Dane County Natural Hazard Mitigation Plan

City of Edgerton Annex

Summer 2022

City of Edgerton Annex

This annex is a part of the Dane County Natural Hazard Mitigation Plan (DCNHMP). The DCNHMP contains additional information to support the Federal Emergency Management Agency's (FEMA) recognition of the plan (including this annex) as the formal natural hazard mitigation plan for the county and participating local governments. This annex will be valid for as long as FEMA approves the DCNHMP.
The strategies adopted in this annex are designed to guide community efforts to reduce risks from natural hazards. These strategies work in conjunction with neighboring communities and Dane County government to reduce risks from natural hazards.

COMMUNITY PROFILE

The City of Edgerton is located in both Rock and Dane County. It is located in the southeast quadrant of Dane County along the I-90 corridor. Land use is dominated by agriculture, the City of Edgerton Business Park, residential subdivisions, and dispersed one-and two-family homes. According to the United States Census Bureau, the City of Edgerton has a total area of 3.7 square miles. None of the area is covered by water except for Saunders Creek.

As of the 2019 Census Estimates, there are 5,550 people, 2,227 households, and 2.48 people per household. The City is split between two counties, Dane County and Rock County.

The City of Edgerton website (http://www.cityofedgerton.com/) reports that in 2019, 5,477 people live in Rock County and 136 people live in Dane County. Due to data calculations being skewed with a population size of less than 500, tables 1-7 will show the profile for the entire City of Edgerton. This plan only applies to the Dane County portion of Edgerton.

Table 1 Population Profile of City of Edgerton, Dane County

Category	Number	Percent
Total population	**5,550**	**100%**
Under 5 years	262	4.7%
5 to 9 years	148	2.7%
10 to 14 years	463	8.3%
15 to 19 years	614	11.1%
20 to 24 years	444	8.0%
25 to 29 years	377	6.8%
30 to 34 years	420	7.6%
35 to 39 years	281	5.1%
40 to 44 years	334	6.0%
45 to 49 years	484	8.7%
50 to 54 years	358	6.5%
55 to 59 years	298	5.4%
60 to 64 years	297	5.4%
65 to 69 years	269	4.8%
70 to 74 years	130	2.3%
75 to 79 years	191	3.4%
80 to 84 years	101	1.8%
85 years and over	79	1.4%

Data Source: 2019 ACS Estimates - U.S. Census

Growth & Development Trends

Table 2-3 illustrates how the entire City of Edgerton has grown in terms of population and number of households between 2010 and 2020. Housing data is to 2020 due to data availability. Table 2-3 is drawn from the Demographics Services Center at the Wisconsin Department of Administration, and shows population projections through 2040.

Table 2 City of Edgerton Change in Population and Households, 2010-2020

2010 Population	2020 Population	Percent Change (%) 2010-2020	2010 # of Households	2020 # of Households	Percent Change (%) 2010-2020
5,461	5,694	4.26%	2,227	2,525	13.38%

Data Source: Demographic Services Center, Wisconsin Department of Administration, 2021

Table 3 City of Edgerton Population Projections, 2020-2040

Population Projection	2020	2025	2030	2035	2040
Increase by half of percent of change (%4.26/2) every 5 years	5,694	5,815	5,938	6,064	6,193

Data Source: Demographic Services Center, Wisconsin Department of Administration, 2021

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Population Summary

Tables 4-7 illustrates key population demographics within the City of Edgerton. Key demographics include: (1) Disability Characteristics, (2) Federal Income Poverty Levels, (3) Educational Attainment, and (4) Household Language with English Speaking Capabilities. Due to data availability, all key demographic information has been provided by the American Community Survey (ACS) 2019 estimates. The ACS is a self-reported survey and may include total sample size differences and statistical margin of error.

Table 4 City of Edgerton – Disability Characteristics by Detailed Age

Category	Number	Percent
Total of Residents Self-Identified as Disabled	**1,324**	**100%**
With a hearing difficulty	**210**	**15.9%**
Population under 18 years	0	-
Population 18 to 64 years	52	-
Population 65 years and over	158	-
With a vision difficulty	**165**	**12.5%**
Population under 18 years	49	-
Population 18 to 64 years	55	-
Population 65 years and over	61	-
With a cognitive difficulty	**250**	**18.9%**
Population under 18 years	33	-
Population 18 to 64 years	191	-
Population 65 years and over	26	-
With an ambulatory difficulty	**352**	**26.6%**
Population under 18 years	0	-
Population 18 to 64 years	96	-
Population 65 years and over	256	-
With a self-care difficulty	**108**	**8.2%**
Population under 18 years	0	-
Population 18 to 64 years	21	-
Population 65 years and over	87	-
With an independent living difficulty	**239**	**18.1%**
Population 18 to 64 years	110	-
Population 18 to 34 years	36	-
Population 65 years and over	129	-

Data Source: 2019 ACS Estimates - U.S. Census

Table 5.1: City of Edgerton – Federal Income Poverty Levels (FIPL) by Families Summary

Category Poverty Level	Number of Families
50 % of poverty level	374
125 % of poverty level	886
150 percent of poverty level	1,181
185 percent of poverty level	1,382
200 percent of poverty level	1,460
300 percent of poverty level	2,334
400 percent of poverty level	3,160
500 percent of poverty level	4,360

Data Source: 2019 ACS Estimates - U.S. Census

Note: Use table 5.2 to interpret table 5.1:

5.1 identifies the *total number of families* (regardless of size) by percentage.

5.2 identifies *family size* in relation to annual family income and the percentage category of the FIPL.

Table 5.2: City of Edgerton – Annual Federal Income Poverty Level Guide

Family Size	% of Federal Poverty Level								
	50%	100%	125%	150%	185%	200%	300%	400%	500%
1	$6,440	$12,880	$16,100	$19,320	$23,828	$25,760	$38,640	$51,520	$64,400
2	$8,710	$17,420	$21,775	$26,130	$32,227	$34,840	$52,260	$69,680	$87,100
3	$10,980	$21,960	$27,450	$32,940	$40,626	$43,920	$65,880	$87,840	$109,800
4	$13,250	$26,500	$33,125	$39,750	$49,025	$53,000	$79,500	$106,000	$132,500
5	$15,520	$31,040	$38,800	$46,560	$57,424	$62,080	$93,120	$124,160	$155,200
6	$17,790	$35,580	$44,475	$53,370	$65,823	$71,160	$106,740	$142,320	$177,900

Data Source: dhs.wisconsin.gov

Table 6: City of Edgerton – Educational Attainment by Householders

Category	Number	Percent
Total of Population 25 years and over	**3,539**	**100%**
Less than high school graduate	251	7.1%
High school graduate (includes equivalency)	1,326	37.5%
Some college, associate's degree	894	25.3%
Bachelor's degree or higher	1,068	30.2%

Data Source: 2019 ACS Estimates - U.S. Census

Table 7: City of Edgerton - Household Language & English Speaking Capabilities

Category	Number	Percent
Total of Households	**2,355**	**100%**
English only	**2,212**	**93.9%**
Spanish:	**76**	**3.2%**
Limited English speaking household	19	-
Not a limited English speaking household	57	-
Other Indo-European languages:	**42**	**1.8%**
Limited English speaking household	0	-
Not a limited English speaking household	42	-
Asian and Pacific Island languages:	**25**	**1.1%**
Limited English speaking household	0	-
Not a limited English speaking household	25	-
Other languages:	**0**	**0.0%**
Limited English speaking household	0	-
Not a limited English speaking household	0	-

Data Source: 2019 American Community Survey

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data due to sourcing, margin of error, and data availability.

Asset Inventory

Assets include the people, property, and critical facilities within the City of Edgerton that are exposed to hazards in general. Inventories of property, essential infrastructure, and natural, cultural or historic resources help provide a comprehensive picture of the community and provide a method of assessing exposure to hazards by establishing the improved and total values, capacities and populations for these assets. It also forms the basis for estimating potential losses, where possible.

General Property

Table 8 Property Exposure Summary

Property Type	Parcel Count	Improved Land Count	Improved Land Value ($)	Content Value ($)	Total Value ($)
Total	**74**	**73**	**41,005,200**	**20,502,600**	**61,507,800**
Agriculture	10	10	3,787,000	1,893,500	5,680,500
Commercial	11	11	2,063,700	1,031,850	3,095,550
Industrial	4	3	24,677,800	12,338,900	37,016,700
Residential	48	48	9,619,900	4,809,950	14,429,850
Utility	1	1	856,800	428,400	1,285,200

Data Source: Dane County Land Information Office, December 2021

Critical Facilities

The City of Edgerton has identified the critical facilities important to protect from disaster impacts. These are collected in Table 9. Table 9 is based on GIS data inventories from Dane County and information gathered from the City. No further supplemental data was provided by the community through the Data Collection Guide.

Table 9 Critical Facility Summary/Essential Infrastructure

Facility	Type*	No. of Facilities	Replacement Value ($)
US Hwy 51/I39/90 alt route	EI	N/A	N/A
Stormwater ponds	EI	$200,000 per pond (3 ponds)	N/A
Electrical Substation (located in own of Albion)	EI	N/A	N/A
Electrical Transmission line	EI	N/A	N/A
Mud Lake/wetland	NA	N/A	N/A
*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: Natural Asset			

Data Source: 2021 City of Edgerton Data Collection Guide

Other Assets

Other assets help define a community beyond the current composition of the City of Edgerton. These assets may provide economic benefit to the community, in addition to preserving the heritage and diversity of the community and may include natural, cultural and historic assets or economic assets such as major employers. It may also include more specific detail on critical facilities. The City of Edgerton has not identified any other assets.

VULNERABILITY ASSESSMENT

A hazard identification and vulnerability analysis was completed for the City of Edgerton using the same methodology in the County's base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete.

The first step in a hazard analysis is to identify which hazards the community is vulnerable to. Table 10 outlines the hazard identification for the City of Edgerton based on the Data Collection Guide issued in 2021. The Data Collection Guide listed all of the hazards that could impact Dane County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. Brooklyn's planning team members were asked to complete the matrix by ranking each category on a scale of 0 to 5 based on the experience and perspective of each planning team member. A ranking of 0 indicated "no concern" while a ranking of 5 indicated "highest concern." This matrix appears as Table 10. This matrix reflects the significance of the hazards relative to one another as perceived by the Example's planning team.

This matrix reflects that the City of Edgerton is most vulnerable to wind storms, winter storms, and tornadoes. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 10: Vulnerability Assessment Matrix for the City of Edgerton

Name of Jurisdiction: City of Edgerton										
Hazard	**Hazard Attributes**			**Impact Attributes**						
				Primary Impact (Short Term - Life and Property)			**Secondary Impact (Long Term – Community Impacts)**			
	Area of Impact	Past History, Probability of Future Occurrence	Short Term Time Factors	Impact on General Structures	Impact on Critical Facilities	Impact on At-Risk Populations	Social Impact	Economic Impact	Severity Of Other Associated Secondary Hazards	**Total of Row Values**
	(1-5)	*(1-5)*	*(1-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	
Dam/Levee failure	0	0	0	0	0	0	0	0	0	0
Extreme Cold	3	5	2	1	1	2	1	1	3	19
Extreme Heat	2	5	1	1	1	2	1	1	3	17
Drought	2	5	1	1	0	1	1	1	1	13
Expansive soils	0	0	0	0	0	0	0	0	0	0
Flood	2	5	4	3	3	4	3	4	3	31
Fog	2	3	3	1	0	1	1	1	1	13
Hail Storm	1	3	4	1	1	1	1	3	3	18
Landslide	0	0	0	0	0	0	0	0	0	0
Lightning	2	3	4	2	2	2	1	1	3	20
Tornado	4	3	4	4	4	2	3	4	5	33
Wildfire	1	1	1	1	1	1	1	1	1	9
Windstorm	4	5	4	4	4	2	3	3	5	34
Winter Storm	4	5	2	4	4	3	2	3	5	32

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County. The previous inventory tables quantify what is exposed to the various hazards within City of Edgerton. Table 11 cross-references the hazards with the various tables where exposure or vulnerability specifics are found. The intent of Table 6 is to quantify, where possible, future impacts of each hazard on the jurisdiction. In many cases it is difficult to estimate potential losses, so the overall exposure of populations, structures, and critical facilities is referenced.

Table 11 Hazard Vulnerability Specifics

Hazard	Populations	Structures	Critical Facilities	Future Damage Potential
Dam Failure	None	None	None	Specifics unknown; See hazard profile in County Plan
Drought	Minimal	Minimal	None	Specifics unknown; See hazard profile in County Plan
Flooding	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below
Fog	Minimal	Minimal	None	Specifics unknown; See hazard profile in County Plan
Hailstorm	Minimal	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Landslide/ Sinkholes/ Erosion	None	None	None	Specifics unknown; See hazard profile in County Plan
Lightning	Moderate	Moderate	Moderate	Specifics unknown; See hazard profile in County Plan
Severe Cold	Moderate	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Severe Heat	Moderate	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Winter Storm	See Tables 4-7 Population	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Tornado	See Table 15 below	See Table 15 below	See Table 15 below	See Table 15 below
Wildfire	Minimal	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Windstorm	Moderate	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan

Data Source: 2021 City of Edgerton Data Collection Guide – Prepared by DCEM

Previous Hazard Events

Through the Data Collection Guide, the City of Edgerton noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the main mitigation plan. These events had a particular impact on the community beyond the impacts and events recorded in the Dane County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

City of Edgerton Historic Natural Hazards

Table 12 City of Edgerton Historic Natural Hazards

Natural Hazard	Date	Impacted Structures	Comprehensive Harm to Jurisdiction	Other reported Losses (Fiscal reports, programs, etc.)	Comments
Flooding	12/22/2018	No structures impacted	Winter rain on frozen farm fields or intense summer rains. 2-3 acres impacted in total.	Approximately an Acre of Crop Damage	Located at corner of Thronson Road and US HWY 51. [High likelihood of reoccurring]

Data Source: 2021 City of Edgerton Data Collection Guide

Flood Hazard

Structures and Properties in the Floodplain

Refer to the flood profile in the mitigation plan for a description of the methodology used to identify potentially flood-prone properties. Figure 1 shows mapped floodplains, future growth areas, and critical or vulnerable facilities. Tables 13 and 14 outline the primary structures on them within the City of Edgerton, Dane County. Potential number of individuals at risk figures are based on primary residential structures and the average household size within Dane County (2.37 people as of 2021). Estimated loss potentials for all structures on floodway can be found within section 4.6 in chapter 4 of the county plan.

Table 13 Primary Structures in the 100 Year Floodplain

Residential Structures in 100 yr. Floodway	Non-Residential Structures in 100 yr. Floodplain	Total Structures in 100 yr. Floodplain	Potential # of People at Risk in 100 yr. Floodplain	Total Assessed Values ($) of Structures in 100 yr. Floodplain
0	0	0	0	$0

Source: Analysis based on Dane County Land Information Office Data

Table 14 Primary Structures in the 500 Year Floodplain

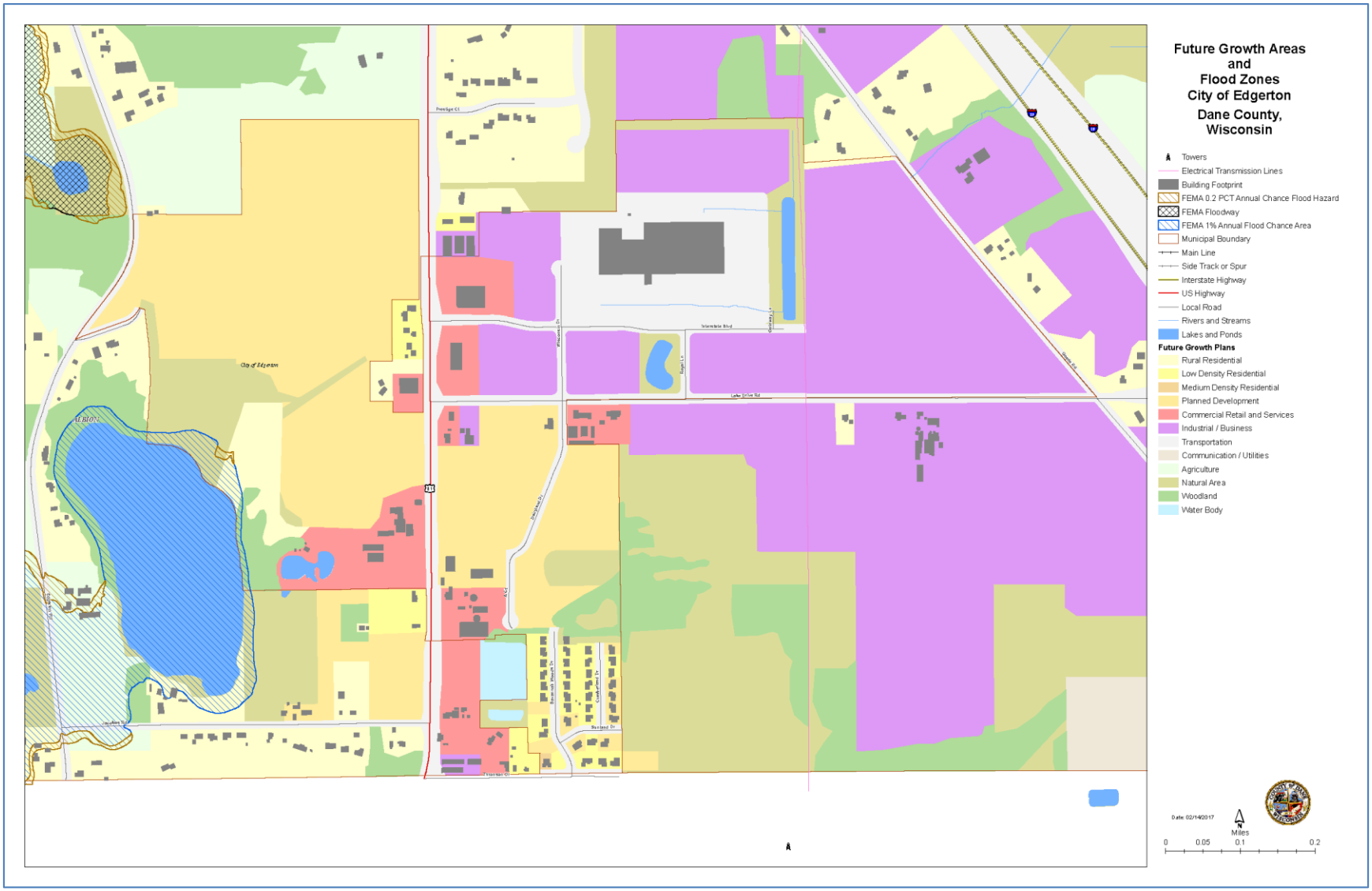
Residential Structures in 500 yr. Floodway	Non-Residential Structures in 500 yr. Floodplain	Total Structures in 500 yr. Floodplain	Potential # of People at Risk in 500 yr. Floodplain	Total Improved Values ($) of Structures in 500 yr. Floodplain
0	0	0	0	$0

Source: Analysis based on Dane County Land Information Office Data

Repetitive Loss Properties and Flood Insurance Polices

- Repetitive loss properties have not been reported in the City of Edgerton, Dane County.
- The City of Edgerton has 27 flood insurance policies in force within Rock County, with a total coverage of $5,573,500.

