

City of Nashua, Iowa

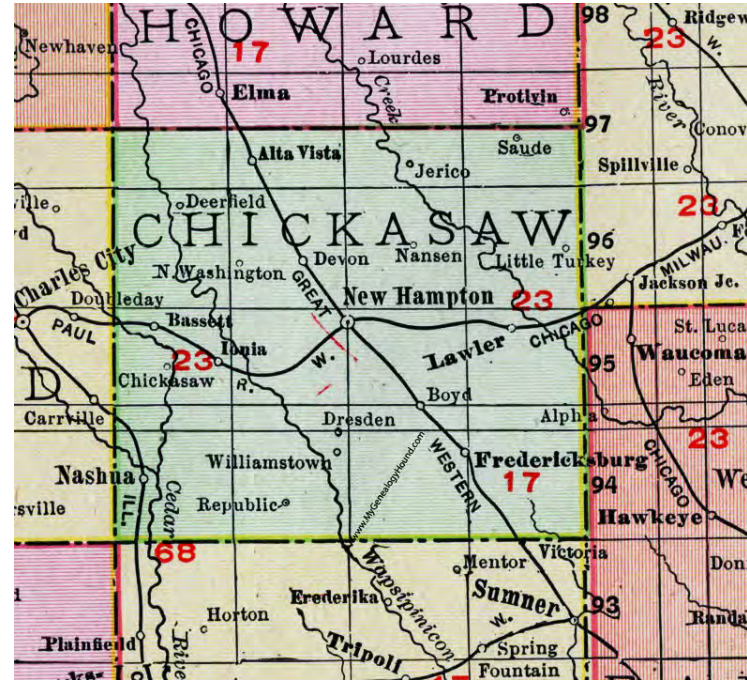
Hazard Mitigation Plan 2024 Update

Appendix F of Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan

Funded by the Chickasaw County Emergency
Management Agency

Prepared by Iowa Northland Regional Council
of Governments (INRCOG)

May 2024



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Table of Contents

Table of Contents	1
About	2
The Planning Process.....	3
City Profile	5
Highway Traffic and Crash Data.....	7
Housing Data	8
Vulnerable Assets	9
Critical Facilities	10
Future Development.....	16
National Flood Insurance Program.....	18
Hazard Risk Assessment	19
Hazard Mitigation Goals.....	22
Existing or Previous Mitigation Activities by Type	23
Strategy for Implementing the Plan	26
Strategic Implementation Plan by Mitigation Activity Type.....	27

Table Index

Table 1: Population Data	5
Table 2: Employment Data	5
Table 3: Employment Industry Data	5
Table 4: Crash Data from 2019-2023	6
Table 5: Housing Data	7
Table 6: Utility Providers	7
Table 7: Dam Information for Nashua Mildam	10
Table 8: Critical Facilities	12
Table 9: Hazard Risk Assessment	18
Table 10: Local Capability Assessment	25
Table 11: <i>Education and Awareness Programs</i> Mitigation Activities	26
Table 12: <i>Emergency Services</i> Mitigation Activities	27
Table 13: <i>Structure and Infrastructure Projects</i> Mitigation Activities	28
Table 14: <i>Natural System Protection/Nature-Based Solutions</i> Mitigation Activities	29
Table 13: <i>Local Plans and Regulations</i> Mitigation Activities	30

Figure Index

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

About

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

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

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

FEMA's Emergency Management Cycle



What is Hazard Mitigation?

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

The emergency management cycle has 4 phases:

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

The Benefits of Hazard Mitigation

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

Those include:

- ✓ An increased understanding of natural, technical, and man-made hazards faced by communities.
- ✓ Taking an opportunity to create more sustainable and disaster-resistant communities.
- ✓ Participating in this collaborative intergovernmental effort is cost effective for all participants.
- ✓ Using limited resources on hazards that have the biggest impacts on a community.
- ✓ Reducing or preventing damage to existing structures, subsequently reducing repair costs.
- ✓ Identifying vulnerable populations to establish equitable outcomes.
- ✓ Setting long-term goals that can be compatible with city policies or planning documents.

The Planning Process

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

Participants in the Chickasaw County Multi-Jurisdictional Hazard Mitigation Planning Committee provided the information in this plan including community profile information, hazard mitigation goals, mitigation activities/action, updates to existing mitigation activities, and components that make up the implementation strategy such as prioritization, designated agencies/persons, estimated costs, and overall strategic direction of this plan.

Participants in the Plan Followed This 5 Step Process



Community Data Sources

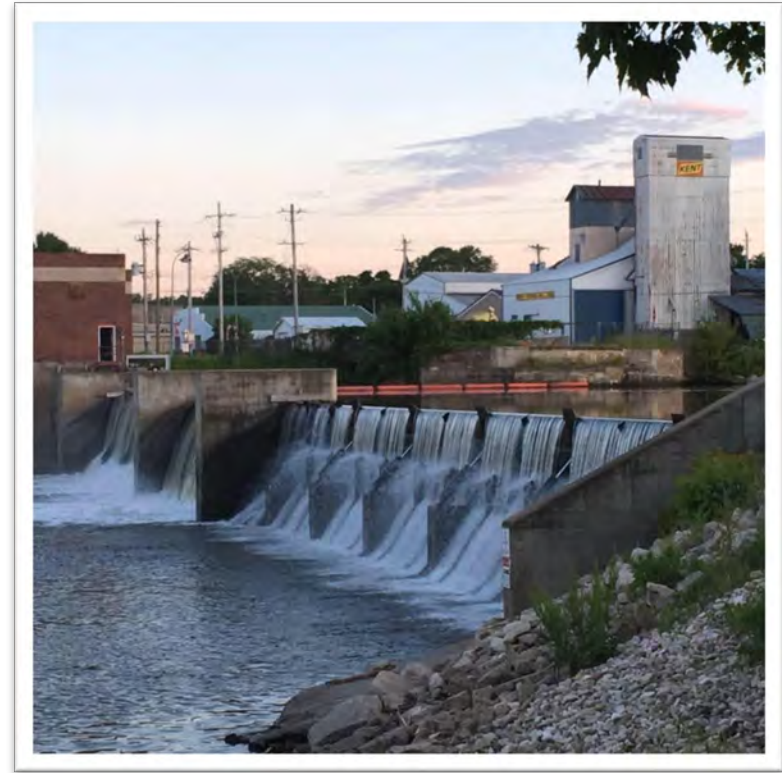
Population data is based on 2020 decennial Census data. The 2022 American Community Survey 5-year estimates are the latest and most reliable survey data sets to understand what is taking place in the county and each city. Most counties, cities, and towns rely on 5-year estimates. Employment, workforce,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

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

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

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

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



The Cedar Lake Dam was completed in March 1990. The Cedar Lake Dam replaced an original dam that was left to age and could no longer function correctly. The original dam eventually failed and drained the Cedar Lake leaving Nashua without its iconic lake. Today, the lake is full once more and flowing over the dam. Residents celebrate the Cedar Lake Dam every year during the Water Over Our Dam Days.

