources	**USDA Animal & Plant Health Inspection Service:** **www.aphis.usda.gov** **Iowa Department of Agriculture and Land Stewardship:** **www.iowaagriculture.gov** **Iowa State University Lloyd Veterinary Medical Center:** **http://vetmed.iastate.edu/vmc** **CBS News Disaster Links** **http://www.cbsnews.com/digitaldan/disaster/disasters.shtml** **The Disaster Center** **http://www.disastercenter.com/**	**-**

Drought

Drought is defined as a period of prolonged lack of precipitation for weeks at a time producing severe dry conditions. There are four types of drought conditions relevant to Iowa:

1. Meteorological drought, which refers to precipitation deficiency;
2. Hydrological drought, which refers to declining surface and groundwater supplies;
3. Agricultural drought, which refers to soil moisture deficiencies; and
4. Socioeconomic drought, which refers to when physical water shortages begin to affect people.

The highest occurrence of drought conditions with recorded events in Iowa is associated with agricultural and meteorological drought as a result of either low soil moisture or a decline in recorded precipitation.

Droughts can be localized or widespread and last from a few weeks to years. A prolonged drought can have a serious impact on a community's water supply and economy. Increased demand for water and electricity may result in shortages of resources. Moreover, food shortages may occur if agricultural production is damaged by loss of crops and/or livestock. While droughts are generally thought to occur during extreme heat events, they can and do occur during the winter months.

According to the Hazards and Vulnerability Research Institute, Hancock County has had 8 reported drought periods since 2001. The details of drought events are shown in **Table 13**.

Table 13 - Droughts in Hancock County

Period	Injuries	Fatalities	Property Damage $	Crop Damage $
08/01/2001	0	0	0	11,350,000
08/01/2003	0	0	12,650,000	5,050,505
7/1/2012-10/1/2012	0	0	0	51,000,000
8/1/2013	0	0	0	21,000,000
6/15/2021-8/1/2021	0	0	0	0
10/18/2022-12/1/2022	0	0	0	0
1/1/2023-12/1/2023	0	0	0	0
1/1/2024-3/1/2024	0	0	0	0

Source: Hazards and Vulnerability Research Institute, 2024

The drought period(s) beginning in 2021 extending through early 2024 have not been assessed for total crop damages to date.

Drought is a normal part of climate fluctuations. Climatic variability can bring dry conditions to a region for up to years at a time. Research and observations of the El Nino/La Nina climatic events are resulting in more predictable climatic forecasts. A drought would likely affect most of Hancock County if not the whole State of Iowa and the Upper Midwest as a whole. Based on its dependence on precipitation, the agricultural community would be the most adversely affected. However, the entire state or region would feel and indirect impact.

Location	Countywide	
Probability	According to the Hazards and Vulnerability Research Institute, Hancock County has had 8 periods of drought from 2001-2024. These drought periods occurred in throughout the years. While some may have been more severe than others, agricultural areas were impacted much more than the metropolitan areas where impacts were indirect. Drought is part of normal climate fluctuations. Climatic variability can bring dry conditions to the area for up to years at a time. Observations from the El Nino/La Nina climatic events are resulting in more accurate and predictable climatic forecasts. Based on the available data, droughts can be considered to occur occasionally or likely. The county committee determined that droughts occur occasionally.	**2**
Magnitude/ Severity	Those dependent on rain would be the most vulnerable to a drought. This means that agriculture, agribusiness, and consumers (if the drought lasted long enough or impacted a large area) would be impacted. A drought limits the ability to produce goods and provide services. Because citizens draw their drinking water from surface water and groundwater sources, a prolonged severe drought may impact all citizens if there were to be a dramatic drop in the stream flow coupled with the drop in the water table. Fire suppression can also become a problem due to the dryness of the vegetation and possible lack of water. A drought would likely affect most of Hancock County if not the whole state of Iowa as a whole. Due to the dependence on precipitation and water the agricultural community would be impacted the most. The agricultural areas would be most adversely impacted, but the entire state would likely feel at least some impact. Few if any health impacts to people in the affected area because of secondary sources of water. Drought in the US seldom results directly in the loss of life. Health impacts would be more significant on livestock without auxiliary water supplies. Property losses would be limited to livestock and crops to the agricultural community. Facilities would not be impacted. Infrastructure could be affected in areas of expansive soils due to drying soils, lower water levels around dams, etc. Delivery of services would be limited to source water delivery and those services that consume large amounts of water. Drought can lead to large and damaging impacts to the agricultural economy. Because of Iowa's reliance on the agricultural economy, the economic and financial impacts would certainly ripple out into other sectors. Rural areas can be especially affected by long-term drought. If restrictions are put on manufacturers that use large amounts of water, the local economy can be impacted that way as well.	**3**

Warning Time	Drought warning is based on a complex interaction of many different variables, water uses, and consumer needs. Drought warning is directly related to the ability to predict the occurrence of atmospheric conditions that produce the physical aspects of drought, primarily precipitation and temperature. There are so many variables that can affect the outcome of climatic interactions, and it is difficult to predict a drought in advance. In fact, an area may already be in a drought before it is even recognized. While the warning of the drought may not come until the drought is already occurring, the secondary effects of a drought may be predicted and	**1**
	warned against weeks in advance.	
Duration	According to Hancock County and Iowa's drought history, most droughts occur for at least a month at a time.	**4**
Further Information/Sources	**Iowa Dept. of Agriculture Climatology Bureau: http://www.agriculture.state.ia.us/climatology.asp Iowa Department of Natural Resources: http://www.iowadnr.gov/InsideDNR/RegulatoryWater National Oceanic & Atmospheric Administration Drought Info. Center: http://www.drought.noaa.gov/ National Climatic Data Center http://www.ncdc.noaa.gov/oa/climate/severeweather/extremes.html**	**-**

Extreme Heat:

Conditions for extreme heat are defined by summertime weather that is substantially hotter and/or more humid than average for a location at that time of year. Extreme heat includes temperatures in excess of 100 degrees Fahrenheit (including the heat index) or at least three successive days of 90+ degrees Fahrenheit. A heat advisory is issued when temperatures reach 105 degrees and a warning is issued at 115 degrees. The heat index is a number in degrees Fahrenheit that tells how hot it really feels when relative humidity is added to the actual air temperature. Exposure to full sunshine can increase the heat index by at least 15 degrees. Heatstroke, sunstroke, cramps, exhaustion, and fatigue are possible with prolonged exposure and/or physical activity due to the body's inability to dissipate heat. Urban areas are particularly at risk because of air stagnation and large quantities of heat absorbing materials, such as streets and buildings. Extreme heat can also result in distortion and failure of structures and surfaces such as roadways and railroad tracks.

According to the Hazards and Vulnerability Research Institute, Hancock County has experienced 5 extreme heat events from 1995 to 2019. The summary of these events is in **Table 14.**

Table 14 - Extreme Heat Events in Hancock County

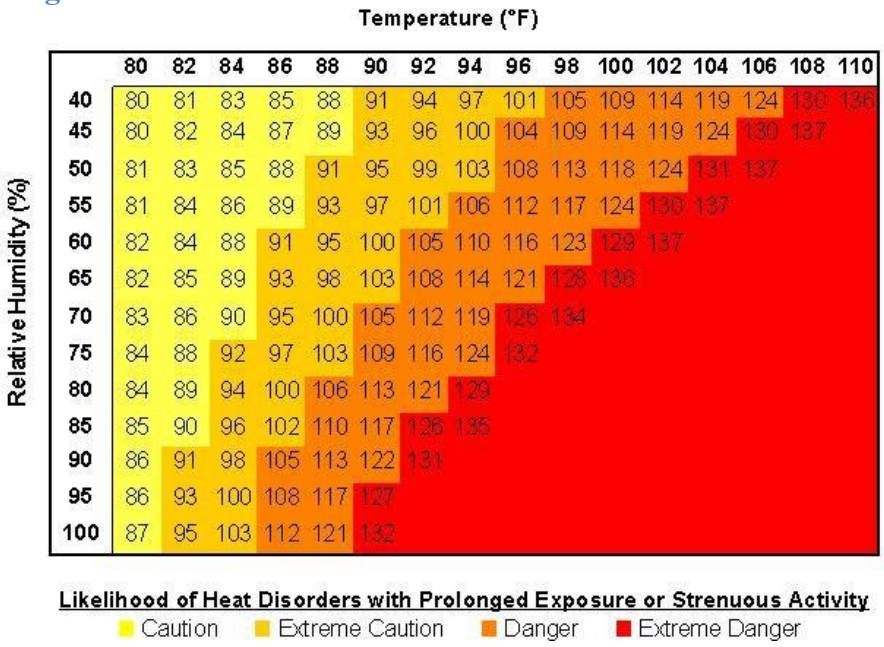
Date	Injuries	Fatalities	Property Damage $
02/01/92	0	0	179,487
07/12/95	0	0	47,500
7/15/11 – 7/28/11	0	0	135,000
7/20/2016	0	0	0
7/19/2019	0	0	0
Total	0	0	361,987

Source: Hazards and Vulnerability Research Institute, 2024

Location	Countywide	
Probability	The committee determined that extreme heat events are highly likely to occur each year regardless of there being only a few recorded extreme heat events. Probability of extreme heat varies from individual to individual based on amount of sun exposure. Greater exposure from the sun increases the heat index.	**4**
Magnitude/ Severity	Elderly persons, small children, chronic invalids, those on certain medications or drugs (especially tranquilizers and anticholinergic), and persons with weight and alcohol problems are particularly susceptible to heat reactions. Healthy individuals working outdoors in the sun and heat are vulnerable as well. Individuals and families with low budgets as well as inner city dwellers can also be susceptible due to poor access to airconditioned rooms. All of Hancock County will likely be impacted by extreme heat, but urban areas of the county pose special risks. The stagnant atmospheric conditions of the heat wave trap pollutants in urban areas and add to the stresses of hot weather. Livestock and other animals are adversely impacted by extreme heat. High temperatures at the wrong time inhibit crop yields as well. The direct costs in transportation, agriculture, production, energy, and infrastructure could impact many other economic sectors indirectly.	**2**
Warning Time	As with other weather phenomena, periods of extreme heat are predictable within a few degrees within 3 days or so. Variations in local conditions can affect the actual temperature within a matter of hours or even minutes. The National Weather Service will initiate alert procedures when the heat index (Figure 8) is expected to exceed 105 degrees Fahrenheit for at least two consecutive days.	**1**

Duration	The definition of an extreme heat event is an occurrence of 90+ degree weather for a minimum of 3 days or excess of 100 degree weather for a minimum of one day	**3**
Further Information/Sources	**National Climatic Data Center:** www.ncdc.noaa.gov **Extreme Heat Guide Book:** http://www.aclink.org/PublicHealth/health_topics/pdf_files/ExtremeHeat2.pdf **FEMA:** http://m.fema.gov/extreme-heat	-

Figure 8 - Heat Index



Flash Flood:

Floods are the most common and widespread of all-natural disasters except fire. A flash flood is an event that occurs with little or no warning where water levels rise at an extremely fast rate. Flash flooding results from intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. Flash flooding is an extremely dangerous form of flooding which can reach full peak in only a few minutes and allows little or no time for protective measures to be taken by those in its path. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding often results in higher loss of life, both human and animal, than slower developing river and stream flooding. The flash flood events that have occurred in Hancock County from January 1996 to April 2017 are shown in **Table 15.**

Table 15 - Flash Floods in Hancock County

Location	Date	Deaths	Injuries	Property Damage $	Crop Damage $
GARNER	06/22/1997	0	0	100,000	50,000
BRITT	06/15/1998	0	0	50,000	25,000
COUNTYWIDE	05/21/2004	0	0	100,000	50,000
GOODELL	6/19/2014	0	0	25,000	0
GOODELL	5/15/2017	0	0	10,000	0

Source: National Climatic Data Center, 2013

On June, 15, 1998 (according to the NCDC), a fairly small cell developed over Hancock County and dumped very heavy rain and caused a flash flood. Six inches of rain fell in just over one hour south of Britt. Highways were under water for a time and agricultural flooding was widespread.

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization increases runoff two to six times over what would occur on natural terrain. Portions of Iowa are very developed with significant amounts of impervious surfaces, as more development occurs in the watersheds; the amount of runoff produced also increases. If measures are not taken to reduce the amount of runoff (or slow its movement), flash floods will continue to occur and may possibly increase.

In certain areas, aging storm sewer systems were not designed to carry the capacity currently needed to handle the increased storm runoff. This combined with rainfall trends (that are moving upwards) and rainfall extremes (that are patterning higher) all demonstrate the high likelihood yet, unpredictable nature of flash flooding.

Location	County-wide (FEMA Flood Zones shown in Appendix A)	
Probability	The probability of floods in Hancock County is nearly a yearly occurrence. These floods occur on open land affecting croplands and grasslands. Some county roads will get covered and the county will have to direct traffic around the washout. Floods are the most common and widespread of allnatural disasters except fire. However, according to the National Climatic Data Center, only 5 of the 32 floods that have occurred in the county from 1996 to 2017 are considered flash floods. Additionally, the damage amount for these flash floods in the table above also includes damage caused by river flooding. The county planning committee determines that flash flooding has an occasional probability of occurring each year.	**2**

Magnitude/ Severity	Flash floods occur in all 50 states in the US. Particularly at risk are those in low-lying areas; close to dry creek beds or drainage ditches; new water; or downstream from a dam, levee, or storage basin. People and property in areas with insufficient storm sewers and other drainage infrastructure can also be put at risk because the drains cannot rid the area of the runoff quickly enough. Nearly half of all flash flood fatalities are auto-related. Motorists often try to traverse water-covered roads and bridges and are swept away by the current. Six inches of swiftly moving water can knock persons off their feet and only two feet of water can float a full-sized automobile. Recreational vehicles and mobile homes located in low-lying areas can also be swept away by the water. Areas in a floodplain, downstream from a dam or levee, or in low-lying areas can certainly be impacted. People and property located in areas with narrow stream channels, saturated soil, or on land with large amounts of impermeable surfaces are likely to be impacted in the event of a significant rainfall. Unlike areas impacted by a river/stream flood, flash floods can impact areas a good distance from the stream itself. Flash flood prone areas are not particularly those areas adjacent to rivers and streams. Streets can become swift moving rivers, and basements can become deathtraps because flash floods can fill them with water in a manner of	**1**
	minutes. Flash floods can quickly inundate areas thought to be out of flood-prone areas. Loss of life; property damage and destruction; damage and disruption of communications, transportation, electric service, and community services; crop and livestock damage and loss and interruption of business are common impacts from flash flooding. However, the committee determined that the magnitude/severity of flash flooding in the county is negligible. Most flooding damage occurs from river flooding.	
Warning Time	Flash floods are somewhat unpredictable, but there are factors that can point to the likelihood of flood's occurring in the area. Flash floods occur within a few minutes or hours of excessive rainfall, a dam or levee failure, or a sudden release of water held by an ice jam. Weather surveillance radar is being used to improve monitoring capabilities of intense rainfall. Knowledge of the watershed characteristics, modeling, monitoring, and warning systems increase the predictability of flash floods. Depending on the location in the watershed, warning times can be increased. The NWS forecasts the height of flood crests, the data, and time the flow is expected to occur at a particular location.	**3**
Duration	The response to the effects of flash flooding is short in duration due to the nature of the hazard.	**1**

Further Information/ Sources	**FEMA Map Service Center:** http://www.msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1 **National Climatic Data Center:** http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms **NFIP Data:** http://www.floodsmart.gov/floodsmart/ **FEMA:** http://www.fema.gov/national-flood-insurance-program **Iowa Flood Center:** http://ifis.iowafloodcenter.org/ifis/en/	-

Grass or Wild-land Fire:

A grass or wild-land fire is an uncontrolled fire that threatens life and property in either a rural or a wooded area. Grass and wild-land fires can occur when conditions are favorable, such as during periods of drought when natural vegetation would be drier and subject to combustibility.

No historically significant wildfire event has been reported by the National Interagency Fire Center (none are on record since the first recorded event in 1804). However, due to the nature of this hazard, the planning committee determined that the probability in any given year is highly likely (more than 30%) due to the amount of fires of various sizes reported.

Location	Countywide	-
Probability	Significant wildfires have not occurred within Hancock County; however, smaller fires that can be extinguished fairly rapidly are still highly likely to occur based on undocumented sources.	**4**
Magnitude/ Severity	While wildfires have proven to be most destructive in the Western US, they have become an increasingly frequent and damaging phenomenon nationwide. People choosing to live in wild-land settings are more vulnerable to wildfires, and the value of exposed property is increasing at a faster rate than population. Hancock County is less vulnerable to wildland fire because of the extremely large percentage of land that is developed agriculturally. Grass fires are often easily contained and usually occur during the harvest months. Most fires are contained in the highway and rail right-of-way ditches and are less than a few acres in size.	**1**
Warning Time	As mentioned above, most grassfires occur without warning and travel at a moderate rate. This situation depends upon conditions at the time such as moisture, wind, and land cover. However, methods for forecasting the probability of occurrence of conditions most suitable for wild-fires to occur has increased with the use of the national wild-land significant fire potential outlook issued by the National Interagency Fire Center and the NOAA Storm Prediction Center.	**4**
Duration	The potential majority of Hancock County wildfires would occur in short duration in areas of brush and forest lands with approximately half of the fires being prescribed as controlled burns supervised by trained experts.	**1**

Further Information/ Sources	**Iowa DNR Rural Fire Protection and Fire Prevention Programs** http://www.iowadnr.gov/Environment/Forestry/FirePrevention/FirePrograms.aspx **Iowa Department of Public Safety State Fire Marshal Division** http://www.dps.state.ia.us/fm/ **National Interagency Fire Center** http://www.nifc.gov/fireInfo/fireInfo_statistics.html	-

Hailstorm:

Hailstorms are an outgrowth of a severe thunderstorm in which pellets or irregularly shaped lumps of ice greater than 1 inch in diameter fall with rain. Hail is produced in many strong thunderstorms by strong rising currents of air carrying water droplets to a height where freezing occurs, the ice particles grow in size until they are too heavy to be supported by the updraft and fall back to earth. Hail can be smaller than a pea or as large as a softball and can be very destructive to plants and crops; pets and livestock are particularly vulnerable to hail. Hail size descriptions are given in **Table 16.**

Table 16 - Hail Scale

Diameter Size	Description
¼"	Pea Size
¾"	Penny Size
7/8"	Nickel Size
1"	Quarter Size
1 ¼"	Half Dollar
1 ½"	Walnut or Ping Pong Ball Size
1 ¾"	Golf Ball Size
2"	Hen Egg Size
2 ½"	Tennis Ball Size
2 ¾"	Baseball Size
3"	Teacup Size
4"	Grapefruit Size
4 ½"	Softball Size

According to the Hazards and Vulnerability Research Institute, 105 hail events have occurred in Hancock County since 1958. Since 1999 in Hancock County, according to the National Climatic Data Center, there have been 58 actual hailstorms (hail greater than 1 inch in diameter). The summary of hailstorm events is shown in **Table 17.**

Table 17 - Hailstorm Events in Hancock County

LOCATION	Date	MAGNITUDE (inches)	Deaths	Injuries	Property Damage $	Crop Damage $

WODEN	09/07/1999	1.75	0	0	5,000	10,000
WODEN	09/07/1999	1	0	0	2,000	5,000
GARNER	05/31/2000	1	0	0	3,000	5,000
CRYSTAL LAKE	04/20/2001	1	0	0	3,000	0
WODEN	09/20/2001	1.75	0	0	15,000	5,000
WODEN	09/20/2001	1.25	0	0	5,000	3,000
GARNER	09/20/2001	2	0	0	25,000	10,000
BRITT	05/08/2004	1	0	0	3,000	5,000
CRYSTAL LAKE	05/19/2004	1	0	0	5,000	5,000
BRITT	05/21/2004	1	0	0	3,000	5,000
KANAWHA	08/26/2004	3	0	0	25,000	10,000
KANAWHA	08/26/2004	5.5	0	0	100,000	10,000
CORWITH	06/21/2007	1.75	0	0	25,000	5,000
CORWITH	06/21/2007	1.75	0	0	25,000	5,000
CORWITH	06/21/2007	1.75	0	0	15,000	5,000
CORWITH	06/21/2007	1.75	0	0	15,000	5,000
CORWITH	06/21/2007	1.75	0	0	15,000	5,000
DENHART	04/12/2010	1	0	0	2,000	0
KANAWHA	06/17/2010	1	0	0	2,000	5,000
BRITT	07/25/2012	1	0	0	10,000	50,000
KANAWHA	04/29/2013	1.25	0	0	2,000	0
KANAWHA	04/29/2013	1.25	0	0	3,000	0
KANAWHA	04/29/2013	1	0	0	1,000	0
DUNCAN	06/26/2013	1	0	0	0	5,000
MILLER	07/22/2013	1	0	0	1,000	10,000
GARNER	07/22/2013	1.75	0	0	25,000	5,000
HAYFIELD	07/25/2013	1.25	0	0	5,000	25,000
GARNER	07/25/2013	1	0	0	2,000	10,000
MILLER	08/01/2013	1	0	0	0	10,000
DENHART	09/06/2015	1.25	0	0	5,000	0
KLEMME	04/09/2017	1.25	0	0	0	0
GOODELL	05/15/2017	1	0	0	0	0
KLEMME	07/10/2017	1.75	0	0	0	0
GOODELL	07/10/2017	1.75	0	0	0	0
GOODELL	05/28/2018	1	0	0	0	0
KANWAHA	08/28/2018	1.75	0	0	5,000	0
GARNER	08/28/2018	3	0	0	25,000	0
GARNER	08/28/2018	2	0	0	10,000	0
HAYFIELD	09/17/2018	1	0	0	0	0
GARNER	04/10/2019	1	0	0	0	0
KANAWHA	07/11/2020	1.5	0	0	0	0
KANAWHA	04/12/2022	1.75	0	0	0	0
BRITT	04/12/2022	1	0	0	0	0
GARNER	04/12/2022	1.75	0	0	0	0
KANAWHA	04/12/2022	1.75	0	0	0	0
KANAWHA	04/12/2022	1.75	0	0	0	0
KANAWHA	06/13/2022	1	0	0	0	0
DUNCAN	06/13/2022	1.75	0	0	0	0

GARNER	06/13/2022	1.25	0	0	0	0
GARNER	03/31/2023	1	0	0	0	0
GOODELL	04/04/2023	1.5	0	0	0	0
WODEN	07/13/2023	1	0	0	0	0
BRITT	07/13/2023	1	0	0	0	0
HUTCHINS	08/11/2023	1	0	0	0	0
KLEMME	08/11/2023	1.75	0	0	0	0
GOODELL	08/11/2023	3	0	0	0	0
KLEMME	08/11/2023	2	0	0	0	0

Source: National Climatic Data Center, 2024

Location	Countywide	
Probability	Data on probability and frequency of occurrence of hailstorms is limited, but based on recorded hailstorms from 1999 to 2023, Hancock County can expect on average 2.3 hailstorms annually.	4
Magnitude/ Severity	Agricultural crops such as corn and beans are particularly vulnerable to hailstorms stripping the plant of its leaves. Hail can also do considerable damage to vehicles and buildings. Hail only rarely results in loss of life directly although injuries can occur. The land area affected by individual hail events is not much smaller than that of parent thunderstorm, an average of 15 miles in diameter around the center of the storm. Damage to property, facilities, and infrastructure is usually limited to broken windows and damaged roofs. Since 1998, hailstorms have caused $450,500 in property damage. Hailstorms cause nearly $1 billion dollars annually in property and crop damage in the United States. The peak hail activity coincides with the Midwest's peak agricultural season. Financial impacts resulting from damage to property is in the millions of dollars every year, most of which is covered by crop and hazard insurance. In Hancock County since 1998, hailstorms have caused $584,000 in crop damage. Additionally, hail less than 1 inch in diameter can cause property and crop damage.	2
Warning Time	Forecasting hailstorms as with their parent thunderstorms, and forecasting the conditions suitable for developing storms with the potential to create hail is becoming quite accurate due to the advancement in Doppler Radar and other technologies operated by the National Weather Service and the local TV stations weather departments.	4
Duration	The occurrence of hailstorms is a short term weather phenomena and usually is limited to less than 6 hours per event.	1
Further Information/ Sources	**FEMA** **http://m.fema.gov/thunderstorms-lightning** **National Climatic Data Center** **http://www.ncdc.noaa.gov/oa/climateresearch.html#dandp**	**-**

Hazardous Materials:

Hazardous Materials covers a fixed hazardous material release, transportation hazardous material release, pipeline transportation release, and the accidental release of flammable or combustible, explosive, toxic, noxious, corrosive, oxidizable, an irritant or radioactive substances or mixtures that can pose a risk to life, health or property. They can potentially cause a need for evacuation.