Figure 1 Flood Hazards and Future Land Use Map



Tornado

While it is difficult to estimate specific losses to a tornado due to the random nature of the event, a methodology was developed that was applied to each jurisdiction during the 2023 update. The table below estimates the percent area of the jurisdiction that could be impacted based on the average sized tornado (F2) in Dane County. High value exposure is based on 100% loss, medium 50% loss, and low is 25% loss to the property potentially impacted. The loss ratio, which is the ratio of the damaged building value to total exposed building value, is a measure of the impact to the jurisdiction as a whole. Communities with loss ratios 10% or more may have difficulty recovering from a disaster. Refer to the tornado hazard profile in the main mitigation plan for more details on this methodology. This data represents only the Dane County portion of the City of Edgerton.

Table 15 Tornado Loss Estimate

% Area impact	Improved Parcel Count	Affected Structure Estimate	Total Exposed Value ($)	Estimated Loss $ (High Damage Range)	Estimated Loss $ (Moderate Damage Range)	Estimated Loss $ (Low Damage Range)	Loss Ratio for Moderate Damage Range
100%	73	73	61,507,800	61,507,800	30,753,900	15,376,950	50%

Data Source: Analysis Based on Dane County Land Information Office's data

Problems or Additional Vulnerability Issues

The City of Edgerton's Data Collection Guide issued in 2021 listed:

- Thronson Road, an area of flooding, currently provides the only exit from a neighborhood serving approximately 50 residential units. This will change as the area develops.

CAPABILITY ASSESSMENT

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities for the City of Edgerton.

Mitigation Capabilities Summary

Table 16 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities, or by themselves contribute to reducing hazard losses. The table also indicates which of these tools are currently utilized in the City of Edgerton.

Table 16 City of Edgerton Regulatory Mitigation Capabilities

Regulatory Tools (ordinances, codes, plans)	Yes/No	Comments
Existing Natural Hazard Mitigation Plan	Yes	County Emergency Planning Agencies
General or Comprehensive plan	Yes	www.cityofedgerton.com
Zoning ordinance	Yes	www.cityofedgerton.com
Subdivision ordinance	Yes	www.cityofedgerton.com
Growth management ordinance	No	N/A
Shoreland / wetland zoning ordinance	Yes	www.cityofedgerton.com
Floodplain zoning ordinance	Yes	www.cityofedgerton.com
FEMA / NFIP Community Rating System	No	N/A
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	www.cityofedgerton.com
Building code	Yes	www.cityofedgerton.com
Fire department ISO rating	Yes	Edgerton Fire District 608 884-3327
Climate change Impact program	No	N/A
Erosion or sediment control program	Yes	www.cityofedgerton.com
Stormwater management program	Yes	www.cityofedgerton.com
Site plan review requirements	Yes	www.cityofedgerton.com
Capital improvements plan	Yes	www.cityofedgerton.com
Economic development plan	Yes	www.cityofedgerton.com
Local emergency operations plan	Yes	www.cityofedgerton.com
Other special plans Neighborhood plan/stormwater study	Yes	www.cityofedgerton.com
Flood insurance study or other engineering study for streams	No	N/A
Elevation certificates (for floodplain development)	No	N/A
Climate Action Plan	No	N/A

Data Source: City of Edgerton Data Collection Guide, 2021

Table 17 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in the City of Edgerton.

Table 17 Responsible Personnel and Departments for the City of Edgerton

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	City Administrator/planner	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Consulting engineer	
Planner/engineer/scientist with an understanding of natural hazards	Yes	Consulting engineer	
Personnel skilled in GIS	Yes		Consulting engineer
Full-time Building Official	No		Consultant/ part time
Floodplain Manager	No		General knowledge of city staff and consulting engineer
Emergency Manager	Yes	City Administrator/planner	
Grant Writer	Yes	Chief of Police	
GIS Data Resources – (land use, building footprints, etc.)	No		
Warning systems/services	Yes	City Administrator/consulting engineer	

Data Source: City of Edgerton Data Collection Guide 2021

Table 18 identifies financial tools or resources that the City of Edgerton could potentially use to help fund mitigation activities.

Table 18 Financial Resources for the City of Edgerton

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Dedicated funding for land, easement or conservation easement acquisition	No
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	No
Withhold Spending in hazard prone areas	No

Data Source: City of Edgerton Data Collection Guide

Additional Capabilities

The City of Edgerton identified the following as past or ongoing public education or information programs:

- We occasionally provide education on natural lawns, rain gardens and other onsite stormwater control methods in an effort to reduce stormwater runoff. We also have a strong tree planting program and provide education on the benefits of trees for stormwater/erosion and cooling.
- We have an ongoing effort to promote and support infill and redevelopment which reduces expansion of the edge of the city thus reducing the creation of more impervious surfaces.

National Flood Insurance Program Participation

The City of Edgerton currently participates in the National Flood Insurance Program as a stand-alone entity, and is listed under Rock County.

Public Involvement Activities

The City of Edgerton provided a publically noticed listening session with the City of Edgerton Public Works Committee on November 3, 2021, and it was noticed on the Edgerton Reporter. No changes were made to the initial draft mitigation strategies.

MITIGATION STRATEGIES

Below are the identified mitigation strategies developed by the City of Edgerton's NHMP steering committee. Mitigation is defined as a sustained action to reduce or eliminate risk to people and property from hazards and their effects. A *mitigation strategy* is a long-term vision for risk reduction in local jurisdictional or regional planning. A mitigation strategy can be achieved by a list of overall improvements to achieve (goals) that provide direction for community efforts to reduce potential losses identified in the risk assessment.

Strategy #1	**Flood Prevention**
Mitigation strategy goal	
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project
The goal is to prevent flooding by implementing land use regulations and plans to protect property and avoid over taxing the City's stormsewer system. Improvements include the installation of upstream stormwater controls. The reduction in flooding will benefit property owners in the immediate area as well as property owners using Thoronson Road for access. The desired outcome is to limit flooding at the head of the city's stormsewer system near the intersection of Hwy 51 and Thronson Drive, to limit impacts on structures, and ensure access	
Defined steps to achieving this mitigation strategy	
1. Review existing neighborhood stormwater plans a. *Responsible Party* – City of Edgerton b. *Funding source* – Stormwater utility c. *Completion date* – December 2022.	

Strategy #1	Flood Prevention

2. Review development proposals to maximize impact of stormwater control measurers

a. *Responsible Party* – City of Edgerton staff and consultants

b. *Funding source* – Stormwater utility and land developers

c. *Completion date* – ongoing

3. Enforce best management practices

a. *Responsible Party* – City of Edgerton

b. *Funding source* – stormwater utility and land developers

c. *Completion date* – ongoing

Dane County Natural Hazard Mitigation Plan

City of Fitchburg Annex

Summer 2022

City of Fitchburg Annex

This annex is a part of the Dane County Natural Hazard Mitigation Plan (DCNHMP). The DCNHMP contains additional information to support the Federal Emergency Management Agency's (FEMA) recognition of the plan (including this annex) as the formal natural hazard mitigation plan for the county and participating local governments. This annex will be valid for as long as FEMA approves the DCNHMP. The strategies adopted in this annex are designed to guide community efforts to reduce risks from natural hazards. These strategies work in conjunction with neighboring communities and Dane County government to reduce risks from natural hazards.

COMMUNITY PROFILE

The City of Fitchburg is located south of Madison, east of the City of Verona, and north of the Village of Oregon. Land use is dominated by residential and agricultural use, and dispersed one - and two-family homes. According to the United States Census Bureau, the City of Fitchburg has a total area of 34.97 square miles of land. As of 2020, there are 12,449 households residing in the City of Fitchburg, with an average of 2.29 people per household. The population density is 2,310 per square mile.

The municipal population data provided by the American Community Survey, a product of the US Census Bureau, indicates that the 2019 population estimates for City of Fitchburg is comprised of 29,450 people. Table 1 shows the population profile by age for City of Fitchburg.

Table 1 Population Profile of City of Fitchburg, Dane County

Category	Number	Percent
Total Population	**29,450**	**100%**
Under 5 years	2,236	7.6%
5 to 9 years	1,719	5.8%
10 to 14 years	1,830	6.2%
15 to 19 years	1,021	3.5%
20 to 24 years	2,747	9.3%
25 to 29 years	3,322	11.3%
30 to 34 years	2,334	7.9%
35 to 39 years	2,328	7.9%
40 to 44 years	1,670	5.7%
45 to 49 years	1,605	5.4%
50 to 54 years	1,363	4.6%
55 to 59 years	1,698	5.8%
60 to 64 years	1,806	6.1%
65 to 69 years	1,653	5.6%
70 to 74 years	871	3.0%
75 to 79 years	699	2.4%
80 to 84 years	280	1.0%
85 years and over	268	0.9%

Data Source: 2019 ACS Estimates - U.S. Census

Growth & Development Trends

Table 2 illustrates how the entire City of Fitchburg has grown in terms of population and number of households between 2010 and 2020. This data may defer from the 2019 Census Population Estimates, due to sampling differences and margin of error. Housing data is to 2020 due to data availability. Table 3 is drawn from the Demographics Services Center at the Wisconsin Department of Administration, and shows population projections through 2040.

Table 2 City of Fitchburg Change in Population and Households, 2010-2020

2010 Population	2020 Population	Percent Change (%) 2010-2020	2010 # of Households	2020 # of Households	Percent Change (%) 2010-2020
25,260	31,869	26.16%	9,955	12,449	25.05%

Data Source: Wisconsin Department of Administration

Table 3 City of Fitchburg Population Projections, 2020-2040

Population Projection	2020	2025	2030	2035	2040
Increase by half of percent of change (26.16%/2) every 5 years	31,869	36,037	40,750	46,080	52,107

Data Source: Demographic Services Center, Wisconsin Department of Administration, 2021

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Population Summary

Tables 4-7 illustrates key population demographics within the City of Fitchburg. Key demographics include: (1) Disability Characteristics, (2) Federal Income Poverty Levels, (3) Educational Attainment, and (4) Household Language with English Speaking Capabilities. Due to data availability, all key demographic information has been provided by the American Community Survey (ACS) 2019 estimates. The ACS is a self-reported survey and may include total sample size differences and statistical margin of error.

Table 4 City of Fitchburg, Dane County – Disability Characteristics by Detailed Age

Category	Number	Percent
Total of Resident of Self-Identified as Disabled	**4,223**	**100%**
With a hearing difficulty	**468**	**11.1%**
Population under 18 years	22	-
Population 18 to 64 years	144	-
Population 65 years and over	302	-
With a vision difficulty	**284**	**6.7%**
Population under 18 years	64	-
Population 18 to 64 years	163	-
Population 65 years and over	57	-
With a cognitive difficulty	**1,250**	**29.6%**
Population under 18 years	414	-
Population 18 to 64 years	645	-
Population 65 years and over	191	-
With an ambulatory difficulty	**1,208**	**28.6%**
Population under 18 years	0	-
Population 18 to 64 years	382	-
Population 65 years and over	826	-
With a self-care difficulty	**341**	**8.1%**
Population under 18 years	44	-
Population 18 to 64 years	107	-
Population 65 years and over	190	-
With an independent living difficulty	**672**	**15.9%**
Population 18 to 64 years	372	-
Population 18 to 34 years	161	-
Population 65 years and over	300	-

Data Source: 2019 ACS Estimates - U.S. Census

Table 5.1: City of Fitchburg, Dane County – Federal Income Poverty Levels (FIPL) by Families Summary

Category	Number of Families
50 percent of poverty level	71
125 percent of poverty level	792
150 percent of poverty level	979
185 percent of poverty level	1,318
200 percent of poverty level	1,371
300 percent of poverty level	2,200
400 percent of poverty level	3,135
500 percent of poverty level	3,940

Data Source: 2019 ACS Estimates - U.S. Census

Note: Use table 5.2 to interpret table 5.1:

5.1 identifies the *total number of families* (regardless of size) by percentage.

5.2 identifies *family size* in relation to annual family income and the percentage category of the FIPL.

Table 5.2: City of Fitchburg, Dane County – Annual Federal Income Poverty Level Guide

Family Size	50%	100%	125%	150%	185%	200%	300%	400%	500%
1	$6,440	$12,880	$16,100	$19,320	$23,828	$25,760	$38,640	$51,520	$64,400
2	$8,710	$17,420	$21,775	$26,130	$32,227	$34,840	$52,260	$69,680	$87,100
3	$10,980	$21,960	$27,450	$32,940	$40,626	$43,920	$65,880	$87,840	$109,800
4	$13,250	$26,500	$33,125	$39,750	$49,025	$53,000	$79,500	$106,000	$132,500
5	$15,520	$31,040	$38,800	$46,560	$57,424	$62,080	$93,120	$124,160	$155,200
6	$17,790	$35,580	$44,475	$53,370	$65,823	$71,160	$106,740	$142,320	$177,900

Data Source: dhs.wisconsin.gov

Table 6: City of Fitchburg, Dane County – Educational Attainment by Householders

Category	Number	Percent
Total of Householders	**7,334**	**100%**
Less than high school graduate	460	6.3%
High school graduate (includes equivalency)	921	12.6%
Some college or associate's degree	1,891	25.8%
Bachelor's degree or higher	4,062	55.4%

Data Source: 2019 ACS Estimates - U.S. Census

Table 7: City of Fitchburg, Dane County – Household Language & English Speaking Capabilities

Category	Number	Percent
Total of Households	**12,449**	**100%**
English only	**10,440**	**83.9%**
Spanish:	**1,289**	**10.4%**
Limited English speaking household	442	-
Not a limited English speaking household	847	-
Other Indo-European languages:	**260**	**2.1%**
Limited English speaking household	42	-
Not a limited English speaking household	218	-
Asian and Pacific Island languages:	**384**	**3.1%**
Limited English speaking household	15	-
Not a limited English speaking household	369	-
Other languages:	**76**	**0.6%**
Limited English speaking household	16	-
Not a limited English speaking household	60	-

Data Source: 2019 American Community Survey

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Asset Inventory

Assets include the people, property, and critical facilities within the City of Fitchburg that are exposed to hazards in general. Inventories of property, essential infrastructure, and natural, cultural or historic resources help provide a comprehensive picture of the community and provide a method of assessing exposure to hazards by establishing the improved and total values, capacities and populations for these assets. It also forms the basis for estimating potential losses, where possible.

General Property

Table 8 Property Exposure Summary

Property Type	Parcel Count	Improved Land Count	Improved Land Value ($)	Content Value ($)	Total Value ($)
Total	**7,493**	**7,474**	**3,742,236,500**	**1,871,118,250**	**5,613,354,750**
Agriculture	504	504	168,836,100	84,418,050	253,254,150
Industrial	96	96	424,489,600	212,244,800	636,734,400
Residential	6,454	6,454	2,772,540,700	1,386,270,350	4,158,811,050
Utility	45	45	1,864,500	932,250	2,796,750
Commercial	287	287	369,990,600	184,995,300	554,985,900
Other	28	25	240,000	120,000	360,000
Institutional/ Governmental	79	63	4,275,000	2,137,500	6,412,500

Data Source: Dane County Land Information Office, December 2021

Critical Facilities

The City of Fitchburg has identified the critical facilities important to protect from disaster impacts. These are collected in Table 9. Table 9 is based on GIS data inventories from Dane County and information gathered from the City. No further supplemental data was provided by the community through the Data Collection Guide.

Table 9 Critical Facility Summary/Essential Infrastructure

Facility	Type*	No. of Asset	Replacement Value ($)
Bridge	EI	1	N/A
Communication Tower	EI	1	N/A
FCC Tower	EI	1	N/A
EMS Station	EI	1	N/A
Fire Station	EI	3	N/A
Police Station	EI	1	N/A
Emergency Operation Center	EI	1	N/A
Correctional Center	EI	1	N/A
Municipal Hall	EI	1	N/A
Extremely Hazardous Subst.	HM	1	N/A
Hazardous Chemicals	HM	1	N/A
Electrical Substation	EI	1	N/A
Power plant	EI	1	N/A
Natural Gas Transfer Station	EI	1	N/A
Water Utility	EI	1	N/A
Water Tower	EI	1	N/A
Well	EI	1	N/A
Affordable Rental Housing	VF	N/A	N/A
Food Pantry	EI	1	N/A
Child Care	VF	N/A	N/A
Senior Center	VF	1	N/A
ProMega	EI/HM	N/A	292,566,400
SubZero Wolf	EI/HM	N/A	92,312,900
Weidner Investment	EI	N/A	85,024,200
Fiduciary Real Estate	EI	N/A	84,028,200
Avante Properties	EI	N/A	82,500,200
Goldleaf Fitchburg LLC	EI	N/A	54,905,500
EJ Plesko Inc.	EI	N/A	48,801,000
CMC 2, The Fountains LLC	EI	N/A	40,247,200
Orchard Pointe Fitchburg LLC	EI	N/A	26,496,100
Certco Inc	EI	N/A	20,746,900

OneNeck Data Center	EI	N/A	18,533,600
Target Corporation	EI	N/A	18,362,100
Reality Income Corporation	EI	N/A	16,168,600
3102/3103 SFH	EI	N/A	15,695,500
Hy-Vee Inc	EI	N/A	13,360,300
Phoenix Re LLC	EI	N/A	13,062,300
Sierra West LLC	EI	N/A	12,599,600
Agrace Hospice	VF	N/A	N/A
Meadowview Trailer Ct	VF	N/A	N/A
Payne & Dolan	HM	N/A	N/A
Eagle School	VF	1	N/A
Stoner Prairie Elementary	VF	1	N/A
Savanah Oaks Middle School	VF	1	N/A
Forest Edge Elementary	VF	1	N/A
*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities			

Data Source: 2021 City of Fitchburg Data Collection Guide

Other Assets

Other assets help define a community beyond the current composition of the City of Fitchburg. These assets may provide economic benefit to the community, in addition to preserving the heritage and diversity of the community and may include natural, cultural and historic assets or economic assets such as major employers. It may also include more specific detail on critical facilities. The City of Fitchburg has not identified any other assets.