City Profile

Jurisdiction: City of Nashua

County: Chickasaw County

Population (2020): 1,551

The City of Nashua is in the lower west quadrant of Chickasaw County. US Highway 218 and Iowa Highway 346 intersect in Nashua. The Little Cedar River converges with the Cedar River at a confluence point located in Nashua.

In 2020, the city's population was 1,551 and 96% White with the median age of 41. Working aged residents (15-60 years) made up 59% of the population. Children and teens (younger than 15 years) made up 20% of Nashua's population while older adults (older than 65 years) made up 21%.

The median household income in 2022 was \$60,000. The unemployment rate was 1.2%. Most people (94%) commute to work, and about 54 people (6% of the workforce), work from home. The top three industry sectors in Nashua with the largest workforce are as follow (in order from highest to lowest): 1) Construction; 2) Educational Services, and health care, and social assistance; and 3) Professional, scientific, management or administrative, and waste management services.

Figure 1: Map of Chickasaw County

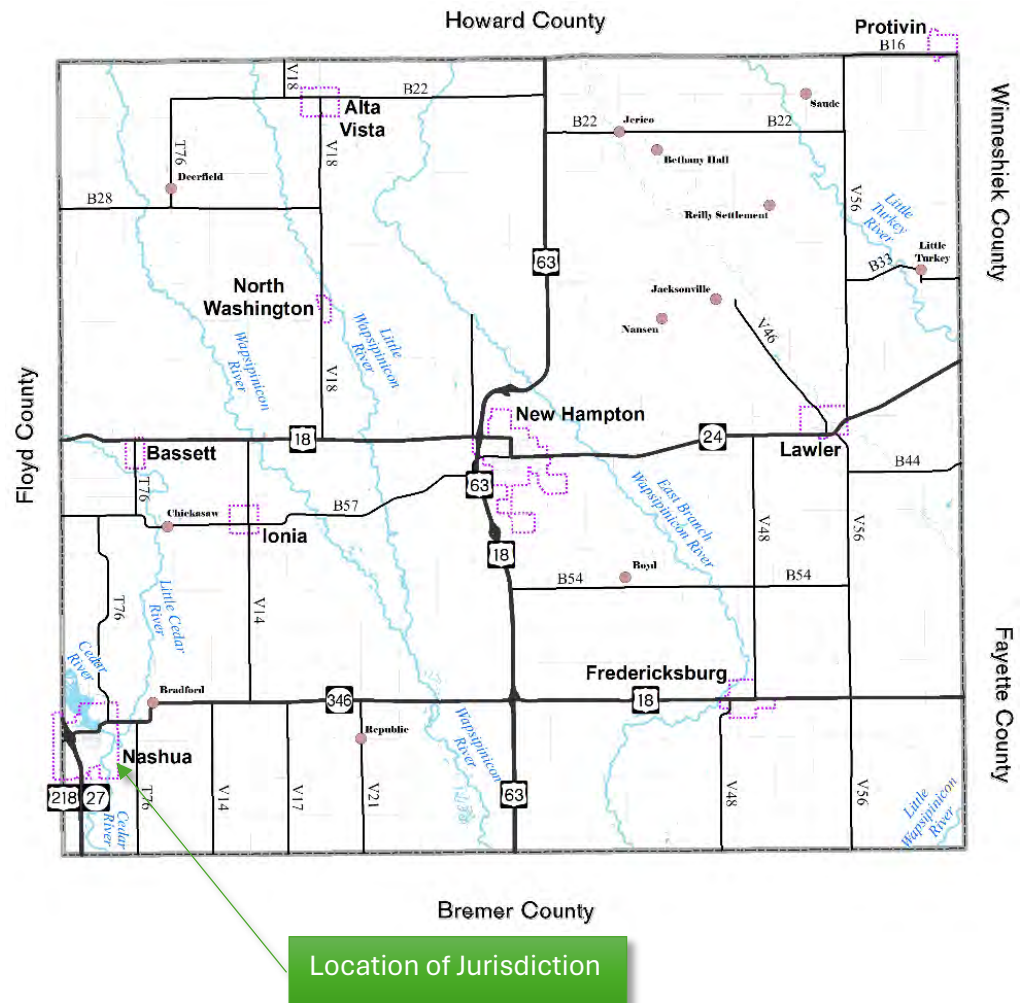


Table 1: Population Data (2020)		
City of Nashua		
	Total	% of Population
Total population	1,551	100%
AGE		
Under 5 years	99	6%
5 to 9 years	98	6%
10 to 14 years	121	8%
15 to 19 years	95	6%
20 to 24 years	72	5%
25 to 29 years	91	6%
30 to 34 years	93	6%
35 to 39 years	94	6%
40 to 44 years	80	5%
45 to 49 years	90	6%
50 to 54 years	80	5%
55 to 59 years	117	8%
60 to 64 years	95	6%
65 to 69 years	89	6%
70 to 74 years	80	5%
75 to 79 years	56	4%
80 to 84 years	49	3%
85 years and over	52	3%
Median Age	40.8	-
RACE		
White	1,483	96%
Black or African American	5	0%
Hispanic or Latino (of any race)	8	1%
American Indian and Alaska Native	1	0%
Asian	1	0%
Native Hawaiian/Other Pacific Islander	0	0%
Some Other Race	2	0%
Two or More Races	59	4%
<i>Source: 2020 Census</i>		

Table 2: Employment Data (2022)		
City of Nashua		
	Value	% of Population
Median Household Income	\$60,000	-
Unemployment Rate (2022)	1.2%	-
Workers that commute to work	775	94%
Workforce that works from home	54	6%
<i>Source: 2022 American Community Survey 5-Yr Estimates</i>		

Table 3: Employment Industry Data (2022)		
City of Nashua		
Workforce Industry	# of Workers	% of Workforce
Workforce	838	100%
Agriculture, forestry, fishing and hunting, and mining	43	5%
Construction	24	3%
Manufacturing	242	29%
Wholesale trade	21	3%
Retail trade	69	8%
Transportation -warehousing, utilities	61	7%
Information	7	1%
Finance and insurance, and real estate and rental and leasing	59	7%
Professional, scientific, and management, and administrative and waste management services	70	8%
Educational services, and health care and social assistance	150	18%
Arts, entertainment, and recreation, and accommodation and food services	26	3%
Other services, except public administration	46	6%
Public administration	20	2%
<i>Source: 2022 American Community Survey 5-Yr Estimates</i>		