A fixed hazardous material release is an accidental release of chemical substances or mixtures, which presents a danger to the public health or safety, during production or handling at a fixed facility. A hazardous substance is one that may cause damage to persons, property, or the environment when released to soil, water, or air. Chemicals are manufactured and used in ever increasing types and quantities, each year, over 1,000 new synthetic chemicals are introduced, and as many as 500,000 products pose physical or health hazards and can be defined as "hazardous materials". Hazardous substances are categorized as toxic, corrosive, flammable, irritant, or explosive. Hazardous material incidents generally affect a localized area and the use of planning and zoning can minimize the area of impact.

A pipeline that transports hazardous materials can pose as a hazardous material incident in the occurrence of a rupture of the pipeline. The pipeline rupture can possibly require evacuation of the surrounding area. An underground pipeline incident can be caused by the following: environmental disruption, accidental damage, or sabotage. Incidents can range from a small slow leak to a large rupture where an explosion is possible. Inspection and maintenance of the pipeline system along with marked gas line locations and an early warning and response procedure can lessen the risk to those near to the pipelines.

According to the United States Department of Transportation Pipeline and Hazardous Materials Safety Administration, there have been 0 significant incidents in Hancock County.

During the period of March 05, 2000 – August 1, 2023, there have been 120 hazardous material incidents in Hancock County according to the Iowa Department of Natural Resources (IDNR). Despite increasing safeguards, more and more potentially hazardous materials are being used in commercial, agricultural, and domestic activities. This situation is made worse by the density of people and hazardous materials in Iowa. However, none of the incidents in Hancock County are considered to be significant and high impact.

The county planning committee determined the probability that an occurrence of a high impact hazardous material incident to be unlikely or less than 10% probability in any given year. A high impact occurrence is one defined as an environmental emergency by the EPA. An environmental emergency is a sudden threat to the public health or the well-being of the environment, arising from the release or potential release of hazardous materials.

Location	Countywide	-

Probability	The planning committee determined the probability that a high impact occurrence of a hazardous material incident is unlikely in any given year. A high impact occurrence is one defined as an environmental emergency by the EPA. An environmental emergency is a sudden threat to the public health or the well-being of the environment, arising from the release of hazardous materials. A high impact incident has not occurred in the past, but low impact hazardous incidents are still highly likely to occur.	**1**
Magnitude/ Severity	A hazardous materials accident can occur almost anywhere, so any area is considered vulnerable to an accident. People, pets, livestock, and vegetation in close proximity to facilities producing, storing, or transporting hazardous substances are at higher risk. Populations downstream, downwind, and downhill of a released substance are particularly vulnerable. Depending on the characteristics of the substance released, a larger area may be in danger from explosion, absorption, injection, ingestion, or inhalation. Occupants of areas previously contaminated by a persistent material may also be harmed either directly or through consumption of contaminated food and water. Facilities are required to have an off-site consequence plan that addresses the population of the surrounding area. Responding personnel are required to be trained to HAZMAT Operations Level to respond to the scene, and those personnel that come into contact with the substances released are required to have HAZMAT Technician level training.	**1**
	Most of the hazardous materials incidents are localized and are quickly contained or stabilized by the highly trained fire departments and hazardous materials teams. Depending on the characteristic of the hazardous material or the volume of product involved, the affected area can be as small as a room in a building or as large as 5 square miles or more. Many times, additional regions outside the immediately affected area are evacuated for precautionary reasons. More widespread effects occur when the product contaminates the municipal water supply or water system such as a river, lake, or aquifer. Specialized training is needed to respond to these types of incidents. If inadequately trained personnel attempt to respond, the impacts could be the same as those for the general public exposed to the toxic materials. Proper training and equipment greatly reduce the risk to response personnel.	
Warning Time	When managed properly under regulations, hazardous materials pose little risk. However, when handled improperly or in the event of an accident, hazardous materials can pose a significant risk to the population. Hazardous materials incidents usually occur very rapidly with little or no warning. Even if reported immediately, people in the area of the release have very little time to be warned and evacuated. During some events, sheltering in-place is the best alternative to evacuation because the material has already affected the area and there is no time to evacuate safely. Public address systems, television, radio, and the NOAA Weather Alert Radios are used to disseminate emergency messages about hazardous materials incidents.	**4**
Duration	Response to a hazardous materials release is generally limited to the immediate effects of a release of dangerous materials and their threat to life and property. However, due to the laws surrounding hazardous materials and the duty of the public to inform and protect citizens from the effects of hazardous materials in their vicinity, response is expanded for environmental emergencies.	**2**

Further Information /Sources	U.S. Environmental Protection Agency http://www.epa.gov/epahome/commsearch.htm Iowa Department of Natural Resources https://programs.iowadnr.gov/hazardousspills/Introductory.aspx Iowa Department of Transportation http://www.iowadot.gov/mvd/omve/hazmat.htm Iowa Pipeline Data http://primis.phmsa.dot.gov/comm/StatePages/Iowa.htm?nocache=4138 U.S. Office of Pipeline Safety http://www.phmsa.dot.gov/pipeline National Transportation Safety Board http://www.ntsb.gov/Surface/pipeline/pipeline.htm	-

Human Disease:

An incident related to human disease is defined as a medical, health, or sanitation threat to the general public (such as contamination, epidemics, plagues, and insect infestation). Public health action to control infectious diseases in the 21st century is based on the 19th century discovery of microorganisms as the cause of many serious diseases (e.g., cholera and TB). Disease control resulted from improvements in sanitation and hygiene, the discovery of antibiotics, and the implementation of universal childhood vaccination programs. Scientific and technologic advances played a major role in each of these areas and are the foundation for today's disease surveillance and control systems. Scientific findings have contributed to a new understanding of the evolving relationship between humans and microbes.

The Centers for Disease Control (CDC) has a list of notifiable infectious diseases at the national level and the latest data that was available was for the year 2009. A notifiable disease is one for which regular, frequent, and timely information regarding individual cases is considered necessary for the prevention and control of the disease. There are 86 notifiable diseases which include the variations of one disease. An example is Hepatitis (Hepatitis, viral, acute; Hepatitis A, acute; Hepatitis B, acute; Hepatitis B virus, perinatal infection; Hepatitis C, acute; and Hepatitis, viral chronic; Chronic Hepatitis B; and Hepatitis C virus infection).

The Iowa Department of Public Health tracks epidemiological statistics in Iowa. Hancock County Public Health works to protect the citizens of Hancock County from infectious diseases and preserves the health and safety of the citizens through disease surveillance, investigation of suspect outbreaks, education and consultation to county, local, and health agencies. Hancock County Public Health also works to reduce the impact of communicable diseases and to reduce or eliminate the morbidity associated with these diseases. Programs that the agency administers guide community based prevention planning, monitor current infectious disease trends, provide early detection and treatment for infected persons, and ensure access to health care for refugees in Iowa. While vaccines are available for many diseases, citizens remain vulnerable to other diseases known and unknown.

A pandemic human disease is defined as a disease that has spread around the world to many people. The word, "pandemic", means that a disease has caused illness in a person on nearly every continent. Many diseases throughout the history of the world have been pandemic. Examples are HIV/AIDS/Influenza. A pandemic will have wide spread economic and societal implications for our state. Response and recovery to a pandemic will likely be lengthy.

From 1900-2000, there were three influenza pandemics, all about 30 years apart in the United States. This seems to follow the same trend with the next occurrence to affect Iowa and Hancock County beginning in 2009 with the H1N1 influenza virus causing 659 hospitalizations across the state and lab confirmed 41 H1N1 deaths across the state. Typically, people who become ill are the elderly, the very young and people with chronic medical conditions and high risk behaviors. Approximately 25% of Hancock County's population is considered high risk.

In 2020 the COVID-19 pandemic affected Hancock County, the State of Iowa, the United States and the entire globe. Over 7 million individuals died world-wide due to the virus. Nearly 1.2 million people in the U.S. died and over 10,500 in the State of Iowa alone. Hancock County reported 51 covid related deaths.

Location	Countywide	**-**
Probability	From 1900-2010, there were four influenza pandemics, all about 30 years apart. This seems to follow the same trend with the next occurrence to affect Iowa and Hancock County; beginning in 2009 the H1N1 influenza virus caused 659 hospitalizations across the state and the state lab confirmed 41 H1N1 deaths across the state. Typically, people who become ill are the elderly, the very young and people with chronic medical conditions and high risk behaviors. Approximately 25% of Hancock County's population is considered high risk. The committee determined that there was greater than 33% probability of a human disease incident in any given year. Incidents include pandemic and nonpandemic. Widespread diseases that are stable in terms of how many people are getting sick., such as certain colds and flus, are non-pandemic. Additionally, Hancock County Public Health works to protect the citizens of the county from infectious diseases and preserve the health and safety of Iowans through disease surveillance, investigation of suspect outbreaks, education and consultation to county, local and public/private health agencies.	**4**

Magnitude/ Severity	Public health agencies work to reduce the impact of communicable diseases within the county. Programs guide community-based prevention planning, monitor current infectious disease trends, prevent transmission of infectious diseases, provide early detection and treatment for infected persons, and ensure access to health care for refugees in Hancock County. While vaccines are available for many diseases that occur, citizens remain vulnerable to known and unknown diseases. Due to the high mobility of our society, these diseases can move rapidly across the county, state and nation within a matter of days and weeks. Many of the diseases on the national notification list result in serious illness if not death. Some diseases are treatable, in others only the symptoms are treatable. Influenza (flu) happens every year in nearly all the countries in the world. It spreads through a population for a few months and then will disappear or move to another area of the world. Influenza usually occurs in the fall and winter months. Typically people who usually become ill are the elderly, the very young and people with chronic medical conditions and high risk behaviors. Approximately 25% of Hancock County's citizens are at high risk.	**2**
Warning Time	The private practitioner is the first line of defense and will undoubtedly be the first to witness the symptoms of human disease incidents. The Hancock Public Health Department along with Iowa Department of Public Health and the US Centers for Disease Control monitor reports submitted by doctors, hospitals, and labs to identify patterns. The public health departments and the CDC are proactive in providing information to the health care community on medical concerns. Conditions related to scope and magnitude can escalate quickly and area resources can be drained of personnel, medications, and vaccinations rather quickly.	**3**
Duration	Response to highly infectious diseases occurs continuously, although the direct effects of a pandemic influenza can occur for months at a time as evident with the H1N1 influenza in August of 2009.	**4**
Further Information/ Sources	**Iowa Department of Public Health** **http://www.idph.state.ia.us/hpcdp/default.asp** **Iowa DPH Influenza** **http://www.idph.state.ia.us/pandemic**	**-**
	Centers for Disease Control http://www.cdc.gov/DataStatistics/ **National Center for Health Statistics http://www.cdc.gov/nchs/** **CDC Prevention** **http://www.cdc.gov/flu/pandemic/healthprofessional.htm** **CDC Emergency Preparedness and Response** **http://emegency.cdc.gov/ Hancock County Public Health** **http://www.hancockcountyia.org/publichealth.htm**	

Infrastructure Failure:

Infrastructure Failure can include communication failure, structural failure, energy failure, and structural fires. Communication failure is the widespread breakdown or disruption of normal

communication capabilities. Communication failure includes major telephone outages, loss of local government radio facilities, long-term interruption of electronic broadcast services, emergency 911, law enforcement, fire, emergency medical services, public works, and emergency warning systems are just a few of the vital services which rely on communication media as well. Mechanical failure, traffic accidents, power failure, line severance, and weather can affect communication systems and disrupt service. Disruptions and failures can range from localized and temporary to widespread and long-term. If switching stations are affected, the outage could be more widespread. Thus, the planning committee supports developing interoperability throughout the county and state.

No widespread communication failures have occurred in Hancock County. Local incidents; due to weather conditions, equipment failure, excavation incidents, or traffic accidents have been reported. The outages were usually resolved in a timely manner. Widespread communication losses are unlikely due to backup systems and redundant system designs. Local communication failures are likely to affect small areas of the county.

An extended interruption of service (electric, petroleum, or natural gas), which by an actual or impending acute shortage of usable energy could create a potential health problem for the population and possibly mass panic. International events could potentially affect supplies of energy producing products while local conditions could affect distribution of electricity, petroleum, or natural gas. The magnitude and frequency of energy shortages are associated with international markets. Local and state events such as ice storms can disrupt transportation and distribution systems; if disruptions are long lasting, public shelters may need to be activated to provide shelter from extreme cold or extreme heat. Stockpiles of energy products eliminate short disruptions but can increase the level of risk to the safety of people and property near the storage site.

The energy crisis of the 1970s had significant impact on many consumers in Hancock County. High inflation and unemployment were associated with the excessive dependence on foreign oil during the early and mid-1970s. An energy shortage of that magnitude has not affected Iowa in recent years. Only when free market forces cease to provide for the health, welfare, and safety of the citizens can governments can take appropriate actions to limit the effects of an energy shortage.

The federal government has a strategic petroleum reserve to supplement the fuel supply during energy emergencies. Shortages, especially electrical shortages, can be unpredictable with immediate effects. Natural events, human destruction, price escalation, and national security energy emergencies can cause unavoidable energy shortages.

The collapse (all or partial) of any public or private structure including roads, bridges, towers, buildings, and etc., is considered a structural failure. Infrastructure failures can be due to the failure of structural components or due to the overload of a structure. Natural events such as snow can cause a failure, heavy rains and flooding can undercut a bridge abutment or washout a road. Building codes and their enforcement can guarantee that a structure will hold-up under normal conditions. Annual or semi-annual inspections will alert stakeholders to weak points in the structure that need to be addressed. The level of damage depends on a number of factors

including but not limited to the following: size, number of occupants, time of day, day of the week, amount of traffic, amount and type of products stored, etc.

There have been a few structural failures in Hancock County; there is no collection of this type of incident, except from the personal experiences of the planning committee. Civil structures may fail in a variety of ways. The unprecedented growth in technology has resulted in a host of problems related to complex structures, special materials, and severe operational and environmental loads, such as fire, excessive vibrations, explosion, high-energy piping failures, missiles, and earthquakes. With the exceptions of misuse, accidental or environmental loads, the causes of failure may be found in deficiencies of design, detailing, material, workmanship, or inspection. With the aging structures in the country along with problems with new materials discussed above, structural failures will continue to occur. Efforts to inspect and maintain these structures will lessen the probability of a failure, but not guarantee that it will not happen in the future. Internal weaknesses can be hidden from inspectors and not be realized until it is too late.

A structural fire is an uncontrolled fire in populated areas that threatens life and property and is beyond normal day-to-day response capability. Structural fires present a far greater threat to life and property and the potential for much larger economic losses. Modern fire codes and fire suppression requirements in new construction and building renovations, coupled with improved fire-fighting equipment, training, and techniques lessen the chance and impact of a major urban fire. Most structural fires occur in residential structures, but the occurrence of a fire in a commercial or industrial facility could affect more people and pose a greater threat to those new the fire or fighting the fire because of the volume or type of the material involved. Structural fires are almost a daily occurrence in some communities. Nearly all are quickly extinguished by on-site personnel or local fire departments. There have been 1,535 deaths in Iowa from fires between the year 1974-1977 and 1980-2002. From 2006 through April of 2010, there have been 167 recorded fire fatalities in the state of Iowa.

Fire prevention efforts have gone to non-residential fires and the results have been highly effective. Even with an increase in the prevention efforts in residential fires, both residential and non-residential fires will continue to occur. During colder months, clogged chimneys and faulty furnaces and fireplaces can increase the probability of structural fires.

Location	Countywide	-

Probability	No widespread communications failures have occurred in Hancock County. Local incidents due to weather conditions, equipment failure, excavation incidents, and traffic accidents have been reported, but outages have usually been resolved in a timely manner. Communication losses are unlikely due to backup systems and redundant system designs. Local communications failures are unlikely to affect cities of Hancock County and small areas of the county. Energy failures happen in the county due to equipment failures, weather conditions, excavation incidents, etc. Local and regional electric and gas utilities maintain the transmission lines and are responsible for providing the energy. They have been proactive in the past 5-10 years in hardening their facilities to ensure proper transmission of energy. There has been no record of structural failures in Hancock County. Structural fires are a yearly occurrence in some communities. Nearly all are quickly extinguished by on-site personnel or local fire departments. Widespread structural fires are unlikely. The Hancock County planning committee determined that infrastructure failure of a certain type has an occasional probability of occurring yearly.	2
Magnitude/ Severity	Most communication systems that are highly necessary have backup and redundant designs to provide continuity of service. Most communications failures would be limited to localized areas. In the event of a widespread communications failure, only portions of Iowa would be impacted, but this is highly unlikely due to the support of other jurisdictions and secondary communications devices. Because Iowa is almost entirely dependent on out-of-state resources for energy, Iowans must purchase oil, coal, and natural gas from outside sources. World and regional fuel disruptions are felt in Iowa. It is likely that increasing prices will occur as market mechanisms are used to manage supply disruptions. This will disproportionately affect the lowincome population because of their lower purchasing power. Agricultural, industrial, and transportation sectors are also vulnerable to supply, consumption, and price fluctuations. In Iowa, petroleum represents 97% of transportation fuel. Individual consumers such as commuters are also vulnerable. The effects of an energy shortage would be felt throughout the state. Because the distribution systems are very developed, local shortages can quickly be covered. There are many buildings in Iowa that are very old or which may become hazardous in the event of an earthquake, fire, high winds, or other natural events. All bridges are vulnerable to the effects of the elements and the deterioration that results. Increases in the amount and weight of	3

	traffic they are expected to support increase their vulnerability to failure. The impacts of the failed structure would be contained to the immediate area and adjacent properties. This could be as small as the house and yard of a fallen chimney, or the area could be relatively extensive if the structure that failed was a multi-story building of a downtown high-rise or a tall communication tower. Dam and levee failures would affect a much larger area and are discussed as separate hazards. Older structures with outdated electrical systems not built to current fire codes are particularly vulnerable to fire. Combustible building materials obviously are more vulnerable than structures constructed of steel or concrete. Structures without early detection devices are more likely to be completely destroyed before containment by response agencies. Structures in areas served by older, smaller, or otherwise inadequate water distribution infrastructure such as water mains and hydrants are also at significant risk. Problems vary from region to region, often because of climate, poverty, education, and demographics. The fire death risk for the elderly and children under 5 years is more than two times that of the average population. With modern training, equipment, fire detection devices, and building regulations and inspections, most fires can be quickly contained and limited to the immediate structure involved. Certain circumstances, such as the involvement of highly combustible materials or high winds, can threaten a larger area. The age and density of a particular neighborhood can also make it more vulnerable to fire due to the spreading of fire from neighboring structures.	
Warning Time	A communications failure would likely occur with little or no warning. It is usually impossible to predict a communications failure. Some communications may be shut down for periodic maintenance and the users are typically given prior notice to the out of service shutdown. The IDNR Energy Bureau monitors domestic and international energy situations and has developed a plan to deal with an energy crisis. Signs of an energy shortage can be seen sometimes be recognized months in advance but energy disruptions happen suddenly and unexpectedly. The actual failure of the structure would likely occur suddenly with little or no warning. Fires typically start with little to no warning and alert devices can allow time for responders to contain the fire.	4
Duration	With the exception of structural fires which are largely handled by local response personnel, the response to the hazards of communications failure, energy failure, and structural failure are widespread in nature and are likely to require outside resources to assist the county and local jurisdictions in emergency response.	4

Further Information/ Sources	**Federal Communications Commission** http://www.fcc.gov/ **Iowa Utility Board** http://www.iowa.gov/iub/	-
	Iowa Department of Natural Resources http://www.iowadnr.gov/energy/index.html **Iowa Division of State Fire Marshall** http://www.dps.state.ia.us/fm/ **National Fire Protection Association** http://www.nfpa.org/categoryList.asp?categoryID=951&URL=Research/Fire%20statistics	

Radiological:

An incident resulting in a release of radiological material at a fixed facility to include power plants, hospitals, laboratories and the like is a fixed radiological incident. Although the term "nuclear accident" has no strict technical definition, it generally refers to events involving the release of significant levels of radiation. Most commercial nuclear facilities in the United State were developed in the mid-1960's and are designed to withstand aircraft attack. Therefore, they should withstand most natural hazards even though they may not have been specifically designed for those forces.

Radiological incidents related to transportation are described as an incident resulting in a release of radioactive material during transportation. Transportation of radioactive materials through Iowa over the interstate highway system is considered a radiological hazard. The transportation of radioactive material by any means of transport is licensed and regulated by the federal government.

When these materials are moved across Iowa highways, Iowa officials are notified and appropriate escorts are provided. As a rule there are two (2) categories of radioactive materials that are shipped over the interstate highways. Low level waste consists primarily of materials that have been contaminated by low level radioactive substances, but pose no serious threat except through long term exposure. These materials are shipped in sealed drums within placarded trailers. The danger to the public is no more than a wide array of other hazardous materials. High-level waste, usually in the form of spent fuel from nuclear plants, is transported in specially constructed casks that are built to withstand a direct hit from a locomotive.

Since 1990, hundreds of shipments have been made through Iowa. There have been no occurrences of a radiological incident in Iowa. Transportation accidents are the most common type of incident involving radioactive materials because of the sheer number of radioactive shipments.

Operators of facilities that use radioactive materials and transporters of radioactive waste are circumspect in the packaging, handling, and shipment of the radioactive waste and, since they are closely regulated by a variety of federal, state, and local organizations, the likelihood of an incident is unlikely.

Location	Countywide	**-**
Probability	Historically there have been zero significant releases of radiation from fixed facilities in the state of Iowa, or even the United States. Operators of facilities that use radioactive materials and transporters of radioactive waste are trained in the packaging, handling, and shipment of the radioactive waste; and, since they are closely regulated by the state, the likelihood of an incident is remote. Since 1990, hundreds of shipments have been made through Iowa. There have been no occurrences of radiological incidents in Iowa. Transportation accidents are the most common type of incident involving radioactive materials because of the sheer number of radioactive shipments. Operators of facilities that use radioactive materials and transporters of radioactive waste are trained in the packaging, handling, and shipment of the radioactive waste; and, since they are closely regulated by a variety of federal, state, and local organizations, the likelihood of an incident is unlikely.	**1**
Magnitude/ Severity	Sources of radioactive materials include medical products, industrial products, nuclear power plant fuel, nuclear weapons, and radioactive waste from hospitals, laboratories, nuclear reactors, and military facilities. Both the Duane Arnold and the Fort Calhoun Nuclear Power Plants have completed construction of on-site storage facilities of spent nuclear fuel. In over 50 years of nuclear power production in the US, no deaths or injuries from radiation have been recorded among the general public. Each of the nuclear facilities in the country identifies a 10 mile radius Emergency Planning Zone and a 50-mile radius Ingestion Pathway Zone. Depending on the level of exposure, radiation can cause loss of life and long and short term health effects. Time, distance, and shielding minimize radiation exposure to the body. Nuclear radiation above normal levels could be a health and safety consideration because of its ability to damage human cells biologically. Specialized training is needed to respond to these types of incidents. If inadequately trained personnel attempt to respond, the impacts could be the same as those for the general public exposed to the toxic materials. Proper training and equipment greatly reduce the risk to response personnel. If the land and facilities cannot be used for weeks, months, or even years, the loss of production would be devastating. Economic impacts would be multi-sector and long-lasting, especially in and around the affected region. The danger to the public is less than a wide array of other hazardous materials. Those working with or near sources of radiation are at a greater risk than the general citizens of the state. Those responding to a radiological incident should be trained in recognizing a radiological incident and minimizing exposure to radioactive materials.	**2**

	Other than a transportation incident involving large amounts of highlevel radioactive materials, radiation exposure will be limited to localized areas. Time, distance, and shielding minimize radiation exposure to the body. Nuclear radiation above normal levels could be a health and safety consideration because of its ability to damage human cells biologically as well as its long-lasting effect on the environment.	
Warning Time	Ionizing radiation cannot be detected with human senses. Detection instruments are needed to indicate the existence of radiation. Distance from the incident would dictate the amount of time needed to avoid exposure from damaging radiation. A radiological incident in Hancock County could result from an incident in handling or transporting radioactive materials. This accident could occur with little or no warning. Ionizing radiation cannot be detected with human senses. Detection instruments are needed to indicate the existence of radiation. Distance from the incident would dictate the amount of time needed to avoid exposure from damaging radiation.	**4**
Duration	Responding to the effects of a high level radiological release in Hancock County is extensive and will require resources and assistance from several Federal agencies to determine and evaluate the threat to life and the environment in the affected sub-areas. However, low level waste is more likely to occur and has a significantly shorter lifespan.	**1**
Further Information/ Sources	**U.S. Environmental Protection Agency** **http://www.nrc.gov/about-nrc/emerg-preparedness.html** **Iowa Department of Health** **http://www.idph.state.ia.us/eh/radiological_health.asp** **Nuclear Regulatory Commission** **http://www.phmsa.dot.gov/hazmat Energy Information Assurance** **http://www.eia.doe.gov/overview_hd.html**	**-**

River Flooding:

River flooding is a rising or overflowing of a tributary or body of water that covers adjacent land, not usually covered by water, when the volume of water in a stream exceeds the channels capacity. Floods are the most common and widespread of all natural disasters, except fire. Most communities may experience some kind of flooding after spring rains, heavy thunderstorms, winter snow thaws, waterway obstructions, or levee or dam failures.