VULNERABILITY ASSESSMENT

A hazard identification and vulnerability analysis was completed for the City of Fitchburg using the same methodology in the County's base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete.

The first step in a hazard analysis is to identify which hazards the community is vulnerable to. Table 10 outlines the hazard identification for the City of Fitchburg based on the Data Collection Guide issued in 2021. The Data Collection Guide listed all of the hazards that could impact Dane County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. Brooklyn's planning team members were asked to complete the matrix by ranking each category on a scale of 0 to 5 based on the experience and perspective of each planning team member. A ranking of 0 indicated "no concern" while a ranking of 5 indicated "highest concern." This matrix appears as Table 10. This matrix reflects the significance of the hazards relative to one another as perceived by the Example's planning team.

This matrix reflects that the City of Fitchburg is most vulnerable to tornado, flood, and windstorm. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 10: Vulnerability Assessment Matrix for the City of Fitchburg

Name of Jurisdiction: City of Fitchburg										
Hazard	**Hazard Attributes**			**Impact Attributes**						
				Primary Impact (Short Term - Life and Property)			**Secondary Impact (Long Term – Community Impacts)**			
	Area of Impact	Past History, Probability of Future Occurrence	Short Term Time Factors	Impact on General Structures	Impact on Critical Facilities	Impact on At-Risk Populations	Social Impact	Economic Impact	Severity Of Other Associated Secondary Hazards	**Total of Row Values**
	(1-5)	*(1-5)*	*(1-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	
Dam/Levee failure	0	0	0	0	0	0	0	0	0	0
Extreme Cold	2	2	2	1	1	2	1	1	1	13
Extreme Heat	2	2	2	0	0	0	1	1	1	10
Drought	2	2	2	0	0	0	1	1	1	9
Expansive soils	1	0	0	0	0	0	0	0	1	2
Flood	2	3	3	1	1	1	1	2	2	16
Fog	1	1	1	0	0	0	0	0	1	4
Hail Storm	2	2	1	1	1	1	1	0	0	9
Landslide	2	2	2	1	1	1	1	1	1	12
Lightning	1	1	1	1	1	1	1	1	1	9
Tornado	2	2	2	3	3	2	3	3	3	23
Wildfire	1	1	1	1	1	0	1	1	1	8
Windstorm	2	2	2	2	2	1	2	2	1	16
Winter Storm	2	2	2	1	1	2	2	2	1	15

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County. The previous inventory tables quantify what is exposed to the various hazards within City of Fitchburg. Table 11 cross-references the hazards with the various tables where exposure or vulnerability specifics are found. The intent of Table 6 is to quantify, where possible, future impacts of each hazard on the jurisdiction. In many cases it is difficult to estimate potential losses, so the overall exposure of populations, structures, and critical facilities is referenced.

Table 11 Hazard Vulnerability Specifics

Hazard	Populations	Structures	Critical Facilities	Future Damage Potential
Dam Failure	None	None	None	Specifics unknown; See hazard profile in County Plan
Drought	None	None	None	Specifics unknown; See hazard profile in County Plan
Flooding	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below
Fog	None	None	None	Specifics unknown; See hazard profile in County Plan
Hailstorm	None	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Landslide/ Sinkholes/ Erosion	None	None	None	Specifics unknown; See hazard profile in County Plan
Lightning	Minimal	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Severe Cold	Moderate	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Severe Heat	Moderate	None	Minimal	Specifics unknown; See hazard profile in County Plan
Winter Storm	Minimal	Moderate	Moderate	Specifics unknown; See hazard profile in County Plan
Tornado	See Table 15 below	See Table 15 below	See Table 15 below	See Table 15 below
Wildfire	None	None	None	Specifics unknown; See hazard profile in County Plan
Windstorm	Minimal	Moderate	Moderate	Specifics unknown; See hazard profile in County Plan

Data Source: 2021 City of Fitchburg Data Collection Guide – Prepared by DCEM

Previous Hazard Events

Through the Data Collection Guide, the City of Fitchburg noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the main mitigation plan. These events had a particular impact on the community beyond the impacts and events recorded in the Dane County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

City of Fitchburg Historic Natural Hazards

Table 12 City of Fitchburg Historic Natural Hazards

Natural Hazard	Date	Impacted Structures	Comprehensive Harm to Jurisdiction	Other reported Losses (Fiscal reports, programs, etc.)	Comments
Tornado	08/18/2005	240 Houses damaged - $34,310,000	$750,000 in crop damage, injuries, power grid damages.	N/A	N/A
Flooding	08/18/2005	N/A	Increased level and area of standing/retained water. Desaturating soils, access, high water, wet basements, mold.	N/A	[High likelihood of reoccurring]
Flood	2019 (Repetitive incident for 9 years)	N/A	Flooding closed Fitchrona Road, which caused Interruption to traffic and subsequent long drive times.	N/A	[High likelihood of reoccurring]

Data Source: 2021 City of Fitchburg Data Collection Guide

Flood Hazard

Structures and Properties in the Floodplain

Refer to the flood profile in the mitigation plan for a description of the methodology used to identify potentially flood-prone properties. Figure 1 shows mapped floodplains, future growth areas, and critical or vulnerable facilities. Tables 13 and 14 outline the primary structures on them within the City of Fitchburg, Dane County. Potential number of individuals at risk figures are based on primary residential structures and the average household size within Dane County (2.37 people as of 2021). Estimated loss potentials for all structures on the floodway can be found within section 4.6 in chapter 4 of the county plan.

Table 13 Primary Structures in the 100 Year Floodplain

Residential Structures in 100 yr. Floodway	Non-Residential Structures in 100 yr. Floodplain	Total Structures in 100 yr. Floodplain	Potential # of People at Risk in 100 yr. Floodplain	Total Improved Values ($) of Structures in 100 yr. Floodplain
1	0	1	2.37	$148,600

Source: Analysis based on Dane County Land Information Office Data

Table 14 Primary Structures in the 500 Year Floodplain

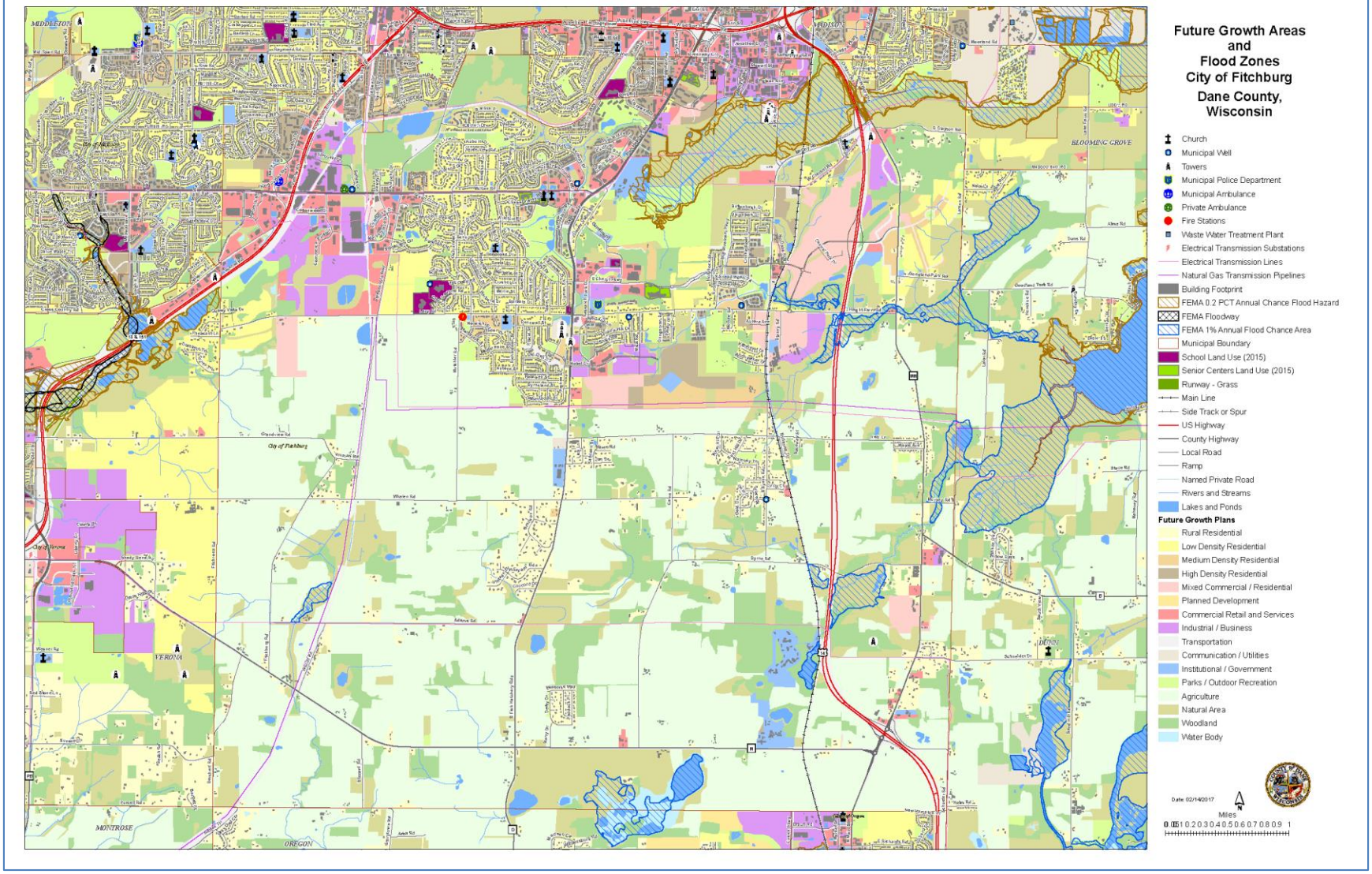
Residential Structures in 500 yr. Floodway	Non-Residential Structures in 500 yr. Floodplain	Total Structures in 500 yr. Floodplain	Potential # of People at Risk in 500 yr. Floodplain	Total Improved Values ($) of Structures in 500 yr. Floodplain
281	41	322	665.97	Not Available

Source: Analysis based on Dane County Land Information Office Data

Repetitive Loss Properties and Flood Insurance Polices

- Repetitive loss properties have not been reported in the City of Fitchburg, Dane County.
- The City of Fitchburg has 27 flood insurance policies in force within Dane County, with a total coverage of $8,027,000.

Figure 1 Flood Hazards and Future Land Use Map



Tornado

While it is difficult to estimate specific losses to a tornado due to the random nature of the event, a methodology was developed that was applied to each jurisdiction during the 2023 update. The table below estimates the percent area of the jurisdiction that could be impacted based on the average sized tornado (F2) in Dane County. High value exposure is based on 100% loss, medium 50% loss, and low is 25% loss to the property potentially impacted. The loss ratio, which is the ratio of the damaged building value to total exposed building value, is a measure of the impact to the jurisdiction as a whole. Communities with loss ratios 10% or more may have difficulty recovering from a disaster. Refer to the tornado hazard profile in the main mitigation plan for more details on this methodology.

Table 15 Tornado Loss Estimate

% Area impact	Improved Parcel Count	Affected Structure Estimate	Total Exposed Value ($)	Estimated Loss $ (High Damage Range)	Estimated Loss $ (Moderate Damage Range)	Estimated Loss $ (Low Damage Range)	Loss Ratio for Moderate Damage Range
2.40%	7474	179	5,613,354,750	134,712,864	67,356,432	33,678,216	1%

Data Source: Analysis Based on Dane County Land Information Office's data

Problems or Additional Vulnerability Issues

The City of Fitchburg's Data Collection Guide issued in 2021 listed:

- **Hazard Concerns**:
  - Special needs populations are especially reliant on the power grid. Heating, cooling, essential medical equipment, and food storage/preparation are most at risk.
- **Growth Trends**:

  Growth and development are designed to follow the City of Fitchburg's comprehensive plan. The plan is influenced by traffic, infrastructure, and municipal sustainability (including climate and weather concerns). Senior housing and multi-family complexes have impacted the City of Fitchburg's population density – allowing the city to efficiently provide utilities and other infrastructure. During an emergency or disaster, emergency services will have to be prepared for a greater demand for resources (in the event of an emergency that requires residents to be displaced).

CAPABILITY ASSESSMENT

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities for the City of Fitchburg.

Mitigation Capabilities Summary

Table 16 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities, or by themselves contribute to reducing hazard losses. The table also indicates which of these tools are currently utilized in the City of Fitchburg.

Table 16 City of Fitchburg Regulatory Mitigation Capabilities

Regulatory Tools (ordinances, codes, plans)	Yes/No	Comments
Existing Natural Hazard Mitigation Plan	Yes	N/A
General or Comprehensive plan	Yes	N/A
Zoning ordinance	Yes	N/A
Subdivision ordinance	Yes	N/A
Growth management ordinance	Yes	N/A
Shoreland / wetland zoning ordinance	Yes	Wetland
Floodplain zoning ordinance	Yes	N/A
FEMA / NFIP Community Rating System	Yes	See Attached Maps
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Stormwater
Building code	Yes	N/A
Fire department ISO rating	Yes	ISO 3 in Urban Service Area / ISO 5 in Non-Hydrant Area
Climate change Impact program	Yes	Sustainability Specialist
Erosion or sediment control program	Yes	N/A
Stormwater management program	Yes	N/A
Site plan review requirements	Yes	N/A
Capital improvements plan	Yes	N/A
Economic development plan	Yes	N/A
Local emergency operations plan	Yes	N/A
Other special plans		N/A
Flood insurance study or other engineering study for streams	Yes	N/A
Elevation certificates (for floodplain development)	Yes	N/A
Climate Action Plan	Yes	Fitchburg's Sustainability Specialist follows Dane County's guidance (at present). The Common Council approved a Sustainability Plan in the 2022 budget.

Data Source: City of Fitchburg Data Collection Guide, 2021

Table 17 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in the City of Fitchburg.

Table 17 Responsible Personnel and Departments for the City of Fitchburg

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	Planning and Zoning Administrator	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Public Works Director/Engineer	
Planner/engineer/scientist with an understanding of natural hazards	Yes	Public Works Civil Engineer	
Personnel skilled in GIS	Yes	Public Works Engineering Department	
Full time building official	Yes	Building Inspection	
Personnel skilled in Climate resilience	Yes	Planning and Zoning Sustainability Specialist	
Floodplain manager	Yes	Public Works Civil Engineer	
Emergency manager	Yes	Fire Department, Fire Chief/Emergency Management Director	
Real estate acquisition personnel	Yes	Assessor	
Grant writer	No		Each Department is responsible for finding funding sources and applying for grant opportunities

Data Source: City of Fitchburg Data Collection Guide 2021

Table 18 identifies financial tools or resources that the City of Fitchburg could potentially use to help fund mitigation activities.

Table 18 Financial Resources for the City of Fitchburg

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	No
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Dedicated funding for land, easement or conservation easement acquisition	No
Fees for water, stormwater, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	Yes
Withhold Spending in hazard prone areas	Possibly

Data Source: City of Fitchburg Data Collection Guide

Additional Capabilities

The City of Fitchburg identified the following as past or ongoing public education or information programs:

- **Past or On-going Public Education:**
  - Public education and information efforts are usually conducted through the Fire Department, Emergency Management, City of Fitchburg Public Information, and Fitchburg Access Community Television (FACTv).
- **Past or On-going Loss Prevention Programs**:

  The City of Fitchburg is actively evaluating the need for (and implementation of) a municipal sustainability plan. This plan is intended to identify the potential for infrastructure impact (looking at how weather and climate influences development –an attempt to reduce the risk of property/infrastructure damage).

National Flood Insurance Program Participation

The City of Fitchburg currently participates in the National Flood Insurance Program.

Public Involvement Activities

The City of Fitchburg provided a publically noticed listening session with the City of Fitchburg Common Council meeting on November 23, 2021. This listening session was noticed on the City of Fitchburg website. Public input was received and documented.

MITIGATION STRATEGIES

Below are the identified mitigation strategies developed by the City of Fitchburg's NHMP steering committee. Mitigation is defined as a sustained action to reduce or eliminate risk to people and property from hazards and their effects. A *mitigation strategy* is a long-term vision for risk reduction in local jurisdictional or regional planning. A mitigation strategy can be achieved by a list of overall improvements to achieve (goals) that provide direction for community efforts to reduce potential losses identified in the risk assessment.

Strategy #1	**Goose Lake Watershed Study**
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	**Structural Project**

Flooding regularly closes Fitchrona Road to traffic. Initial mitigation plans call for increased pipe capacity under Fitchrona Road. Downstream "roadblocks" effect adequate drainage and must be addressed in order to alleviate flooding to the roadway. This is a multi-jurisdictional project involving the City of Fitchburg (COF) and the Town of Verona (TOV).