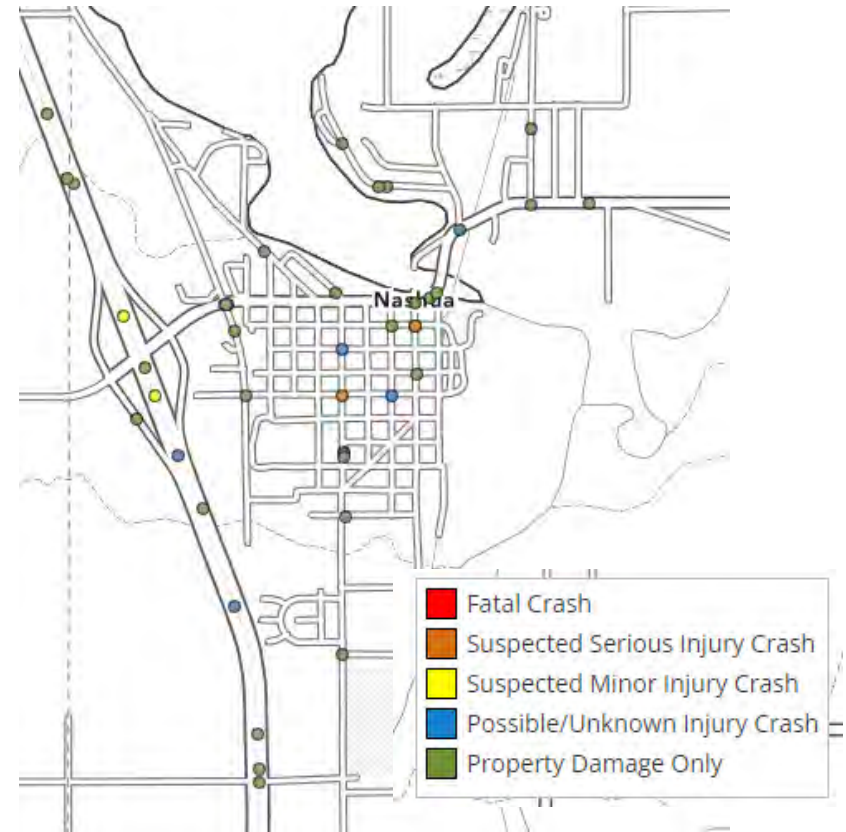
Highway Traffic and Crash Data

Based on Iowa DOT crash data, between 2019 and 2023 there have been 44 incidents. No fatalities or serious injury crashes occurred. There were 33 incidents involving property damage that totaled \$247,800 over the 5-year period. See Figure 2 for a map of the types of car crashes that occurred within Nashua over this 5-year time period.

Table 4: Crash Data from 2019-2024	
Total Crashes	44
Crash Type by Severity or Causalities	
Fatal	0
Suspected Serious Injury	2
Suspected Minor Injury	2
Unknown	6
Property Damage Only	33
Property Damage Total	\$247,800

Source: Iowa Crash Analysis Tool (ICAT) provided by Iowa DOT

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



Source: Iowa DOT

Housing Data

The City of Nashua has 646 occupied housing units. Nearly 83% of the existing occupied housing stock are single family type housing. About 11 housing units (2% of housing stock) are 2-unit type apartments. About 29 housing units (5%) are multi-family apartment type housing that have 3 or more

Table 5: Housing Data (2022)

City of Nashua		
	Total	% of Occupied Units
Occupied housing units	646	100%
Housing Unit Type		
1, detached	535	83%
1, attached	26	4%
2 apartments	11	2%
3 or 4 apartments	29	5%
Mobile home or other type of housing	21	3%
Year Structure Built	Total	% of Occupied Units
2020 or later	7	1%
2010 to 2019	12	2%
2000 to 2009	43	7%
1980 to 1999	69	11%
1960 to 1979	172	27%
1940 to 1959	94	15%
1939 or earlier	249	39%
House Heating Fuel	Total	% of Occupied Units
Utility gas	461	71%
Bottled, tank, or LP gas	7	1%
Electricity	172	27%
Fuel oil, kerosene, etc.	0	0%
Coal or coke	0	0%
All other fuels	6	1%
No fuel used	0	0%

Source: 2022 American Community Survey 5-Year Estimates

units. About 21 housing units (3%) are either mobile homes or other types of housing.

The biggest portion of Nashua's housing stock was built before 1940 (39%). About 47% of the housing stock is under 60 years old. Most homes heat their units with gas (87%). Black Hills Energy is the gas utility provider. See Table 5 on the following page for more housing data.

Community Utility Providers

MidAmerican Energy provides utility electric services and natural gas services to Nashua. Quest is the service provider for telephones and broadband internet services. Residents receive water service from the City of Nashua. The City contracts sewer services to PeopleService, Inc. Jendro Sanitation provides refuse / recycling collection services for Nashua.

Table 6: Utility Providers

City of Nashua	
<i>Electric</i>	MidAmerican Energy
<i>Natural Gas</i>	MidAmerican Energy
<i>Telephone/Internet</i>	Quest
<i>Cable TV</i>	Butler-Bremer Communications
<i>Water Services</i>	City of Nashua
<i>Sewer Services</i>	Ion (Contracted)
<i>Sanitation</i>	Jendro Sanitation

Vulnerable Assets

People

Vulnerable Age Groups

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

Households Facing Poverty or With Limited Income

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

Nashua's Vulnerable Populations

In Nashua, 56 (8.7% of occupied households) households live below the poverty level. About 38% of occupied households have at least one elderly occupant (60 years and over). About 150 households have an elderly resident (65 years and over) live alone.

Most households in Nashua have access to a vehicle. However, 41 households (6%) lack access to any vehicle. Of those with lack of access to a vehicle, 23 are owner-occupied and 18 are renter-occupied. Nearly 29% of households have a person living with a disability. This is broadly defined from the data estimates for Nashua. Persons with mobility disabilities may have higher risks to sudden natural hazards such as tornados or earthquakes than others.

Manufactured homes are unsafe in a tornado. Fatality rates during tornados are higher for those that occur in mobile/manufactured homes than those that occur in homes with permanent foundations¹. An alternative shelter should be identified prior to a tornado watch or warning. There are possibly 21 mobile homes estimated in Nashua. With an average household size of 2.2 persons, that potentially puts 4 people at a greater fatality risk than others.

¹ 1: S.M. Strader, W.S. Ashley, Fine-scale assessment of mobile-home tornado vulnerability in the Central and Southeast U.S, Weather Clim. Soc. (2018)

Critical Facilities

Water Supply and Distribution

The City of Nashua draws its water from three active wells and draw two aquifers: the Jordan and Devonian aquifer. These wells produce approximately 1,625 gallons of water per minute. The City has elevated water supply with a total capacity of 300,000 gallons. Typical daily usage is approximately 140,000 gallons per day, and just over 50 million gallons are used annually in the city. Peak consumption is approximately 0.25 million gallons per day (MGD). The rated capacity of the water plant is 1.296 MGD.