Floodwaters can be extremely dangerous; the force of six inches of swiftly moving water can knock people off their feet and two feet of water can float a car. Floods can be slow or fastrising but generally develop over a period of days. Flooding is a natural and expected phenomenon that occurs annually, usually restricted to specific streams, rivers or watershed areas.

The most recent statewide flood-related event in June 2008 resulted in a Presidential declared disaster for Hancock County. However, the declaration relates more towards severe storms and tornados than flooding for Hancock County. Given the history of river flooding in Iowa and Hancock County, it is likely that there will be many minor events in any given year. According to the Hazards and Vulnerability Research Institute, there have been 35 recorded flooding events from 1997 to 2019. These events have produced an estimated $1,559,000 in property damage and $21,093,000 in crop damage. The spring and summer of 2024 saw Hancock County quickly transition from drought conditions to an over abundance of water and flooding occurred throughout the county. The primary losses will be realized in the agricultural community once harvest has been completed in the fall and the true impact of the flooding is realized. Data on the reported river flooding events with property damage greater than $10,000 is provided in Table 18.

Table 18 - Flooding Events in Hancock County (Property Damage Greater than $10,000)

Date	Injuries	Fatalities	Property Damage $	Crop Damage $
06/20/1998	0	0	75,000	10,000
06/20/1998	0	0	50,000	5,000
06/21/1998	0	0	100,000	20,000
06/24/1998	0	0	75,000	20,000
06/28/1998	0	0	75,000	20,000
04/22/1999	0	0	10,000	0
5/16/1999	0	0	200,000	25,000
05/21/1999	0	0	50,000	10,000
06/09/1999	0	0	50,000	75,000
07/19/1999	0	0	100,000	150,000
06/09/2000	0	0	25,000	25,000
06/13/2000	0	0	20,000	50,000
04/07/2001	0	0	150,000	0
05/01/2001	0	0	75,000	0
05/21/2001	0	0	30,000	0
6/12/2001	0	0	25,000	0
05/22/2004	0	0	100,000	298,040
09/15/2004	0	0	50,000	100,000
05/13/2005	0	0	30,000	0
06/26/2005	0	0	74,070	50,000
09/20/2018	0	0	50,000	150,000
03/14/2019	0	0	100,000	0

Source: Hazards and Vulnerability Research Institute, 2024

Location	See Appendix A	**-**
Probability	The floods of 2008 and 2010 are still fresh in the minds of Iowans. However, according to the National Climatic Data Center and Hazards Vulnerability Research Institute, there was no reported river flooding damage in Hancock County. Still, flooding has been a regular and frequent hazard in Hancock County. Hancock County has been involved in Presidential Disaster Declarations related to flooding since 1965. Given the history of this hazard, it is likely that there will be a river flooding event each year.	**3**
Magnitude/ Severity	The vulnerability from river flooding is quite delineated. Much work in the area of flood hazard mapping has allowed may communities to restrict development in the hazardous areas. The Federal Emergency Management Agency has delineated the probable extent of the 1% chance flood hazard area in many areas of the county and those maps are located in Appendix I. These maps depict the areas that have at least a 1% chance of flooding occurring on these areas in any given year. Much of the areas are parkland, agricultural areas, or conservation land, but residential and commercial areas are impacted by river flooding as well. Flooding impacts include potential loss of life. River flooding does not have as high of risk as does flash flooding because of the slower onset of the river flood. Personal property can be extensively damaged and destroyed by swift moving water. Facilities and infrastructure can be scoured around and degrading its structural integrity. The severity of the floods in Hancock county have been limited to the areas directly involved or approximately 10% to 25% of the property has been severely damaged.	**2**
Warning Time	There is a river gage on the West Nishnabotna River that provides for an early flood warning system. River flooding usually develops over the course of several hours or even days depending on the basin characteristics and the position for the particular reach of the stream. The National Weather Service provides flood forecasts for Iowa. Flood warnings are issued over emergency radio and television messages as well as the NOAA Weather Radio. People in the paths of river floods may have time to take appropriate actions to limit harm to themselves and their property.	**3**
Duration	The response to the effects of river flooding in Hancock County are extensive and require many days to adequately respond to the needs of the citizens of the County.	**2**
Sources /Further Info	**FEMA Map Service Center** http://www.msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1	

	Iowa Department of Natural Resources http://www.iowadnr.gov/water/floodplain/index.html **National Climatic Data Center** http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms **Iowa Flood Center** http://ifis.iowafloodcenter.org/ifis/en/	

Severe Winter Storms

Severe winter weather conditions that affect day-to-day activities can include blizzard conditions, heavy snow, blowing snow, freezing rain, heavy sleet, and extreme cold. Winter storms are common during the months of October through April.

The various types of severe winter weather can cause considerable damage. Heavy snows can immobilize transportation systems, down trees and power lines, collapse buildings, and the loss of livestock and wildlife. Blizzard conditions are winter storms lasting at least three hours with sustained winds of 35 mph or more, reduced visibility of ¼ mile or less, and white out conditions. Heavy snows of more than six inches in a 12 hour period or freezing rain greater than ¼ inch accumulation causing hazardous conditions in the community can slow or stop the flow of vital supplies as well as disrupting emergency and medical services.

Loose snow begins to drift when wind speed reaches a critical speed of 9-10 mph under freezing conditions. The potential for drifting is substantially higher in open country than in urban areas where buildings, trees, and other features obstruct the wind.

Ice storms have resulted in fallen trees, broken tree limbs, downed power lines and utility poles, fallen communications towers, and impassable transportation routes. Severe ice storms have caused total electric power outages over large areas of Iowa and rendered assistance unavailable to those in need due to impassable roads.

Hancock County has had 38 reported winter weather events from January 1999 to July 2024 according to the Hazards and Vulnerability Research Institute. These events have caused 0 deaths, 0 injuries and $490,900 in property damage. These impacts are not limited to just Hancock County but other areas of the State of Iowa as well. **Table 19** shows the events with over $10,000 in reported property damage.

Hancock County has been presidentially declared a Major Disaster for winter storms one time. This was in March 2007. Hancock County can experience 3-4 winter storms in any given year.

Table 19 – Winter Storms in Hancock County

Date	Injuries	Fatalities	Property Damage $	Crop Damage $
01/01/1999	0	0	10,000	0
03/08/1999	0	0	10,000	0
01/19/2000	0	0	1,000	0

12/10/2000	0	0	24,900	0
04/06/2003	0	0	5,000	0
02/24/2007	0	0	250,000	0
12/01/2007	0	0	10,000	0
12/08/2008	0	0	10,000	0
12/18/2008	0	0	5,000	0
12/24/2009	0	0	50,000	0
01/06/2010	0	0	25,000	0
02/08/2010	0	0	10,000	0
12/19/2012	0	0	25,000	0
03/10/2013	0	0	5,000	0
02/01/2015	0	0	50,000	0
11/20/2015	0	0	0	0
12/28/2015	0	0	0	0
03/23/2016	0	0	0	0
12/16/2016	0	0	0	0
01/24/2017	0	0	0	0
03/12/2017	0	0	0	0
01/22/2018	0	0	0	0
03/23/2018	0	0	0	0
04/03/2018	0	0	0	0
04/08/2018	0	0	0	0
04/18/2018	0	0	0	0
01/18/2019	0	0	0	0
01/27/2019	0	0	0	0
02/19/2019	0	0	0	0
11/26/2019	0	0	0	0
01/17/2020	0	0	0	0
03/15/2021	0	0	0	0
12/10/2021	0	0	0	0
01/14/2022	0	0	0	0
01/28/2013	0	0	0	0
02/22/2013	0	0	0	0
01/08/2024	0	0	0	0
01/12/2024	0	0	0	0

Source: Hazards and Vulnerability Research Institute, 2024

Location	Countywide	-
Probability	Hancock County has had 38 severe winter storm events from 1999 to 2024. These events have caused 0 deaths, 0 injuries and $490,900 in property damage. These impacts are not limited to just Hancock County but other areas of the State of Iowa as well.	4
Magnitude/ Severity	Hazardous driving conditions due to snow and ice on highways and bridges lead to many traffic accidents. The leading cause of death during winter storms is transportation accidents. Emergency services such as police, fire, and ambulance are unable to respond due to road conditions. Emergency needs of remote or isolated residents for food or fuel, as well as for feed, water and shelter for livestock are unable to be met. People, pets, and livestock are also susceptible to frostbite and hypothermia during winter storms. Winter storms are quite vast and would likely impact not only Hancock County but the Northern Iowa region as a whole. Certain areas may experience local variations in storm intensity and quantity of snow or ice. IDOT, county road departments, and local public works agencies are responsible for the removal of snow and treatment of snow and ice with sand and salt on the streets and highways of Hancock County.	2
Warning Time	The National Weather Service (NWS) has developed effective weather advisories that are promptly and widely distributed (**Table 20**). Radio, TV, and Weather Alert Radios provide the most immediate means to do this. Accurate information is made available to public officials and the public up to days in advance. Notifications made by the National Weather Service include winter storm watch, winter storm warning, blizzard warning, winter weather advisory, and frost/freeze advisory.	1
Duration	Severe winter storms in Iowa and the response to these declared events are tied to multiple storms necessitating large expenses to cities for snow removal and road service. The associated losses and dangers of electrical outages to rural areas further compounds the duration of responding to major storm events.	2
Sources /Further Info	**National Climatic Data Center** http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms **FEMA** http://www.fema.gov/hazard/winter/index.shtm **Iowa Department of Transportation** http://weatherview.iowadot.gov/ **Iowa Travel Information** http://www.511ia.org/	

Table 20 - Winter Storm Notifications

Winter Weather Advisory	Used when snow...or a mixture of precipitation such as snow, sleet, freezing rain or drizzle is expected, but will not reach warning criteria. Issued for snowfall amounts of less than 4". Forecast amounts would be 1-2", 1-3", 24", or perhaps 3". If only freezing rain or freezing drizzle is expected, then the product would be issued as a Freezing Rain or Freezing Drizzle advisory.
Freezing Rain Advisory	Used when freezing rain is expected to coat surfaces with up to one quarter of an inch of ice.
Wind Chill Advisory	Issued when wind chill temperatures are expected to range from -10F to -24F, with a minimum wind speed of 10 mph.
Winter Storm Watch	Issued if there is a threat for heavy snow or sleet, significant accumulations of freezing rain or freezing drizzle, or any combination of these. Issued for the second and third periods of a forecast, i.e. 12 to 36 hours in advance of the event. Not issued for the fourth period of a forecast unless confidence is high. The definition of heavy snow in Iowa is 4" or more in 12 hours, or 6" or more in 24 hours.
Winter Storm Warning	Issued if there is a high probability that severe winter weather will occur, such as heavy snow or sleet, significant accumulations of freezing rain or freezing drizzle, or any combination of these. Issued normally for the first period forecast, i.e. less than or equal to 12 hours in advance of the event. A winter storm warning may be extended into the second period of the forecast if necessary.
Ice Storm Warning	Issued when ice accumulations are expected to exceed one quarter of an inch on exposed surfaces.
Blizzard Warning	Issued for winter storms with sustained winds or frequent gusts of 35 mph or greater and considerable falling and/or blowing snow reducing visibilities to 1/4 mile or less. These conditions should last for 3 hours or longer.
Wind Chill Warning	Issued when wind chill temperatures are expected to reach -25°F or colder, with a minimum wind speed of about 10 mph.

Terrorism

Terrorism can come from domestic or international sources. A terrorist attack can be large-scale or small-scale. A large-scale attack would affect the entire population and would cause mass destruction and extensive casualties. Some areas would experience direct weapons' effects: blast, heat, and nuclear radiation; others would experience indirect weapons' effect, primarily radioactive fallout.

The federal government monitors the international political and military activities of other nations and would notify the State of Iowa of escalating military threats. Hancock County authorities would be notified by the State of Iowa. There have been no enemy attacks on or in Hancock County in modern times, but the probability exists that they can happen in the future. An enemy attack is still a possibility due to international conflicts and the large number of conventional and nuclear weapons in existence throughout the world. Besides nuclear, there are biological, chemical, agro, conventional weapons and explosives, non-peaceful riots, and cyber terrorism.

Biological terrorism occurs for the purposes of intimidation, coercion, or ransom. Liquid or solid contaminants can be dispersed using sprayers/aerosol generators or by point of line sources such as munitions, covert deposits and moving sprayers. These agents pose a viable threat from hours to years depending on the substance used and the conditions for which it exists.
Depending on the agent used and the effectiveness of the deployment of the agent, contamination can be spread thru wind and water. Infections could also spread from human to human, animal to animal, or human to animal and vice versa.

Chemical terrorism involves the use or threat of chemical agents against persons or property in violation of the criminal laws of the US and the State of Iowa for the purposes of intimidation, coercion, or ransom. Liquid/aerosol or dry contaminants can be dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/containers; or munitions. Chemical agents may pose viable threats for hours to weeks depending on the agent and the conditions in which it exists. Contamination can be carried out of the initial target area by persons, vehicles, water, water and wind. Chemicals may be corrosive or otherwise damaging over time if not mitigated.

Hancock County has experienced releases of anhydrous ammonia by persons engaged in illegal drug manufacturing.

Causing intentional harm to an agricultural product or vandalism of an agricultural/animal related facility is agro-terrorism. Activities could include the following examples: animal rights activists who release mink or lab animals; disgruntled employees who intentionally contaminate bulk milk tanks or poison animals; eco-terrorists who destroy crops/facilities; theft of agricultural products, machinery, or chemicals; or criminals who vandalize agricultural facilities.

Incidents such as this have occurred in the state of Iowa. Hancock County is not known to have experienced any of these incidents. There are however cases of theft of agricultural machinery, products, and chemicals on a yearly basis within the county.

Use of conventional weapons and explosives against persons or property in violation of the criminal laws of the US and the State of Iowa for purposes of intimidations, coercion, or ransom is conventional terrorism. Hazard affects are instantaneous; additional secondary devices may be used, lengthening the time duration of the hazard until the attack sit is determined to be clear. The extent of damage is determined by the type and quantity of explosive. Effects are generally static other than cascading consequences, incremental structural failures, etc. Conventional terrorism can also include tactical assault or sniping from remote locations.

Domestically, non-peaceful mass demonstrations/riots can potentially occur. These are the assembling of people in a manner that substantially interferes with public peace and constitutes a threat and with the use of unlawful force against another person, or causing property damage or attempting to interfere with, disrupting, or destroying the government, political subdivision, or group of people. Vandalism is usually initiated by a small number of individuals and limited to small target group or institution. Most events are within the capacity of local law enforcement.

Electronic attack using one computer system against another in order to intimidate people or disrupt other systems is a cyber-attack. Cyber terrorism may last from minutes to days depending upon the type of intrusion, disruption, or infection. Generally, there are no direct effects on the built environment, but secondary effects may be felt depending upon the system being terrorized. Inadequate security can facilitate access to critical computer systems allowing them to be used to conduct attacks.

Cyber-security and critical infrastructure protection are among the most important national security issues facing our country today, and they will only become more challenging in the years to come. Recent attacks on our infrastructure components have taught us that security has been a relatively low priority in the development of computer software and internet systems. These attacks not only have disrupted electronic commerce, but have also had a debilitating effect on public confidence in the internet.

Based on the knowledge of various security and law enforcement experts from within the United States, large-scale, 9-11 style attacks are currently unlikely to occur within Hancock County and the United States. However, uncertainty exists about other forms of attacks and disruptions as small-scale. The probability of an enemy attack can drastically change based on current world/local events. Furthermore, anti-terrorism efforts are focused more on densely populated areas and facilities critical to state and federal governments. With resources concentrated elsewhere, small towns similar to those in Hancock County can be considered easier targets. Political statements and large-scale panic can be created by terrorist attacking small or large populated areas. There will never be a way to totally eliminate all types of these clandestine activities. If person or persons are inclined to cause death and destruction, they are usually capable of finding a way to carry out their plans. Ultimately, with the existing uncertainty and various degrees of attention paid to domestic and international terrorism by the national media by individuals, individuals hold differing beliefs about the likelihood of terrorism occurring in their area.

At the time of the hazard scoring, the representation at the Hancock County planning committee believed a terrorist attack based on any one of descriptions above is unlikely to occur in any given year within the county. Hancock County does not have any history of attacks but the planning committee could not rule out a future incident.

Location	Countywide	-

Probability	The State of Iowa has experienced acts of terrorism. Internationally, such acts have, unfortunately, become quite commonplace, as various religious, ethnic, and nationalistic groups have attempted to alter and dictate political and social agendas. Persons and groups who have threatened violence and are inclined to cause death and destruction, are usually capable of carrying out their plans. Due to the rural nature of Hancock County and that the county is located in the breadbasket of the world; there is an increased risk to agro-terrorist activity. There is also the potential for other types of terrorist activity Law enforcement agencies respond to barricaded subject calls and deliver high risk warrants against armed persons. Protecting the computer systems of the county shall remain a high priority due to the increase of cyber-terrorism whether it is directed to the county or not. Destructive civil disturbances are rare; the potential is always there for an incident to occur. This is even truer today, where television, radio, and internet provide the ability to instantly broadcast information in real time to the entire community. This spread of information can easily devolve a situation from peaceful to violent. The Hancock County planning committee determined that terrorism is unlikely to occur but there is a very remote possibility.	1
Magnitude/ Severity	Since targets of attacks will include civilian and government facilities, the entire community is considered vulnerable to direct and indirect impacts. The entire county would likely to be impacted in some way, areas near government facilities, transportation, communications, and fuel facilities would experience the largest impacts. A full-scale attack is unlikely in the near future; however a limited attack could take place that could potentially threaten the target areas. Given the tremendous destructive capability of even one nuclear device or the detonation of said nuclear device at a high altitude over the middle of the country causing an EMP wave that destroys all electronics would be far worse than anything ever experienced in this country. Innocent people are often the victims of terrorist activity targeted at certain organizations and activities. Based on the method of delivery, the general public is vulnerable to bioterrorism. There are many factors in terrorism that geographic extent is hard to determine due to agent used, effectiveness of delivery, spread by air, water, or human and animal vectors. Our society is highly networked and interconnected. An attack could be	2

	launched from anywhere on earth and could cause impacts as small as a computer lab to as large as the world wide web. Duration of exposure to the effects of radiological terrorism, distance from the source of radiation, and the amount of shielding between source and target determine exposure to radiation. Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic. Radiological terrorism, the severity of an incident would primarily be isolated to the impact point and areas that are downwind from the impact. Civil disturbances are often difficult for local communities to handle. There is a fine line between the Constitutional right of individuals and groups to assemble and air their grievances and the overall needs of the community to provide essential services, ensure personal safety of citizens, prevent property damage, and facilitate normal commerce. Fortunately, most demonstrations and large public gatherings are held in peaceful, responsible manner. However, there never seems to be a shortage of groups whose primary objective is to disrupt normal activities and perhaps even cause injury and property damage. Civil unrest often results in injuries, deaths, and property damage. Perhaps even more tragic has been the lingering, negative impact and loss of investment in the communities ravaged by the uprisings. Many riot areas do not fully recover from the damage, destruction, and negative image brought on by such events. Looting, burning, and sniping can occur during severe civil disturbances. Fires can sometimes burn uncontrolled because firefighters and equipment are unable to respond due to resistance from rioters.	
Warning Time	Acts of terrorism can be immediate and often come after little or no warning. There are occasions when terrorists have warned the targeted organization beforehand, but often the attack comes without previous threat. Terrorists threaten people and facilities through "bomb threats" and other scare tactics. Even if it is a shallow threat, precautions must be taken to ensure the safety of the people and property involved.	4
Duration	The response to all sources of terrorism are extensive and will result in the need for outside resources and response from Federal agencies in both the investigation of a crime scene and in the response to the direct threats to life and property.	2
Sources /Further Info	**U.S. Department of Homeland Security** http://www.dhs.gov/index.shtm **Iowa Homeland Security** http://www.iowahomelandsecurity.org/ **U.S. Department of Justice** http://www.justice.gov **Center for Disease Control** http://emergency.cdc.gov	

Thunderstorms and Lightning

Thunderstorms are common in Hancock County and can occur singly, in clusters, or in lines. Thunderstorms result in heavy rains, winds reaching or exceeding 58 mph, producing a tornado, or dropping surface hail at least 1.00 inch in diameter. They are created from a combination of moisture, rapidly raising warm air, and a lifting mechanism such as clashing warm and cold air masses.

Between 1956 and July of 2022, at least 75 reported thunderstorm events have impacted Hancock County according to the Hazards and Vulnerability Research Institute. They have caused $1,555,000 in property damage and $194,750 in crop damage. Because thunderstorms occur singly, in clusters, or in lines, it is possible that several thunderstorms may affect the same area over the course of a few hours and only be listed as one occurrence. It is highly possible that more than 75 severe thunderstorm events have happened since 1958. The reported events with combined crop and property damage greater than $10,000 are provided in **Table 21**.

Most thunderstorms produce only thunder, lightning, and rain. Severe storms, however, can produce tornadoes, straight-line winds and microbursts above 58 mph, lightning, hailstorms, and flooding. The National Weather Service (NWS) considers a thunderstorm severe if it produces hail at least 1-inch in diameter, wind meeting or exceeding 58mph, or tornadoes. Straight-line winds can often exceed 60 mph, are common occurrences, and are often mistaken for tornadoes. A number of thunderstorms have caused other hazards such as flash flooding, river flooding, and tornadoes.

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt", this flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches temperatures approaching 50,000 degrees Fahrenheit in a split second, this rapid heating, expansion, and cooling of air near the lightning bolt creates thunder. Hancock County has experienced 2 reported lightning events between 1962 and 2006. The events caused $247,372 in property damage and 2 reported fatalities. However, with an average of 25 million lightning strikes in the US in any given year, there are probably more than 13 events that have occurred in Hancock County. The reported events are in **Table 22**.

The planning committee determined that thunderstorms and lightning events in Hancock County have more than a 33% probability of occurring in any given year or as highly likely.