Defined steps to achieving this mitigation strategy

1. Understand the historical perspective of flooding within the Goose Lake Watershed.
   a. *Responsible Party* – Public Works – Environmental Engineer (COF & TOV)
   b. *Funding source* – Municipal Budget. Ongoing operating expense (COF & TOV)
   c. *Completion date* – October 2020

2. Continually report on existing conditions within the Goose Lake Watershed (Water Surface Elevation).
   a. *Responsible Party* – Public Works – Environmental Engineer (COF & TOV)
   b. *Funding source* – Municipal Budget. Ongoing operating expense (COF & TOV)
   c. *Completion date* – Ongoing

Strategy #1	Goose Lake Watershed Study

3. Identify mitigation alternatives (Increase downstream conveyance and Increase storage in the system).
   a. *Responsible Party* – Public Works and Environmental Engineer (COF & TOV)
   b. *Funding source* – Municipal Budget- Ongoing operating expense. (COF & TOV)
   c. *Completion date* – October 2020

4. Identify primary plan (overflow route, outlet capacity, and lower water surface level.)
   a. *Responsible Party* – Public Works and Environmental Engineer (COF & TOV)
   b. *Funding source* – Municipal Budget – Ongoing operating expense. (COF & TOV)
   c. *Completion date* – Ongoing

5. Confirm primary plan and meet with stakeholders to establish project requirements and funding.
   a. *Responsible Party* – Public Works and Environmental Engineer (COF & TOV)
   b. *Funding source* – Future Capital Improvement Plan and potential FEMA grant funding.
   c. *Completion date* – TBD – based on municipal budget approvals.

Strategy #2	**Lake Barney Stormwater & Flood Mitigation**
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	**Structural Project**

Since 2018, runoff and high groundwater from abnormally high rainfall has raised water levels in Lake Barney, causing the lake to find a surface water outflow for the first time in over 70 years. The higher lake levels have caused local flooding, loss of agricultural lands, loss of flood storage, and stormwater flooding downstream in the Town and Village of Oregon. This project will determine what can be done to improve the negative impacts that have been seen surrounding Lake Barney.

Defined steps to achieving this mitigation strategy

1. Understand the historical perspective water retention within the Lake Barney Kettles.
   a. *Responsible Party* – Public Works – Environmental Engineer
   b. *Funding source* – Municipal Budget. Ongoing operating expense
   c. *Completion date* – September 2020

2. Continually report on existing conditions within Lake Barney – Water retention.
   a. *Responsible Party* – Public Works – Environmental Engineer
   b. *Funding source* – Municipal Budget. Ongoing operating expense
   c. *Completion date* – Ongoing

3. Identify mitigation alternatives (what areas will benefit from lowering the lake level).
   a. *Responsible Party* – Public Works and Environmental Engineer
   b. *Funding source* – Municipal Budget- Ongoing operating expense.
   c. *Completion date* – TBD

Strategy #2	Lake Barney Stormwater & Flood Mitigation

4. Determine annual farming revenue lost – and other property impacts
   a. *Responsible Party* – Public Works and Environmental Engineer
   b. *Funding source* – Municipal Budget – Ongoing operating expense
   c. *Completion date* – Ongoing

5. Estimate Costs (permitting, designing, constructing, and maintaining the system).
   a. *Responsible Party* – Public Works and Environmental Engineer
   b. *Funding source* – Local, State, and Federal considerations
   c. *Completion date* – TBD – based on design and jurisdictional involvement.

Strategy #3	Create Sustainability Plan
Prevention	**Natural Resource Protection**
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

A sustainability plan serves as a value statement, a guidebook, and an analytical framework that documents a municipality's principles, goals, and progress toward environmental and climate considerations. Efforts include greater community engagement, civic participation, and enhanced connections to conservation and maintenance.

Defined steps to achieving this mitigation strategy

1. Work with the Resource Conservation Commission to move a sustainability plan forward.
   a. *Responsible Party* – Planning and Zoning – Sustainability Specialist
   b. *Funding source* – Municipal Budget. Ongoing operating expense.
   c. *Completion date* – Ongoing

2. Anticipate impacts associated with climate change in respect to Fitchburg's 2019 Clean Energy Resolution that calls for a resiliency/sustainability and adaption plan.
   a. *Responsible Party* – Planning and Zoning – Sustainability Specialist
   b. *Funding source* – Municipal Budget. Ongoing operating expense
   c. *Completion date* – Ongoing

3. Identify existing plans in the City of Fitchburg that are related to or mention sustainability efforts.
   a. *Responsible Party* – Planning and Zoning – Sustainability Specialist
   b. *Funding source* – 2022 City of Fitchburg Operating Budget
   c. *Completion date* – End of Year 2022

Strategy #3	Create Sustainability Plan

4. Identify an engineering firm that will assist with process design and analytical tasks.
   a. *Responsible Party* – Planning and Zoning – Sustainability Specialist
   b. *Funding source* – 2022 City of Fitchburg Operating Budget
   c. *Completion date* – End of Year 2022

5. Project plan implementation.
   a. *Responsible Party* – Sustainability Specialist and Resource Conservation Commission
   b. *Funding source* – TBD Operating Budget
   c. *Completion date* – TBD – based on Sustainability Plan recommendations.

Strategy #3	Hazard Awareness & Education
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

Support Dane County efforts to mitigate natural hazards at the local level through continued collaboration with County projects in the City of Fitchburg area. The City will support community resiliency be raising awareness of potential hazards and building support for mitigation strategies community-wide.

Defined steps to achieving this mitigation strategy

1. Utilize existing and future City communication avenues, such as the City's website, social media platforms, Monona's WVMO radio, local print media, and other resources to provide residents with information on potential hazards and mitigation strategies.
   a. *Responsible Party* – City Administration, Fire Department, and Police Department.
   b. *Funding source* – Existing departmental budgets.
   c. *Completion date* – On-going

2. Train a contingent of volunteers to assist public safety and public works safely and appropriately in disaster response efforts. Examples of volunteer partners include (but not limited to): Fire Department volunteers, Red Cross, Salvation Army, staff of Monona WVMO radio station, untrained community volunteers.
   d. *Responsible Party* – Police and Fire/EMS Departments
   e. *Funding source* – Existing departmental budgets
   f. *Completion date* – On-going

Strategy #3	Hazard Awareness & Education

3. Improve non-emergency communications with stakeholders that do not require 911 dispatch communications. Examples of such communications include: "breach in sandbag levee"; "Central location to report problems"; "coordination of donation material collections"; Where is Red Cross set up"; "Report a lost child"; "Rumor control", etc.
   d. *Responsible Party* – Police and Fire/EMS Departments, City Administration, Community Media Department.
   e. *Funding source* – Existing departmental budgets
   f. *Completion date* – On-going

Dane County Natural Hazard Mitigation Plan

City of Madison Annex

Summer 2022

City of Madison Annex

This annex is a part of the Dane County Natural Hazard Mitigation Plan (DCNHMP). The DCNHMP contains additional information to support the Federal Emergency Management Agency's (FEMA) recognition of the plan (including this annex) as the formal natural hazard mitigation plan for the county and participating local governments. This annex will be valid for as long as FEMA approves the DCNHMP. The strategies adopted in this annex are designed to guide community efforts to reduce risks from natural hazards. These strategies work in conjunction with neighboring communities and Dane County government to reduce risks from natural hazards.

COMMUNITY PROFILE

The City of Madison is located in the center of Dane County. The city completely surrounds the smaller Town of Madison and the City of Monona, as well as the villages of Maple Bluff and Shorewood Hills. Madison shares borders with its largest suburb, Sun Prairie, and three other communities, Middleton, McFarland, and Fitchburg. Downtown Madison is located on an isthmus between Lakes Mendota and Monona. The city is sometimes described as The City of Four Lakes, comprising the four successive lakes of the Yahara River: Lake Mendota ("Fourth Lake"), Lake Monona ("Third Lake"), Lake Waubesa ("Second Lake") and Lake Kegonsa ("First Lake"), although Waubesa and Kegonsa are not actually in Madison, and is situated to the south of the city. A fifth smaller lake, Lake Wingra, is within the city as well, separate to the Yahara River chain. The Yahara flows into the Rock River, which in turn, flows into the Mississippi River. The city's trademark of "Lake, City, Lake" reflects this geography. Notable areas within the City include the Wisconsin State Capitol and the University of Wisconsin-Madison. Land use is intensely urban in the City's core, with commercial, residential, and industrial land uses throughout the other areas of the City. According to the Dane County Land Information Office, the City of Madison a total area of 79.4 square miles.

As of the 2019 Census Estimates, the population is approximately 254,977 people, and the number of 110,294 households residing in the City of Madison. The population density is 3,037 per square mile, and the average of household size is 2.21 people per household. Table 1 shows the population profile by age for City of Madison.

Table 1 Population Profile of City of Madison, Dane County

Category	Number	Percent
Total Population	**254,977**	**100%**
Under 5 years	12,572	4.9%
5 to 9 years	11,590	4.5%
10 to 14 years	10,951	4.3%
15 to 19 years	19,337	7.6%
20 to 24 years	41,241	16.2%
25 to 29 years	26,831	10.5%
30 to 34 years	22,328	8.8%
35 to 39 years	17,267	6.8%
40 to 44 years	13,942	5.5%
45 to 49 years	12,414	4.9%
50 to 54 years	12,315	4.8%
55 to 59 years	12,425	4.9%
60 to 64 years	12,167	4.8%
65 to 69 years	10,957	4.3%
70 to 74 years	6,573	2.6%
75 to 79 years	4,801	1.9%
80 to 84 years	3,351	1.3%
85 years and over	3,915	1.5%

Data Source: 2019 ACS Estimates - U.S. Census

Growth & Development Trends

Table 2-3 illustrates how the entire City of Madison has grown in terms of population and number of households between 2010 and 2020. Housing data is to 2020 due to data availability. Table 2-3 is drawn from the Wisconsin Department of Administration.

Table 2 City of Madison Change in Population and Households, 2010-2020

2010 Population	2020 Population	Percent Change (%) 2010-2020	2010 # of Households	2020 # of Households	Percent Change (%) 2010-2020
233,209	259,233	11.15%	102,516	144,245	40.70%

Data Source: DCEM & Wisconsin Department of Administration

Table 3 City of Madison Population Projections, 2020-2040

Population Projection	2020	2025	2030	2035	2040
Increase by half of percent of change (11.15%/2) every 5 yrs.	259,233	273,672	288,915	305,007	321,996

Data Source: Demographic Services Center, Wisconsin Department of Administration, 2021

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Population Summary

Tables 4-7 illustrates key population demographics within the City of Madison. Key demographics include: (1) Disability Characteristics, (2) Federal Income Poverty Levels, (3) Educational Attainment, and (4) Household Language with English Speaking Capabilities. Due to data availability, all key demographic information has been provided by the American Community Survey (ACS) 2019 estimates. The ACS is a self-reported survey and may include total sample size differences and statistical margin of error.

Table 4 City of Madison, Dane County – Disability Characteristics by Detailed Age

Category	Number	Percent
Total of Residents Self-Identified as Disabled	**36,240**	**100%**
With a hearing difficulty	**5,049**	**13.9%**
Population under 18 years	155	-
Population 18 to 64 years	1,947	-
Population 65 years and over	2,947	-
With a vision difficulty	**3,054**	**8.4%**
Population under 18 years	145	-
Population 18 to 64 years	1,654	-
Population 65 years and over	1,255	-
With a cognitive difficulty	**8,417**	**23.2%**
Population under 18 years	981	-
Population 18 to 64 years	5,778	-
Population 65 years and over	1,658	-
With an ambulatory difficulty	**8,612**	**23.8%**
Population under 18 years	110	-
Population 18 to 64 years	4,117	-
Population 65 years and over	4,385	-
With a self-care difficulty	**3,827**	**10.6%**
Population under 18 years	264	-
Population 18 to 64 years	1,981	-
Population 65 years and over	1,582	-
With an independent living difficulty	**7,281**	**20.1%**
Population 18 to 64 years	4,257	-
Population 18 to 34 years	1,605	-
Population 65 years and over	3,024	-

Data Source: 2019 ACS Estimates - U.S. Census

Table 5.1: City of Madison, Dane County – Federal Income Poverty Levels (FIPL) by Families Summary

Category	Number of Families
50 percent of poverty level	1,415
125 percent of poverty level	4,256
150 percent of poverty level	5,574
185 percent of poverty level	7,559
200 percent of poverty level	8,382
300 percent of poverty level	13,712
400 percent of poverty level	20,348
500 percent of poverty level	27,026

Data Source: 2019 ACS Estimates - U.S. Census

Note: Use table 5.2 to interpret table 5.1:

5.1 identifies the *total number of families* (regardless of size) by percentage.

5.2 identifies *family size* in relation to annual family income and the percentage category of the FIPL.

Table 5.2: City of Madison, Dane County – Annual Federal Income Poverty Level Guide

2021 Annual Federal Poverty Level Guide									
Family Size	50%	100%	125%	150%	185%	200%	300%	400%	500%
1	$6,440	$12,880	$16,100	$19,320	$23,828	$25,760	$38,640	$51,520	$64,400
2	$8,710	$17,420	$21,775	$26,130	$32,227	$34,840	$52,260	$69,680	$87,100
3	$10,980	$21,960	$27,450	$32,940	$40,626	$43,920	$65,880	$87,840	$109,800
4	$13,250	$26,500	$33,125	$39,750	$49,025	$53,000	$79,500	$106,000	$132,500
5	$15,520	$31,040	$38,800	$46,560	$57,424	$62,080	$93,120	$124,160	$155,200
6	$17,790	$35,580	$44,475	$53,370	$65,823	$71,160	$106,740	$142,320	$177,900

Data Source: dhs.wisconsin.gov

Table 6: City of Madison, Dane County – Educational Attainment by Householders

Category	Number	Percent
Total of Householders	**50,843**	**100%**
Less than high school graduate	2,033	4.0%
High school graduate (includes equivalency)	6,508	12.8%
Some college, associate's degree	11,721	23.1%
Bachelor's degree or higher	30,581	60.1%

Data Source: 2019 ACS Estimates - U.S. Census

Table 7: City of Madison, Dane County – Household Language & English Speaking Capabilities

Category	Number	Percent
Total of Households	**110,294**	**100%**
English only:	**93,590**	**84.9%**
Spanish:	**5,377**	**4.9%**
Limited English speaking household	831	-
Not a limited English speaking household	4,546	-
Other Indo-European languages:	**4,151**	**3.8%**
Limited English speaking household	368	-
Not a limited English speaking household	3,783	-
Asian and Pacific Island languages:	**5,945**	**5.4%**
Limited English speaking household	1,694	-
Not a limited English speaking household	4,251	-
Other languages:	**1,231**	**1.1%**
Limited English speaking household	216	-
Not a limited English speaking household	1,015	-

Data Source: 2019 American Community Survey

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Asset Inventory

Assets include the people, property, and critical facilities within the City of Madison that are exposed to hazards in general. Inventories of property, essential infrastructure, and natural, cultural or historic resources help provide a comprehensive picture of the community and provide a method of assessing exposure to hazards by establishing the improved and total values, capacities and populations for these assets. It also forms the basis for estimating potential losses, where possible.

General Property

Table 8 Property Exposure Summary

Property Type	Parcel Count	Improved Land Count	Improved Land Value ($)	Content Value ($)	Total Value ($)
Total	**75,020**	**75,020**	**45,808,306,300**	**22,904,153,150**	**68,712,459,450**
Agriculture	150	150	32,957,500	16,478,750	49,436,250
Industrial	807	807	1,356,041,200	678,020,600	2,034,061,800
Residential	69,705	69,705	36,000,796,800	18,000,398,400	54,001,195,200
Transportation	171	171	284,639,400	142,319,700	426,959,100
Utility	225	225	40,227,400	20,113,700	60,341,100
Commercial	2,875	2,875	7,737,232,200	3,868,616,100	11,605,848,300
Other	381	381	100,084,400	50,042,200	150,126,600
Institutional/ Governmental	706	706	256,327,400	128,163,700	384,491,100

Data Source: Dane County Land Information Office, December 2021

Critical Facilities

The City of Madison has identified the critical facilities important to protect from disaster impacts. These are collected in Table 9. Table 9 is based on GIS data inventories from Dane County and information gathered from the Town. No further supplemental data was provided by the community through the Data Collection Guide.

Table 9 Critical Facility Summary/Essential Infrastructure

Facility	Type*	No. of Facilities	Replacement Value ($)
Housing Structures by Type	**X**	**X**	**X**
- Single Family	VF	47,975	$10,025,647,600
- Multi Family	VF	7,095	$8,542,538,700
- Condos	VF	25	$324,016,200
- Owner Occupied	VF	46,058	$10,563,055,200
- Housing units owned & Maintained by City	VF	742	N/A
Built Environment	**X**	**X**	**X**
- Lane Miles for motorized vehicles	EI	998	N/A
- Miles of storm sewer maintained by City	EI	529	N/A
- Water holding / retention ponds	EI	509	N/A
- Greenways	EI	195	N/A
- Government Buildings	EI	982	N/A
- Healthcare Facilities	EI	25	N/A
- Power Generating Facilities	EI	2	N/A
- Public & Private Schools (K-12)		43	N/A
- Colleges & Technical Schools	EI	14	N/A
- Food Pantries	EI	19	N/A
Natural Environment	**X**	**X**	**X**
- Public Parks	NA	255	N/A
- Active Landfills	NA	1	N/A
- Ponds / Lakes / Streams	NA	67	N/A
Economy	**X**	**X**	**X**
- Number of Jobs	X	242,364	N/A
- Average Commute Time	X	19 Minutes	N/A
- Madison GDP	X	$51,475,512	N/A
*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: Natural Assets			

Data Source: 2021 City of Madison Data Collection Guide

Other Assets

Other assets help define a community beyond the current composition of the City of Madison. These assets may provide economic benefit to the community, in addition to preserving the heritage and diversity of the community and may include natural, cultural and historic assets or economic assets such as major employers. It may also include more specific detail on critical facilities. The City of Madison has not identified any other assets.

VULNERABILITY ASSESSMENT

A hazard identification and vulnerability analysis was completed for the City of Madison using the same methodology in the County's base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete.

The first step in a hazard analysis is to identify which hazards the community is vulnerable to. Table 10 outlines the hazard identification for the City of Madison based on the Data Collection Guide issued in 2021. The Data Collection Guide listed all of the hazards that could impact Dane County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. Brooklyn's planning team members were asked to complete the matrix by ranking each category on a scale of 0 to 5 based on the experience and perspective of each planning team member. A ranking of 0 indicated "no concern" while a ranking of 5 indicated "highest concern." This matrix appears as Table 10. This matrix reflects the significance of the hazards relative to one another as perceived by the Example's planning team.