Wastewater Treatment Plant

The Nashua wastewater treatment plant is located along the Cedar River near the southern part of the city's boundary area. The facility is a Grade III active sludge sewage treatment plant with two aeration tanks. Chemical disinfection is used in the summer before the treated disinfected water is discharged into the Cedar River.

The average dry load (demand) of the system is designed at 122,000 gallons per day. Peak load is approximately 300,000 gallons per day. The design capacity of the system is 720,000 gallons per day. Inflow and infiltration account for the increase from average to peak flows in the system.

Cedar Lake Dam

In 2023, Iowa DNR Dam Safety Division contracted Houston Engineering, Inc. to develop a report titled the Iowa High Hazard Dam Assessments: Dam Risk Reviews and Rankings.

Thirty-nine (39) dams were assessed in Iowa for potential failure modes. The objective of this study was to collect dam data from inspection reports, as-built plan sets, geotechnical reports, hydrology and hydraulic reports, and other studies. An overview of the Cedar Lake Dam is located below in Table 7.

Table 7: Cedar Lake Dam Information

Owner:	City of Nashua	Last Inspection Date	08/31/2023
National Inventory ID	IA01314	Condition Assessment	Fair
Hazard Classification	Significant	Dam Height (ft)	20
Structure Classification	Major	Surface Area (acres)	405
DNR Permit	1989-209	Normal Storage (acre-ft)	3,245
County	Chickasaw	Storage at Emergency Spillway (acre-ft)	0
Designer	Warzyn Engineering	Maximum Storage (acre-ft)	5,242
Year Completed	1917	Drainage Area (sq mi)	1,113
Year Modified	1990	Dam Length (ft)	1,170

Source: Iowa DNR Dam Inventory

Reports and studies were obtained through the Iowa Online Dam Inventory site or provided directly from Iowa Dam Safety.

The Cedar Lake Dam was not designated as a high hazard dam.

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

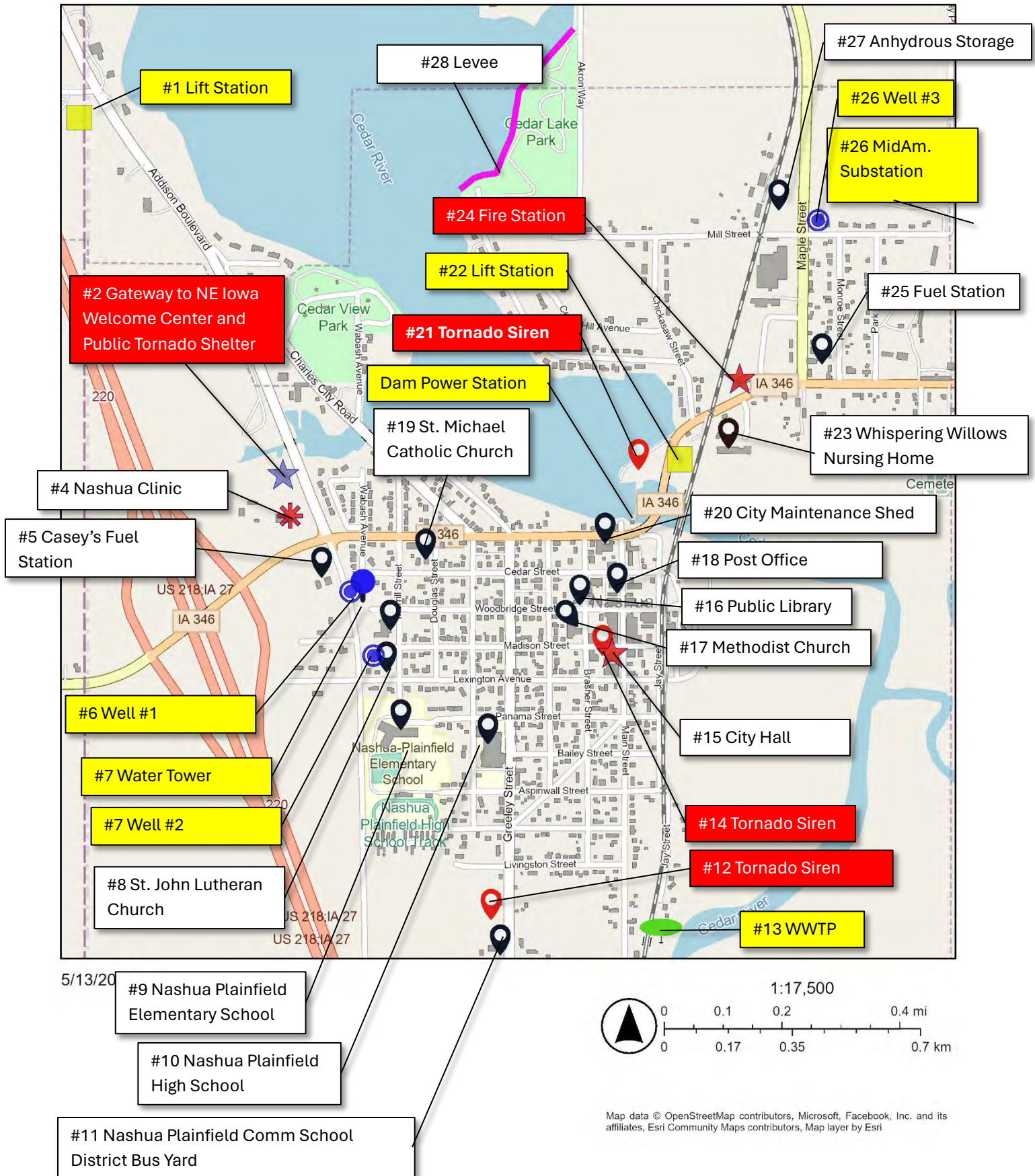
See Figure 3 for a map depicting the location of critical facilities within Nashua.

Critical facilities are structures that serve a vital and critical part of life, safety, and economy. The operation of these critical sites is crucial during and after a natural disaster. When disrupted, the operation or function of these structures have an impact on the life and safety of residents. These are considered community lifelines which include those that classify as structures that provide services for safety/security, food/water/shelter, health and medical, energy (power and fuel), communication, transportation, and hazardous materials.

Other critical facilities include those that house vulnerable populations such as nursing homes, day cares, or schools. The operation of these facilities also serves an important part of the local economy and way of life. Historical and cultural sites are also important to community life and the local economy. Those are listed in Table 8.