Table 21 - Thunderstorm events in Hancock County

Date	Injuries	Fatalities	Property Damage ($)	Crop Damage ($)
06/12/1994	0	0	100,000	1,000
07/07/1994	0	0	50,000	500
07/04/1995	0	0	30,000	2,000
07/16/1995	0	0	10,000	1,000

08/04/1996	0	0	20,000	0
05/15/1998	0	0	50,000	3,000
06/23/1998	0	0	225,000	44,000
07/15/1998	0	0	70,000	26,000
06/06/1999	1	0	25,000	0
08/16/2000	0	0	25,000	5,000
04/20/2001	0	0	60,000	0
04/18/2004	0	0	15,000	0
04/15/2006	0	0	10,000	0
06/16/2006	0	0	20,000	0
05/23/2007	0	0	20,000	0
07/16/2007	0	0	35,000	0
08/15/2007	0	0	20,000	0
09/04/2012	0	0	42,000	0
05/19/2013	0	0	75,000	0
06/26/2013	0	0	25,000	10,000
06/16/2014	0	0	220,000	0
06/22/2015	0	0	20,000	0
05/15/2017	0	0	10,000	0
05/17/2017	0	0	20,000	0
06/13/2017	0	0	20,000	0
07/10/2017	0	0	215,000	100,000
05/28/2018	0	0	20,000	0
09/17/2018	0	0	20,000	0

Source: Hazards and Vulnerability Research Institute, 2013

Table 22 - Lightning events in Hancock County

Date	Injuries	Fatalities	Property Damage ($)	Crop Damage ($)
05/18/62	0	1	-	-
08/24/64	0	1	-	-

06/06/72	0	0	5,000	-
06/06/72	0	0	5,000	-
06/12/76	0	0	12,500	-
06/14/78	0	0	128,205	128,205
07/05/78	0	0	119,048	119,048
03/14/84	0	0	67	-
05/25/84	0	0	505	-
08/09/85	0	0	5,051	-
09/05/85	0	0	119	119
05/15/98	0	0	5,000	-
06/20/06	0	0	30,000	-

Source: Hazards and Vulnerability Research Institute, 2013

Location	**Countywide**	-
Probability	Between 1956 to July 2022, at least 75 thunderstorm events have impacted Hancock County. Because thunderstorms occur singly, in clusters, or in lines, it is possible that several thunderstorms may affect the same area over the course of a few hours and only be listed as one occurrence. It is highly possible that more than 75 thunderstorm events have happened since 1956. Hancock County has experienced 13 reported lightning events between 1962 and 2006, causing $247,372 in property damage. However with an average of 25 million lightning strikes in the US in any given year, there are probably more than 13 events that happened in Hancock County. The State of Iowa experiences between 30 and 50 thunderstorm days per year on average. With Iowa's and Hancock County's location located in the interior of the US, there is a very high likelihood that a few of these thunderstorms will become severe and cause damage. Due to the humid continental climate that Iowa experiences, ingredients of a severe thunderstorm are usually available (moisture to form clouds and rain, relatively warm and unstable air that can rise rapidly, and weather fronts and convective systems that lift air masses).	4
Magnitude/ Severity	Those in unprotected areas, mobile homes, or automobiles during a storm are at risk. Sudden strong winds often accompany a severe thunderstorm and may blow down trees across roads and power lines. Lightning presents the greatest immediate danger to people and livestock during a thunderstorm. It is the second most frequent weather-related killer in the US with nearly 100 deaths and 500 injuries each year. (Floods and flash floods are the number one cause of weather related deaths in the US. Livestock and people who are outdoors, especially under a tree or other natural lightning rods, in or on water, or on or near hilltops are at risk	2

	from lightning. Hail can be very dangerous to people, pets, and livestock if shelter is not available. Flash floods and tornadoes can develop during thunderstorms as well. People who are in automobiles or along low-lying areas when flash flooding occurs and people who are in mobile homes are vulnerable to the impacts of severe thunderstorms. Severe thunderstorms can be quite expansive with areas of localized severe conditions. Most severe thunderstorm cells are 5 to 25 miles wide with a larger area of heavy rain and strong winds around the main cell. Most non-severe thunderstorms have a lifespan of 20 to 30 minutes, while thunderstorms last longer than 30 minutes. Like tornadoes, thunderstorms and lightning can cause death, serious injury, and substantial property damage. The power of lightning's electrical charge and intense heat can electrocute people and livestock on contact, split trees, ignite fires, and cause electrical failures. Thunderstorms can also bring large hail that can damage homes and businesses, break glass, destroy vehicles, and cause bodily harm to people, pets, and livestock. High winds can damage trees, homes, mobile homes, and businesses and can knock vehicles off of the road. Straight-line winds are responsible for most thunderstorm damage. One or more severe thunderstorms occurring over a short period (especially saturated ground) can lead to flooding and cause extensive power and communication outages as well as agricultural damage.	
Warning Time	Some thunderstorms can be seen approaching, while other hit without warning. The NWS issues severe thunderstorm watches and warnings as well as statements about severe weather and localized storms. These messages are broadcast over NOAA Weather Alert Radios and area TV and radio stations. Advances in weather prediction and surveillance have increased warning times. The resolutions of radar and Doppler radar have increased the accuracy of storm location and direction. Weather forecasting and severe weather warnings issued by the NWS usually provide residents and visitors alike adequate time to prepare. Isolated problems arise when warnings are ignored.	4
Duration	The immediate response related to severe thunderstorm and lightning events are more aptly associated with the cascading effects of multiple events occurring over a short amount of time in the case of flash and river flooding, and in particularly severe thunderstorm events in the case of tornadoes. Response to thunderstorm events is relatively minor in scope.	1
Sources/ Further Information	**National Climatic Data Center** http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms **FEMA** http://www.fema.gov/hazard/thunderstorm/index.shtm	-

Tornado

A tornado is a violently rotating column of air, in contact with the ground, either pendant from a cumuliform cloud or underneath a cumuliform cloud, or often (but not always) visible as a funnel cloud. A tornado is an extremely violent local storm. A tornado is most commonly associated with a cumulonimbus cloud and can occur with heavy rainfall, lightning and hail. The vortex of the tornado usually rotates cyclonically although on rare occasions they have been observed to rotate anti-cyclonically. Wind speeds have been observed to as low as 40 mph to as high as 300 mph. Wind speeds are estimated on the basis of wind damage using the Enhanced Fujita scale (**Table 25**) or EF scale (**Table 24**). Tornadoes occur most commonly in the Midwest region of the United States but can occur anywhere.

In the US, Iowa is ranked third in the number of tornadoes per 10,000 square miles. Between 1951 and 2022 there have been 22 tornado events in Hancock County causing 0 deaths and11 injuries, $12,126,000 in property damage, and $15,600 in crop damage.

The planning committee determined that the probability that a damaging tornado will occur in Hancock County is occasional in any given year.

Table 23 - Tornado events in Hancock County

Date	Injuries	Fatalities	Property Damage	Crop Damage	Magnitude
06/25/1951	8	0	0	0	F2
05/10/1953	3	0	250,000	0	F4
05/29/1957	0	0	0	0	F1
05/09/1963	0	0	250,000	0	F2
04/30/1967	0	0	2,500,000	0	F2
09/26/1973	0	0	25,000	0	F1
09/26/1973	0	0	25,000	0	F2
06/27/1980	0	0	25,000	0	F1
09/20/1980	0	0	2,500,000	0	F2
05/17/1982	0	0	250,000	0	F2
06/07/1984	0	0	5,000,000	0	F2
07/14/1984	0	0	250,000	0	F2
04/23/1990	0	0	250,000	0	F1
06/18/1994	0	0	1,001,000	10,100	F3
06/15/1997	0	0	50,000	5,000	F1
06/06/1999	0	0	0	0	F0
06/08/1999	0	0	0	0	F0
08/26/2002	0	0	0	500	F0

07/14/2003	0	0	0	0	F0
05/01/2004	0	0	0	0	F0
07/16/2010	0	0	0	0	F0
12/15/2021	0	0	0	0	F0
04/12/2022	0	0	0	0	F0

Source: Hazards and Vulnerability Research Institute, 2013

Location	Countywide	-
Probability	In the US, Iowa is ranked third in the number of tornadoes per 10,000 square miles. Between 1951 and 2022 there have been 22 tornado events in Hancock County causing 0 deaths, 11 injuries, $12,126,000 in property damage, and $15,600 in crop damage. The Hancock County planning committee determined that a tornado event will occasionally occur.	2
Magnitude/ Severity	Those most at risk from tornadoes include people living in mobile homes, campgrounds, and other dwellings without secure foundations or basements. People in automobiles are also very vulnerable to twisters. The elderly, very young, and physically and mentally handicapped are most vulnerable because of the lack of mobility to escape the path of destruction. People who may not understand watches and warnings due to language barriers are also at risk. Generally the destructive path of a tornado is only a couple hundred feet in width, but stronger tornadoes can leave a path of devastation up to a mile wide. Normally a tornado will stay on the ground for no more than 20 minutes; however, one tornado can touch ground several times in different areas. Large hail, strong straight-line winds, heavy rains, flash flooding, and lightning are also associated with severe storms and may cause significant damage to a wider area. Impacts can range from broken tree branches, shingle damage to roofs, and some broken windows; all the way to complete destruction and disintegration of well-constructed structures, infrastructure, and trees. Tornadoes can impact many critical services, mainly electrical power. Buried services are not as vulnerable, but can be affected by their system components that are above ground. Whole towns have been known to be "wiped off the map." Economic impacts can result from direct damages to facilities or business disruption from the lack of critical services such as power, gas, or water. Currently the severity of tornadoes is measured by intensity based upon the Enhanced Fujita Scale. The severity of a tornado is measured by using 5 different factors. 1. The size of the tornado, with an EF-5 tornado being the most severe. 2. The amount of time a tornado stays on the ground. 3. The time of day will determine the number of people in vehicles. 4. The location within the county the tornado hits.	2

	5. The density of the population at the point of impact.	
Warning Time	Tornadoes strike with an incredible velocity. Wind speeds may exceed 300 mph and the storm can travel across the ground at more than 70 mph. These winds can uproot trees and structures and turn harmless objects	4
Duration	The response to a tornado event is tied to responding to the immediate threat to life and property immediately following the tornado event and in the shelter of affected families and individuals.	1
	National Climatic Data Center http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms	-
Sources/ Further Information	**FEMA** http://www.fema.gov/hazard/tornado/index.shtm **NOAA National Weather Service** http://www.crh.noaa.gov/images/dmx/IowaTorClimatology.pdf **FEMA Declared Disasters** http://www.fema.gov/femaNews/disaster Search.do	

Figure 9 - Tornado Activity in the US

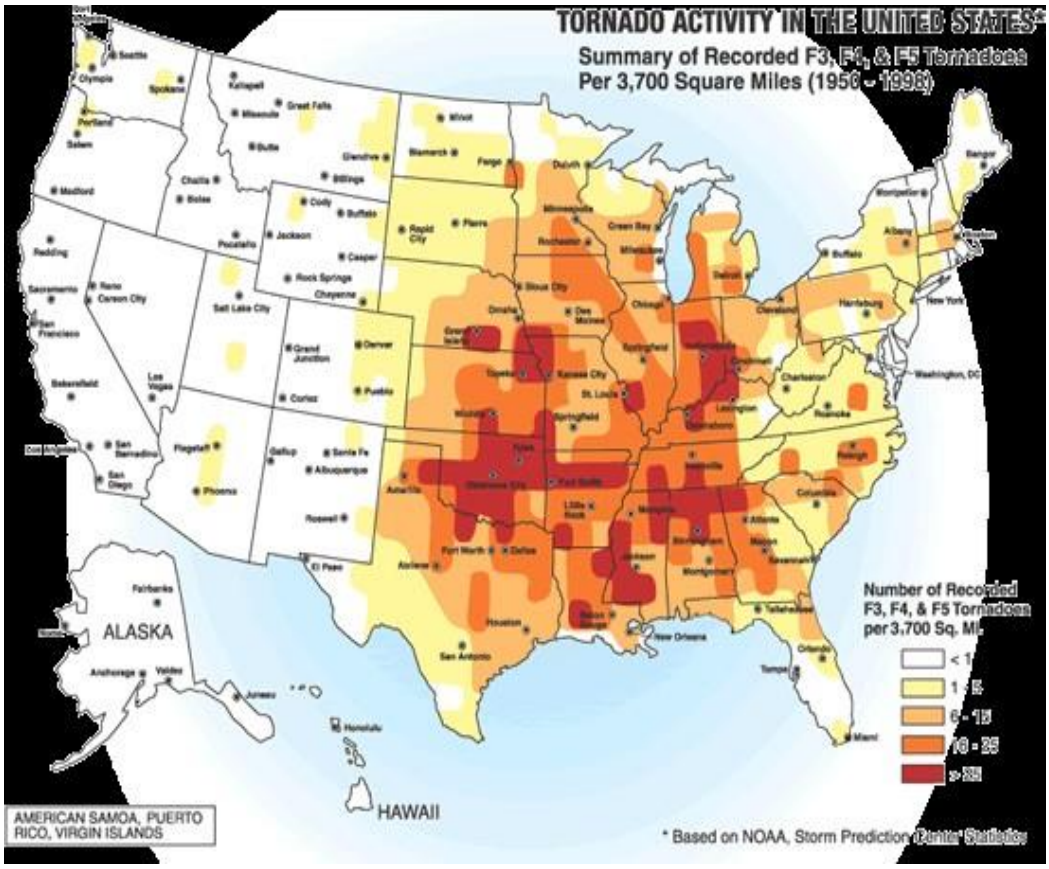


Table 24 - Enhanced Fujita Scale

EF Number	3-Second Gust(mph)	Description of Damage
0	65-85	**Light damage**. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
1	86-110	**Moderate damage**. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads
2	111-135	**Considerable damage**. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
3	136-165	**Severe damage**. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
4	166-200	**Devastating damage**. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.

5	Over 200	**Incredible damage**. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds.); trees debarked; incredible phenomena will occur.

Table 25 - Fujita Scale used prior to Feb. 2007

Scale	Wind Speed (MPH)	Typical Damage
F-0	< 73	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F-1	73-112	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F-2	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F-3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F-4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F-5	261+	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds.); trees debarked; incredible phenomena will occur.

Transportation Incident

This hazard encompasses the following hazards: air transportation incident, highway transportation, railway transportation, and waterway incident. This includes a transportation accident involving any mode of transportation that directly threatens life and which results in property damage and/or death(s)/injury(s) and/or adversely impacts a community's capabilities to provide emergency services.

An air transportation incident may involve a military, commercial, or private aircraft. Air transportation is playing a more prominent role in transportation as a whole; airplanes, helicopters, and other modes of air transportation are used to transport passengers, goods, services for business and recreation. A variety of circumstances can result in an air transportation incident; mechanical failure, pilot error, enemy attack, terrorism, weather conditions, and on-board fire can all lead to an incident at or near the airport. Air transportation incidents can occur in remote unpopulated areas, residential areas, or downtown business districts, incidents involving military, commercial, or private aircraft can also occur while the aircraft is on the ground.

Hancock County has one public airport, located inside Forest City, and 2 private airports. The Forest City Municipal Airport has two paved runways (5,806 ft. and 2,708 ft.) and is a general service airport. No commercial services are offered at the airport. Any place in Hancock County could experience a significant air transportation incident; the most likely scenarios exist near airports.

More and more people are utilizing air travel now than in the past. The trend of increasing numbers of people flying is likely to continue as will the crowdedness of airports and the skies above Iowa. Despite the increase in the number of people using air travel, incidents that require response personnel and involve casualties are likely to continue to decrease in number due to increases in the quality of training, equipment, and safety. Proper land-use near the airport will also decrease the chance that people and property on the ground will suffer significant impacts in the event of an air transportation accident.

A highway transportation incident can be single or multi-vehicle requiring responses exceeding normal day-to-day capabilities. An extensive surface transportation network exists in Iowa; local residents, travelers, business, and industry rely on this network on a daily basis. Hundreds of thousands of trips a day are made on the streets, roads, and highways of Hancock County. The design capacity of the roadway if exceeded has the potential for increasing the occurrences of a serious highway incident. Weather conditions play a major role in the ability of traffic to flow safely in and through the county as does the time of day and day of week and time of the year (planting and harvest). Incidents involving busses and other high-occupancy vehicles could trigger a response that exceeds the normal day-to-day capabilities of local response agencies.

Between 2004 and 2008 (latest data available) in rural Hancock County, there were 615 vehicle crashes. Of these crashes, 6 were fatal, 45 were major, 84 were minor, and 282 were possible/unknown. 373 crashes caused property damage. These crashes resulted in 343 injuries. Out of these crashes, there were 50 major injuries, 128 minor injuries, and 159 possible or unknown injuries.

Although traffic engineering, inspection of traffic facilities, land use management of adjacent areas to roads and highways, and the readiness of local response agencies has increased, highway incidents continue to occur. As the volume of traffic on Iowa streets, highways, and interstates increase, the number of traffic accidents will increase. The combination of large numbers of people on the road, unpredictable weather conditions, potential mechanical problems, and human error create the potential for a transportation accident.

The planning committee determined that the probability of a serious highway transportation incident occurring in Hancock County is highly likely to occur in any given year.

A railway transportation incident is a train accident that directly threatens life and/or property or adversely impacts a community's capabilities ability to provide emergency services. Railway incidents may include derailments, collisions, and highway/rail crossing accidents. Train incidents can result from a variety of causes; human error, mechanical failure, faulty signals, and/or problems with the track. Results of an incident can range from minor "track hops" to

catastrophic hazardous material incidents and even human/animal casualties. With the many miles of track in Iowa, vehicles must cross the railroad tracks at numerous at-grade crossings.

According to the Federal Railroad Administration Office of Safety Analysis, from January 2004 to July 2013 (most recent time period), there have been 5 incidents. These incidents have caused 1 injury. With street and highway crossings the probability of an incident is more likely to happen. Derailments are also possible, while a major derailment would occur less frequently.

A waterway incident is an accident involving any water vessel that threatens life and/or adversely affects a community's capability to provide emergency services. Waterway incidents will primarily involve pleasure craft on rivers and lakes. In the event of an incident involving a water vessel, the greatest threat would be drowning, fuel spillage, and/or property damage. Water rescue events would largely be handled by first responding agencies. Waterway incidents may also include events in which a person, persons, or object falls through the ice on partially frozen bodies of water.

There have been no disasters causing waterway incidents in Hancock County. There have been search and rescue events involving a single person or small boats with only a few people on board. There are no navigable waterways in Hancock County that are used for commercial purposes.

Location	Countywide	-

Probability	Hancock County has two private airports and on public airport, located in Forest City. The Forest City Municipal Airport has two paved runways (5,806 ft. and 2,708 ft.). The airport is a general aviation airport. No commercial services are offered at the airport. Any place in Hancock County could experience a significant air transportation incident; the most likely scenarios exist near airports. More and more people are utilizing air travel now than in the past; the trend of increasing numbers of people flying is likely to continue as will the crowdedness of airports and the skies above Iowa. Despite the increase in the number of people using air travel, incidents that require response personnel and involve casualties are likely to continue to decrease in number due to increases in the quality of training, equipment, and safety. Proper land-use near the airport will also decrease the chance that people and property on the ground will suffer significant impacts in the event of an air transportation accident. Between 2004 and 2008 (latest data available) in rural Hancock County, there were 615 vehicle crashes. Of these crashes, 6 were fatal, 45 were major, 84 were minor, and 282 were possible/unknown. 373 crashes caused property damage. These crashes resulted in 343 injuries. Out of these crashes, there were 50 major injuries, 128 minor injuries, and 159 possible or unknown injuries. Although traffic engineering, inspection of traffic facilities, land use management of adjacent areas to roads and highways, and the readiness of local response agencies has increased, highway incidents continue to occur. As the volume of traffic on Iowa streets, highways, and interstates increase, the number of traffic accidents will increase. The combination of large numbers of people on the road, unpredictable weather conditions, potential mechanical problems, and human error create the potential for a transportation accident. According to the Federal Railroad Administration Office of Safety Analysis, from January 2004 to July 2013 (most recent time period), there have been 5 incidents. These incidents have caused 1 injury. With street and highway crossings the probability of an incident is more likely to happen. Derailments are also possible, while a major derailment would occur less frequently. There have been no disasters causing waterway incidents in Hancock County. There have been search and rescue events involving a single person or small boats with only a few people on board. There are no navigable waterways in Hancock County that are used for commercial purposes. The Hancock County planning committee determined that the only transportation incidents highly likely to occur are highway incidents involving vehicles	4
Magnitude/ Severity	People aboard airplanes are the most vulnerable. Statistics from the	1

National Transportation Safety Board and the airline industry show that the majority (over 75%) of airplane crashes and accidents occur during the takeoff or landing phases of a flight. As a result, developed areas adjacent to the airports and in airport flight paths are particularly vulnerable to this hazard. For areas away from the airport, a smaller percentage of the population would be directly in the area of impact. Because of the infrequency of aircraft in the skies above areas away from the airport, these areas would not be considered as vulnerable.

As mentioned above, most accidents occur during takeoffs and landings. Accordingly, the spatial extent of the majority of incidents would occur on airport grounds or adjacent areas. Compared to many other hazards, an air transportation accident would occupy a relatively small area. The extent to which the impacts would be felt would depend on the materials involved. For example, if a cargo plan transporting volatile or hazardous materials were involved in an accident, the area of concern would be significantly larger than the area for an accident involving a small personal aircraft carrying stable materials.

Users of surface transportation systems are the most vulnerable. Travelers, truckers, delivery personnel, and commuters are at risk at all times that they inhabit the roadway. Certain times of the day, week, and year the number of vehicles and people on the roadway are significantly higher. This is also true after major public events; sports, concerts, etc. Pedestrians are less vulnerable but not immune from the impacts of a highway incident.

Highway incidents are usually contained to areas on the roadway or directly adjacent to the roadway. Very few highway incidents affect areas outside the traveled portion of the road and the right-of-way. Extensive segments of the transportation system can be impacted during significant weather events, such as a large snowstorm, when multiple separate accidents occur. The area of impact can extend beyond the localized areas if the vehicle(s) involved transporting hazardous materials.

People and property near railway lines, crossings, sidings, switching yards, and loading/unloading points are more at risk. Those away from railways and facilities are vulnerable only to large-scale incidents including those in which hazardous material are involved.

The railways that traverse Hancock County include the UP (Union Pacific) and the Canadian National Railway. These railways provide services to haul grain, chemicals, farm equipment and ethanol from the producers of these materials in Hancock County. The railways go through the towns of Sheffield, Hampton, and Geneva. Harmful products may contaminate streams, rivers, lakes, and entire watersheds. If this would happen a large portion of the community or county could be affected. The ability of response personnel to contain the product on-scene usually limits the area affected.

	Passengers of watercraft are vulnerable to a waterway incident. The maximum extent of a waterway incident would be limited. Impacts would	

	not extend beyond the initial incident scene. The only exception would be during a search and rescue event that could expand downstream. In the case of a hazardous material being released to the waterway the extent could expand rapidly.	
Warning Time	The amount of warning time for a transportation incident could vary from tens of minutes to a few seconds. Operators of aircraft, vehicles, trains, and watercraft are affected by the road conditions and weather. There is not enough ample warning time attributed to these hazards.	4
Duration	Instances of transportation incidents, particularly rail, air and waterway related hazards are likely to create more intensive response and resources to protect life and safety of those affected.	1
Further Information/ Sources	**US Department of Transportation** http://hazmat.dot.gov/ **Federal Railroad Administration** http://fra.dot.gov/safety/hazmat.htm **National Transportation Safety Board** http://www.ntsb.gov/ **Federal Aviation Administration** http://www.faa.gov/ **Iowa Crash Statistics** http://ai.fmcsa.dot.gov/CrashProfile/StateCrashProfileMain.asp?StCd=IA **Iowa Department of Natural Resources** http://www.iowadnr.gov/law/boating/index.html	-

Windstorm

Windstorms can be described as extreme winds associated with severe winter storms, severe thunderstorms, downburst, and very steep pressure gradients. Windstorms, other than tornadoes, are experienced in all regions of the United States. It is difficult to separate the various wind components that cause damage from other wind-related natural events that often occur with or generate windstorms.

Although Iowa does not experience direct impacts from hurricanes, the state is no stranger to strong, damaging winds. Unlike tornadoes, windstorms may have a destructive path that is tens of miles wide and the duration of the event could range from hours to days. These events can produce straight line winds in excess of 64 knots causing some power outages, property damage, impaired visibility, and crop damage.

Windstorms occur in Hancock County. Historically, windstorm events are associated with severe thunderstorms and blizzards. It is often difficult to separate windstorms and tornado damage when winds get above 64 knots (73MPH).

The NWS has developed a windstorm warning system similar to other events such as, tornado, winter storm, and thunderstorm. Watches are issued when conditions are favorable for windstorms to develop and they come 12 to 24 hours in advance. Advisories are issued when existing or imminent windstorms cover part or all of the area and pose a mere inconvenience.

Windstorm warnings are issued when existing or imminent high winds cover part or all of the forecast area and pose a threat to life and property.

According to NCDC data, there are no reports of strong wind events, although as mentioned above it is hard to separate wind events from thunderstorms and tornados. The planning committee determined that the probability of a windstorm event in Hancock County as highly likely to occur in any given year in relation to other hazards.

Location	Countywide	-
Probability	Windstorms occur in Hancock County. Historically, windstorm events are associated with severe thunderstorms and blizzards. It is often difficult to separate windstorms and tornado damage when winds get above 64 knots (73MPH). According to NCDC data there are no reports of strong wind events, although as mentioned above it is hard to separate wind events from thunderstorms and tornados. According to the 2010 State of Iowa Hazard Mitigation Plan, Hancock County has experienced between 18-23 events since 1993.	4
Magnitude/ Severity	Those most at risk from windstorms include living in mobile homes, campgrounds, and other dwellings without secure foundations or basements. People in automobiles are also very vulnerable to wind storms, particularly tornadoes. The elderly, very young, and the physically and mentally handicapped are most vulnerable because of the lack of mobility to seek shelter or escape the path of destruction. People who may not understand watches and warnings due to language barriers are also at risk. Unlike tornadoes, windstorms may have a destructive path that is tens of miles wide and several hundred miles long. Large hail, strong straightline winds, heavy rains, flash flooding, and lightning are also associated with severe storms and may cause significant damage to a wider area. Disruption of critical services can also affect operations. Employees may be affected and unable to attend work-related issues. Impacts can range from broken tree branches, shingle damage to roofs, and some broken windows; all the way to complete destruction of well-constructed structures, infrastructure, and trees. Windstorms can affect many critical services, especially electrical power. Buried services are not as vulnerable, but can be affected by their system components that are above ground. Economic impacts can result from direct damages to facilities or business disruption from the lack of critical services such as power. Crop damage is often associated with windstorms; laying down crops, breaking stalks, and twisting plants, reducing the yield and making it difficult to harvest. The Beaufort Wind Scale is given in **Table 26**	2

Warning Time	Wind speeds may approach 120 miles per hour and the storm can travel across the ground at more than 50 mph. These winds can uproot trees and structures and turn harmless objects into deadly missiles, all in a matter of seconds. The development of conditions suitable for high and strong wind events is available a day in advance. The advancement in weather forecasting has allowed watches to be delivered to those in the path of these storms up to hours in advance. The best warning lead-time for a specific severe storm is about 30 minutes.	4
Duration	The response tied to windstorm events is one directly related to the immediate protection of vulnerable populations from the direct threat to	1
	life and property. Response time is limited to event duration and immediate impact.	
Further Information/ Sources	**National Climatic Data Center** http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms **FEMA** http://www.fema.gov/hazard/tornado/index.shtm	-

Table 26- Beaufort Wind Scale

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind determined on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4ft. becoming longer, numerous whitecaps	Dust, leaves and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-20 ft, white foam streaks off breakers	Whole trees moving, resistance determined walking against wind
8	34-30	Gale	Moderately high (13-20 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Whole trees in motion, resistance determined walking against wind

9	41-47	Strong Gale	High waves (20 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (20-30 ft) with overhanging crests sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (30-45 ft.) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced	

Hazards Not Considered

There are hazards that are identified by the Federal Emergency Management Agency and the State of Iowa that do not apply to Hancock County or were not considered to be profiled by the Hancock County Planning Committee. The following table identifies the hazards that are not included in this plan and the reason they were excluded.