This matrix reflects that the City of Madison is most vulnerable to tornadoes, wind storms, and floods. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 10: Vulnerability Assessment Matrix for the City of Madison

Name of Jurisdiction: City of Madison										
Hazard	**Hazard Attributes**			**Impact Attributes**						
				Primary Impact (Short Term - Life and Property)			**Secondary Impact (Long Term – Community Impacts)**			
	Area of Impact	Past History, Probability of Future Occurrence	Short Term Time Factors	Impact on General Structures	Impact on Critical Facilities	Impact on At-Risk Populations	Social Impact	Economic Impact	Severity Of Other Associated Secondary Hazards	**Total of Row Values**
	(1-5)	*(1-5)*	*(1-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	
Dam/Levee failure	5	2	5	3	4	3	4	4	4	34
Extreme Cold	5	5	2	2	3	5	2	2	1	27
Extreme Heat	5	5	2	1	3	5	2	2	1	25
Drought	5	5	2	0	1	2	2	2	1	20
Expansive soils	1	1	1	1	1	1	1	1	1	9
Flood	3	5	5	4	4	4	4	4	4	37
Fog	2	4	3	0	0	0	0	0	0	9
Hail Storm	3	4	3	4	1	2	2	3	2	24
Landslide	1	1	1	1	1	1	1	1	1	9
Lightning	3	5	4	3	3	2	2	2	2	26
Tornado	3	5	4	5	5	4	4	4	4	38
Wildfire	1	1	1	1	1	1	1	1	1	9
Windstorm	4	4	4	4	4	4	4	4	4	36
Winter Storm	5	5	3	2	2	4	4	2	2	29

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County. The previous inventory tables quantify what is exposed to the various hazards within City of Madison. Table 11 cross-references the hazards with the various tables where exposure or vulnerability specifics are found. The intent of Table 6 is to quantify, where possible, future impacts of each hazard on the jurisdiction. In many cases it is difficult to estimate potential losses, so the overall exposure of populations, structures, and critical facilities is referenced.

Table 11 Hazard Vulnerability Specifics

Hazard	Populations	Structures	Critical Facilities	Future Damage Potential
Dam Failure	See Tables 4-7 Population	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Drought	Moderate	None	Minimal	Specifics unknown; See hazard profile in County Plan
Flooding	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below
Fog	None	None	None	Specifics unknown; See hazard profile in County Plan
Hailstorm	Moderate	See Property Exposure table 8	Minimal	Specifics unknown; See hazard profile in County Plan
Landslide/ Sinkholes/ Erosion	Minimal	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Lightning	Moderate	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Severe Cold	See Tables 4-7 Population	Moderate	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Severe Heat	See Tables 4-7 Population	Minimal	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Winter Storm	See Tables 4-7 Population	Moderate	Moderate	Specifics unknown; See hazard profile in County Plan
Tornado	See Table 15 below	See Table 15 below	See Table 15 below	See Table 15 below
Wildfire	Minimal	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Windstorm	See Tables 4-7 Population	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan

Data Source: 2021 City of Madison Data Collection Guide – Prepared by DCEM

Previous Hazard Events

Through the Data Collection Guide, the City of Madison noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the main mitigation plan. These events had a particular impact on the community beyond the impacts and events recorded in the Dane County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

City of Madison Historic Natural Hazards

Table 12 City of Madison Historic Natural Hazards

Natural Hazard	Date	Impacted Structures	Comprehensive Harm to Jurisdiction	Other reported Losses (Fiscal reports, programs, etc.)	Comments
Winter Storm	1/29/1996	N/A	A rare, widespread ground blizzard tormented Southcentral and Southeast Wisconsin with the worst whiteout conditions ever experienced by some residents and travelers.	N/A	High likelihood of reoccurring
Winter Storm	1/16/1997	N/A	Whiteout conditions, due to blowing snow, stopped traffic on I-94 in Kenosha county before daybreak. Traffic was also brought to a standstill in rural points of Racine county during the late afternoon hours.	N/A	High likelihood of reoccurring
Winter Storm	2/24/2007	N/A	Heavy snows at the rate of 1 to 3 inches per hour occurred for several hours along with frequent east wind gusts of 30 to 33 knots (35 to 38 mph) reduced visibilities to 1/8 to 1/4 mile.	N/A	High likelihood of reoccurring

Winter Storm	12/11/2010	N/A	An upper-level trough deepened over the central Plains, developing a deep area of surface low pressure that tracked from Iowa across Illinois. A state of emergency was declared for all 72 counties by Governor James Doyle.	N/A	High likelihood of reoccurring
Winter Storm	2/1/2011	N/A	Drifting snow closed county roads, with many stranded motorists having to be rescued from vehicles buried in the drifting snow. About 100 National Guardsman were mobilized statewide in response to Gov. Scott Walker's emergency declaration for 29 counties to help rescue motorists and run emergency shelters at armories.	N/A	High likelihood of reoccurring
Winter Storm	12/20/2012	N/A	Major highways as well as a majority of side roads became nearly impassible as plowing operations were greatly limited, or completely suspended as plows became stuck in the heavy, wet, drifting snow. Area airports suspended all flight operations.	N/A	High likelihood of reoccurring
Drought	8/1/2002	N/A	N/A	N/A	High likelihood of reoccurring
Drought	8/1/2003	N/A	N/A	N/A	High likelihood of reoccurring
Drought	9/1/2003	N/A	N/A	N/A	High likelihood of reoccurring

Drought	10/1/2003	N/A	N/A	N/A	High likelihood of reoccurring
Drought	11/1/2003	N/A	N/A	N/A	High likelihood of reoccurring
Drought	12/1/2003	N/A	N/A	N/A	High likelihood of reoccurring
Drought	7/1/2005	N/A	The drought was preceded by a long period of below-normal precipitation extending back to March, 2005.	N/A	High likelihood of reoccurring
Drought	8/1/2005	N/A	At Madison's Truax Field (Dane Co.) , a 3.11 inch rainfall deficit was reported in August, setting the March through August deficit at 7.19 inches.	N/A	High likelihood of reoccurring
Drought	9/1/2005	N/A	Rainfall deficits grew once again the following week as a hot and dry air mass resided over the region.	N/A	High likelihood of reoccurring
Drought	10/1/2005	N/A	N/A	N/A	High likelihood of reoccurring
Drought	11/1/2005	N/A	For the month, except for Lafayette County, all counties had at least 3 to 4 inches of rain, with a band from Beloit to West Bend to Port Washington receiving 4 to 5 inches	N/A	High likelihood of reoccurring
Drought	7/1/2007	N/A	The corn, soybean, and alfalfa (hay) crops planted in poorer or well-drained soils had their growth affected. Yields per acre were expected to be below normal during the fall harvest season.	N/A	High likelihood of reoccurring

Drought	6/26/2012	N/A	Rainfall amounts ranged from around 3/10 inch in the south-central area to around 3 inches in the city of Sheboygan. This translated to monthly deficits ranging from around 4 inches to 1 inch.	N/A	High likelihood of reoccurring
Drought	7/1/2012	N/A	The extremely dry conditions that began in June continued in July across southern Wisconsin. Many locations did not see any precipitation until several rounds of thunderstorms moved through the region during the middle and end of the month.	N/A	High likelihood of reoccurring
Drought	7-11/2012	N/A	Conditions continue	N/A	High likelihood of reoccurring
Drought	9/1/2012	N/A	Conditions continue	N/A	High likelihood of reoccurring
Drought	10/1/2012	N/A	Conditions continue	N/A	High likelihood of reoccurring
Drought	11/1/2012	N/A	Conditions continue	N/A	High likelihood of reoccurring
Excessive Heat	1-3/2000	N/A	Extreme heat conditions throughout January to March.	N/A	High likelihood of reoccurring
Excessive Heat	7/17/2011	N/A	Maximum daily heat index values ranged from 102 to 110 over the four days of July 17th through July 20th.	N/A	High likelihood of reoccurring
Excessive Heat	7/2/2012	N/A	N/A	N/A	High likelihood of reoccurring
Excessive Heat	6/29/2018	N/A	Heat index values ranging from 100 to 118 degrees.	N/A	High likelihood of reoccurring

Extreme Cold	1-2/1996	N/A	Extended below freezing conditions throughout January to February.	N/A	High likelihood of reoccurring
Extreme Cold	1/17/1997	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	5/20/1997	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	1/5/1999	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	12/18/2005	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	2/17/2006	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	2/18/2006	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	2/3/2007	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	1/2008	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	12/2008	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	1/13/2009	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	1/14/2009	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	1/24/2009	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	1/21/2011	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	1/21/2013	N/A	N/A	N/A	High likelihood of reoccurring
Extreme Cold	1/27/2014	N/A	Wind chill temperatures ranged from 20 below to 34 below zero.	N/A	High likelihood of reoccurring
Extreme Cold	1/7/2015	N/A	Wind chill temperatures of 20 below to 34 below zero.	N/A	High likelihood of reoccurring
Extreme Cold	1/9/2015	N/A	Wind chill temperatures of 15 below to 25 below zero.	N/A	High likelihood of reoccurring
Extreme Cold	12/14/2016	N/A	Wind chill	N/A	High likelihood

			temperatures dropped to around 20 below zero.		of reoccurring
Extreme Cold	12/18/2016	N/A	Wind chill temperatures dropped to 20 to 26 below zero with the coldest readings the morning of December 19th.	N/A	High likelihood of reoccurring
Extreme Cold	12/25/2017	N/A	Wind chill temperatures of 20 below to 34 below zero, and low temperatures below zero occurred at times during this period of prolonged arctic air. The Dane County Medical Examiner confirmed four deaths due to hypothermia. Four businesses and two apartments suffered water damage from burst pipes, but more instances of frozen and burst pipes likely occurred.	N/A	High likelihood of reoccurring
Extreme Cold	1/1/2018	N/A	Wind chill temperatures of 20 below to 34 below zero, and low temperatures below zero occurred at times during this period of prolonged arctic air. The Dane County Medical Examiner confirmed four deaths due to hypothermia. Four businesses and two apartments suffered water damage from burst pipes, but more instances of frozen and burst pipes likely occurred.	N/A	High likelihood of reoccurring

Extreme Cold	2/6/2021	N/A	Wind chill temperatures mainly from 20 below to 34 below zero.	N/A	High likelihood of reoccurring
Extreme Cold	2/13/2021	N/A	Coldest wind chill temperatures mainly from 25 below to 34 below zero.	N/A	High likelihood of reoccurring
Flood	06/17/1996	N/A	Significant flooding up to 3 ft. deep on roadways, retention ponds over flowed in housing developments, soil erosion and flooded farm lands. $10 million in crop damage, $3 million in economic loss.	N/A	High likelihood of reoccurring
Flood	08/04/1997	Multiple Intuitional Structures Impacted	Urban street flooding, water reported over the curbs on the UW Campus.	N/A	High likelihood of reoccurring
Flood	03/30/1998	None	Brief power outage, minor urban street flooding.	N/A	High likelihood of reoccurring
Flood	02/11/1999	N/A	Torrential rain with frozen ground lead to urban street flooding, mudslide on the UW campus. Power outages, trees and power lines toppled.	N/A	High likelihood of reoccurring
Flood	06/28/1999	N/A	Urban street flooding.	N/A	High likelihood of reoccurring
Flood	06/14/2001	N/A	Torrential rain lead to urban street flooding 1-2 inches of rain per hour. Minor urban and small stream flooding.	N/A	High likelihood of reoccurring
Flood	09/07/2001	N/A	Street flooding cause many cars to stall out in low lying areas.	N/A	High likelihood of reoccurring

Flood	06/04/2004	Multiple Impacted Structures	Street flooding lakes at record levels. Minor flooding to 127 homes, and major damage to three homes. $1 Million in total damages.	N/A	High likelihood of reoccurring
Flood	08-09/2018	Multiple Impacted Structures	Hundreds of homes flooded and damaged. One death attributed to flash flooding. $1 million in damage	N/A	High likelihood of reoccurring
Flood	06/29/2020	Primary Impacted Structure	Sustained flooding, primarily in camp Randall stadium.	N/A	High likelihood of reoccurring
Wind Storm	04/06/1997	N/A	Strong gradient winds enhanced by scattered snow showers Madison tv-3 recorded peak wind of 71 mph. Power outages followed.	N/A	High likelihood of reoccurring
Wind Storm	11/10/1998	Multiple Impacted Structures	Numerous reports of damage toppled and damaged trees, barns, fences, boats, campers, trucks, homes, sheds. One death from windblown vehicle. Power outages followed. Extensive crop damage and commercial damage.	N/A	High likelihood of reoccurring
Wind Storm	10/10/2010	Multiple Impacted Structures	Numerous reports of damage roofs peeled back. trees fell on homes on the east side and regent street semi-trailer toppled by wind toppled and damaged trees, barns, fences, boats,	N/A	High likelihood of reoccurring

			campers, trucks, homes, sheds.		
Wind Storm	01/10/2013	N/A	Power outages, power lines down, toppled trees.	N/A	High likelihood of reoccurring
Wind Storm	03/16/2016	Multiple Impacted Structures	10k structure damage to roofs and shingles. Power outage to 2200 MG & E customers.	N/A	High likelihood of reoccurring
Wind Storm	07/19/2017	Multiple Impacted Structures	Home damage and power outages.	N/A	High likelihood of reoccurring
Lightening	07/1997	Multiple Impacted Structures	Multiple impacted structures, caused fires, and damages.	N/A	High likelihood of reoccurring
Lightening	06/18/1998	Multiple Impacted Utilities	Scattered trees and powerline damage	N/A	High likelihood of reoccurring
Lightening	05/16/1999	Multiple Impacted Properties	1 serious home fire and 5 vehicles damaged at a car dealership.	N/A	High likelihood of reoccurring
Lightening	06/01/2000	Multiple Impacted Structures	60 downed trees blocked various roads damage to homes damage to vehicles. 18 power lines down streets flooded.	N/A	High likelihood of reoccurring
Lightening	04/18/2002	Multiple Impacted Structures	2 home fires due to roof lightening strikes.	N/A	High likelihood of reoccurring
Lightening	05/21/2004	Multiple Impacted Properties	$150,000 lightening and storm damage	N/A	High likelihood of reoccurring
Lightening	05/06/2005	Multiple Impacted Properties	Struck 3 condo units causing $60,000 in damage.	N/A	High likelihood of reoccurring
Tornado	06/23/2004	Multiple impacted structures	2000 customers lost their electrical power. 194 residential homes reported damage. 11 residential homes had major damage 410k.	N/A	High likelihood of reoccurring

Tornado	08/08/2011	N/A	Tornado EF0	N/A	High likelihood of reoccurring
Tornado	06/16/2014	Multiple Impacted Structures	23 homes damaged. uprooted and snapped trees. $5 million in economic loss.	N/A	High likelihood of reoccurring
Tornado	10/07/2017	Multiple Impacted Structures	EF0 Severe storm damage o property, homes and vehicles 3 households were displaced 250.k damage.	N/A	High likelihood of reoccurring
Winter Storm	03/08/1998	N/A	Interstate hwy 90/94 and hwy 51 north closed during the afternoon and evening dozens of toppled powerlines many other road closures.	N/A	High likelihood of reoccurring
Winter Storm	01/02/1999	N/A	10.8 inches of snow fall	N/A	High likelihood of reoccurring
Winter Storm	02/11/2003	N/A	4- 5.1 inches of snow fall reported wind gusts 44mph.	N/A	High likelihood of reoccurring
Winter Storm	01/06/2005	N/A	11 inches of snow fall reported wind gusts 35mph.	N/A	High likelihood of reoccurring
Winter Storm	04/11/2007	N/A	Scattered power outages 10,000 customers lost power in south central wisconsin numerous flight delays and cancellations.	N/A	High likelihood of reoccurring
Winter Storm	2008	N/A	Dropped temperatures, vehicle slide offs, thunderstorms and wind gusts in late and early winter.	N/A	High likelihood of reoccurring
Winter Storm	2009	N/A	Heavy snow, blowing, and drifting snow in late and early winter.	N/A	High likelihood of reoccurring

Winter Storm	02/26/2013	N/A	Heavy snow 6-9 inches	N/A	High likelihood of reoccurring
Winter Storm	01/26/2014	N/A	1 road closure, stranded motorists and vehicle slide offs.	N/A	High likelihood of reoccurring
Winter Storm	2015	N/A	Moderate to heavy snowfall 2-12 inches. Heavy snow in late and early winter.	N/A	High likelihood of reoccurring
Winter Storm	12/29/2020	N/A	Heavy snowfall 4-8 inches.	N/A	High likelihood of reoccurring

Data Source: 2021 City of Madison Data Collection Guide

Flood Hazard

Structures and Properties in the Floodplain

Refer to the flood profile in the mitigation plan for a description of the methodology used to identify potentially flood-prone properties. Figure 1 shows mapped floodplains, future growth areas, and critical or vulnerable facilities. Tables 13 and 14 outline the primary structures on them within the City of Madison, Dane County. Potential number of individuals at risk figures are based on primary residential structures and the average household size within Dane County (2.37 people as of 2021). Estimated loss potentials for all structures on the floodway can be found within section 4.6 in chapter 4 of the county plan.