Table 8: Critical Facilities	
Gateway to Northeast Iowa Welcome Center (tornado shelter)	Assisted Living Center
Fire Station	Nashua Plainsfield Elementary School
City Hall	Nashua Plainsfield Middle/High School
City Maintenance Shed	Taylor Therapy
Lift Stations (2)	United Methodist Church
Wastewater Treatment Plant (WWTP)	Saint John Lutheran Church
Potable Water Wells (3)	Saint Michaels Catholic Church
Water tower	Cedar Point Church
Mid-American substation	Tornado Sirens (3)
Dam Power House	Nashua Clinic
*Little Brown Church (not w/in city limits but notable local significance)	

Figure 3: Critical Sites Map



Measuring Vulnerability to Selected Hazards

Tornado Hazard

In 1992, an EF2 tornado passed through south of the city. The tornado caused \$500,000 in property damage. In 2003, an EF0 caused \$20,000 in property damage.

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

Using the assessed value from December 2023, the valuation of all 1,771 parcels in the City of Nashua is \$195,397,445 based on Chickasaw County assessor data. The City of Nashua has a potential property loss of \$3,155,600 from a tornado disaster.

Table 1: Valuation of All Parcels in City of North Washington (2023)

Valuation of All Parcels in City of Nashua (2023)	
Percent of City at Risk to a Tornado	100%
# of Affected Parcels	1,771
Total Assessed Value of Buildings and Dwellings on Affected Parcels in 2023	\$195,397,445
<i>Source: Chickasaw County Assessor’s Office</i>	

Flood Prone Areas

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

In Figures 4 and 5, the maps show the flood hazard zone in and around the City of Nashua. The river basin is depicted in the topography shown in Figure 5. The parcels that are impacted by the 1% annual chance of flood are highlighted in Figure 6. There are 190 parcels within Nashua potentially affected. The value of all buildings and dwellings on the affected parcels is \$85,787,611 based on the latest Chickasaw County assessor information. This covers 13.7% of the city’s total parcels.

Table 2: Potential Property Losses from the 1% Annual Chance Flood

Potential Property Losses from the 1% Annual Chance Flood	
Percent of City Affected	13.7%
# of Parcels	190
Total Value (Building and Dwelling)	\$85,787,611
<i>Source: Chickasaw County Assessor’s Office</i>	

Figure 4: Flood Plain Map

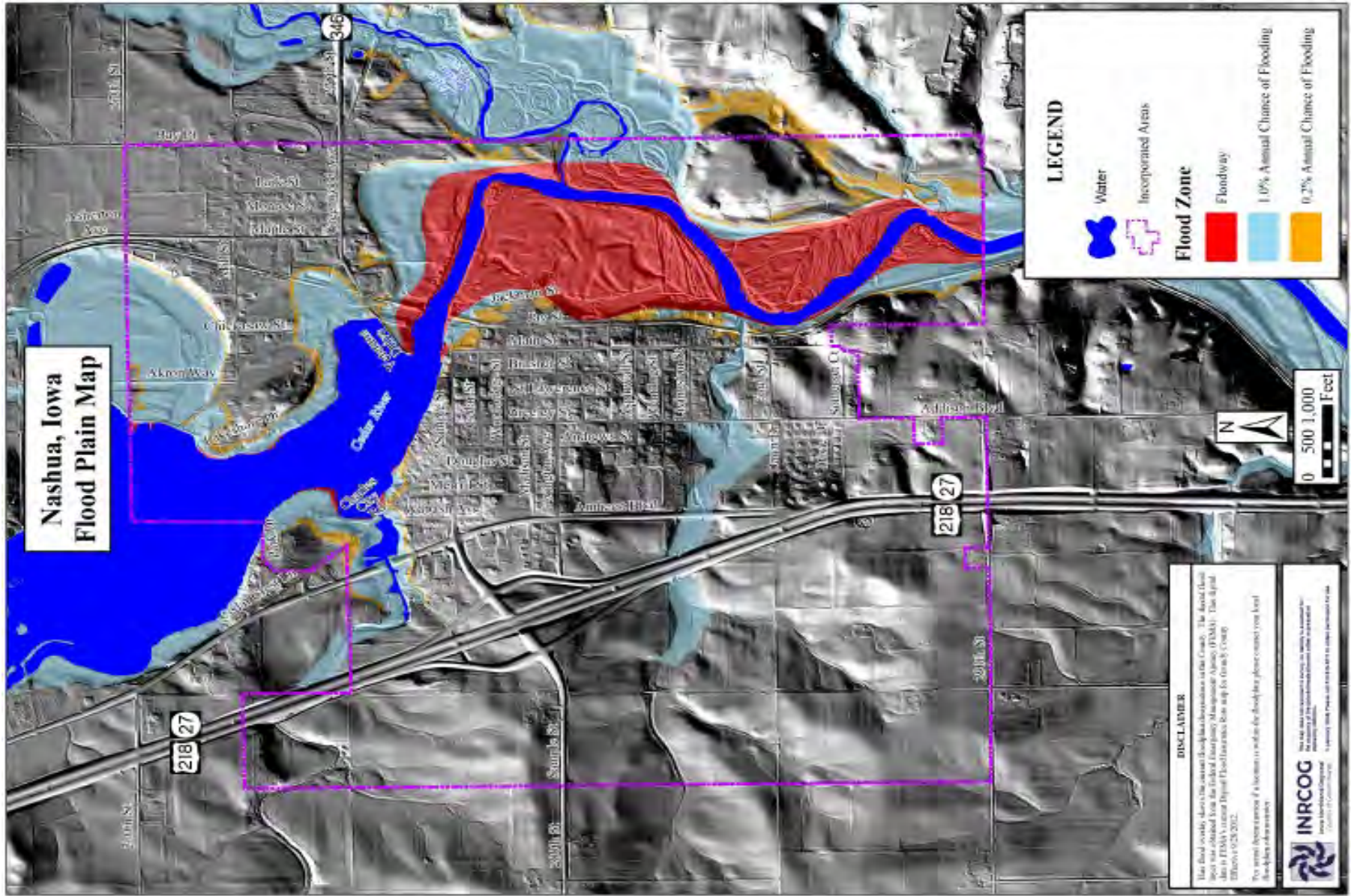
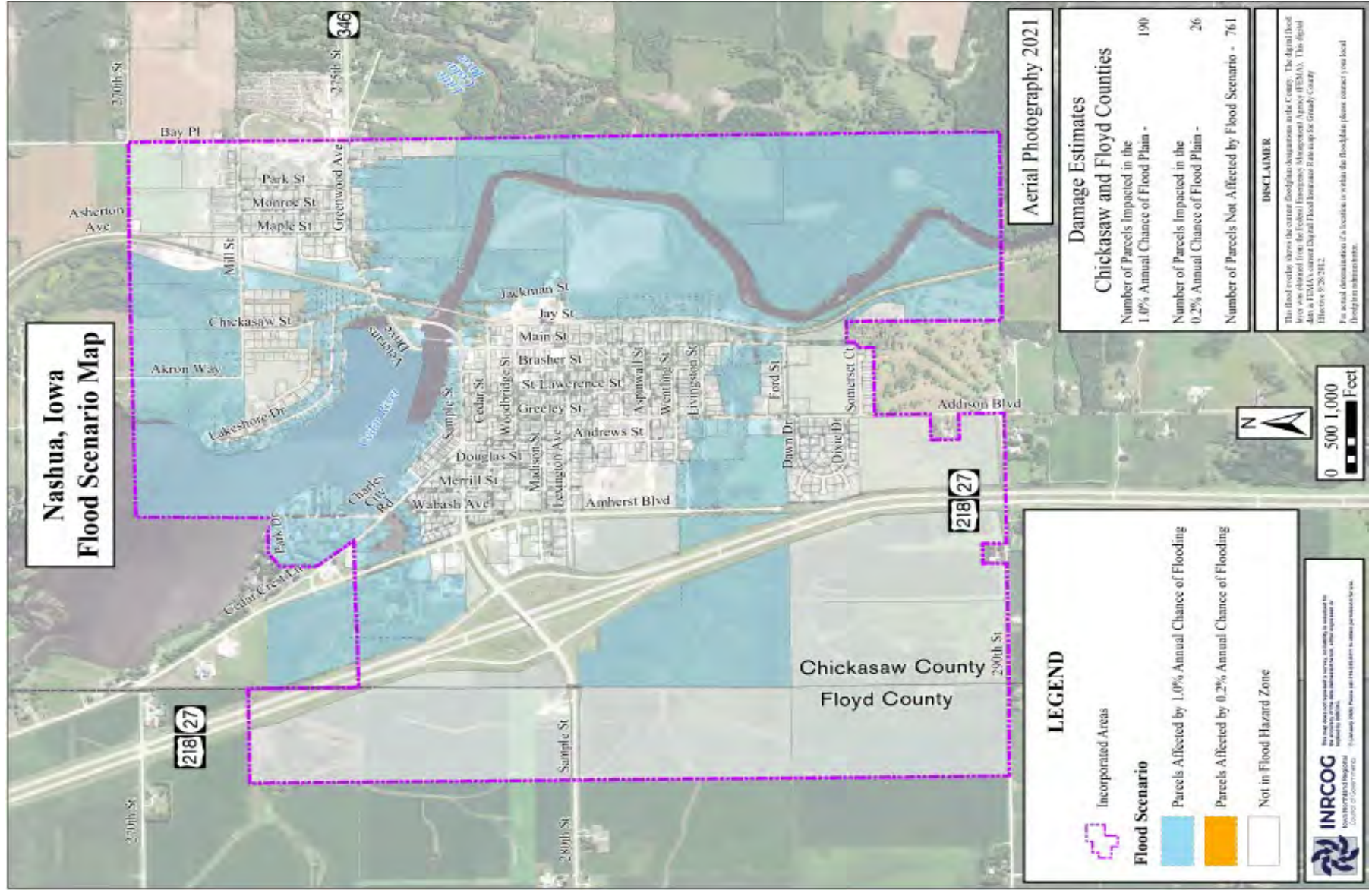