Hazards Excluded	Reasoning
Dam Failure	Dam failure is not being profiled, but was scored due to no known high-hazard dams being located in the county, according to IHSEMD. The only dam located in Hancock County is of the low-head type. Low-head dams do not hold water back in a reservoir. They were mostly used for grain milling in the late 1800's and now provide stream flow stabilization.
Earthquake	Earthquakes may be possible in any location and was scored in the HARA. However, there is no identified seismic activity or fault lines of concern that would affect Hancock County.
Expansive Soils	Expansive Soils are not present in Hancock County by strict definition. Loosely interpreted they could potentially affect a small area of the County so it was considered during scoring in the HARA.
Landslide	Minor landslides and rock falls do occur in Hancock County. Due to the geography and incident rate information provided by HLSEM, that any landslide that may occur is only going to be small and cause only minor damage with no threats to human safety and minimal threats to property.
Levee Failure	Planning committee research revealed no records of levees in the planning area. The National Levee Database, maintained by the U.S.A.C.E., shows no federal levees located in Hancock County. While it is likely that levees exist, such as low-head agricultural levees, no records indicate that the breach or overtopping of these levees would impact property other than that of the levee owner. Significant damage to residential structures is unlikely.

Sinkholes	There are no known sinkholes in Hancock County according to the Iowa Department of Natural Resources. Due to the highly unlikely situation of an unknown sinkhole occurring the hazard was scored during HARA.

CHAPTER 4: HAZARD PRIORITIZATION

The Hazard Mitigation planning committees identified and scored the hazards affecting their community. Some committees decided to remove or combine hazards that were identified by the county planning committee for scoring. They examined each hazard in relation to the risk it posed to the county based on available data and their own reasoning.

After committees scored each factor for the hazards, the weighted scores were calculated. These scores were calculated by using the following formula:

(Probability x .45) + (Magnitude/Severity x .30) + (Warning Time x .15) + (Duration x .10) = Final Hazard Assessment Score

The weighted score gave the committees a basis to prioritize the hazarsd and determine which mitigation measures to apply to each hazard. The following tables show the priority levels for each jurisdiction starting with the County. Priority Group 1 hazards are candidates for immediate focus in the emergency plans because of their high risk. Priority Group 2 hazards are those hazards that should be addressed, but are longer-term in focus. These are low-risk hazards that can affect the community, but will not be addressed immediately. Priority Group 3 hazards are those that have a less significant level of risk. The hazards are ranked in descending order. Scores and priorities are provided in **Tables 27-37.**

Using a quantifiable system as described above gives more detail and still allows for adjustments when necessary. The idea of weighing comes from the State of Iowa 2010 Hazard Mitigation Plan. The committee determined that it was easier to use the State's method than create their own.

Table 27 - Hancock County Hazard Scores and Priorities

Dam Failure, Earthquakes, expansive soils, landslides, levee failures, radiological incidents, sinkholes and transportation incidents were eliminated due to the threats not being present or high enough in probability to consider in Hancock County.

Hazard	Probability	Severity	Warning Time	Duration	Weighted Score	Rank	Priority
Thunderstorms and Lightning	3.5	2.5	3.5	2.5	3.1	1	1
Severe Winter Storm	3.5	2.5	3	3	3.08	2	
Animal/Plant/Crop Disease	3	2.5	2.5	4	2.88	3	
River Flooding	3	2.5	3	3	2.85	4	
Hailstorms	3	2.5	4	1	2.8	5	
Tornado	3	2	4	1	2.65	6	2
Windstorms	3	2	4	1	2.65	6	
Infrastructure Failure	2	3	4	2	2.6	8	
Drought	3	2	1	4	2.5	9	
Grass/Wildland Fire	2	1.5	4	2	2.15	10	
Terrorism	1	3	4	2	2.15	10	3
Extreme Heat	2	2	1.5	3.5	2.08	12	
Flash Flooding	1.5	1.5	.3.5	3	1.95	13	
Hazardous Materials Incident	1	1.5	4	2	1.7	14	
Human Disease Outbreak	1	1.5	4	2	1.63	15	

Table 28 - Garner Hazard Scores & Priorities

The Garner planning committee determined to eliminate dam failure and earthquakes because the participants believed that either was either impossible or highly improbable.

Hazard	Probability	Severity	Warning Time	Duration	Weighted Score	Rank	Priority
Human Disease Outbreak	3	4	1	4	3.1	1	1
Hailstorms	3	3	4	1	2.95	2	
Grass/Wildland Fires	4	1	4	1	2.8	3	
Hazardous Material Incident	2	4	4	1	2.8	3	
Thunderstorms and Lightning	3	3	3	1	2.8	3	
Windstorms	3	3	3	1	2.8	3	
Extreme Heat	3	3	1	3	2.7	7	2
River Flooding	3	2	3	3	2.7	7	
Severe Winter Storms	3	3	1	3	2.7	7	
Expansive Soils	3	1	4	4	2.65	10	
Terrorism	1	4	4	4	2.65	10	
Flash Flooding	1	4	4	3	2.55	12	
Drought	3	2	1	4	2.5	13	
Radiological Incident	1	4	3	1	2.5	13	
Infrastructure Failure	3	1	4	1	2.35	15	3
Tornado	1	4	4	1	2.35	15	
Animal/Plant/Crop Disease	2	2	1	4	2.05	17	
Transportation Incident	1	1	4	2	1.55	18	
Landslides	1	1	4	1	1.45	19	
Levee Failure	1	1	4	1	1.45	19	
Sinkholes	1	1	1	4	1.3	21	

Table 29 - Kanawha Hazard Scores & Priorities

The Kanawha planning participants scored all potential hazards because of the potential in assuming that the hazard may not exist or potentially threaten the community may not be in the best interest of the safety of the area and its residents.

Hazard	Probability	Severity	Warning Time	Duration	Weighted Score	Rank	Priority
Severe Winter Storms	3.6	2.8	1.8	2.8	3.01	1	
Windstorms	3	2.5	2.83	2.83	2.81	2	
Thunderstorms and Lightning	3.6	1.8	2.2	2.2	2.71	3	
Extreme Heat	3	2.17	2.17	3.5	2.68	4	
Drought	2.83	2.67	1.17	4	2.65	5	
Animal/Plant/Crop Disease	2.5	2.5	2.75	3.25	2.61	6	
Hailstorms	3	2.6	2.2	1.4	2.6	7	
Flash Flooding	2.5	2.5	2.75	2.5	2.54	8	
Tornado	2.8	1.8	2.8	2.8	2.5	9	
Human Disease Outbreak	2.4	2.2	2	3.8	2.42	10	
Infrastructure Failure	1.5	2.5	4	3	2.33	11	
River Flooding	2.4	2	2.4	2.8	2.32	12	
Levee Failure	1	2	4	4	2.05	13	
Grass/Wildland Fire	1.5	2	3.75	2	2.04	14	
Terrorism	1.5	1.5	4	3	2.03	15	
Hazardous Materials Incident	1.75	2	2.75	1.75	1.98	16	
Landslides	1	2	4	3	1.95	17	
Radiological Incident	1.25	1.5	3.75	2.75	1.85	18	
Dam Failure	1.5	1.5	2	3.5	1.78	19	
Transportation Incident	1.25	1.75	2.75	2.75	1.78	19	
Expansive Soils	1	1	2.75	3.25	1.49	21	
Sinkholes	1	1	4	1	1.45	22	
Earthquake	1	1	3	2	1.4	23	

Table 30 - Crystal Lake Hazard Scores and Priorities

The Crystal Lake planning committee determined to eliminate dam failure, earthquakes, expansive soils, landslides, levee failure, radiological incidents and sinkholes based on no known threats in the community.

Hazard	Probability	Severity	Warning Time	Duration	Weighted Score	Rank	Priority
Thunderstorms and Lightning	4	2	4	1	3.1	1	1
Tornado	2	4	4	1	2.8	2	
Hailstorms	3	2	4	1	2.65	3	
Windstorms	3	2	4	1	2.65	3	
Extreme Heat	3	2	2	2	2.45	5	
Severe Winter Storms	3	2	2	2	2.45	5	
Flash Flooding	2	2	4	1	2.2	7	2
Hazardous Materials Incident	1	3	4	2	2.15	8	
Terrorism	1	3	4	1	2.05	9	
Infrastructure Failure	2	1	3	3	1.95	10	
Drought	2	1	1	4	1.75	11	
Grass/Wildland Fires	1	2	4	1	1.75	11	3
Human Disease Outbreak	1	2	2	4	1.75	11	
River Flooding	1	1	3	3	1.5	14	
Transportation Incident	1	1	4	1	1.45	15	
Animal/Plant/Crop Disease	1	1	1	4	1.3	16	

Table 31 - Klemme Hazard Scores and Priorities

The Klemme planning committee determined to Animal/Plant/Crop disease, dam failure, earthquake, landslides, levee failure, radiological incident, river flooding, sinkholes, terrorism and transportation incidents based on no known threats and no river existing in the community.

Hazard	Probability	Severity	Warning Time	Duration	Weighted Score	Rank	Priority
Tornado	2.33	3	3.67	1.67	2.67	1	1
Hailstorms	2.67	1.67	3.67	1.67	2.42	2	
Severe Winter Storms	2.33	2	2.33	2.33	2.23	3	
Thunderstorms and Lightning	2.33	2	3	1.33	2.23	3	
Windstorms	2	2	3.33	1.67	2.17	5	2
Flash Flooding	1.67	1.33	3.67	2	1.9	6	
Infrastructure Failure	2	1	4	1	1.9	6	
Extreme Heat	2	1	2	3	1.8	8	
Expansive Soils	1	1	4	4	1.75	9	3
Drought	1.33	1	2	3	1.5	10	
Hazardoud Materials Incident	1	1	4	1	1.45	11	
Human Disease Outbreak	1	1	4	1	1.45	11	
Grass/Wildland Fire	1	1	3	1	1.3	13	

Table 32 - Woden Hazard Scores and Priorities

The Woden planning committee determined to eliminate dam failure, earthquake, expansive soils, landslides, levee failure and radiological incidents.

Hazard	Probability	Severity	Warning Time	Duration	Weighted Score	Rank	Priority
Thunderstorms and Lightning	2.25	1.75	2.5	2.25	2.14	1	1
Tornado	1.75	1.75	3.25	3.25	2.13	2	
Severe Winter Storms	2	1.75	2	2.75	2	3	
Animal/Plant/Crop Disease	1.5	2	2.25	3.25	1.94	4	
Drought	2	1.75	1	3.5	1.93	5	
Hailstorm	1.8	1.8	2.8	2	1.9	6	
Windstorm	1.75	1.75	2.25	2.25	1.88	7	2
Transportation Incident	1	2	3	1	1.6	8	
Extreme Heat	1.67	1.34	1	2.67	1.57	9	
River Flooding	1	2	2	2	1.55	10	
Grass/Wildland Fire	1.5	1.5	1.5	1	1.45	11	
Infrastructure Failure	1	1	3	2	1.4	12	
Human Disease Outbreak	1	1	2	3	1.35	13	3
Flash Flooding	1	1	1	1	1	14	
Hazardoud Materials Incident	1	1	1	1	1	14	
Sinkholes	1	1	1	1	1	14	
Terrorism	1	1	1	1	1	14	

Table 33 - Garner-Hayfield-Ventura CSD Hazard Scores and Priorities

The Garner-Hayfield-Ventura Community School District planning committee determined to eliminate dam failure, earthquakes, expansive soils, landslides, levee failure, radiological incidents and sinkholes due to no known threats.

Hazard	Probability	Severity	Warning Time	Duration	Weighted Score	Rank	Priority
Thunderstorms and Lightning	2	4	4	1	3.05	1	1
Severe Winter Weather	3	2	3	4	2.8	2	
Tornado	2	4	4	1	2.8	2	
Hailstorms	3	2	4	1	2.65	4	
Windstorms	3	1	4	1	2.35	5	
Extreme Heat	3	1	2	3	2.25	6	
Flash Flooding	2	2	4	1	2.2	7	2
Hazardoud Materials Incident	1	3	4	1	2.15	8	
Grass/Wildland Fire	2	1	4	2	2	9	
Infrastructure Failure	1	2	4	3	1.95	10	
Drought	2	1	2	4	1.9	11	
River Flooding	2	1	2	3	1.8	12	3
Human Disease Outbreak	1	2	2	4	1.75	13	
Transportation Incident	1	2	4	1	1.75	13	
Terrorism	1	1	4	2	1.55	15	
Animal/Plant/Crop Disease	1	1	2	4	1.45	16	

Table 34- West Hancock CSD Hazard Scores and Priorities

The West Hancock Community School District planning committee determined to eliminate landslides and levee failures due to no known threat existing in the community.

Hazard	Probability	Severity	Warning Time	Duration	Weighted Score	Rank	Priority
Tornado	3.5	3	4	2.5	3.33	1	1
Windstorms	3.5	3	3.5	2.5	3.25	2	
Flash Flooding	3	3	4	3	3.15	3	
Hailstorms	3.5	3	3	2	3.13	4	
Extreme Heat	3.5	2.5	3	3	3.08	5	
Thunderstorms and Lightning	3.5	3	2.5	2	3.05	6	
Severe Winter Storm	3.5	3	2	2.5	3.03	7	
Drought	3	2.5	1.5	4	2.73	8	2
River Flooding	3	2	2.5	3.5	2.68	9	
Grass/Wildland Fires	2	3	4	2.5	2.65	9	
Sinkholes	2	2	4	3	2.4	11	
Infrastructure Failure	2.5	1	4	3	2.33	12	
Transportation Incident	1.5	2	4	3	2.18	13	
Terrorism	1.5	1.5	4	3	2.03	14	
Hazardous Materials Incident	1	2	4	3	1.95	15	3
Animal/Plant/Crop Disease	1.5	2	1.5	3.5	1.85	16	
Radiological Incident	1	1	4	4	1.75	17	
Human Disease Outbreak	1.5	1.5	1.5	3.5	1.7	18	
Earthquake	1	1	4	2.5	1.6	19	
Expansive Soils	1	1	2.5	2.5	1.38	20	
Dam Failure	1	1	1	4	1.3	21	

Table 35 – Britt Hazard Scores and Priorities

The Britt planning committee determined to eliminate dam failures, landslides, levee failures, and radiological incidents due to no known threats existing in the community.

Hazard	Probability	Severity	Warning Time	Duration	Weighted Score	Rank	Priority
Hailstorm	3.67	3.67	3	1.67	3.37	1	1
Thunderstorms and Lightning	3.67	3.67	2.67	1.67	3.32	2	
Severe Winter Storm	3.67	3.33	2.33	2	3.2	3	
Windstorms	3.33	3.33	3	1.33	3.08	4	
Drought	3.33	3.33	1.33	3.33	3.03	5	
Grass/Wildland Fires	3.33	3	3	1.33	2.98	6	
Tornado	3.33	3	3	1.33	2.98	6	
Extreme Heat	3.67	2.33	2.67	2	2.95	8	2
Flash Flooding	3	2.67	3	2	2.8	9	
Animal/Plan/Crop Disease	2.67	3	2	2.33	2.63	10	
Transportation Incident	2.67	2.33	3.33	1.67	2.57	11	
River Flooding	3	2	2	2.5	2.5	12	
Infrastructure Failure	2.67	2	3	1.67	2.42	13	
Hazardous Materials Incident	2	2.33	3.67	2	2.35	14	3
Human Disease Outbreak	2.67	2	1.67	2	2.25	15	
Terrorism	1.67	1.67	3	1.67	1.87	16	
Sinkholes	1.5	1.5	3.5	2	1.85	17	
Expansive Soils	2	1.67	1.67	1.33	1.78	18	
Earthquakes	1	1	4	1	1.45	19	

Table 36 - Corwith Hazard Scores and Priorities

Corwith planning committee determined to score each potential hazard.

Hazard	Probability	Severity	Warning Time	Duration	Weighted Score	Rank	Priority
Tornado	3	3	4	3.25	3.18	1	1
Dam Failure	3	2	4	4	2.95	2	
Severe Winter Storms	3.5	2	1.75	3	2.74	3	
Windstorms	2.75	2.25	3.25	2.25	2.63	4	
Thunderstorms and Lightning	3.25	1.75	3	1.75	2.61	5	
Expansive Soils	2.5	2	3	3.5	2.53	6	
Flash Flooding	2.5	2.25	3.25	2.25	2.51	7	
Infrastructure Failure	2.25	2.25	3.25	2.75	2.45	8	2
Levee Failure	2.5	1.5	4	2.5	2.43	9	
Drought	2.75	2	1	4	2.39	10	
Extreme Heat	3	1.5	1.25	3.25	2.31	11	
Hailstorm	2.75	1.5	3.25	1.25	2.3	12	
River Flooding	2	2	2.5	3.5	2.23	13	
Human Disease Outbreak	2	2	2	4	2.2	14	
Transportation Incident	1.67	1.33	4	2	1.95	15	
Sinkholes	1.33	1.67	3.33	3.33	1.93	16	3
Grass/Wildland Fire	1.33	1.67	3.67	2.67	1.92	17	
Animal/Plant/Crop Disease	2	1.5	1	4	1.9	18	
Hazardous Materials Incident	1.25	1.75	3.5	2.5	1.86	19	
Landslides	1	1	4	2.5	1.6	20	
Radiological Incident	1	1	4	1.5	1.5	21	
Earthquake	1	1	4	1	1.45	22	
Terrorism	0.75	1.25	2.25	1.75	1.23	23	

Table 37 - Goodell Hazard Scores and Priorities

The Goodell planning committee determined eliminate dam failures, drought, earthquakes, expansive soils, grass and wildland fires, hazardous materials incidents, landslides, levee failures, radiological incidents, river flooding, sinkholes, terrorism and transportation incidents due to the threat not being present in the community or the likelihood of the threat being too minimal to score.

Hazard	Probability	Severity	Warning Time	Duration	Weighted Score	Rank	Priority
Tornado	3	4	4	1	3.25	1	1
Severe Winter Storms	4	3	1	2	3.05	2	
Thunderstorms and Lightning	4	3	1	1	2.95	3	
Windstorms	3	3	3	1	2.8	4	
Extreme Heat	4	1	1	3	2.55	5	2
Hailstorms	2	2	4	1	2.2	6	
Infrastructure Failure	1	1	4	3	1.65	7	
Flash Flooding	1	1	4	1	1.45	8	3
Human Disease Outbreak	1	1	1	4	1.3	9	
Animal/Plant/Crop Disease	1	1	1	3	1.2	10	

CHAPTER 5: VULNERABILITY & LOSS ESTIMATATION

In order to identify appropriate mitigation techniques and projects, the committee determined that it was necessary to determine the amount of vulnerable structures and residents. The table that follows lists the Hancock County's assets that would be affected if the entire community was to be impacted by a hazard. Hazards do not typically affect an entire community to complete destruction; however, **Tables 38-47** indicate community valuations for Hancock County (unincorporated and incorporated). The county planning committee determined that hazards do not typically affect a jurisdiction to complete destruction. This chapter also provides loss estimation by hazards and a list of critical facilities that can potentially be vulnerable to hazards.

Table 38 – Hancock County Vulnerability and Loss Estimates (Includes areas of Forest City within Hancock County)
Residential/Commercial/Industrial = Assessed Value.
Agricultural = Undeveloped parcels of land.
Exempt Parcels: Religious, Non-profits, County Courthouse, Fire Stations, Public Works facilities, etc.

Type of Structure	Number of Vulnerable Structures		Potential Damages (Loss Estimates) of Structures		Number of Vulnerable People	
	# in County	# vulnerable	$ in County	$ Loss	# in County	# vulnerable
Residential	4,603	4,603	494,928,109	494,928,109	10,795	10,795
Commercial	573	573	141,186,411	141,186,411		
Industrial	62	62	158,270,120	158,270,120		
Agricultural (land)	-	-	584,953,670	584,953,670		
Exempt	-	-	12,389,061	12,389,061		
Totals	**5,238**	**5,238**	**1,391,727,371**	**1,391,727,371**	**10,795**	

Source: Hancock County Assessor's Office-Abstract for 2024-Unincorporated and Incorporated, 2020 Census

Table 39 - Unincorporated Areas Vulnerability and Loss Estimates

Type of Structure	Number of Vulnerable Structures		Potential Damages (Loss Estimates) of Structures		Number of Vulnerable People	
	# in area	# vulnerable	$ in County	$ Loss	# in County	# vulnerable
Residential	811	811	124,853,866	124,853,866	3,740	3,740
Commercial	99	99	35,920,624	35,920,624		
Industrial	36	36	109,833,800	109,833,800		
Agricultural (land)	-	-	579,975,060	579,975,060		
Exempt	-	-	-	-		
Totals	**946**	**946**	**850,583,350**	**850,583,350**	**3,740**	

Source: Hancock County Assessor's Office-Abstract for 2024-Unincorporated and Incorporated, 2020 Census

Table 40 - Garner Vulnerability and Loss Estimates

Type of Structure	Number of Vulnerable Structures		Potential Damages (Loss Estimates) of Structures		Number of Vulnerable People	
	# in area	# vulnerable	$ in County	$ Loss	# in county	# vulnerable
Residential	1,183	1183	208,696,518	208,696,518	3,065	3,065
Commercial	145	145	39,170,432	39,170,432		
Industrial	13	13	20,151,960	20,151,960		
Agricultural (land)	-	-	349,980	349,980		
Exempt	-	-	-	-		
Totals	**1,341**	**1,341**	**268,368,890**	**268,368,890**	**3,129**	

Source: Hancock County Assessor's Office-Abstract for 2024-Unincorporated and Incorporated, 2020 Census

Table 41 -Britt Vulnerability and Loss Estimates

Type of Structure	Number of Vulnerable Structures		Potential Damages (Loss Estimates) of Structures		Number of Vulnerable People	
	# in area	# vulnerable	$ in County	$ Loss		# vulnerable
Residential	837	837	87,149,749	87,149,749	2,044	2,044
Commercial	112	112	18,329,041	18,329,041		
Industrial	3	3	1,621,640	1,621,640		

Agricultural (land)	-	-	210,920	210,920		
Exempt	-	-	-	-		
Totals	**952**	**952**	**107,311,350**	**107,311,350**	**2,044**	

Source: Hancock County Assessor's Office-Abstract for 2024-Unincorporated and Incorporated, 2020 Census

Table 42 - Crystal Lake Vulnerability and Loss Estimates

Type of Structure	Number of Vulnerable Structures		Potential Damages (Loss Estimates) of Structures		Number of Vulnerable People	
	# in area	# vulnerable	$ in County	$ Loss	# in county	# vulnerable
Residential	121	121	7,394,510	7,394,510	253	253
Commercial	29	29	742,260	742,260		
Industrial	-	-	-	-		
Agricultural (land)	-	-	75,830	75,830		
Exempt	-	-	-	-		
Totals	**150**	**150**	**8,212,600**	**8,212,600**	**253**	

Source: Hancock County Assessor's Office-Abstract for 2024-Unincorporated and Incorporated, 2020 Census

Table 43 - Woden Vulnerability and Loss Estimates

Type of Structure	Number of Vulnerable Structures		Potential Damages (Loss Estimates) of Structures		Number of Vulnerable People	
	# in area	# vulnerable	$ in County	$ Loss	# in county	# vulnerable
Residential	115	115	5,264,610	5,264,610	188	188
Commercial	23	23	6,320,390	6,320,390		
Industrial	-	-	-	-		
Agricultural (land)	-	-	376,180	376,180		
Exempt	-	-	-	-		
Totals	**138**	**138**	**11,961,180**	**11,961,180**	**188**	

Source: Hancock County Assessor's Office-Abstract for 2024-Unincorporated and Incorporated, 2020 Census

Table 44 - Corwith Vulnerability and Loss Estimates

Type of Structure	Number of Vulnerable Structures		Potential Damages (Loss Estimates) of Structures		Number of Vulnerable People	
	# in area	# vulnerable	$ in County	$ Loss	# in county	# vulnerable
Residential	129	129	5,563,060	5,563,060	266	266
Commercial	39	39	9,193,990	9,193,990		
Industrial	-	-	-	-		
Agricultural (land)	-	-	1,358,630	1,358,630		
Exempt	-	-	-	-		
Totals	**168**	**168**	**16,115,680**	**16,115,680**	**266**	

Source: Hancock County Assessor's Office-Abstract for 2024-Unincorporated and Incorporated, 2020 Census

Table 45 - Kanawha Vulnerability and Loss Estimates

Type of Structure	Number of Vulnerable Structures		Potential Damages (Loss Estimates) of Structures		Number of Vulnerable People	
	# in area	# vulnerable	$ in County	$ Loss		# vulnerable
Residential	298	298	20,318,419	20,318,419	658	658
Commercial	37	37	9,883,841	9,883,841		
Industrial	2	2	1,185,260	1,185,260		
Agricultural (land)	-	-	1,922,290	1,922,290		
Exempt	-	-	-	-		
Totals	**335**	**335**	**33,309,810**	**33,309,810**	**658**	

Source: Hancock County Assessor's Office-Abstract for 2024-Unincorporated and Incorporated, 2020 Census

Table 46 - Klemme Vulnerability and Loss Estimates

Type of Structure	Number of Vulnerable Structures		Potential Damages (Loss Estimates) of Structures		Number of Vulnerable People	
	# in area	# vulnerable	$ in County	$ Loss	# in county	# vulnerable
Residential	222	222	13,793,399	13,793,399	441	441
Commercial	37	37	5,121,731	5,121,731		
Industrial	4	4	1,580,240	1,580,240		
Agricultural (land)	-	-	221,050	221,050		
Exempt	-	-	-	-		
Totals	**263**	**263**	**20,716,420**	**20,716,420**	**441**	

Source: Hancock County Assessor's Office-Abstract for 2024-Unincorporated and Incorporated, 2020 Census

Table 47 - Goodell Vulnerability and Loss Estimates

Type of Structure	Number of Vulnerable Structures		Potential Damages (Loss Estimates) of Structures		Number of Vulnerable People	
	# in area	# vulnerable	$ in County	$ Loss	# in county	# vulnerable
Residential	75	75	3,156,810	3,156,810	140	140
Commercial	20	20	252,200	252,200		
Industrial	-	-	-	-		
Agricultural (land)	-	-	356,680	356,680		
Exempt	-	-	-	-		
Totals	**95**	**95**	**3,765,690**	**3,765,690**	**140**	

Source: Hancock County Assessor's Office-Abstract for 2024-Unincorporated and Incorporated, 2020 Census

Table 48 - Hancock County Loss Estimation by Natural Hazards

Flood	Drought	Extreme Heat	Extreme Cold	Hail
$11,429,000	$1,600,131	$3,000	$283,375	145,062
Snow & Ice	**Tornado**	**Lightning**	**Thunderstorm**	**Windstorm**
$40,264	$206,550	$5,000	$54,000	$78,194

Source: 2010 State of Iowa Hazard Mitigation Plan

The planning committees have identified specific structures as critical facilities and infrastructure. Due to the function and value of the structures in the communities, they need to be protected against the hazards previously identified. **Table 49** provides a list of critical facilities.