Table 13 Primary Structures in the 100 Year Floodplain

Residential Structures in 100 yr. Floodway	Non-Residential Structures in 100 yr. Floodplain	Total Structures in 100 yr. Floodplain	Potential # of People at Risk in 100 yr. Floodplain	Total Assessed Values ($) of Structures in 100 yr. Floodplain
61	28	89	144	$72,714,415

Source: Analysis based on Dane County Land Information Office Data

Table 14 Primary Structures in the 500 Year Floodplain

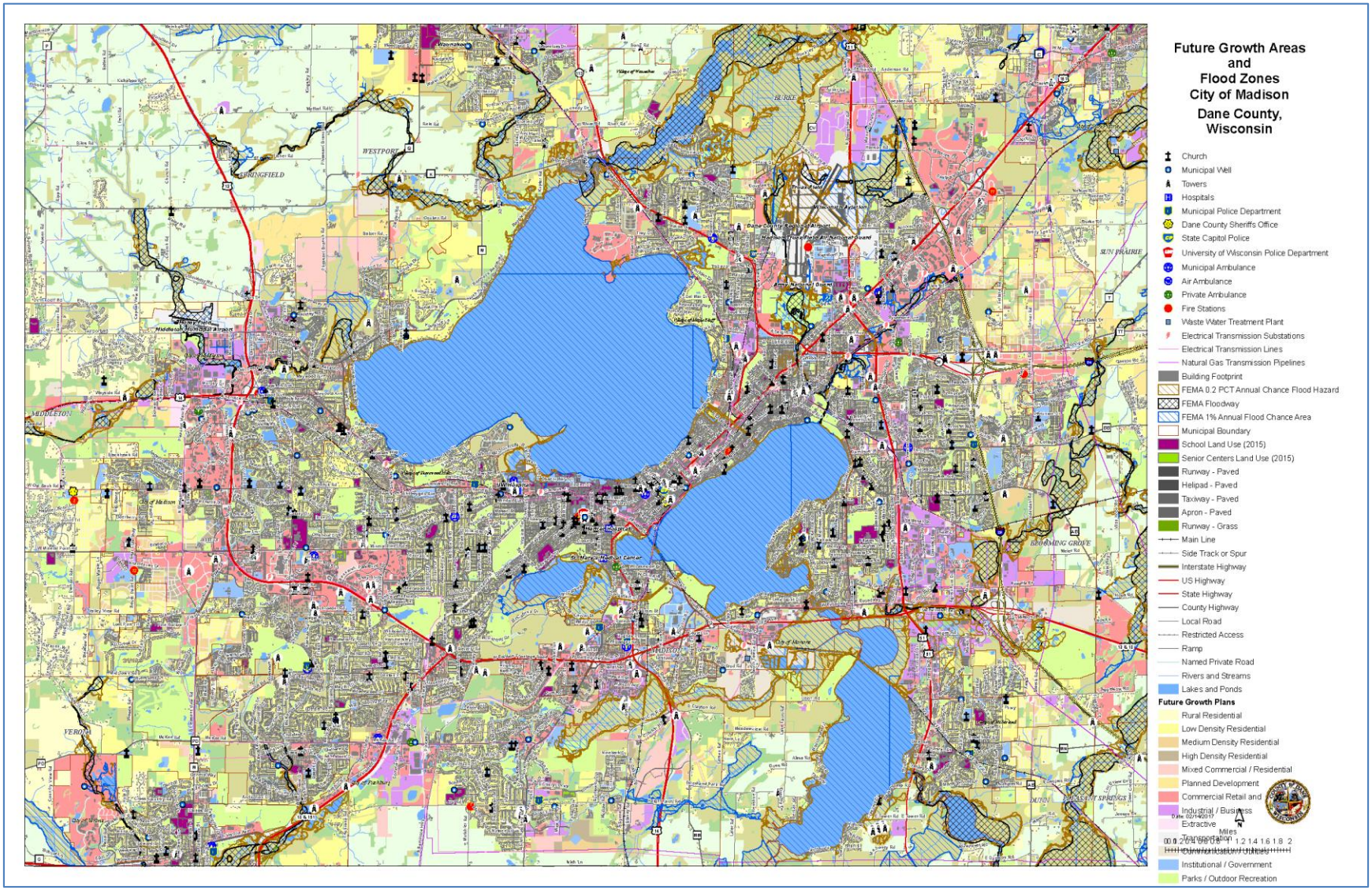
Residential Structures in 500 yr. Floodway	Non-Residential Structures in 500 yr. Floodplain	Total Structures in 500 yr. Floodplain	Potential # of People at Risk in 500 yr. Floodplain	Total Improved Values ($) of Structures in 500 yr. Floodplain
281	9	290	666	$94,755,706

Source: Analysis based on Dane County Land Information Office Data

Repetitive Loss Properties and Flood Insurance Polices

- Three repetitive loss properties have been reported in the City of Madison, Dane County.
- The City of Madison has 373 flood insurance policies in force within Dane County, with a total coverage of $112,829,900.

Figure 1 Flood Hazards and Future Land Use Map



Tornado

While it is difficult to estimate specific losses to a tornado due to the random nature of the event, a methodology was developed that was applied to each jurisdiction during the 2023 update. The table below estimates the percent area of the jurisdiction that could be impacted based on the average sized tornado (F2) in Dane County. High value exposure is based on 100% loss, medium 50% loss, and low is 25% loss to the property potentially impacted. The loss ratio, which is the ratio of the damaged building value to total exposed building value, is a measure of the impact to the jurisdiction as a whole. Communities with loss ratios 10% or more may have difficulty recovering from a disaster. Refer to the tornado hazard profile in the main mitigation plan for more details on this methodology.

Table 15 Tornado Loss Estimate

% Area impact	Improved Parcel Count	Affected Structure Estimate	Total Exposed Value ($)	Estimated Loss $ (High Damage Range)	Estimated Loss $ (Moderate Damage Range)	Estimated Loss $ (Low Damage Range)	Loss Ratio for Moderate Damage Range
1.06%	75,020	797	68,712,459,450	730,177,417	365,088,708	182,544,354	1%

Data Source: Analysis Based on Dane County Land Information Office's data

Problems or Additional Vulnerability Issues

Please refer to Chapter 4 in the County Plan for emerging vulnerability issues.

CAPABILITY ASSESSMENT

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities for the City of Madison.

Mitigation Capabilities Summary

Table 16 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities, or by themselves contribute to reducing hazard losses. The table also indicates which of these tools are currently utilized in the City of Madison.

Table 16 City of Madison Regulatory Mitigation Capabilities

Regulatory Tools (ordinances, codes, plans)	Yes/ No	Comments
Existing Natural Hazard Mitigation Plan	Yes	2018 annex to Dane County Plan
General or Comprehensive plan	Yes	Imagine Madison adopted 2018
Zoning ordinance	Yes	CH 28 MGO
Subdivision ordinance	Yes	CH 16 MGO
Growth management ordinance	N/A	N/A
Shoreland / wetland zoning ordinance	Yes	Ch 28 MGO
Floodplain zoning ordinance	Yes	Ch 28 MGO
FEMA / NFIP Community Rating System	Yes	As administered by FEMA.
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	CH 37 MGO (Stormwater)
Building code	Yes	2015 International Building Code
Fire department ISO rating	Yes	Rating: 1
Climate change Impact program	Yes	In 2021, the City of Madison hired a sustainability and resilience coordinator. That position is charged with developing a plan to abate climate change.
Erosion or sediment control program	Yes	CH 37 MGO (Stormwater)
Stormwater management program	Yes	CH 37 MGO (Stormwater)
Site plan review requirements	Yes	CH 37 MGO (Stormwater); Ch28 Zoning, others
Capital improvements plan	Yes	Capitol Finance Budget
Economic development plan	Yes	Connect Madison: Economic Development Plan approved 201

Regulatory Tools (ordinances, codes, plans)	Yes/ No	Comments
Local emergency operations plan	Yes	Adopted in 2011
Other special plans	N/A	N/A
Flood insurance study or other engineering study for streams	Yes	Citywide Watershed Studies (23 total; in progress)
Elevation certificates (for floodplain development)	Yes	Part of plan submittal and approval
Climate Action Plan	Yes	In 2021, the City of Madison hired a sustainability and resilience coordinator. That position is charged with developing a plan to abate climate change.

Data Source: City of Madison Data Collection Guide, 2021

Table 17 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in the City of Madison.

Table 17 Responsible Personnel and Departments for the City of Madison

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	Engineering; Various staff Planning, various staff	Engineering: Stormwater, Sanitary Sewer, Street, etc. Planning: Development Review, Neighborhood Planning, Comprehensive Planning
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Building Inspection/ Construction Supervisor	Kyle Bunnow, P.E.
Planner/engineer/scientist with an understanding of natural hazards	Yes	Engineering; Various staff	Stormwater, Sanitary Sewer, Street, etc.
Personnel skilled in GIS	Yes	Planning, Engineering, Traffic Engineering; IT; Parking Utility; Water Utility	30+ staff
Full-time Building Official	Yes	Building Inspection	N/A
Personnel Skilled in Climate Resilience	Yes	Mayor's Office/Sustainability and Resilience Coordinator	N/A
Floodplain Manager	Yes	Zoning Administrator functions in this capacity.	N/A
Emergency Manager	Yes	Fire/ Fire Marshal-Emergency Management Coordinator	N/A

Real Estate Acquisition Personnel	Yes	Economic Development-Office of Real Estate	N/A
Grant Writer	N/A	Grant director and citywide grants group with representatives from various agencies	N/A
Other Personnel	N/A	N/A	N/A
GIS Data Resources – (land use, building footprints, etc.)	Yes	Engineering, Planning, IT, Water Utility,	Critical facilities maintained by engineering and respective utilities, land use data updated by planning, building footprints updated by Engineering, vulnerable facilities maintained by planning
Warning systems/services	Yes	Outdoor warning sirens, Emergency Alert System, RAVE alerts, cell phone alerts	RAVE is similar to Reverse 911

Data Source: City of Madison Data Collection Guide 2021

Table 18 identifies financial tools or resources that the City of Madison could potentially use to help fund mitigation activities.

Table 18 Financial Resources for the City of Madison

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Dedicated funding for land, easement or conservation easement acquisition	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	No
Withhold Spending in hazard prone areas	No

Data Source: City of Madison Data Collection Guide

National Flood Insurance Program Status

The City of Madison currently participates in the National Flood Insurance.

Additional Capabilities

The City of Madison has identified the following as additional capabilities in the 2021 Data Collection Guide:

- City of Madison Flooding website has a variety of information for homeowners https://www.cityofmadison.com/flooding for household preparedness, adaption and emergency response.
- The City of Madison Stormwater website has environmental education: https://www.cityofmadison.com/engineering/stormwater/education
- The Water Utility has information on sustainability and water use: https://www.cityofmadison.com/water/sustainability
- Citywide Flood Mitigation studies and watershed studies to identify deficiencies in the Stormwater and drainage system. This program helps inform capital improvement projects. The high lake level analysis/dam breach analysis identified vulnerable infrastructure and provides key elevations for the installation of back-up generators and helps improve emergency response.

Public Involvement Activities

The City of Madison provided a publically noticed listening session with the City of Madison Common Council Executive meeting on December 7, 2021 as well as the Sustainable Madison Committee on November 11, 2021. Both meetings were noticed on the City of Madison website, and provided an agenda discussing the draft mitigation strategies. Minimal additions have been added to the draft mitigation strategies.

MITIGATION STRATEGIES

Below are the identified mitigation strategies developed by the City of Madison's NHMP steering committee. Mitigation is defined as a sustained action to reduce or eliminate risk to people and property from hazards and their effects. A *mitigation strategy* is a long-term vision for risk reduction in local jurisdictional or regional planning. A mitigation strategy can be achieved by a list of overall improvements to achieve (goals) that provide direction for community efforts to reduce potential losses identified in the risk assessment.

Strategy #1	**Emergency power for critical facilities and services**
Prevention	Natural Resource Protection
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	Structural Project

Provide emergency back-up power to critical emergency services and public works facilities including but not limited to fire stations, police stations, communication towers, and lift stations. During severe weather and power interruptions, it is imperative that essential City facilities have back-up power generators to ensure that essential services and communications are maintained without interruption. While many facilities buildings have now been equipped for this, some still remain and this remains a key strategy. Grant funding would be very useful for completing this strategy.

Defined steps to achieving this mitigation strategy

1. Develop a prioritized list of City facilities based on criticality of need for emergency back-up power during severe weather and power interruptions.
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – City of Madison
   c. *Completion date* – January 2022

Strategy #1	Emergency power for critical facilities and services

2. Conduct site visits to develop a comprehensive inventory of existing emergency back-up power generators, map circuits and functional areas served by existing equipment and assess current condition.
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – City of Madison
   c. *Completion date* – June 2022

3. Inventory and assess the power use of existing equipment, complete a power generator load study to determine the most economical, reliable and efficient solution for each facility.
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – City of Madison
   c. *Completion date* – December 2022

4. Design, procurement, and installation.
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – City of Madison, FEMA Hazard Mitigation Grant Program
   c. *Completion date* – December 2027

5. Train facilities maintenance personnel on proper operation and maintenance.
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – City of Madison, FEMA Hazard Mitigation Grant Program
   c. *Completion date* – December 2027

Strategy #2	Improving Resilience to Extreme Heat Events
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

Purpose: Characterize risk and vulnerabilities to extreme heat events, develop and apply a Heat Resilience Action Plan to equitably avoid, minimize, and mitigate the impacts of these events in the City of Madison.

Desired outcome: Through the successful application of equitable, community-driven solutions, the City of Madison will minimize or eliminate urban heat island effect and negative health outcomes and death from extreme heat events. City of Madison operations and residents have the information, tools, and resource they need to be resilient during extreme heat events. Extreme heat events no longer disproportionately impact our most vulnerable residents.

Defined steps to achieving this mitigation strategy

1. Conduct analysis to create maps that identify and visualize air and surface temperatures in Madison, where urban heat islands occur, and the location of populations most sensitive or vulnerable to extreme heat events.
   a. *Responsible Party* – City of Madison in partnership with researchers at the University of Wisconsin at Madison
   b. *Funding source* – City of Madison budget plus grant assistance if available.
   c. *Completion date* – Q4 2022 or earlier

2. Engage the community to understand current heat resilience practices, identify needs, and develop solutions that will improve heat resilience that result in a Heat Resilience Action Plan, with a particular focus on equitable solutions that providing heat island mitigation and adaptation for sensitive and vulnerable populations.
   a. *Responsible Party* – City of Madison in partnership with researchers at the University of Wisconsin at Madison and community organizations
   b. *Funding source* – City of Madison budget plus grant assistance.
   c. *Completion date* – Q3 2023 or earlier

Strategy #2	Improving Resilience to Extreme Heat Events

3. Apply solutions identified in the Heat Resilience Action Plan to minimize or eliminate urban heat island effect and provide City operations and residents with the information, tools, and resource they need to be resilient during extreme heat events.
   a. *Responsible Party* – City of Madison in partnership with community organizations
   b. *Funding source* – City of Madison budget plus grant assistance.
   c. *Completion date* – Q4 2023 and beyond

Strategy #3	Improving Resilience to Extreme Heat Events
Prevention	**Natural Resource Protection**
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	**Structural Project**

Purpose: Characterize risk and vulnerabilities to climate change impacts, develop and apply a plan to equitably improve climate resilience of people, infrastructure, and natural systems in the City of Madison.

Desired outcome: Through the successful application of equitable, community-driven solutions, the City of Madison operations and residents will be prepared for and experience minimal disruption from a changing climate. The impacts of climate change will no longer disproportionately impact our most vulnerable residents.

Defined steps to achieving this mitigation strategy

1. Conduct GIS and social analyses as well as community outreach to understand and map community vulnerability to a full suite of climate change impacts and create maps that communicate risk.
   a. *Responsible Party* – City of Madison in partnership with researchers at the University of Wisconsin at Madison and others
   b. *Funding source* – City of Madison budget plus grant assistance if available.
   c. *Completion date* – Q4 2023 or earlier

2. Engage the community to identify needs and develop solutions that will improve climate resilience, with a particular focus on equitable solutions that improve the capacity and resilience of sensitive and vulnerable populations.
   a. *Responsible Party* – City of Madison in partnership with researchers at the University of Wisconsin at Madison and community organizations
   b. *Funding source* – City of Madison budget plus grant assistance.
   c. *Completion date* – Q4 2025 or earlier

Strategy #3	Improving Resilience to Extreme Heat Events

3. Apply solutions identified to improve climate resilience and provide City operations and residents with the information, tools, and resource they need to prepare for and adapt to a changing climate.
   a. *Responsible Party* – City of Madison in partnership with community organizations
   b. *Funding source* – City of Madison budget plus grant assistance.
   c. *Completion date* – 2025 and beyond as funding sources become available

Strategy #4	Forsythia Place Floodwall
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

The City of Madison is working to mitigate flood impacts on residents, and the Forsythia Place floodwall project would reduce flood risk to adjacent properties by preventing flooding up to the 1% chance storm.

The project would include creating a channel to direct stormwater from the north/south Park Division property line along Elder Place and Forsythia Place to the major stormwater system. The project would also build a floodwall along the major stormwater channel that would be high enough to prevent flooding of homes along Forstyhia Place and Bordner Drive in the 1% chance event.

The project will also help keep residents safe as they travel through their neighborhood, and improve emergency response times during flood events. Additionally, it would allow for access to the public housing facilities that currently flood in the 1% chance event.

Defined steps to achieving this mitigation strategy

1. Complete detailed design and permitting
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

2. Seek public feedback on design
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within first year of project initiation.

Strategy #4	Forsythia Place Floodwall

3. Grant writing to FEMA – Pre-Disaster Mitigation Grant Program, Wisconsin DNR, Dane County, and other applicable parties
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

4. Implementation process/construction after awarded grant is received.
   a. *Responsible Party* – General Contractor per competitive bidding process
   b. *Funding source* – FEMA, DNR, Dane County, City of Madison Municipal Budget
   c. *Completion date* – 2-4 years after project initiation.

Strategy #5	Frisch Rd.-Tottenham Rd. Box Culvert
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

The City of Madison is working to mitigate flood impacts on residents, and the Frisch Rd and Tottenham Rd box culvert upgrades would significantly reduce street flooding and structural flooding during the 10% chance storm in this area. Such improvements would also help reduce flooding during the 1% chance storm.

The project would include upsizing the box culverts at street crossings to allow for improved conveyance downstream. This effort, combined with improvements in the local storm sewer, would significantly reduce flood risk of the 24 homes that currently flood in the 1% chance storm.

The project will also help keep residents safe as they travel through their neighborhood, and improve emergency response times during flood events where impassible flood water is present for several hours.

Defined steps to achieving this mitigation strategy

1. Complete detailed design and permitting
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

2. Seek public feedback on design
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within first year of project initiation.

Strategy #5	Frisch Rd.-Tottenham Rd. Box Culvert

3. Grant writing to FEMA – Pre-Disaster Mitigation Grant Program, Wisconsin DNR, Dane County, and other applicable parties
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

4. Implementation process/construction after awarded grant is received.
   a. *Responsible Party* – General Contractor per competitive bidding process
   b. *Funding source* – FEMA, DNR, Dane County, City of Madison Municipal Budget
   c. *Completion date* – 2-4 years after project initiation.