Figure 5: Flood Scenario Map



Future Development

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

Long term trends of climate patterns for the region were summarized in the Fourth National Climate Assessment Midwest Section.² The National Climate Report is mandated to be updated every 4 years and deliver results to Congress and President on the effects to agriculture, energy productions, land use, transportation, and human health.

Yearly precipitation levels and annual average temperatures provide trends that may help determine future intensities of climate systems.

Annual Precipitation Levels in Chickasaw County

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

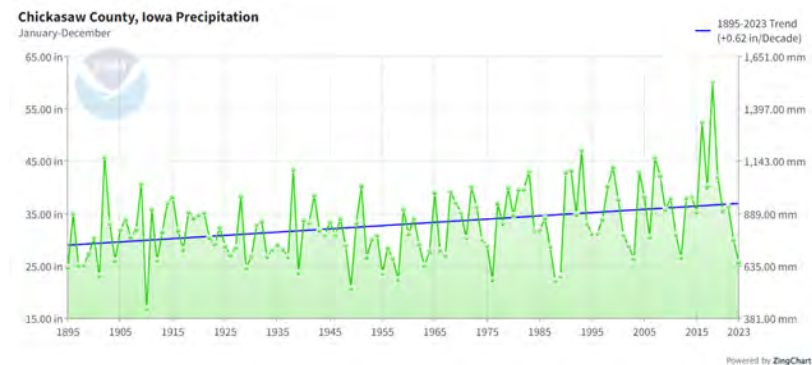
Yearly precipitation has been increasing at a rate of +0.62 in every decade. Based on this historical trend, precipitation is likely to continue to increase in the coming years.

² USGCRP, 2018: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.

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

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

Figure 6: Historical Precipitation Data and Trend for Chickasaw County, Iowa³

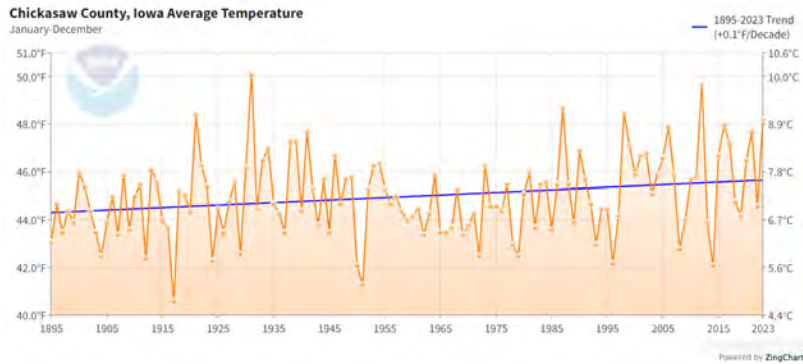


Average Annual Temperatures in Chickasaw County

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

³ NOAA National Centers for Environmental information, Climate at a Glance: County Time Series, published February 2024, retrieved on April 15, 2024, from <https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series>

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



Climate Patterns from Higher Average Temperatures

Extreme heat events during the summers may occur with more frequency in the Midwest.

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

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

Warming winters can increase the survival and reproduction of existing insect pests which allow new insect pests and crop pathogens to move into the Midwest region.

Climate Patterns from Increasing Precipitation and Higher Temperatures

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

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

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

Projected Trends of Natural Hazards in Chickasaw County

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

National Flood Insurance Program

The City of Nashua participates in the National Flood Insurance Program. The current effective FIRM map date is September 28, 2012. There are 11 policies within the community with a total coverage of \$1,210,000. There were 14 losses reported with a net of \$224,598 paid.

FEMA defines a repetitive loss property as an insurable building that has experienced two losses in a 10-year period in which each loss is \$1,000 or more. There is 1 reported repetitive loss properties. The location of these properties is known by city request to FEMA data records.