Table 49 – Reported Critical Facilities Data in Hancock County

Structures listed below are not known to be in a Special Flood Hazard Area (SFHA) and more research will be conducted at the next plan update to determine if any of the following structures or possible new structures added to this list at the next plan update currently exist in an (SFHA).

Area	Facility	Building Replacement Value ($)	Contents Value ($)	Occupancy
Garner	High School	$19,302,762	$2,912,542	-
	City Hall/Fire Dept/Police Dept	$2,852,387	-	-
	Water Treatment Plant	$555,951		
	North Water Tower	$1,199,893		
	South Water Tower	$480,106		
	City Maintenance Shed	$1,580,746		
	Sewer Plant	$4,374,981		
	Elementary/ Middle School	$12,706,958	$2,275,207	-
	Bus Barn	$1,022,088	$102,000	-
Kanawha	Community Home	-	-	-
	Water Tower	$900,000	--	-
	Water Plant	$800,000	-	-
	Fire Department	$600,000	-	-
	City Hall	$1,750,000	-	-
	Christian School	-	-	-
	West Hancock Middle School	$7,775,714	$1,968,240	
	Lift Station	$350,000	-	-
Klemme	City Hall	$763,486	-	-
	Water Tower	$649,134	-	--
	Fire Station/Water Plan	$1,327,510	-	-
Crystal Lake	Water Tower	$372,555	-	-
	Fire Station	$283,198	$124,274	-
	City Hall	$292,748	$154,700	-
	Lagoon	$353,864	$1,500	-
	Sirens	-	$14,184	-
	Gas Station	-	-	-
Woden	Fire Station	$715,000	-	-

	Water Tower	$275,000	-	-
	Community Center	$155,000	-	
Corwith	Lagoon	$727	$3,640	-
	Water Tower	$112,215	-	-
	Electrical Substation	$89,677	-	-
	Fire Station	$450,118	-	-
	City Hall – Safe Room	$628,033	$41,166	-
Goodell	Water Department	$58,800	$80,100	-
	Fire Department	$231,113	307,390	-
	Community Hall	$280,000	$37,200	-
Hancock County	Courthouse	-	-	-
	Sheriff's Office	-	-	-
Britt	Hancock County Memorial Hospital	-	-	-
	High/Elementary School	$20,606,614	$3,377,342	-
	City Hall/Fire Department	$1,743,199	309,212	
	Well House/Filter Plant	$608,373	$60,000	
	Disposal Control Building	$252,499	$50,000	
	Waste Water Treatment Plant	$808,393	$2,096,544	
	Digester Pump/Boiler Building	$304,905	$424,114	
	Water Tower	$1,506,291		

CHAPTER 6: MITIGATION ACTIVITIES

This section is intended to give a brief overview of mitigation activities that have been undertaken by the jurisdictions in Hancock County. The mitigation activities can apply to individual jurisdictions, the entire county, or the North Iowa region.

Britt Mitigation Activities

- Updating community water service – **ongoing**
- Upgrade and improve community storm water handling capacity and infrastructure – **future project**
- Emergency generator upgrade for waste water handling infrastructure – **ongoing project**
- Emergency power generation capability for Police Department - **future project**

Corwith Mitigation Activities

- Continued expansion of storm water handling capacity – **ongoing**
- Replacement and/or repair of storm water system intake grates to prevent debris – **ongoing**
- Establishment of storm shelter with emergency power generation capability – **future project**

- Establishment of heating/cooling shelters as needed – **ongoing**
- Upgrade and improve community sewer system to prevent inundation of homes during heavy/prolonged rain events – **future/ongoing project.**

Crystal Lake Mitigation Activities

- Outdoor warning siren upgrade – **ongoing**
- Continued enhanced training for Fire and EMS – **ongoing**
- Increase in storm water handling capacity – **future project/ongoing**
- Increase pumping capacity for City sewer – **ongoing.**

Garner Mitigation Activities

- Outdoor warning siren upgrade – **completed**
- Emergency power generation capability for water supply and sewage systems – **completed**
- Emergency power generation for Fire Department – **completed**
- Emergency power generation for community center – **ongoing**
- Establishment of community shelter for high risk weather events, heating and cooling shelters – **ongoing**
- Cottonwood sewer upgrade – **completed**
- Allen Avenue storm water/draining handling upgrade/enhancement – **ongoing**
- Construction of community tornado safe room – **ongoing**
- Enhancement of water handling/sewer bypass pumping - **ongoing**

Goodell Mitigation Activities

- Emergency power generator for City Hall – **ongoing**
- Emergency power generator for Fire Department – **completed**
- Construction of community tornado safe room (high priority) – **ongoing/future project**
- Increase community awareness and use of NOAA Weather Radios – **ongoing**
- Community Sewer upgrade – **completed**
- Community water supply system upgrade – **in process**
- Emergency power generator for new water supply system – **ongoing/future project**
- Upgrade community snow removal equipment – **ongoing**
- Addition/Upgrade community outdoor warning siren capability – **ongoing/future project**

Kanawha Mitigation Activities

- Continued enhancement of Law, Fire and EMS training – **ongoing**
- Construction of community tornado safe room – **ongoing/future project**
- Installation of emergency power generation for critical infrastructure – **ongoing/future project**
- Construction of micro-power grid for community in the event of total community power disruption – **future project**

Klemme Mitigation Activities

- Fire and EMS enhanced training – **ongoing**
- Sewer system cleaning and televising – **ongoing**
- Sewer lining project to prevent infiltration – **future project**
- Construction of Tornado Safe Room – **future project**
- Increase stormwater discharge capacity – **future project**
- Acquisition of trash pumps – **completed and ongoing**
- Construction of retention pond - **ongoing**

Woden Mitigation Activities

- Outdoor warning siren upgrade for remote activation – **ongoing**
- Continue block leader program for emergencies – **ongoing**
- Fire and EMS enhanced training – **ongoing**
- Addition of additional outdoor warning siren(s) – **future project**

The mitigation measures that were identified in the previous plans have either been completed, are ongoing, cancelled, or not yet initiated. The measures that are identified in the Hancock County Multi-Jurisdictional Plan have replaced the previous measures.

County-wide and Regional Mitigation Activities

Alongside the mitigation activities for the individual jurisdictions, there are certain activities that apply to Hancock County and/or the North Iowa region as a whole. These activities are described below.

Hazardous Materials

The North Iowa Hazardous Emergency Action Team (NIHEAT) was formed in 1993. The program is administered by the North Central Regional Emergency Planning Commission (NCREPC) with representatives from Cerro Gordo, Emmet, Floyd, Franklin, Hancock, Kossuth, Mitchell, Palo Alto, and Worth. The hazardous emergency action team consists of twenty-six (26) hazardous materials technicians, twenty-six (26) of which are Mason City Firefighters. When a hazmat incident occurs, the team assembles technicians for response. The firefighters in Franklin County's fire departments are trained to operations level. Contact information for Hazardous Material Response is as follows:

Hazardous Material Response
350 Fifth St. SW
Mason City, IA 50401
Phone: 641-421-3640

Tornado/Windstorm Activities

Tornadoes have been known to cause great destruction. They can demolish entire buildings and it is not uncommon to hear of a tornado tearing off the roof of a house. With this type of potential damage, it is important that mitigation efforts are made to protect people from this deadly force. The most important measure in reducing the threat of injury is to be aware of the oncoming danger. Hancock County has weather sirens implemented within most communities. Members of the emergency services departments in the cities act as tornado spotters if storm conditions warrant.

There are a wide variety of early warning messages provided through local radio and television stations as well as the cable channel, Weather Channel. The National Oceanic and Atmospheric Administration (NOAA) provides an alternative weather band over the radio. Special NOAA Weather Radios and general radios capable of tuning into this band receive weather information that is broadcast from nearby National Weather Service offices. The local National Weather Service office broadcasts National Weather Service warnings, watches, forecasts and other hazardous weather information 24 hours a day. Information regarding protecting oneself in the event of a tornado should be largely publicized in the form of flyers, radio, newspaper, and television announcements. The following is an example of the types of actions that should be taken in the event of a tornadic storm.

Table 50 - Tornado Safety Rules

1.	In a home or building, move to a pre-designated shelter such as a basement.
2.	If an underground shelter is not available, move to a small interior room or hallway on the lowest floor and get under a sturdy piece of furniture. Put as many walls as possible between you and the outdoors.
3.	Stay away from windows.
4.	Stay away from automobiles.
5.	Do not try to outrun a tornado in your car, leave it and immediately seek shelter. If caught outside or in a vehicle, lie flat in a nearby ditch or depression and cover your head with your hands.
6.	Highway overpasses do not provide shelter from tornadoes and high speed winds.
7.	Be aware of flying debris. Flying debris from tornadoes causes most fatalities and injuries.
8.	Mobile homes, even if tied down, offer little protection from tornadoes. You should leave a mobile home and go to the lowest floor of a sturdy nearby building or storm safe-room.

Winter Storm

Hancock County residents rely on local forecasting efforts to predict the onset of a winter storm. Current technology usually allows for one or more days of notice before the arrival of a major

winter storm. NOAA estimates that approximately 70 percent of all deaths attributed to winter storms occur in an automobile. Therefore, the Hancock County road department provides snow and ice removal for roadways to mitigate the negative effects of winter storms. Snow removal equipment has been updated regularly within the past five years to give Hancock County a fast response time.

Sheriff's Department

Law enforcement and protection is provided by the Hancock County Sherriff's Department, which is located at the address below. All officers must be certified by the Iowa Law Enforcement Academy, be certified in CPR annually, train on a firing range annually and view films on crime control. Additional police services are provided through the local jurisdictions police departments and the Iowa State Patrol and the communications center is also operated by the Hancock County Sherriff's office within the City of Garner.

Hancock County Sheriff's Office
875 State Street
P.O. Box 70
Garner, Iowa 50438-0070

Emergency Medical Services and Health and Human Services

The Hancock County Health System (HCHS) is a county-owned, tax-supported health system affiliated with the Mercy Health Network. The facilities within HCHS include the Hancock County Memorial Hospital, a 25 bed Critical Access Hospital in Britt; an outpatient rehabilitation clinic in Garner; and four primary care clinics located in Britt, Garner, Kanawha, and Wesley (located in Kossuth County). Extensive renovations to the Britt Medical Clinic and the hospital Emergency Department were completed in 2008. A hospital-based electronic health record was implemented in September 2008 that increases patient safety and quality of care.

The hospital and clinics offer a broad range of services, including radiology, laboratory, physical therapy, respiratory therapy, and Sports Medicine. Visiting specialty physicians offer convenient and expanded health care services for local residents in Orthopedics, Ear Nose and Throat, Neurology, Urology, Podiatry, Cardiology and Surgical Services. Cataract surgery, outpatient surgery and many laparoscopic and arthroscopic procedures are available.

Other services that HCHS provide include; sleep studies with the results linked directly to the Sleep Disorder Lab at Mercy Medical Center—North Iowa; health and safety services to local employers through the Business Health Department; Med Spa provides hand, foot and skin care; diabetic education; and a Fitness Room open to the community.

CHAPTER 7: MITIGATION GOALS & MEASURES ANALYSES

The Hancock County Mitigation planning committee and the committees for each jurisdiction identified hazard mitigation planning goals. The committees set as a priority the development of broad-based goals that would address a multitude of hazards and encompass a variety of mitigation activities. The hazard mitigation plan goals identified are provided in **Table 52**.

Table 51 - Hazard Mitigation Goals

Goals ***Requirement §201.6(c)(3)(i):*** *[The hazard mitigation strategy **shall** include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*	
1. Minimize vulnerability of the people and their property in Hancock County to the impacts of hazards.	2. Protect critical facilities, infrastructure and other community assets from the impacts of hazards.
3. Improve education and awareness regarding hazards and risk in Hancock County.	4. Strengthen communication among agencies and between agencies and the public.

The purpose of establishing goal statements is to set a general guideline for eliminating or reducing the long-term effects to property and life, reducing costs of response and recovery and minimizing disruption to Hancock County following a hazardous event. Goal statements do not spell out specific strategies that can be measured but are written in general terms. Mitigation actions or measures are designed to be measured. The subsections of the hazards worksheets sections, i.e., probability, magnitude/severity, warning time, and duration (which form the methodology of the assessment) were consulted as necessary. These are all the goals that were established and considered by the planning committees.

Mitigation Measures Feasibility

The planning committees' members were given a list of 12 mitigation measures starting on page 105. These were the mitigation measures that were discussed. After mitigation measures were chosen, each person present was given the STAPLEE score sheet, which follows, and was told to consider the STAPLEE statements while rating each mitigation measure based on a 0-3 score. The score ranking is described after the STAPLEE statements. The scores were collected, were added, and divided by the number turned into the planner to receive the priority of the mitigation measure.

The mitigation measures are categorized as follows:

A. **Prevention:** Administrative or regulatory actions or processes that influence the way land and buildings are developed and built.
B. **Property protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area.
C. **Structural:** Actions that involve the construction of structures to reduce the impact of hazards.

D. **Natural resource protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.
E. **Public education and awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential way to mitigate them.

The planning committees reviewed the hazards that had been identified as well as the mitigation measure goals and categories with regards to the identified hazards. Anyone on the committee and in attendance at the meetings could verbally submit a mitigation measure to be considered in the plan, and then each mitigation measure was discussed, placing particular emphasis on new and existing buildings and infrastructure. Through much discussion of a comprehensive range of alternatives, the county planning committee achieved a consensus on the measures to include in the plan. Each jurisdiction had respective measures that were important to them. Each jurisdiction would be willing to accomplish any/all measure(s), if funds were secured.

STAPLEE stands for the following:

- **Social:** Will the action be acceptable to the community? Could it have an unfair effect on a particular segment of the population?
- **Technical:** Is the action technically feasible? Are there secondary impacts? Does it offer a long-term solution?
- **Administrative:** Are there adequate staffing, funding, and maintenance capabilities to implement the project?
- **Political:** Will there be adequate political and public support for the project?
- **Legal:** Does your jurisdiction have the legal authority to implement the action?
- **Economic:** Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- **Environmental:** Will there be negative environmental consequences from the action? Does it comply with environmental regulations? Is it consistent with community environmental goals?

Score	Explanation
0	This is a mitigation action that does **NOT** need to be considered.
1	This is an action that would benefit the mitigation of hazards, but considered a **LOW** priority based on the STAPLEE criteria.
2	This is an action that would benefit the mitigation of hazards, but considered a **MODERATE** priority based on the STAPLEE criteria.
3	This is an action that would benefit the mitigation of hazards and considered a **HIGH** priority based on the STAPLEE criteria.

Hazard Mitigation Measure Definitions

1. **Develop/update/publicize emergency management plans, including preparedness, response, recovery, operations, long term recovery, and mitigation plans and maintain data inventory.**
   This measure will allow the jurisdiction to produce required and relevant plans that are up to date and are working documents that the community can use.

2. **Public Education and Awareness of all hazards.**
   This measure gives the jurisdiction the opportunity to produce, inform, etc. using a variety of mass communication methods to inform the public and to keep them aware of the hazards that pose or could potentially pose a threat to the jurisdiction.

3. **Continuity of Operations Plan (COOP)**
   This measure gives the jurisdiction the means to provide the jurisdiction a plan that in the case of severe destruction a means to continue operations, who is in charge, where to set up control and command, etc.

4. **Construct, retrofit, or maintain water supply, drainage, sewage, retention and detention systems to provide for the proper functioning of those systems.**
   This measure will allow the jurisdiction to construct proper water supply, drainage and sewer systems in order to prevent infiltration of silt, soil, and other foreign materials into their supply and sewage systems causing backup into homes and businesses and to maintain proper functioning of water supply to decrease inefficiencies in those systems.

5. **Construction or retrofit existing structures into public safe rooms at government facilities, recreational facilities, recreational areas, manufactured home parks, schools, day care centers, and other critical facilities.**
   This measure will allow the jurisdiction to construct safe rooms that will protect the public during extremely hazardous events, i.e., tornado, thunderstorms and lightning, severe winter storm, etc. The Garner-Hayfield-Ventura and West Hancock School Districts would like to have tornado safe rooms as a part of their facilities in order to protect the children during hazardous weather. Right now the children go to the hallway during a tornado warning which has been proven as unsafe. This measure would ensure that the children and others that are in the school building are protected during a tornadic event. This measure is supported by the school districts as well as the communities as the facilities that are designed to be used not only by the school but also the community as a whole, many residents will also benefit from the safe room.

6. **Acquire flood prone properties for conversion into green space; or elevate structures to or above base flood elevation; construction of levees, dams, and culverts to ensure adequate capacity and protection levels for property and critical facilities.**
   This measure will allow the jurisdiction the option to acquire flooded properties in order to prevent the continued flooding of structures located in a flood plain, or elevate structures as to not have to have the threat of repeated flooding to the subject property. This measure

will allow the jurisdiction the ability to prevent damage from flash floods with additional capacity to handle large amounts of water from heavy rains.

7. **Purchase/install backup power generators.**
   This mitigation measure assures that a jurisdiction's critical facilities as designated by the Board of Supervisors, City Councils, Emergency Management Coordinator, Sheriff's Department, etc., have adequate backup power supply to carry on the critical mission of the jurisdictions during a disaster.

8. **Heating/Cooling centers/shelters.**
   This measure will allow the jurisdiction to provide a place for residents to come to get warm or cool depending on the time of year and preferably would have backup power generators due to the use of these structures during an infrastructure failure i.e. energy failure.

9. **Install and maintain security measures at all critical facilities and training of emergency response personnel.**
   This measure will ensure that security measures at noted critical facilities will be in place to prevent damage and protect those that rely on the function of those critical facilities. This measure will also provide that training of response personnel is up to date and relevant to the disaster at hand.

10. **Complete FIRM (Flood Insurance Rate Maps) and encourage and starting or continuing NFIP community and individual participation, and survey of flood prone areas, and river channel studies, and update of existing flood maps.**
    This action ensures the safety and property protection of Hancock County residents and property owners and the participation in NFIP.

11. **Develop and promote comprehensive, cost-effective, common sense recommendations for adoption and enforcement of land use, ordinances and regulations, zoning, and building codes that decrease risk in areas susceptible to hazards.**
    This measure will allow jurisdictions the option of putting into place proper ordinances and building codes to prevent or lessen the damage from hazardous events.

12. **Natural resource measures to prevent the damage to critical facility functions.**
    This measure will prevent many hazardous events like flooding, grass or wild-land fire, etc. This measure will ensure safety and property protection of Hancock County residents and property owners.

Mitigation Measures Scoring and Prioritization

The following tables show the mitigation measures for each jurisdiction that were chosen by each jurisdiction and their respective scores. The weighted score gives the priority of mitigation measures for each jurisdiction. The score ranges from 0-3; a score of 0=no priority, or mitigation

measure does not need to be considered; a score of 3=mitigation measure needs to be focused on by the city. They are ranked by descending order in the tables.

Table 52 - Hancock County Measures Scores and Prioritization

Mitigation Measure	Weighted Score	Priority
3	2.67	1
1	2.33	
7	2.33	
4	2	2
11	1.67	
2	1.33	
5	1.33	3
9	1.33	
10	1.33	
12	1.33	4
6	1	
8	1	

Table 53 – West Hancock CSD Measures Scores and Prioritization

Mitigation Measure	Weighted Score	Priority
3	2.54	1
9	2.38	
1	2.31	
4	2.08	2
5	2	
7	1.85	
2	1.69	3
12	1.38	
11	1.23	
8	1.15	4
10	1.08	
6	0.54	

Table 54 - Britt Measures Scores and Prioritization

Mitigation Measure	Weighted Score	Priority
3	2.875	1
1	2.75	
2	2.5	
4	2.5	2
7	2.125	
9	2.125	
11	1.75	3
5	1.625	
12	1.625	
8	1.25	4
10	0.875	
6	0.125	

Table 55 - Woden Measures Scores and Prioritization

Mitigation Measure	Weighted Score	Priority
4	2.57	1
1	2.43	
3	2.43	
5	2	2
2	1.86	
12	1.83	
8	1.71	3
7	1.57	
9	1.29	
11	0.86	4
6	0.71	
10	0.57	

Table 56 - Garner-Hayfield-Ventura CSD Measures Scores and Prioritization

Mitigation Measure	Weighted Score	Priority
9	2.91	1
1	2.54	
3	2.27	
5	2	2
2	1.9	
8	1.9	
11	1.9	3
4	1.72	
12	1.63	
7	1.54	4
10	0.91	
6	0.63	

Table 57 - Crystal Lake Measures Scores and Prioritization

Mitigation Measure	Weighted Score	Priority
3	3	1
4	3	
1	2.67	
7	2.5	2
8	2.5	
5	2.17	
9	2.17	3
2	2	
12	1.83	
10	1.17	4
11	1	
6	0.17	

Table 58 - Garner Measures Scores and Prioritization

Mitigation Measure	Weighted Score	Priority
4	2.77	1
1	2.38	
2	2.15	
3	2.08	2
9	1.92	
7	1.85	
12	1.62	3
5	1.46	
8	1.38	
11	1.38	4
10	1	
6	0.46	

Table 59 - Klemme Measures Scores and Prioritization

Mitigation Measure	Weighted Score	Priority
1	2.71	1
4	2.57	
7	2.57	
3	2.43	2
2	2.29	
12	1.71	
11	1.57	3
5	1.29	
9	1.29	
10	1.29	4
8	0.86	
6	0.43	

Table 60 - Corwith Measures Prioritization

Mitigation Measure	Weighted Score	Priority
4	2.67	1
7	2.44	
1	2.33	
3	2.33	2
9	2	
5	1.89	
8	1.78	3
11	1.67	
2	1.56	
10	1.56	4
12	1.44	
6	1	

Table 61- Goodell Measures Prioritization

Mitigation Measure	Weighted Score	Priority
5	2.86	1
3	2.71	
7	2.71	
4	2.14	2
1	2	
2	1.86	
8	1.86	3
9	1.57	
11	1.57	
6	1.14	4
12	1	
10	0.86	

CHAPTER 8: ACTION PLAN

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

All the mitigation actions included in the revised list received a preponderance of positive ratings and were discussed at length. The planning committees chose many of the same measures and many of them received the highest votes. The following Mitigation Actions Table identifies the goal(s), hazard addressed, and action category (ies) from page 104.