Strategy #6	General Flooding Storm Improvements
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

The City of Madison is working to mitigate flood impacts on residents, and is currently developing watershed studies that lay out storm sewer system upgrades that will build flood resilience citywide. Each year, the city will upsize stormwater infrastructure along with street reconstruction projects per what is defined within the watershed studies. The City will also complete non-street related flood mitigation projects as budgeting allows. The flood mitigation projects will be prioritized in part based on where the flood risk is the greatest, and where there are vulnerable residents and facilities.

By working to implement the master plans established by the watershed studies, the City will begin to reduce the amount of homes that flood in the 1% chance storm, and keep streets passible by emergency vehicles in up to the 4% chance event.

Defined steps to achieving this mitigation strategy

1. Complete detailed design and permitting
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

2. Seek public feedback on design
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within first year of project initiation.

Strategy #6	General Flooding Storm Improvements

3. Grant writing to FEMA – Pre-Disaster Mitigation Grant Program, Wisconsin DNR, Dane County, and other applicable parties
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

4. Implementation process/construction after awarded grant is received.
   a. *Responsible Party* – General Contractor per competitive bidding process
   b. *Funding source* – FEMA, DNR, Dane County, City of Madison Municipal Budget
   c. *Completion date* – 2-4 years after project initiation.

Strategy #7	Gettle Ave Box Culvert
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

The City of Madison is working to mitigate flood impacts on residents, and the Gettle Ave Box Culvert upsizing project would reduce flood risk to adjacent properties by significantly reducing the flood depths around homes and significantly reduce the number of homes that flood during the 1% chance storm.

The project would include upsizing the Gettle Ave box culvert to allow for all of the floodwater running through Bordner Park to enter the box culvert and prevents backups and surcharging of the storm sewer.

The project will also help keep residents safe as they travel through their neighborhood, and improve emergency response times during flood events.

Defined steps to achieving this mitigation strategy

1. Complete detailed design and permitting
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

2. Seek public feedback on design
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within first year of project initiation.

Strategy #7	Gettle Ave Box Culvert

3. Grant writing to FEMA – Pre-Disaster Mitigation Grant Program, Wisconsin DNR, Dane County, and other applicable parties
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

4. Implementation process/construction after awarded grant is received.
   a. *Responsible Party* – General Contractor per competitive bidding process
   b. *Funding source* – FEMA, DNR, Dane County, City of Madison Municipal Budget
   c. *Completion date* – 2-4 years after project initiation.

Strategy #8	Odana Pond Reconstruction
Prevention	**Natural Resource Protection**
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

The City of Madison is working to mitigate flood impacts on residents, Enhance Wetland functionality and lessen downstream flooding. The Odana Ponds reconstruction project would reduce flood risk to adjacent properties by providing sufficient flood storage to keep the 1% storm from inundating surrounding homes maintaining the existing peak discharge rate.

The project would also reduce the depth and frequency of residential street flooding on Dearholt Rd and Milward Drive that currently flood frequently, and to impassible depths during large events. The pond project will help protect resident's property and improve travel on the residential streets.

The last component of this project is to provide natural resource protection. Odana Pond is a shallow kettle pond and the ecological function of the pond has been degraded due to stormwater. The pond retrofit will enhance emergent vegetation zones, provide areas for sediment removal and improve the habitat in the pond.

Defined steps to achieving this mitigation strategy

1. Complete detailed design and permitting
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

2. Seek public feedback on design
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within first year of project initiation.

Strategy #8	Odana Pond Reconstruction

3. Grant writing to FEMA – Pre-Disaster Mitigation Grant Program, Wisconsin DNR, Dane County, and other applicable parties
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

4. Implementation process/construction after awarded grant is received.
   a. *Responsible Party* – General Contractor per competitive bidding process
   b. *Funding source* – FEMA, DNR, Dane County, City of Madison Municipal Budget
   c. *Completion date* – 2-4 years after project initiation.

Strategy #9	Old Sauk Trails Business Park Ponds
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

The City of Madison is working to mitigate flood impacts on residents, Enhance Wetland functionality and lessen downstream flooding. The Odana Ponds reconstruction project would reduce flood risk to adjacent properties by providing sufficient flood storage to keep the 1% storm from inundating surrounding homes maintaining the existing peak discharge rate.

The project would also reduce the depth and frequency of residential street flooding on Dearholt Rd and Milward Drive that currently flood frequently, and to impassible depths during large events. The pond project will help protect resident's property and improve travel on the residential streets.

The last component of this project is to provide natural resource protection. Odana Pond is a shallow kettle pond and the ecological function of the pond has been degraded due to stormwater. The pond retrofit will enhance emergent vegetation zones, provide areas for sediment removal and improve the habitat in the pond.

Defined steps to achieving this mitigation strategy

1. Complete detailed design and permitting
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

2. Seek public feedback on design
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within first year of project initiation.

Strategy #9	Old Sauk Trails Business Park Ponds

3. Grant writing to FEMA – Pre-Disaster Mitigation Grant Program, Wisconsin DNR, Dane County, and other applicable parties
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

4. Implementation process/construction after awarded grant is received.
   a. *Responsible Party* – General Contractor per competitive bidding process
   b. *Funding source* – FEMA, DNR, Dane County, City of Madison Municipal Budget
   c. *Completion date* – 2-4 years after project initiation.

Strategy #10	University Ave Flood Mitigation
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

The City of Madison is working to mitigate flood impacts on residents and local businesses, and to increase passability of arterial streets by emergency vehicles during large flood events. Improvements to the University Ave corridor storm sewer infrastructure to increase conveyance would reduce risk of private property flooding adjacent to University Ave, making it less likely that private structures will flood in mid-sized storm events.

The project would also reduce the depth and frequency of flooding on University Ave, a major east-west corridor through the City that serves several neighborhoods, the University of Wisconsin – Madison, and perhaps most critically, the UW Hospital complex, a major area health center. Currently, the road floods and becomes impassible in relatively small rain events (down to the 5-year event). This project will help keep residents safe as they travel across the City, and improve emergency response times during flood events.

Defined steps to achieving this mitigation strategy

1. Complete detailed design and permitting
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 2.0 years of project initiation.

2. Seek public feedback on design
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within first year of project initiation.

Strategy #10	University Ave Flood Mitigation

3. Grant writing to FEMA – Pre-Disaster Mitigation Grant Program, Wisconsin DNR, Dane County, and other applicable parties
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 2.0 years of project initiation.

4. Implementation process/construction after awarded grant is received.
   a. *Responsible Party* – General Contractor per competitive bidding process
   b. *Funding source* – FEMA, DNR, Dane County, City of Madison Municipal Budget
   c. *Completion date* – 2-4 years after project initiation.

Strategy #11	West Towne Pond Expansion
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

The City of Madison is working to mitigate flood impacts on residents, and the West Towne Pond expansion project would reduce flood risk to adjacent properties by providing sufficient flood storage within in the pond up to the 1% chance storm.

The project would also reduce the depth and frequency of arterial street flooding on Mineral Point Road, Gammon Road and Odana Road that currently flood frequently, and to impassible depths during large events. The pond project will help keep residents safe as they travel across the City, and improve emergency response times during flood events. Additionally, it would allow for access to the high school, middle school, and neighboring childcare facilities.

Defined steps to achieving this mitigation strategy

1. Complete detailed design and permitting
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

2. Seek public feedback on design
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within first year of project initiation.

3. Grant writing to FEMA – Pre-Disaster Mitigation Grant Program, Wisconsin DNR, Dane County, and other applicable parties
   a. *Responsible Party* – City of Madison Engineering
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within 1.5 years of project initiation.

Strategy #11	West Towne Pond Expansion

4. Implementation process/construction after awarded grant is received.
   a. *Responsible Party* – General Contractor per competitive bidding process
   b. *Funding source* – FEMA, DNR, Dane County, City of Madison Municipal Budget
   c. *Completion date* – 2-4 years after project initiation.

Strategy #12	Backup Generators for Police Facilities
Prevention	Natural Resource Protection
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	Structural Project

The police department is tasked with providing 24/7/365 services throughout the City. Currently, several of our key facilities (3 district stations, Training Center, and 1 evidence storage location) do not have any emergency/backup generators. This project would ensure that police services are maintained during a natural disaster that may cause interruption in power supply. The project also identifies the training center, key for service deliver, and the evidence storage, where key evidence may be destroyed if loss of power results in loss of refrigeration/freezing of said evidence.

Defined steps to achieving this mitigation strategy

1. Emergency power generator decision on location(s)
   a. *Responsible Party* – Police Department
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within first month of project initiation.

2. Grant writing to FEMA – Pre-Disaster Mitigation Grant Program
   a. *Responsible Party* – City of Madison Emergency Management
   b. *Funding source* – Municipal Budget
   c. *Completion date* – Complete within first six months of project initiation

3. Implementation process/construction after awarded grant is received.
   a. *Responsible Party* – Third party vendor
   b. *Funding source* – FEMA
   c. *Completion date* – 1 year after project initiation

Strategy #13	Emergency Action Plans
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

Everyone has the right to know where and when to shelter or evacuate during an emergency. The action plan would go over routes to take, where to shelter, where not to shelter, evacuations, safe practices, etc.

The desired outcome would be a better overall knowledge and sense of confidence when an event occurs.

Defined steps to achieving this mitigation strategy

1. Make Emergency Evacuation Maps of all City owned Buildings
   a. *Responsible Party* – Risk Management
   b. *Funding source* – N/A
   c. *Completion date* – 2025

2. Display finished Emergency Maps
   a. *Responsible Party* – Facilities/Engineering/Risk
   b. *Funding source* – N/A, but maybe the Budget
   c. *Completion date* – After maps are done

3. Train Employees/Public on Emergency Plans
   a. *Responsible Party* – Risk/help from L&D
   b. *Funding source* – N/A
   c. *Completion date* – Ongoing

Strategy #14	Storm Shelter(s)
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

Three mobile home communities are located in the city. Due to the limited protection provided by a mobile home during a tornado, those residents are at greater risk of injury and death. The same is true for homeless people and those living at the Dairy Drive encampment. FEMA approved storm shelters are necessary to protect residents during extreme wind events.

Defined steps to achieving this mitigation strategy

1. Determine best location(s) for community storm shelter(s).
   a. *Responsible Party* – Emergency Management Coordinator
   b. *Funding source* – City budget
   c. *Completion date* – January of 2023

2. Acquire land for construction of storm shelter(s)
   a. *Responsible Party* – City Real Estate and City Engineering
   b. *Funding source* – City Budget
   c. *Completion date* – June of 2024

3. Design storm shelter(s)
   a. *Responsible Party* – City Engineering
   b. *Funding source* – City Budget and Hazard mitigation Grant Funds
   c. *Completion date* – To be determined

Strategy #14	Storm Shelter(s)

4. Construct storm shelter(s)
   a. *Responsible Party* – City Engineering
   b. *Funding source* – City budget and hazard mitigation grant funds
   c. *Completion date* – To be determined

Strategy #15	Debris collection site
Prevention	Natural Resource Protection
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	Structural Project

Natural hazards can create significant amounts of debris, from construction materials to downed trees and limbs. Further snow events often require hauling to offsite location from locations near downtown due to limited storage creating vision hazards for pedestrians, bikes and autos.

The city needs a site to collect debris. A perfect site would be a fenced hard surface, minimum 3 acres with electric service and located within 6 miles of the State Capitol.

Defined steps to achieving this mitigation strategy

1. Identify three potential properties that can be used as debris collection sites. Conduct feasibility study and solicit neighborhood input.
   a. *Responsible Party* – Streets and Real Estate
   b. *Funding source* – City Budget
   c. *Completion date* – October 2023

2. Purchase the selected property
   a. *Responsible Party* – City Real Estate
   b. *Funding source* – City budget and hazard mitigation funds
   c. *Completion date* – January 2025

3. Design and bid site work. Obtain city approvals.
   a. *Responsible Party* – Streets, City Engineering, City Real Estate, Zoning
   b. *Funding source* – City budget
   c. *Completion date* – July 2025

Strategy #15	Debris collection site

4. Site improvements
   a. *Responsible Party* – City Engineering
   b. *Funding source* – City budget
   c. *Completion date* – November 2025

Strategy #16	SCADA-MWU Emergency Generator Monitoring and fueling
Prevention	Natural Resource Protection
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	Structural Project

This will enable the system Operator to monitor the generator status and fuel levels for MWU owned Emergency Generators using our SCADA System. A second goal is in the event of widespread power outage we need to modify current security measures to allow our fuel vendor to daily auto fill our generators with fuel during an emergency, without the need to contact MWU.

Defined steps to achieving this mitigation strategy

1. Connecting all MWU Emergency generators to the SCADA system for monitoring purposes.
   a. *Responsible Party* – MWU Supply and Operations as well as NCummins
   b. *Funding source* – Operating budget
   c. *Completion date* – 7-1-2022

2. Establish security protocols and an Emergency fuel provider contract
   a. *Responsible Party* – MWU Operations and Supply
   b. *Funding source* – Operating budget
   c. *Completion date* – This will be completed once the generator monitoring and security protocols have been established and an Emergency fuel provider contract has been awarded.

Dane County Natural Hazard Mitigation Plan

City of Middleton Annex

Summer 2022

City of Middleton Annex

This annex is a part of the Dane County Natural Hazard Mitigation Plan (DCNHMP). The DCNHMP contains additional information to support the Federal Emergency Management Agency's (FEMA) recognition of the plan (including this annex) as the formal natural hazard mitigation plan for the county and participating local governments. This annex will be valid for as long as FEMA approves the DCNHMP. The strategies adopted in this annex are designed to guide community efforts to reduce risks from natural hazards. These strategies work in conjunction with neighboring communities and Dane County government to reduce risks from natural hazards.

COMMUNITY PROFILE

The City of Middleton is a western suburb of the State Capital, Madison, WI. Land use is dominated by commercial, industrial, a general aviation airport, and residential homes. According to the United States Census Bureau, the City of Middleton has a total area of 9 square miles, and 0.14% of it being water.

As of the 2019 Census Estimates, there are 19,487 people, 8,899 households, with an average of 2.18 people per household. The population density is 1,941.8 people per square mile. Table 1 shows a population age profile for the City of Middleton as of the 2019 Census Estimates.

Table 1 Population Profile of City of Middleton, Dane County

Category	Number	Percent
Total Population	**19,487**	**100%**
Under 5 years	952	4.9%
5 to 9 years	971	5.0%
10 to 14 years	1,346	6.9%
15 to 19 years	1,144	5.9%
20 to 24 years	1,330	6.8%
25 to 29 years	1,376	7.1%
30 to 34 years	1,462	7.5%
35 to 39 years	1,372	7.0%
40 to 44 years	1,106	5.7%
45 to 49 years	1,134	5.8%
50 to 54 years	1,722	8.8%
55 to 59 years	1,330	6.8%
60 to 64 years	1,199	6.2%
65 to 69 years	1,206	6.2%
70 to 74 years	670	3.4%
75 to 79 years	561	2.9%
80 to 84 years	279	1.4%
85 years and over	327	1.7%

Data Source: 2019 ACS Estimates - U.S. Census

Growth & Development Trends

Table 2-3 illustrates how the entire City of Middleton has grown in terms of population and number of households between 2010 and 2020. Housing data is to 2020 due to data availability. Table 2-3 is drawn from the Demographics Services Center at the Wisconsin Department of Administration, and shows population projections through 2040.

Table 2 City of Middleton Change in Population and Households, 2010-2020

2010 Population	2020 Population	Percent Change (%) 2010-2010	2010 # of Households	2020 # of Households	Percent Change (%) 2010-2020
17,442	21,964	25.93%	8,037	9,343	16.25%

Data Source: Demographic Services Center, Wisconsin Department of Administration, 2021

Table 3 City of Middleton Population Projections, 2020-2040

Population Projection	2020	2025	2030	2035	2040
Increase by half of percent of change (25.93%/2) every 5 years	21,964	24,810	27,659	31,243	35,292

Data Source: Demographic Services Center, Wisconsin Department of Administration, 2021

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Population Summary

Tables 4-7 illustrates key population demographics within the City of Middleton. Key demographics include: (1) Disability Characteristics, (2) Federal Income Poverty Levels, (3) Educational Attainment, and (4) Household Language with English Speaking Capabilities. Due to data availability, all key demographic information has been provided by the American Community Survey (ACS) 2019 estimates. The ACS is a self-reported survey and may include total sample size differences and statistical margin of error.

Table 4 City of Middleton, Dane County – Disability Characteristics by Detailed Age

Category	Number	Percent
Total of Residents that Self-Identified as Disabled	**2,662**	**100%**
With a hearing difficulty	**536**	**20.1%**
Population under 18 years	0	-
Population 18 to 64 years	107	-
Population 65 years and over	429	-
With a vision difficulty	**183**	**6.9%**
Population under 18 years	8	-
Population 18 to 64 years	48	-
Population 65 years and over	127	-
With a cognitive difficulty	**427**	**16.0%**
Population under 18 years	73	-
Population 18 to 64 years	215	-
Population 65 years and over	139	-
With an ambulatory difficulty	**728**	**27.3%**
Population under 18 years	0	-
Population 18 to 64 years	243	-
Population 65 years and over	485	-
With a self-care difficulty	**282**	**10.6%**
Population under 18 years	39	-
Population 18 to 64 years	67	-
Population 65 years and over	176	-
With an Independent living difficulty	**506**	**19.0%**
Population under 18 years	136	-
Population 18 to 64 years	52	-
Population 65 years and over	318	-

Data Source: 2019 ACS Estimates - U.S. Census

Table 5.1: City of Middleton, Dane County – Federal Income Poverty Levels (FIPL) by Families Summary

Category	Number of Families
50 percent of poverty level	115
125 percent of poverty level	220
150 percent of poverty level	247
185 percent of poverty level	441
200 percent of poverty level	483
300 percent of poverty level	1,131
400 percent of poverty level	1,746
500 percent of poverty level	2,340

Data Source: 2019 ACS Estimates - U.S. Census

Note: Use table 5.2 to interpret table 5.1:

5.1 identifies the *total number of families* (regardless of size) by percentage.

5.2 identifies *family size* in relation to annual family income and the percentage category of the FIPL.