Hazard Risk Assessment

The top three hazards from the risk assessment are:

1. Tornado/ Windstorm
2. Pandemic/ Endemic Human Disease
3. Thunderstorm/ Lighting/ Hail

Methodology

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

Hazard Risk Score Formula

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

Source: Provided by Iowa HSEMD during scope of work

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

The factors in the hazard risk calculation are defined and the score values for each part is summarized in the following sections:

Probability

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

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

Magnitude or Severity

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

Magnitude or Severity Score Definitions		
Score	Description	
1	Negligible	Less than 10% of property severely damaged, the shutdown of facilities and services for less than 24 hours, and/or injuries/illnesses treatable with first aid
2	Limited	10% to 25% of property severely damaged, shutdown of facilities and service for more than a week, and/or injuries/illnesses that do not result in permanent disability.
3	Critical	25% to 50% of property severely damaged, shutdown of facilities and services for at least two weeks, and/or injuries/illnesses that result in permanent disability.
4	Catastrophic	More than 50% of property severely damaged, shutdown of facilities and services for more than 30 days, and/or multiple deaths.

Warning Time

This should be taken as an anticipated warning time.

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

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

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

Duration

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

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

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

Table 3: Hazard Risk Assessment

Hazard Risk Assessment					
Hazards	Probability	Magnitude	Warning Time	Duration	Score
Tornado/Windstorm	4	4	4	1	3.7
Pandemic/ Endemic Human Disease	4	4	2	4	3.7
Thunderstorm/ Lighting/ Hail	4	2	4	1	3.1
Flooding - Flash	4	2	3	2	3.1
Infrastructure Failure	3	2	4	4	3.0
Hazardous Materials	3	2	4	3	2.9
Transportation Incidents	3	2	4	2	2.8
Animal/ Crop/ Plant Disease	4	1	1	4	2.7
Severe Winter Storm	4	1	1	2	2.5
Earthquake	1	4	4	1	2.4
Grass/Wildland Fire	3	1	4	1	2.4
Drought	3	1	1	4	2.2
Extreme Heat	3	1	1	4	2.2
Terrorism	1	1	4	2	1.6
Sinkholes	1	1	4	1	1.5
Expansive Soils	1	1	1	4	1.3
Landslide	1	1	1	1	1.0
Levee/Dam Failure	1	1	1	1	1.0
Flooding - Riverine	1	1	1	1	1.0
Radiological	1	1	1	1	1.0

Source: Completed by City Representative. Score calculation completed by INRCOG.

Hazard Mitigation Goals

for Nashua, Iowa

The following list of goals was developed by planning committee participants from the associated jurisdiction. Goals 1 through 7 were developed in the previous 2019 Chickasaw County Multi-Jurisdictional Hazard Mitigation Plan. The planning committee participants chose to adopt the same goals and add additional goals. Goals 8 through 9 were created by the city's committee representatives which provided updated and additional mitigation goals and activities.

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

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

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

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

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

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

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

Goal #8 Invest in a flood resistant community with storm water management planning.

Goal #9 Invest in updated city improvements to ensure functionality and sustainable use of public infrastructure.

Existing or Previous Mitigation Activities by Type

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

Emergency Services in Alta Vista

Chickasaw County Emergency Management Agency

Nashua works with the Chickasaw County Emergency Management Coordinator, based out of the City of New Hampton, on various safety and emergency events. The Emergency Management Coordinator works in conjunction with local fire, rescue, police, and government officials to draft and implement workable emergency action plans in the community. The Chickasaw County Emergency Management Coordinator is Jeff Bernatz.

Law Enforcement

The City of Nashua no longer has a police department. All police services are contracted through the Chickasaw County Sheriff's Office. The Sheriff and deputies are available 24/7 to respond to emergency and non-emergency calls.

The City of Nashua has partnered with the Chickasaw County Sheriff's Office to abide by the mission statement for serving the people of Nashua. Community policing is part of the mission of the City of Nashua. The mission and other police programs have continued through a partnership with the Chickasaw County Sheriff's Department.

Fire Protection and EMS Services

Fire protection for the City of Nashua is provided by the Nashua Fire Department. The station is located at 125 Greenwood Avenue, Nashua, IA 50658.

There are approximately 30 volunteer fire fighters that serve the community. All members must be HAZMAT certified. Dispatch is provided via a paging system through the Chickasaw County Rescue Squad.

The Nashua Fire Department maintains 28E agreements with the following communities: Floyd County, City of Ionia, City of New Hampton, City of Fredericksburg, City of Lawler, City of North Washington, City of Alta Vista, City of Plainfield, City of Greene, and City of Clarksville.

Equipment used by the Nashua Fire Department includes the following:

- 1993 GMC Pumper
- 1977 Ford Pumper
- 1975 Ford Tanker
- 1965 Ford Tanker
- 1984 Chevy 1-ton Rescue Truck
- 1984 Chevy 1-ton, 4x4 Grass/Rescue Truck
- 17 ft. Rescue Boat w/ 40 hp outboard
- Jaws of Life (vehicle extraction device)

EMS Services

Chickasaw Ambulance Service provides ambulance service to area hospitals. Chickasaw Ambulance Service is a private company that contracts service with local entities. The company is based out of New Hampton, approximately 14 miles northeast of Nashua.

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

Medical Facilities

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

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

HAZMAT Response Teams

Nashua contracts with Northeast Iowa Response Group for response to hazardous material spills. The Northeast Iowa Response Group is a division of Waterloo Fire Rescue as is the Hazardous Materials Regional Training Center. The

Training Center provides training to fire departments and companies from around the state and country. Not only is this a training center, but it also serves as a hazardous materials quick response unit to Black Hawk County, surrounding counties, and many municipalities in a ten-county region. The Unit provides local fire departments with hazard materials emergency procedures thus reducing additional contamination. An evacuation plan is also in place in conjunction with the activities of the local department. Contact information for the facility is as follows: Hazardous Materials Regional Training Center, 1925 Newell Street, Waterloo, Iowa 50707, Phone: (319) 291-4275, Toll Free: (800) 291-4682, Fax: (319) 291-4285

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

City Warning Systems

1) Tornado Sirens

Nashua purchased a new tornado warning siren system as of November 2023 with a 30-year life use.

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

2) Alert Iowa Mass Communication System

Alert Iowa allows for emergency notifications via landline telephones, cell phones, email, text messages, and social media. This is useful for communities that may not have an operating warning siren or may not hear the sirens.

The County will use its emergency notification network for all the following events: blizzards, flash flooding, severe thunderstorms, and tornadoes.

Public Works/Street Department

The Department has 2 employees and is responsible for snow removal, minor road maintenance, grass mowing and miscellaneous projects throughout the city.

Education and Outreach Projects in Nashua

The City of Nashua provides annual training for fire department personnel, law enforcement personnel, and ambulance crews to address all hazards. Equipment they have available include snowplows, a road grader, end loader and pickup trucks.