Priority is based on the number of votes. Generally, the measure with the highest vote is listed as a high priority and the next top vote getter receives medium priority and so on. In the case of a tie, priority is given to the measure considered by the community to have the least costs but most benefit.

Table 62 - Multi-Jurisdictional Mitigation Measures and Goals

Measure	Goals	Hazard addressed	Action Category
Develop/update/publicize emergency management plans, including preparedness, response, recover, operations, long term recovery, and mitigation plans and maintain data inventory.	1,2,3,4	All hazards	Public education and awareness
Public education and awareness of all hazards.	3,4	Drought; Extreme Heat; Flash Flood; Hailstorm; Hazardous Materials; Human Disease; Radiological; River Flooding; Severe Winter Storm; Thunderstorms and Lightning; Tornado; Transportation Incident; Windstorm	Public education and awareness
Continuity of Operations Plan (COOP)	2,4	Human Disease; Severe Winter Storm; Tornado	Prevention
Construct, retrofit, or maintain water supply, drainage, sewage, retention and detention systems to provide for the proper functioning of those systems.	1,2	Flash Flood; River Flooding	Property protection, structural

Construction or retrofit existing structures into public safe rooms at government facilities, recreational facilities, recreational areas, manufactured home parks, schools, day care centers, and other critical facilities.	1,2	Hailstorm; Tornado; Windstorm	Property protection, structural
Acquire flood prone properties for conversion into green space; or elevate structures to or above base flood elevation; construction of levees, dams, and culverts to ensure adequate capacity and protection levels for property and critical facilities.	1,2	River Flooding	Prevention, Property protection, structural
Purchase/install backup power generators.	1,2	Severe Winter Storm; Thunderstorms and Lightning; Tornado; Windstorm	
Heating/Cooling centers/shelters.	2	Extreme Heat, Severe Winter Storm	Structural
Install and maintain security measures at all critical facilities and training of emergency response personnel.	1,2,4	Hazardous Materials; Human Disease	Prevention, Property protection, structural
Complete FIRM (Flood Insurance Rate Maps) and encourage NFIP community and individual participation, and survey of flood prone areas, and river channel studies, and update of existing flood maps.	1,2,3	River Flooding	Prevention, Property protection, structural, public education and awareness
Develop and promote comprehensive, costeffective, common sense recommendations for adoption and enforcement of land use, ordinances and regulations, zoning, and building codes that decrease risk in areas susceptible to hazards.	1,2,3,4	Hazardous Materials; Transportation Incidents	Prevention, Property protection, Natural resource protection
Natural resource measures to prevent the damage to critical facility functions.	1,2	Hazardous Materials	Natural resource protection

Funding of Future Mitigation Measures

The planning committee analyzed the future mitigation actions and identified future funding associated with each mitigation action. The actions that called for a continuation of a current activity were easily identified, whereas other cost estimates were available from previous planning documents or project plans. Some of the costs were estimated by the committee's knowledge of the activity in question. **The projects are to be considered for implementation during the next five years and a full cost/benefit analysis will be required to determine the feasibility of each project.**

Factors and/or information necessary for further consideration of future mitigation activities:

1. Estimated Cost = Estimated cost to construct or purchase.
2. Federal Funds = Federal funds identified as possible source of funds.
3. State Funds = State funds identified as possible source of funds.
4. Local Funds = Local (City and County) funds identified as possible source of funds.
5. $ = Possible future funding source.

Table 63 - Funding of Future Measures

Mitigation Action	Estimated Cost	Federal Funds	State Funds	Local Funds	Comment and Responsible Party
Develop/update/publicize emergency management plans, including preparedness, response, recover, operations, long term recovery, and mitigation plans and maintain data inventory.	$1,000+	-	-	15%-100%	Local boards and city Councils, Emergency Management Coordinator, Fire Departments
Public education and awareness of all hazards.	-	-	-	100%	Local Boards and City Councils, Emergency Management Coordinator
Continuity of Operations Plan (COOP)	-	-	-	100%	Local Boards and City Councils
Construct, retrofit, or maintain water supply, drainage, sewage, retention and detention systems to provide for the proper functioning of those systems.	$50,000+	?	?	10%-100%	Local Boards and City Councils, Public Works Departments
Construction or retrofit existing structures into public safe rooms at government facilities, recreational facilities, recreational areas, manufactured home parks, schools, day care centers, and other critical facilities.	$250,000+	75%	10%	15%	Local Boards and City Councils
Acquire flood prone properties for conversion into green space; or elevate structures to or above base flood elevation; construction of levees, dams, and culverts to ensure adequate capacity and protection levels for property and critical facilities.	$5,000+	75%	10%	15%	Local Boards and City Councils, Emergency Management Coordinator, Local Floodplain Managers
Purchase/install backup power generators.	$5,000+	-	-	100%	Local Boards and City Councils

Heating/Cooling centers/shelters.	$5,000+	-	-	100%	Local Boards and City Councils
Install and maintain security measures at all critical facilities and training of emergency response personnel.	$500+	-	-	100%	Local Boards and City Councils, Police and Fire Departments, Public Works Departments
Complete FIRM (Flood Insurance Rate Maps) and encourage NFIP community and individual participation, and survey of flood prone areas, and river channel studies, and update of existing flood maps.	?	-	-	-	Local Boards and City Councils, State DNR and Emergency Management
Develop and promote comprehensive, cost-effective, common sense recommendations for adoption and enforcement of land use, ordinances and regulations, zoning, and building codes that decrease risk in areas susceptible to hazards.	?	-	-	-	Local Boards and City Councils
Natural resource measures to prevent the damage to critical facility functions.	$500+	-	-	100%	Local Boards and City Councils, State DNR and Emergency Management

CHAPTER 9: PLAN MAINTENANCE, REVIEW, & UPDATE

Mitigation Prioritization

There are a number of hazards that could potentially affect the residents of Hancock County indicated throughout this plan. In relation, there are also a large number of activities that could be undertaken to mitigate the effects of these hazards. Unfortunately, the jurisdictions do not have an unlimited amount of funds or funding sources for mitigation projects. In an attempt to determine the most immediate mitigation needs, the planning committees prioritized each mitigation activity for every hazard as detailed in the **MITIGATION MEASURES FEASIBLILITY** section of this plan.

Plan Adoption and Amendment

This plan and any future amendments to the plan shall occur only after an official Public Notice has been posted in courthouse and local publications and city halls announcing a Public Meeting on the matter. After the public has had the opportunity to review the proposed amendments the Hancock County Board of Supervisors and local city councils may, by resolution, choose to accept any amendments to the plan. Amendments to the plan will be shared with the County Emergency Management Coordinator, the Iowa Department of Homeland Security and Emergency Management Division, the Federal Emergency Management Agency.

Phasing

Phasing is a budgetary responsibility of the Hancock County Board of Supervisors, city councils, and Department Heads who will review the projects annually. It is recommended that this review be incorporated into the strategic planning documents and plans, i.e. comprehensive land use plan, floodplain ordinance, etc. For projects that require a local match commitment, the governing bodies should begin setting aside appropriate resources to meet their match liability. Land-use plans and county evacuation plans shall be incorporated within this plan as well as this plan shall be implemented in those future plans. The Board of Supervisors and city councils will incorporate the requirements of this plan into these future plans and any other plans the Board sees fit to include.

Continued Public Participation

In order to ensure that the public remains involved in the future implementation of this plan, a file shall remain on hand at the County Courthouse and city halls. This plan shall be made available to any party who requests to see it. Furthermore, if Hancock County or other jurisdictions intend to make amendments to the plan, a posted public notice in local newspapers and local fliers should be made available so that the public can be made aware. Public notice should also be posted for any meetings that deal with the amendment of this plan. Said meetings are to remain open to the public.

Evaluation and Review Process

Members of the public and elected officials of each community will review and evaluate progress of the mitigation plan once each year. The plan will be reviewed and updated by the end of every fifth year. The planning committees will invite a cross section of the community to participate in any future meetings regarding the update or amendment of the Plan. In addition, public notice will be posted at the County Courthouse and city halls inviting the general public to participate as

members of the planning committee and/or to review the plan and provide comments. The county auditor and city clerks are responsible for contacting members and organizing the five year update meetings. The meetings will be held after the first of the year and committee members will be responsible for evaluating the progress of the plan activities. To make sure that the plan is current with expected conditions, the planning committees will review each goal and activity to determine the relevance to the county, as well as changes in state or federal policies. The planning committees will also review the risk assessment for updates and modifications. The responsible department/individual for each activity will then report the status of each project including implementation process that worked well, the difficulties that were encountered during the activity and how strategies could be revised. Hancock County will then update the plan and make the appropriate changes to the plan. Copies of the plan and the committee's review will be available at the County Courthouse and city halls. Following the planning committees' completion of the review process, the findings of the annual review and recommended changes, if applicable, will be presented during a regular Board of Supervisors meeting and a public hearing will be held at that time. Copies of the plan will then be sent to the Iowa Department of Homeland Security and Emergency Management Division and the Federal Emergency Management Agency. Any changes to future plans will be integrated with the multihazard mitigation plan. The multi-hazard mitigation plan will also take into account any changes in these plans and incorporate the information in the next update.

The jurisdictions will use Worksheet #1 (located in the Appendix) when they are working on a mitigation activity. This will give the future committees a good place to start when updating the plan and deciding which activities were successful or not. The committees will use Worksheet #2 during each yearly review and during the 5 year plan update to evaluate how to make the committees more representative of the community and surrounding communities. The committees and county will use Worksheet #3 to evaluate each activity that was completed and each activity that was not completed. The committees and county will use Worksheet #4 at each yearly review and update to evaluate the risk assessment in order to address new concerns and update inventories of assets.

The Hancock County Multi-Jurisdictional Mitigation Plan will be updated every five years as stated, and reviewed annually and after hazardous events by the Board of Supervisors, Emergency Management Coordinator, city councils, and other key community members.

Schedule for Updating

In the five year cycle, the Board of Supervisors and city councils will look at the plan at its annual review and at that time appoint committee members to update the plan. If assistance is needed, the county will contact a planner and ask for assistance in updating their plan. The updating process will consist of two to three meetings of the planning committees for each community and county-wide to discuss changes that need to be made to the plan. After that time the committees will recommend the plan be offered for adoption by the Hancock County Board of Supervisors and city councils. Following adoption by the Board the county will submit the plan to Iowa Homeland Security and Emergency Management and FEMA for final approval. The following is a schedule that Hancock County will follow for plan updates.

Objective A. Evaluate the effectiveness of the planning process.

1. Reconvene or reappoint the Planning Team.
2. Review your Planning Process.
   Items to Discuss:
   a. Building the Planning Team.
   b. Engaging the Public.
   c. Data Gathering and Analysis.
   d. Coordinating with other Agencies.

Objective B. Evaluate the effectiveness of your actions.

1. What were the results of the implemented action? Did the results achieve the goals/objectives outlined in the plan? Did the actions have the intended results?
2. Were the actions cost-effective? Did (or would) the project result in the reduction of potential losses?
3. Document those actions that were slow to get started or not implemented.

Objective C. Determine why the actions worked or did not work.

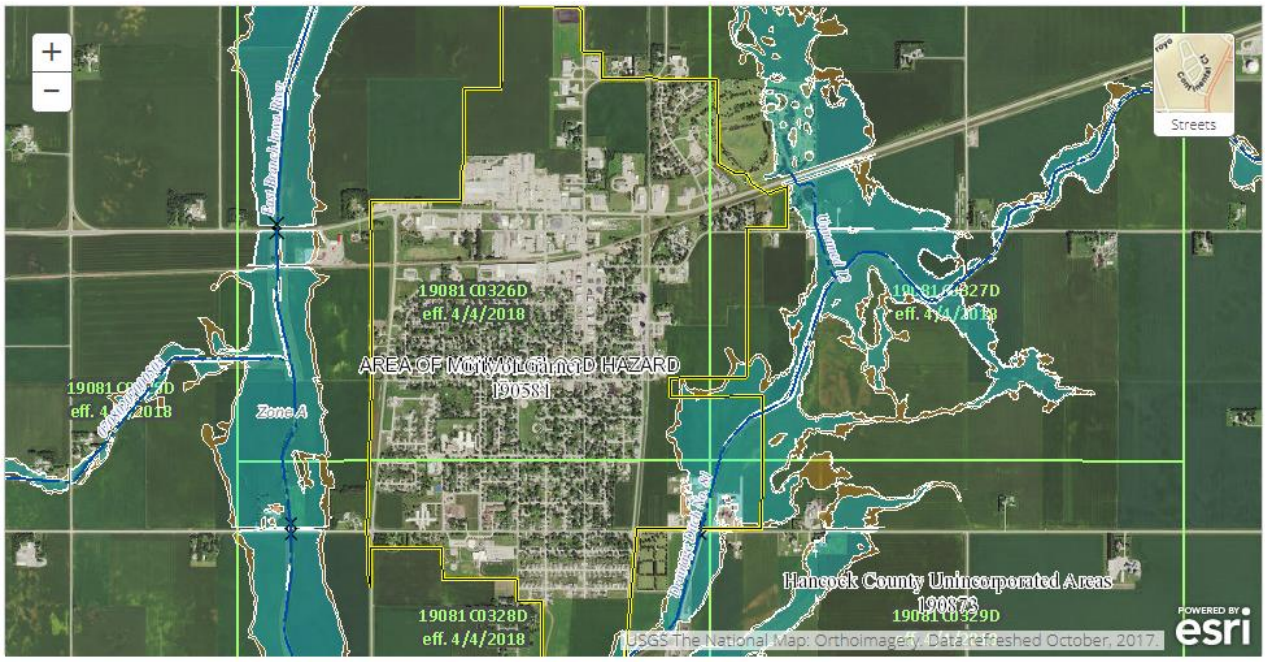
1. Lack of available resources.
2. The political or popular support for or against the action.
3. The availability of funds.
4. The workloads of the responsible parties.
5. The actual time necessary to implement the actions.

Existing Document Incorporation

The hazard mitigation planning committees within Hancock County will remain focused on this plan and will ensure this plan's recommendations are included in current planning processes. The Emergency Management Coordinator will monitor development and the effectiveness of ordinances and will continue to do so following adoption of the Mitigation Plan. These activities will be incorporated into the Plan Evaluation and Review Process.

Note that the committees intend to review current ordinances as part of the implementation, in order to ensure that we do not have to wait until a new plan or ordinance is created in order to update the methods used to monitor land use in the county. The capital improvements planning of the future will include some of the recommendations of this plan and will include funding toward some of the capital infrastructure issues discussed in this plan. Within 12 months, the adopted plan should be incorporated fully into the current and future county and other jurisdiction plans.

APPENDIX A: MAPS



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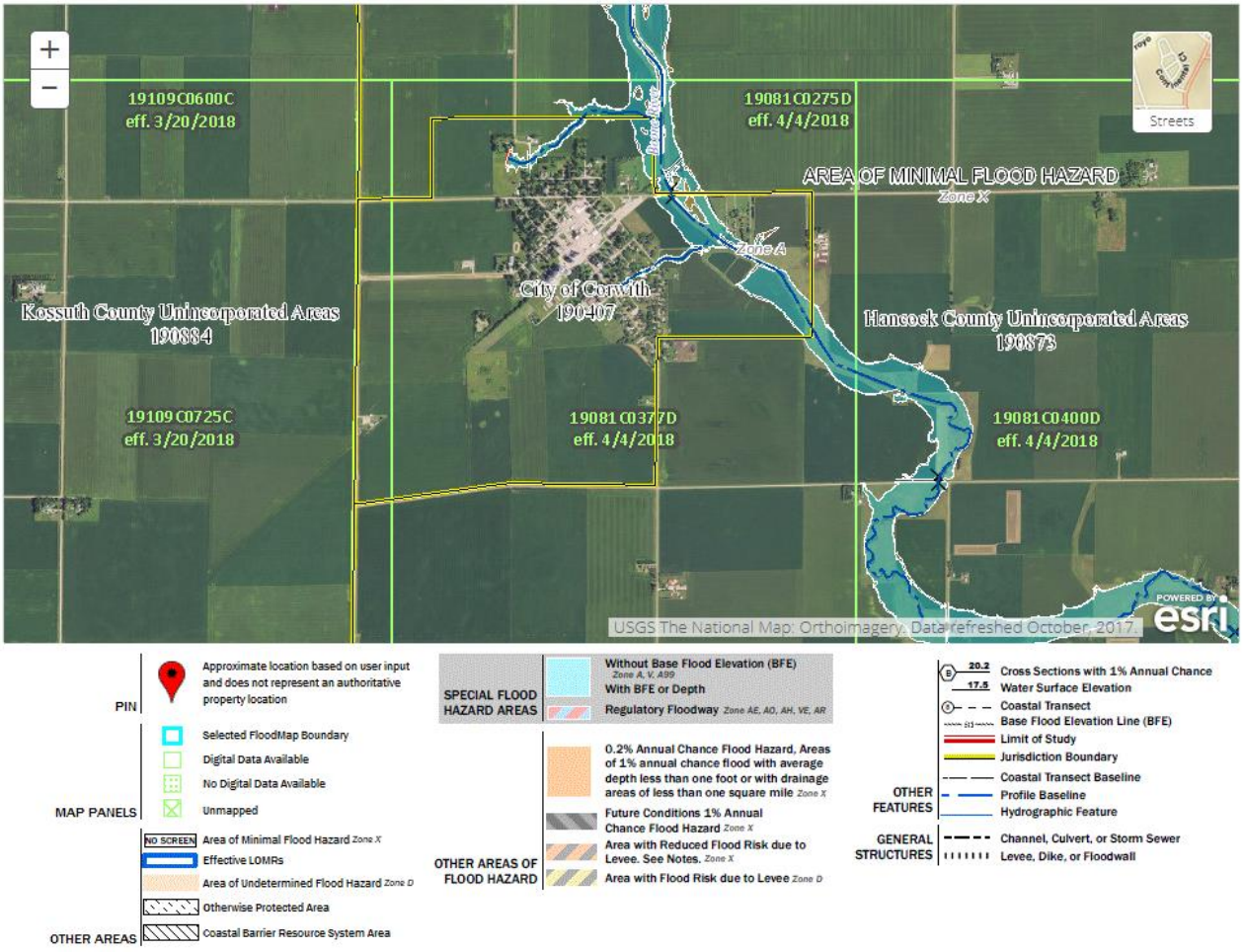
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*
- Otherwise Protected Area
- Coastal Barrier Resource System Area

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth
- Regulatory Floodway *Zone AE, AO, AH, VE, AR*