Natural Resource Protection in Nashua

Nashua has a floodplain ordinance (Chapter 160) that charges the City Clerk as the flood plain administrator to carry out enforcement of the floodplain ordinance in addition to his/her other duties. The ordinance allows for new construction within the floodplain if conditions are met that would demonstrate minimized flood damage including construction methods and practices over the flood elevation.

The City has encouraged the use of monitoring wells. The City treats and monitors the water supply to provide publicly available water monitoring results.

Structural Projects in Nashua

The City constructed a Welcome Center which also serves as a public storm shelter open 24/7. The shelter is a FEMA-certified tornado safe room.

Local Plans and Regulations in Nashua

The City has required back flow valves on sanitary sewer connections in all new building construction.

The City has been enforcing designated truck routes for the transport of hazardous materials.

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

Table 10: Local Capability Assessment	
Community	City of Nashua
Previous HMP Participant?	Yes
Comprehensive Plan?	Yes
Building Code?	Yes
Zoning Ordinance? RR=restricted residential	RR
Subdivision Regulations?	Yes
Floodplain Management Ordinance?	Yes
Tree-Trimming Ordinance?	Yes
Storm Water Ordinance?	Yes
Snow Removal Ordinance?	Yes

Strategy for Implementing the Plan

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

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

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

- Each task (line item) stands on its own so it can be completed whenever possible.
- Each action item is not limited to the details presented below and may change based on future conditions.
- The tasks were categorized based on mitigation type. The mitigation types are not shown in any order (no priority over the other).

This implementation strategy is presented to help with the general understanding of how hazard mitigation may feed into the City’s existing or future priorities.

Priority Level

The priority level was informed through discussions among planning committee members who considered potential benefits of implementing the activity, some hurdles that the city may face in implementing the action step, and the

drawbacks of implementation. *Committee representatives considered a cost-benefit approach.*

Timeframe

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

Estimated Costs

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

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

Strategic Implementation Plan by Mitigation Activity Type

Table 11: 'Education and Awareness' Type Mitigation Activities						
Description: These types of actions keep residents informed about potential natural disasters.						
Priority	Tasks	Hazard(s)	Primary Agency Responsible for Implementation	Time Frame to Complete	Estimated Cost (s)	Funding Source
High	Prepare an outreach strategy to get residents to sign up for Alert Iowa.	All	EMA, Fire Dept, Police Dept, City Council	Short 1-3 years	Minimal 0-\$10K	Hazard mitigation grant program
High	Evaluate and make improvements to outdoor warning siren network.	All	EMA, Fire Department, Police, City Council	Short 1 - 3 years	Low \$10K to 99K	Hazard mitigation grant program, City gen fund
Medium	Ensure up to date annual HAZMAT response training for first responders.	Hazardous Materials, Transportation Incidents, Infrastructure Failure	Fire Department, Police Department, City Council	Short 1-3 years	Medium \$100K to \$300K	City general fund, hazard mitigation grant program
Medium	Maximize investment opportunity by partnering with local businesses/orgs that will pitch in to build a public shelter in town especially for vulnerable populations (mobile homes, elderly, schools, incarcerated).	Tornado/ Windstorm	County EMA, Fire Dept, City Council	Long Term 5-10 Years	High Greater than \$300K	Hazard mitigation grant program, City general fund

Table 12: 'Emergency Services' Type Mitigation Activities

Description: Actions that protect people and property during and immediately after a disaster or hazard event.						
<i>Priority</i>	<i>Tasks</i>	<i>Hazard(s)</i>	<i>Primary Agency Responsible for Implementation</i>	<i>Time Frame to Complete</i>	<i>Estimated Cost (s)</i>	<i>Funding Source</i>
Low	Maintain a backup fuel supply for necessary equipment.	All	City Council, Public Works	Mid Term 3-5 Years	Moderate \$100K to \$299K	City General Fund

Table 13: Structure and Infrastructure Project Type Mitigation Activities

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

Priority	Action/Activity	Hazard(s) Addressed by Action	Primary Agency Responsible for Implementation	Time Frame to Complete Action	Estimated Cost(s) to Implement	Funding Source
High	Install a security surveillance system at critical infrastructure from crime and disaster.	All	Police Chief, Public Works Director	Long Term 5-10 years	High \$300k or greater	Hazard Mitigation Grant Program, State and Local Cybersecurity Grant Program
High	Partner with MidAmerican Energy to develop a plan for relocating overhead power lines underground.	Severe Winter Storm, Hailstorm, Thunderstorm and Lightning, Tornado, Windstorm, Infrastructure Failure	City Council, MidAmerican Energy	Short-Term (6 months - 3 years)	Moderate \$10K-\$30K	City General Fund, Utility provider

Table 14: Natural System Protection and Nature-Based Mitigation Type

Description: Actions that minimize damage and losses by preserving or restoring the functions of natural systems. This type of action can include green infrastructure and low impact development, nature-based solutions

Priority	Action/Activity	Hazard(s) Addressed by Action	Primary Agency Responsible for Implementation	Time Frame to Complete	Estimated Cost (s)	Funding Source
High	Apply for a planning grant to prepare a flood mitigation plan that may address riverbank erosion and retention basins to mitigate storm water pollution.	River Flooding, Flash Flooding	City Council, County EMA	Medium 3-5 years	Low \$10K-\$100K	Flood Mitigation Assistance Program (Planning Grants)
Medium	Implement Iowa DNR BMPs for erosion control measures.	River flooding, flash flooding, Tornado/Windstorm	City Council, Public Works	Medium 3-5 years	High \$300K +	Flood Mitigation Assistance Program
Low	Continue to monitor and treat municipal water.	Flooding, hazardous materials, sinkholes	City council, public works	Long 5-10 years	Medium \$100K to \$299K	City general fund

Table 13: Local Plans and Regulations Mitigation Activities

Description: Actions by administrative or regulatory processes which direct how land and buildings are developed and built. These actions include regulations by public entities to reduce hazard losses.

Priority	Action/Activity	Hazard(s) Addressed by Action	Primary Agency Responsible for Implementation	Time Frame to Complete Action	Estimated Cost(s) to Implement	Funding Source
High	Develop a storm water management plan.	Flooding (river and flash)	County EMA, City Council	Short 1-3 Years	Medium \$100K-\$299K	Flood Mitigation Assistance Program - Planning Grants
Medium	Implement wellhead protection program.	Flooding (river and flash)	City Council, Public Works	Short 1-3 Years	Low \$10K - \$99K	City general fund, state revolving loan fund
Low	Coordinate with County EMA Coordinator to ensure Tier II reports are being regularly sent out.	Hazardous Materials	County EMA, City council	Short 1-3 Years	Minimal 0-\$10K	City general fund
Low	Enforce back flow valves in all new construction per updated code.	Wild/ Grass fire	City	Immediate 1-6 months	Minimal 0-\$10K	City General Fund