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall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Hancock County Unincorporated Areas
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OTHER AREAS
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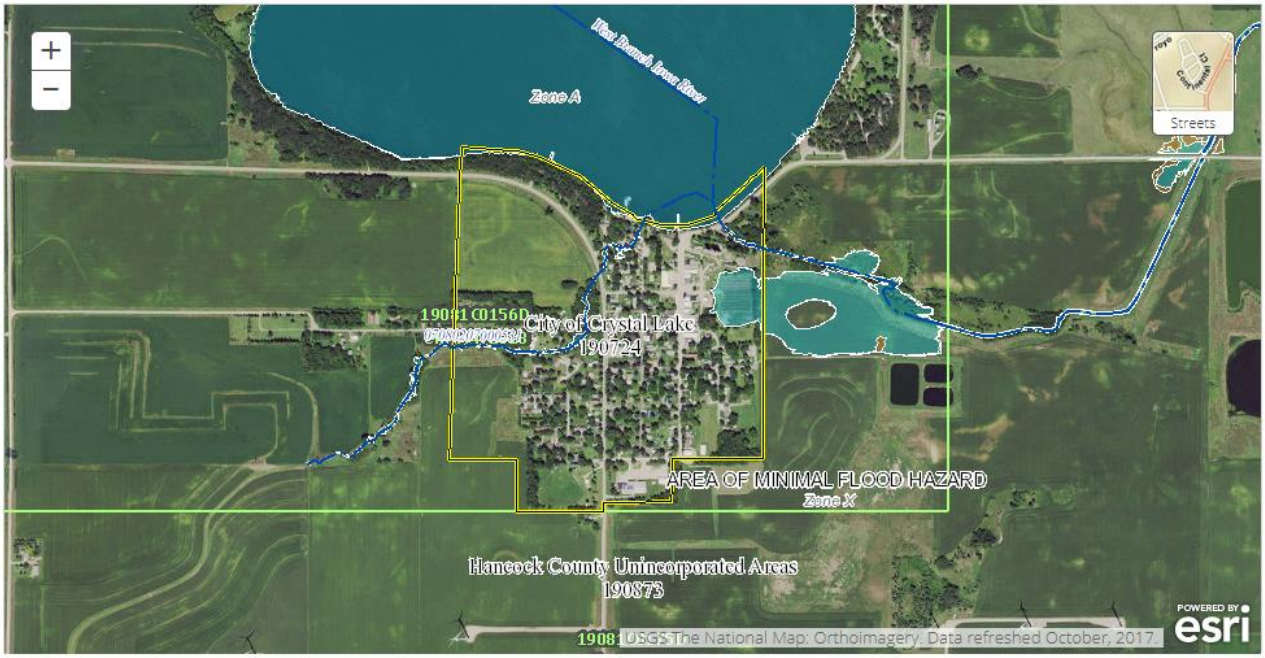
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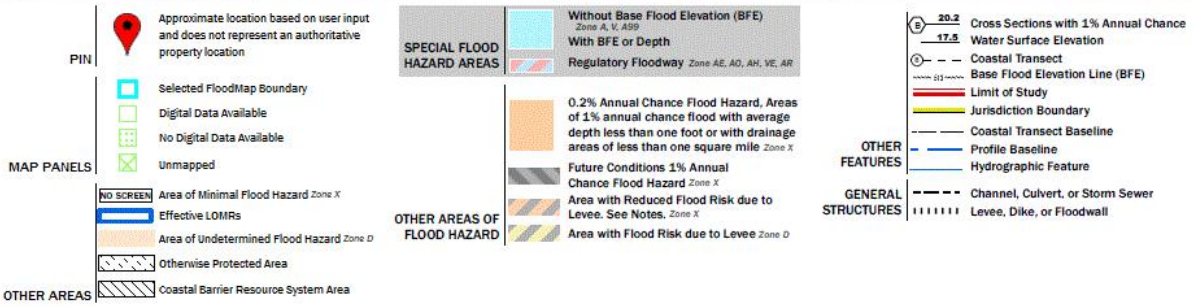
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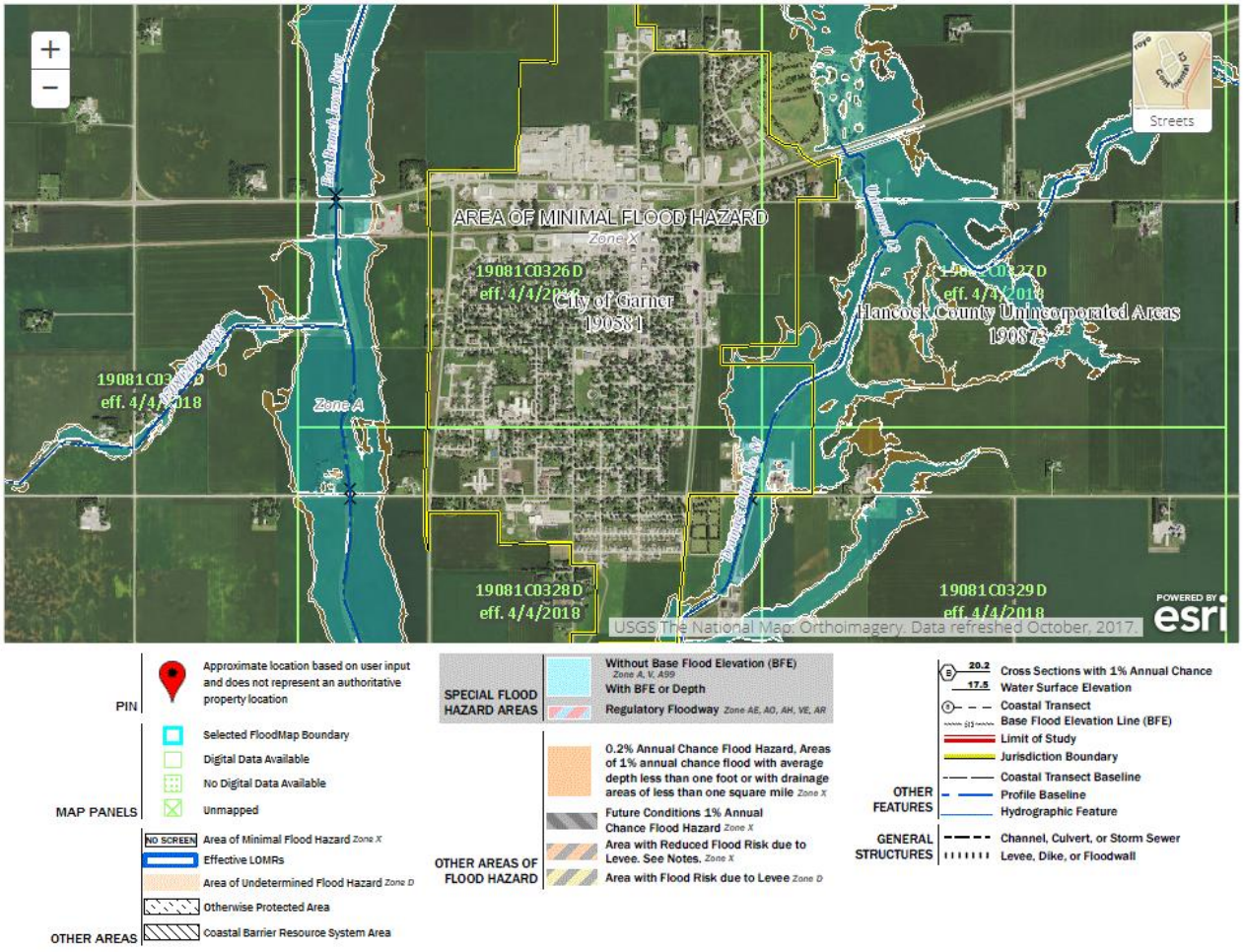
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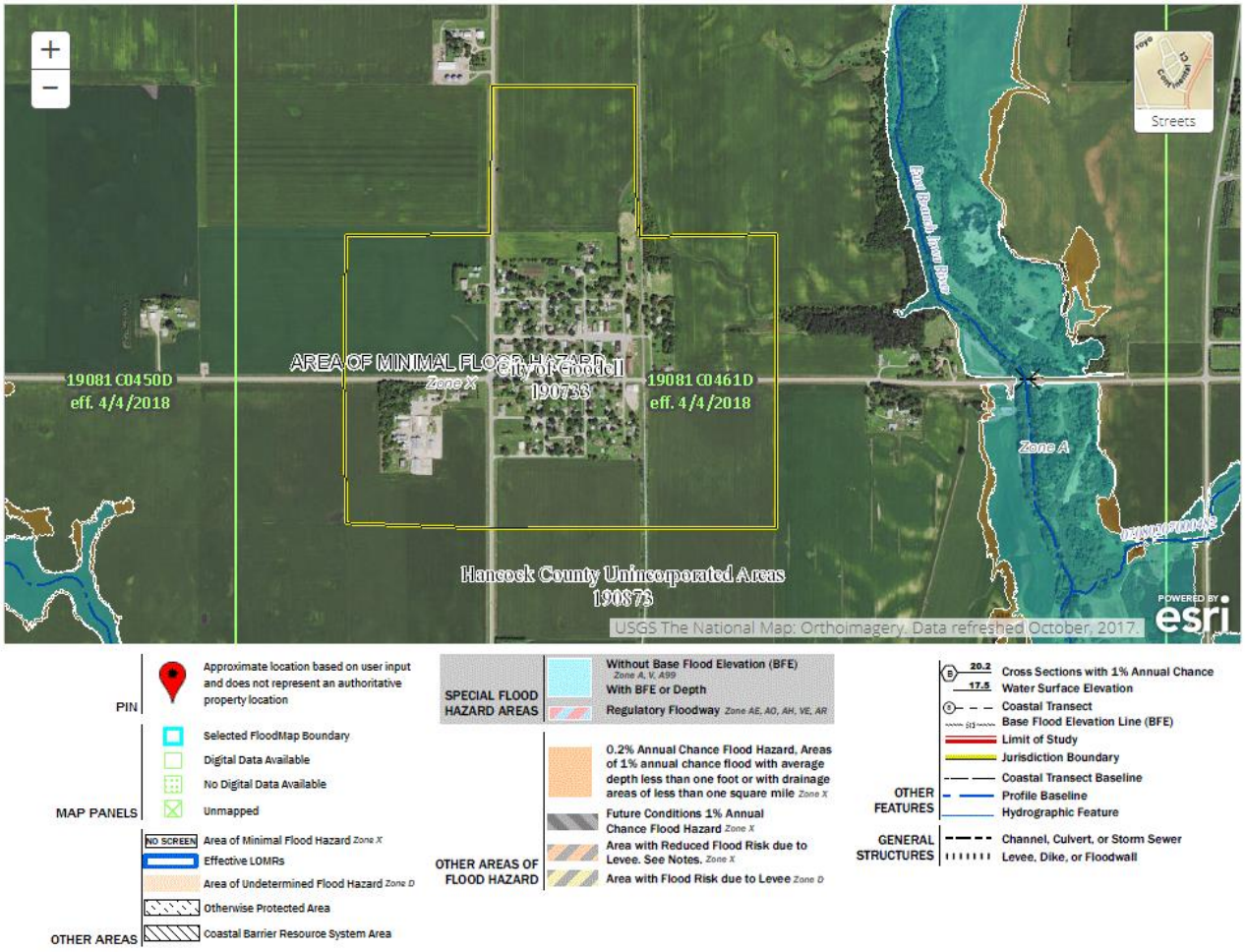
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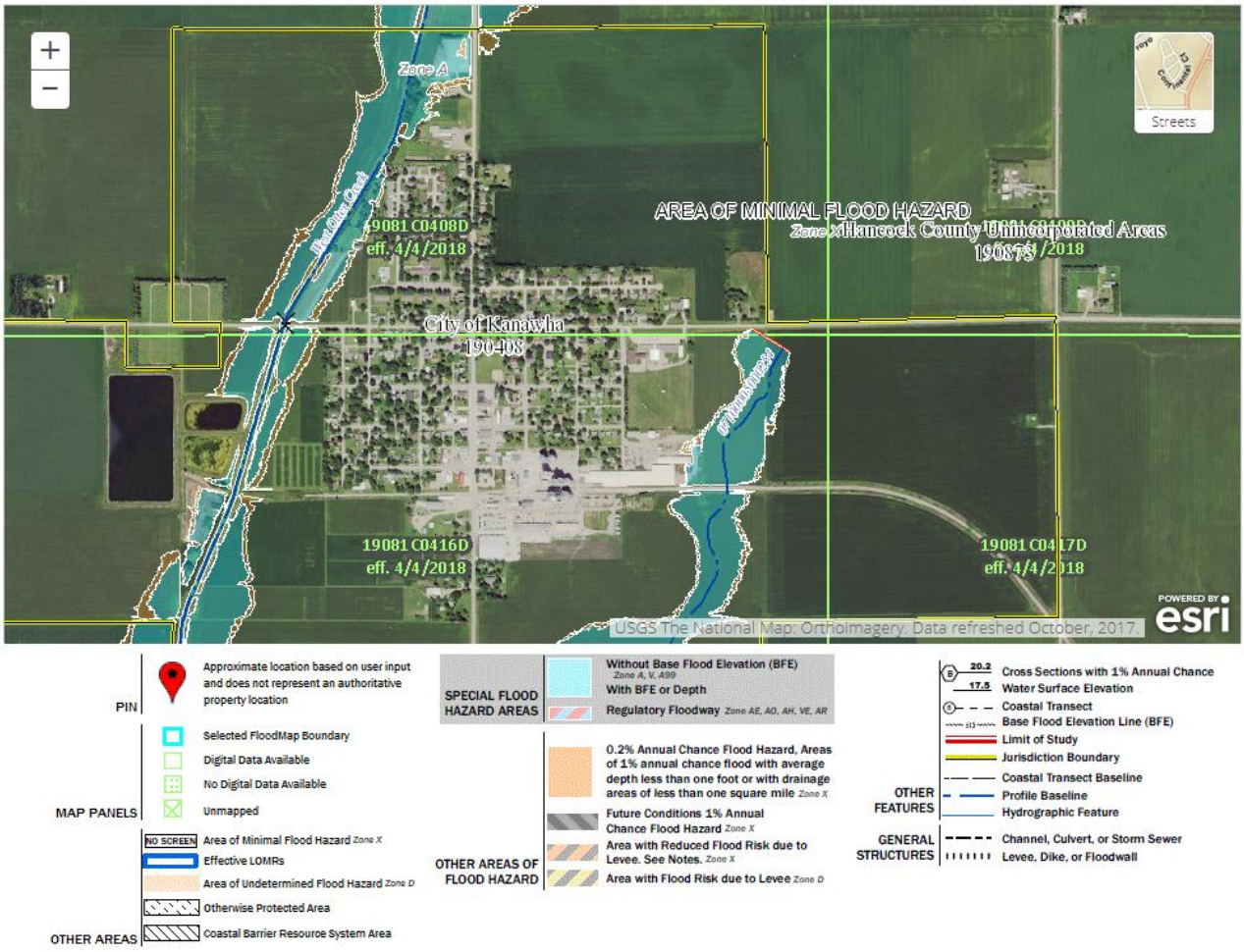
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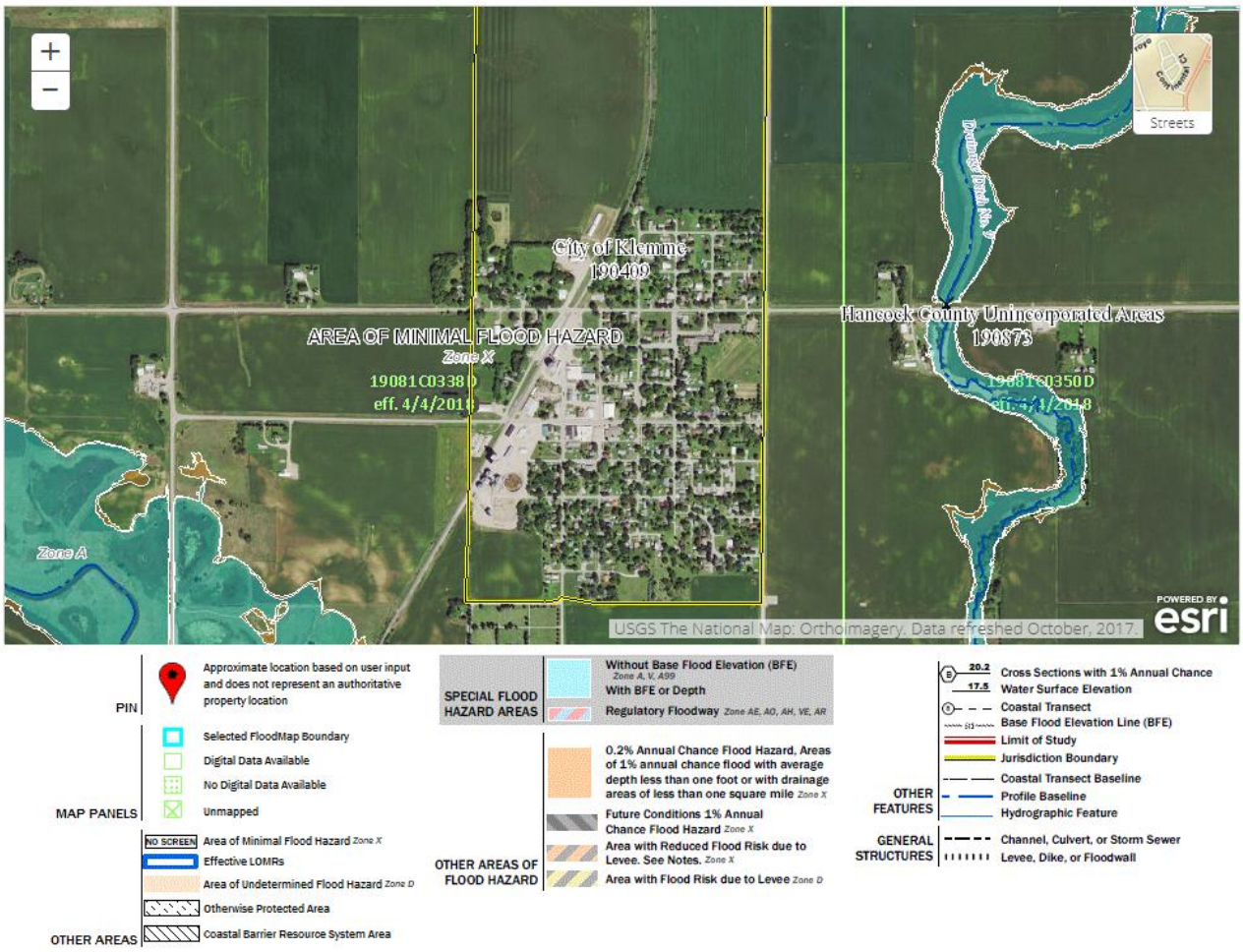
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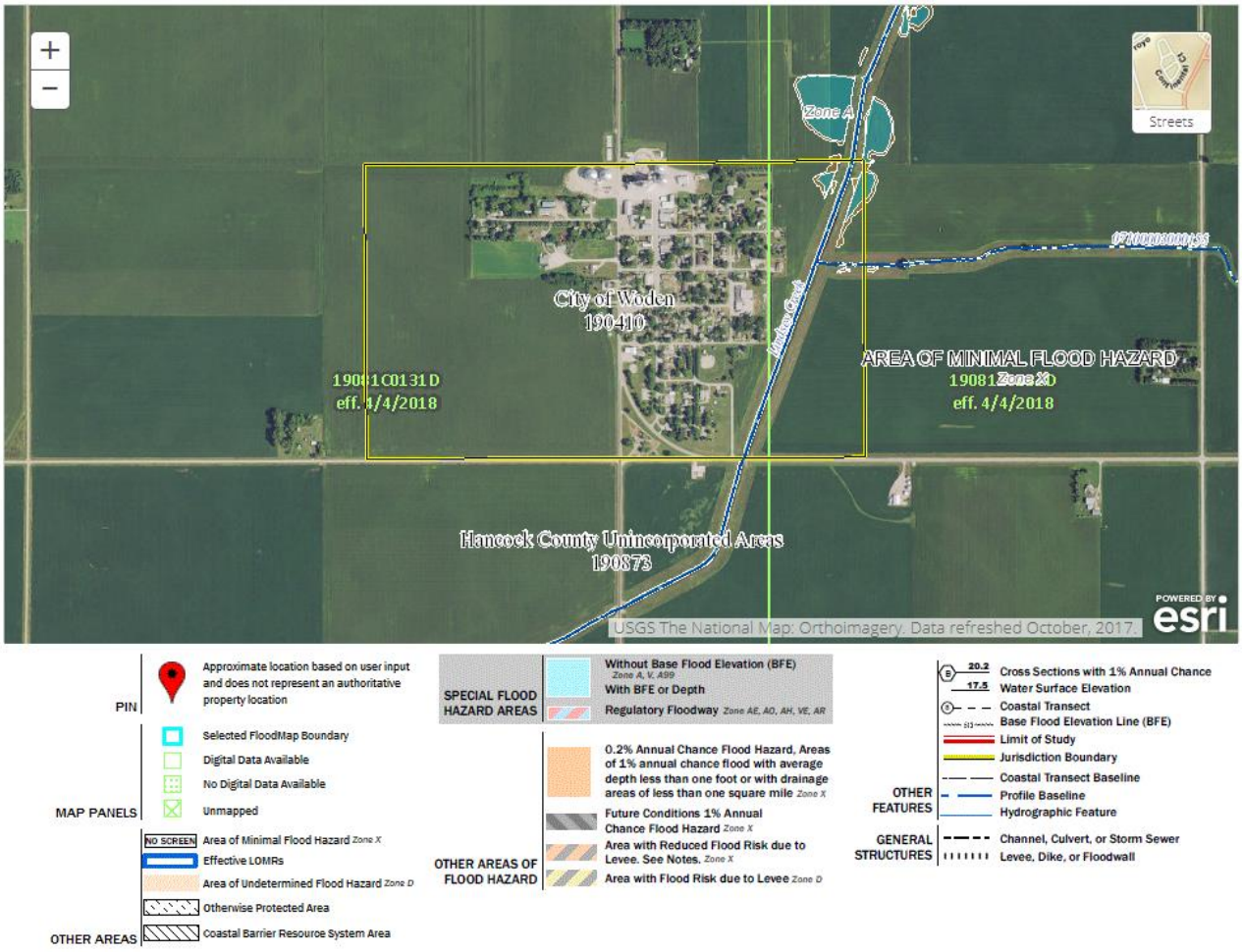
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APPENDIX B: AGENDA

The following agendas were used for each of the meetings in the 8 incorporated communities, the Board of Supervisors and the 2 Community School Districts.

2025 Hancock County Hazard Mitigation Plan Update

Hazard Analysis/Risk Assessment

AGENDA

I. Introductions
II. Explanation of Hazard Mitigation Planning
III. Explanation of HARA Methodology
IV. Hazard Analysis and Risk Assessment
  a. Electronic Submission
  b. Survey Form
V. Discussion of next steps to plan completion
  a. Identification of Hazards in Community
  b. Identification of Planning factors for risk reduction
  c. Project Identification
VI. Questions

2025 Hancock County Hazard Mitigation Plan Update

HARA Review and Identification of Measures and Projects

AGENDA

I. Introductions
II. Review of Hazard Analysis and Risk Assessment Information
III. Review of past Hazard Mitigation identified projects and their status
IV. Identification of ongoing and future hazard mitigation projects
V. Identification and scoring of mitigation measures
  a. 12 measures
  b. Scored by average of respondants.
VI. Discussion regarding next steps to plan completion
  a. Completion of information to be included in the plan
  b. 30 day review period
  c. Resolution adopting County-wide plan
VII. Questions

APPENDIX C: ACRONYM LIST

Acronym List

BCA	Benefit Cost Analysis
BFE	Base Flood Elevation
CBD	Central Business District
CFR	Code of Federal Regulations
COG	Council of Governments
CRS	Community Rating System
DMA 2000	Disaster Mitigation Act of 2000
EMI	Emergency Management Institute
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
GIS	Geographic Information Systems
$HAZUS_{MH}$	Hazards U.S. – Multi- Hazard
HMGP	Hazard Mitigation Grant Program
HQ	Headquarters
ISO	Insurance Services Office
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
N/A	Not Applicable
NCDC	National Climatic Data Center
NEIC	National Earthquake Information Center
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
PDM	Pre-Disaster Mitigation
PGA	Peak Ground Acceleration
QC	Quality Control
SHMO	State Hazard Mitigation Officer
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, Environmental
USGS	U.S. Geological Survey

APPENDIX D: UPDATE SHEETS

Worksheet # 1: Progress Report

Progress Report Period: _____ to _____
(Date) (Date)

Project Title: _____ Project ID#: _____

Responsible Agency: _____

Address: _____

City/County: _____

Contact Person: _____ Title: _____

Phone #(s): _____ e-mail address: _____

List Supporting Agencies and Contacts: _____

_____

Total Project Cost: $_____ Anticipated Cost Overrun/Under run: _____

Date of Project Approval: _____ Start date of the project: _____

Anticipated completion date: _____

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase).

_____
_____
_____
_____
_____

Milestones	Complete	Projected Date of Completion

Plan Goal(s)/Objective(s) Addressed:

Goal: _____

Objective: _____

Indicator of Success (e.g., losses avoided as a result of the acquisition program): *In most cases, you will list losses avoided as the indicator. In cases where it is difficult to quantify the benefits in dollar amounts, you will use other indicators, such as the number of people who now know about mitigation or who are taking mitigation actions to reduce their vulnerability to hazards.*

_____
_____
_____

Status *(Please checks pertinent information and provide explanations for items with an asterisk. For completed or canceled projects, see Worksheet #2 — to complete a project evaluation):*

Project Status

☐ (1) Project on schedule

☐ (2) Project completed

(3) ☐ Project delayed*
*explain: _____
_____

(4) ☐ Project canceled

Project Cost Status

☐ (1) Cost unchanged

☐ (2) Cost overrun*
*explain: _____
_____

(3) ☐ Cost under run*
*explain: _____

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

B. What obstacles, problems, or delays did you encounter, if any?

C. How was each problem resolved?

Next Steps: What is/are the next step(s) to be accomplished over the next reporting period?

Other comments:

Worksheet #2: Evaluating Your Planning Team

When gearing up for the plan evaluation, the planning team should reassess its composition and ask the following questions:

	YES	NO

Have there been local staffing changes that would warrant inviting different members to the planning team?

Comments/Proposed Action:

Are there organizations that have been invaluable to the planning process or to project implementation that should be represented on the planning team?

Comments/Proposed Action:

Are there any representatives of essential organizations who have not fully participated in the planning and implementation of actions? If so, can someone else from this organization commit to the planning team?

Comments/Proposed Action:

Are there procedures (e.g., signing of MOAs, commenting on submitted progress reports, distributing meeting minutes, etc.) that can be done more efficiently?

Comments/Proposed Action:

Are there ways to gain more diverse and widespread cooperation?

Comments/Proposed Action:

Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?

Comments/Proposed Action:

If the planning team determines the answer to any of these questions is "yes," some changes may be necessary.

Worksheet #3: Evaluate Your Project Results

Project Name and Number: **Project Budget:** **Project Description:** **Associated Goal and Objective (s):** **Indicator of Success (e.g., losses avoided):**	***Insert location map*** ***include before and after photos if appropriate***

Was the action implemented?

IF YES ↓ **IF NO** ↓

What were the results of the implemented action?	**Why not?**		
Was there political support	for the action?	**YES**	**NO**
	Were enough funds available?	**YES**	**NO**
Were workloads equitably or	realistically distributed? **YES**	**NO**	
	Was new information discovered about the risks or community that made **YES NO** implementation difficult or no longer sensible?		
Was the estimated time of	implementation reasonable?	**YES**	**NO**
Were sufficient resources	(for example staff and technical assistance) available?	**YES**	**NO**

↓

Were the outcomes as expected?

Did the results achieve the goal and objective (s)? **YES** **NO**

Explain how: **YES**

Was the action cost-effective? Explain how or how not: **YES** **NO**

If No, please explain: **NO** **Additional comments or other outcomes:**

What were the losses avoided after having completed the project?

If it was a structural project, how did it change the hazard profile?

Date _____

Prepared by: _____

Worksheet #4: Revisit Your Risk Assessment

Risk Assessment Steps	Questions	YES	NO	COMMENTS
Identify hazards	Are there new hazards that can affect your community?			
Profile hazard events	Are new historical records available?			
	Are additional maps or new hazard studies available?			
	Have chances of future events (along with their magnitude, extent, etc.) changed?			
	Have recent and future development in the community been checked for their effect on hazard areas?			
Inventory assets	Have inventories of existing structures in hazard areas been updated?			
	Are future developments foreseen and accounted for in the inventories?			
	Are there any new special high-risk populations?			
Estimate losses	Have loss estimates been updated to account for recent changes?			

If you answered "Yes" to any of the above questions, review your data and update your risk assessment information accordingly

Worksheet #5: Revise the Plan

Prepare to update the plan.

When preparing to update the plan: **Check the box when addressed ✓**

1. Gather information, including project evaluation worksheets, progress reports, studies, related plans, etc. ☐

Comments:

2. Reconvene the planning team, making changes to the team composition as necessary (see results from *Worksheet #2*). ☐

Comments:

Consider the results of the evaluation and new strategies for the future.

When examining the community consider:	**Check the box when addressed ✓**
1. The results of the planning and outreach efforts. **Comments:**	☐
2. The results of the mitigation efforts. **Comments:**	☐
3. Shifts in development trends. **Comments:**	☐
4. Areas affected by recent disasters. **Comments:**	☐
5. The recent magnitude, location, and type of the most recent hazard or disaster. **Comments:**	☐

6. New studies or technologies. **Comments:** ☐

7. Changes in local, state, or federal laws, policies, plans, priorities, or funding. ☐

Comments:

8. Changes in the socioeconomic fabric of the community. **Comments:** ☐

9. Other changing conditions. ☐

Comments:

Incorporate your findings into the plan.

When examining the plan: **Check the box when addressed ✓**

1. Revisit the risk assessment. ☐

Comments:

2. Update your goals and strategies. ☐

Comments:

Solution ☐

3. Recalculate benefit-cost analyses of projects to prioritize action items.

Comments:

Use the following criteria to evaluate the plan:

Criteria	**YES**	**NO**	
Are the goals still applicable?			
Have any changes in the state or community made the goals obsolete or irrelevant? Do existing actions need to be reprioritized for implementation? Do the plan's priorities correspond with state priorities?			
Can actions be implemented with available resources?			

Comments:

APPENDIX E: ADOPTION RESOLUTIONS