Table 5.2: City of Middleton, Dane County – 2021 Annual Federal Income Poverty Level Guide

Family Size	50%	100%	125%	150%	185%	200%	300%	400%	500%
1	$6,440	$12,880	$16,100	$19,320	$23,828	$25,760	$38,640	$51,520	$64,400
2	$8,710	$17,420	$21,775	$26,130	$32,227	$34,840	$52,260	$69,680	$87,100
3	$10,980	$21,960	$27,450	$32,940	$40,626	$43,920	$65,880	$87,840	$109,800
4	$13,250	$26,500	$33,125	$39,750	$49,025	$53,000	$79,500	$106,000	$132,500
5	$15,520	$31,040	$38,800	$46,560	$57,424	$62,080	$93,120	$124,160	$155,200
6	$17,790	$35,580	$44,475	$53,370	$65,823	$71,160	$106,740	$142,320	$177,900

Data Source: dhs.wisconsin.gov

Table 6: City of Middleton, Dane County – Educational Attainment by Householders

Category	Number	Percent
Total of Householders	**5,207**	**100%**
Less than high school graduate	7	0.1%
High school graduate (includes equivalency)	582	11.1%
Some college or associate's degree	1,181	22.6%
Bachelor's degree or higher	3,437	66.0%

Data Source: 2019 ACS Estimates - U.S. Census

Table 7: City of Middleton, Dane County – Household Language & English Speaking Capabilities

Category	Number	Percent
Total of Households	**8,899**	**100%**
English only	**7,934**	**89.2%**
Spanish:	**395**	**4.4%**
Limited English speaking household	103	-
Not a limited English speaking household	292	-
Other Indo-European languages:	**296**	**3.3%**
Limited English speaking household	14	-
Not a limited English speaking household	282	-
Asian and Pacific Island languages:	**218**	**2.4%**
Limited English speaking household	39	-
Not a limited English speaking household	179	-
Other languages:	**56**	**0.6%**
Limited English speaking household	0	-
Not a limited English speaking household	56	-

Data Source: 2019 American Community Survey

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Asset Inventory

Assets include the people, property, and critical facilities within the City of Middleton that are exposed to hazards in general. Inventories of property, essential infrastructure, and natural, cultural or historic resources help provide a comprehensive picture of the community and provide a method of assessing exposure to hazards by establishing the improved and total values, capacities and populations for these assets. It also forms the basis for estimating potential losses, where possible.

General Property

Table 8 Property Exposure Summary

Property Type	Parcel Count	Improved Land Count	Improved Land Values ($)	Content Value ($)	Total Value ($)
Total	**6,096**	**5,823**	**3,089,732,900**	**1,544,866,450**	**4,634,599,350**
Agriculture	2	0	0	0	0
Commercial	396	348	830,343,000	415,171,500	1,245,514,500
Industrial	139	132	198,916,700	99,458,350	298,375,050
Institutional/ Governmental	52	3	1,232,200	616,100	1,848,300
Other	22	1	30,624,300	15,312,150	45,936,450
Residential	5,424	5,338	1,997,258,300	998,629,150	2,995,887,450
Utility	61	1	31,358,400	15,679,200	47,037,600

Data Source: Dane County Land Information Office, December 2021

Critical Facilities

The City of Middleton has identified the critical facilities important to protect from disaster impacts. These are collected in Table 9. Table 9 is based on GIS data inventories from Dane County and information gathered from the City. No further supplemental data was provided by the community through the Data Collection Guide.

Table 9 Critical Facility Summary/Essential Infrastructure

Facility	Type*	No. Of Facilities	Replacement Value ($)
Middleton Airport	EI	1	798199
Lakeview Park Park Shelter	EI	1	1530000
Lakeview Park Small Open Air Building	VF	1	26785.2
Lakeview Park Splash Pad/Shade Shelter	EI	1	26785.2
City Hall	EI	1	4609090
Ems Bldg	EI	1	3140833
Well House #8	EI	1	1144692
Depot Tourism Center	VF	1	516740.1
Well #3 Pump House	EI	1	304708.4
Well #2 Pump House	EI	1	107676.5
Well #4 Pump House	EI	1	2522202
Well #5 Pump House	EI	1	2199065
Well #6 Pump House	EI	1	1197941
Baskerville Lift Station	EI	1	137890.2
Middleton Beach Rd Lift Station	EI	1	108747.9
Library	EI	1	8310698
Maintenance Building	VF	1	103283.7
Restrooms	EI	N/A	145497.2
Parisi Park	EI	1	48641.92

Facility	Type*	No. of Facilities	Replacement Value ($)
Senior Center	VF/EI	1	4751052
Aquatic Center	VF	1	915839.6
Aquatic Center Pool	VF	1	2142000
Orchid Heights Park	VF	1	107140.8
Middleton Hills Park	VF	1	32999.37
Pleasant View Golf Course Club House	VF	1	1583648
Pleasant View Golf Course Maintenance Building	VF	1	365457.3
Pleasant View Golf Course Well Pump House And Equipment	VF	1	71400
Firemen's Park Large Shelter	VF	1	138854.5
Firemen's Park Shade Shelter	VF	1	13285.46
Firemen's Park Small Shelter	VF	1	59463.14
Police And Municipal Ct. Facility	EI	1	15735126
Municipal Operations Center	EI	1	11507458
Municipal Operations Recycling Center	EI	1	1210048
Firefighters Memorial Park	VF	1	488669.2
Lucille Taylor Memorial Park Pergola	VF	1	16285.4
Lucille Taylor Memorial Park Taylor Park Shelter	VF	1	515100
Middleton Hills Park South	VF	1	8249.842
Stonefield Park	VF	1	131783.2
Meadows Park	VF	1	8249.842
Middleton Station Park	VF	1	26785.2
Middleton Hills Ls	EI	1	374135.7
Terrace Ave Reservoir	EI	1	3537468
Hidden Oaks Ls	EI	1	425884.7

Esser Pond Ls	EI	1	695343.8
Nursery Drive Ls	EI	1	537739.7
Orchid Heights Ls	EI	1	450955.6
High Rd Tank	EI	1	1522042
Highland Tank	EI	1	2130281
Maywood Ave Ls	EI	1	352921.8
Orchid Heights Park	VF	1	424
N. High Point Rd Grinder	EI	1	41999.19
Greenway Booster Station	EI	1	1130335
Parks Ce	VF	1	40499.22
*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities			

Data Source: 2021 City of Middleton Data Collection Guide

Other Assets

Other assets help define a community beyond the current composition of the City of Middleton. These assets may provide economic benefit to the community, in addition to preserving the heritage and diversity of the community and may include natural, cultural and historic assets or economic assets such as major employers. It may also include more specific detail on critical facilities. The City of Middleton has not identified any other assets.

VULNERABILITY ASSESSMENT

A hazard identification and vulnerability analysis was completed for the City of Middleton using the same methodology in the County's base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete.

The first step in a hazard analysis is to identify which hazards the community is vulnerable to. Table 10 outlines the hazard identification for the City of Middleton based on the Data Collection Guide issued in 2021. The Data Collection Guide listed all of the hazards that could impact Dane County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. Brooklyn's planning team members were asked to complete the matrix by ranking each category on a scale of 0 to 5 based on the experience and perspective of each planning team member. A ranking of 0 indicated "no concern" while a ranking of 5 indicated "highest concern." This matrix appears as Table 10. This matrix reflects the significance of the hazards relative to one another as perceived by the Example's planning team.

This matrix reflects that the City of Middleton is most vulnerable to flooding, tornadoes, extreme cold, and extreme heat. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 10: Vulnerability Assessment Matrix for the City of Middleton

Name of Jurisdiction: City of Middleton										
Hazard	**Hazard Attributes**			**Impact Attributes**						
				Primary Impact (Short Term - Life and Property)			**Secondary Impact (Long Term – Community Impacts)**			
	Area of Impact	Past History, Probability of Future Occurrence	Short Term Time Factors	Impact on General Structures	Impact on Critical Facilities	Impact on At-Risk Populations	Social Impact	Economic Impact	Severity Of Other Associated Secondary Hazards	**Total of Row Values**
	(1-5)	*(1-5)*	*(1-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	
Dam/Levee failure	1	1	1	0	0	0	0	0	0	3
Extreme Cold	5	3	1	0	1	3	1	1	1	16
Extreme Heat	5	3	1	0	1	3	1	1	1	16
Drought	5	1	1	0	0	0	0	0	0	7
Expansive soils	1	1	1	0	1	0	0	0	0	4
Flood	4	4	2	3	4	3	2	4	2	28
Fog	1	1	1	0	0	0	0	0	0	3
Hail Storm	2	3	1	2	1	1	0	1	0	11
Landslide	1	1	1	0	0	0	0	0	0	3
Lightning	1	2	1	1	1	1	0	0	0	7
Tornado	2	2	3	4	4	4	4	4	4	31
Wildfire	1	1	1	0	0	0	0	0	0	3
Windstorm	3	3	2	1	1	1	1	1	0	13
Winter Storm	5	2	1	1	1	1	1	0	0	12

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County. The previous inventory tables quantify what is exposed to the various hazards within City of Middleton. Table 11 cross-references the hazards with the various tables where exposure or vulnerability specifics are found. The intent of Table 6 is to quantify, where possible, future impacts of each hazard on the jurisdiction. In many cases it is difficult to estimate potential losses, so the overall exposure of populations, structures, and critical facilities is referenced.

Table 11 Hazard Vulnerability Specifics

Hazard	Populations	Structures	Critical Facilities	Future Damage Potential
Dam Failure	None	None	None	Specifics unknown; See hazard profile in County Plan
Drought	None	None	None	Specifics unknown; See hazard profile in County Plan
Flooding	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below
Fog	None	None	None	Specifics unknown; See hazard profile in County Plan
Hailstorm	Moderate	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Landslide/ Sinkholes/ Erosion	None	None	None	Specifics unknown; See hazard profile in County Plan
Lightning	Minimal	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Severe Cold	See Tables 4-7 Population	None	Minimal	Specifics unknown; See hazard profile in County Plan
Severe Heat	See Tables 4-7 Population	None	Minimal	Specifics unknown; See hazard profile in County Plan
Winter Storm	Minimal	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Tornado	See Table 15 below	See Table 15 below	See Table 15 below	See Table 15 below
Wildfire	None	None	None	Specifics unknown; See hazard profile in County Plan
Windstorm	Minimal	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan

Data Source: 2021 City of Middleton Data Collection Guide – Prepared by DCEM

Previous Hazard Events

Through the Data Collection Guide, the City of Middleton noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the main mitigation plan. These events had a particular impact on the community beyond the impacts and events recorded in the Dane County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

City of Middleton Historic Natural Hazards

Table 12 City of Middleton Historic Natural Hazards

Natural Hazard	Date	Impacted Structures	Comprehensive Harm to Jurisdiction	Other reported Losses (Fiscal reports, programs, etc.)	Injuries/Deaths	Comments
Flood	2018	Multiple Impacted Structures	-About $7 million primarily to storm water infrastructure -$33 million damage to businesses; About $5 million to residential properties	Coverage for lift station, fire truck and Stricker tennis courts.	Several rescues from flood waters at Costco/Business Park/Hotels	Several roads closed hampering economic activity for up to one month in many instances. [High likelihood of reoccurring]
Winter Storm	2/1-2/2011	None	Many businesses shut down due to impassable roads.	Documented City costs of $23,437.	None	18.7" of snow [High likelihood of reoccurring]

Winter Storm	12/20/2012	None	Some businesses closed. Impassable Roads	Documented costs of $33,337 for the event.	None	19.9' of snow
Polar Vortex	01/XX/2014	Multiple Impacted Structures	Outside work was limited to the degree possible, with some special accommodations needed (warming tents, working in shorter rotation) for those that had to work outside. Several schools had to close.	N/A	N/A	At least 8 days in January reaching -10-deg. F, and one at nearly -20-deg. Wind chill factors made exposure to the elements hazardous.

Data Source: 2021 City of Middleton Data Collection Guide

Flood Hazard

Structures and Properties in the Floodplain

Refer to the flood profile in the mitigation plan for a description of the methodology used to identify potentially flood-prone properties. Figure 1 shows mapped floodplains, future growth areas, and critical or vulnerable facilities. Tables 13 and 14 outline the primary structures on them within the City of Middleton, Dane County. Potential number of individuals at risk figures are based on primary residential structures and the average household size within Dane County (2.37 people as of 2021). Estimated loss potentials for all structures on the floodway can be found within section 4.6 in chapter 4 of the county plan.

Table 13 Primary Structures in the 100 Year Floodplain

Residential Structures in 100 yr. Floodway	Non-Residential Structures in 100 yr. Floodplain	Total Structures in 100 yr. Floodplain	Potential # of People at Risk in 100 yr. Floodplain	Total Assessed Values ($) of Structures in 100 yr. Floodplain
17	3	20	40	$12,489,815

Source: Analysis based on Dane County Land Information Office Data

Table 14 Primary Structures in the 500 Year Floodplain

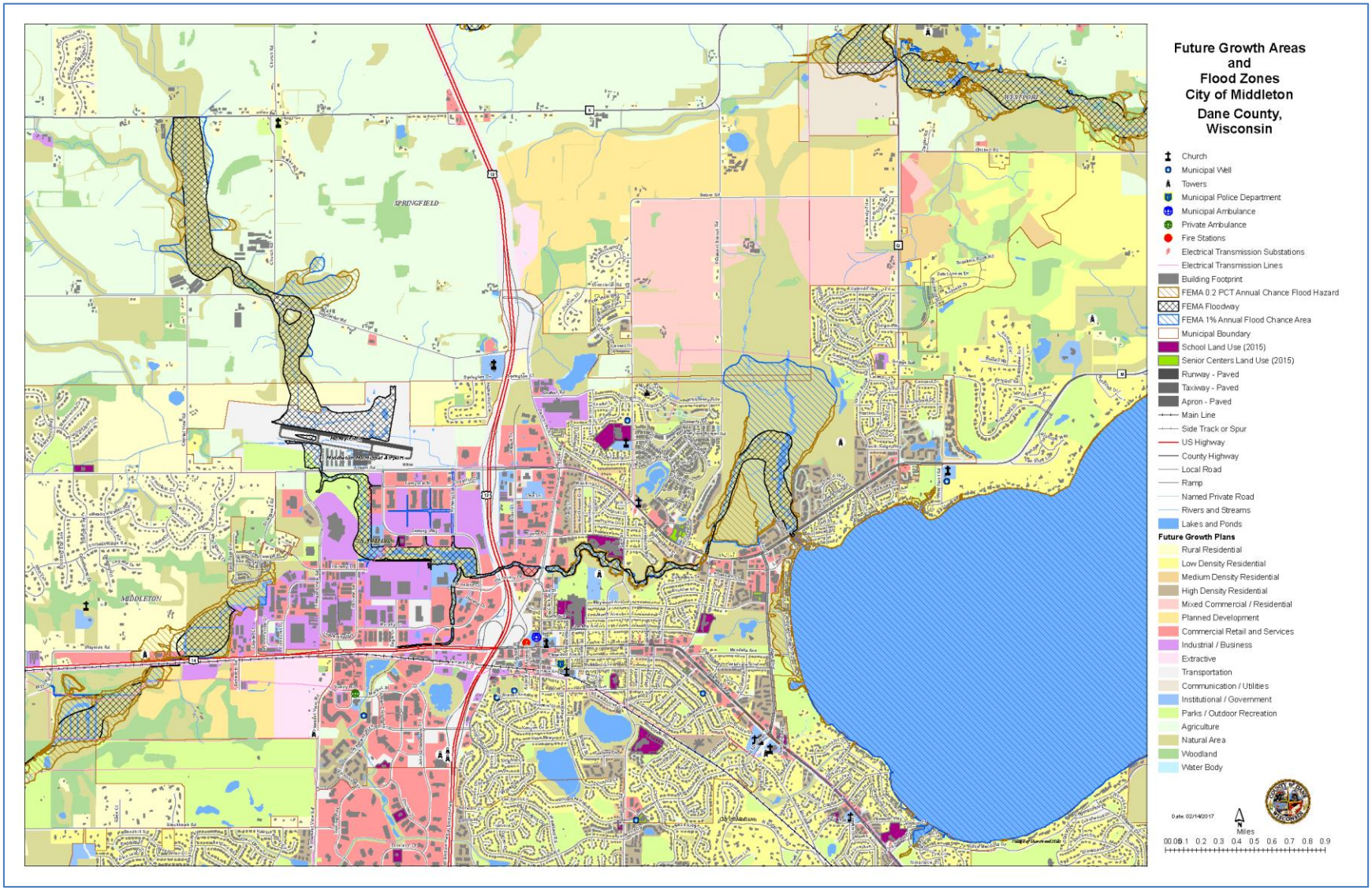
Residential Structures in 500 yr. Floodway	Non-Residential Structures in 500 yr. Floodplain	Total Structures in 500 yr. Floodplain	Potential # of People at Risk in 500 yr. Floodplain	Total Improved Values ($) of Structures in 500 yr. Floodplain
121	4	125	287	$23,783,940

Source: Analysis based on Dane County Land Information Office Data

Repetitive Loss Properties and Flood Insurance Polices

- Repetitive loss properties have not been reported in the City of Middleton, Dane County.
- The City of Middleton has 65 flood insurance policies in force within Dane County, with a total coverage of $27,517,200.

Figure 1 Flood Hazards and Future Land Use Map



Tornado

While it is difficult to estimate specific losses to a tornado due to the random nature of the event, a methodology was developed that was applied to each jurisdiction during the 2023 update. The table below estimates the percent area of the jurisdiction that could be impacted based on the average sized tornado (F2) in Dane County. High value exposure is based on 100% loss, medium 50% loss, and low is 25% loss to the property potentially impacted. The loss ratio, which is the ratio of the damaged building value to total exposed building value, is a measure of the impact to the jurisdiction as a whole. Communities with loss ratios 10% or more may have difficulty recovering from a disaster. Refer to the tornado hazard profile in the main mitigation plan for more details on this methodology.

Table 15 Tornado Loss Estimate

% Area impact	Improved Parcel Count	Affected Structure Estimate	Total Exposed Value ($)	Estimated Loss $ (High Damage Range)	Estimated Loss $ (Moderate Damage Range)	Estimated Loss $ (Low Damage Range)	Loss Ratio for Moderate Damage Range
9.3%	5,976	556	4,634,136,150	4,30,970,528	2,15,485,264	107,742,632	5%

Data Source: Analysis Based on Dane County Land Information Office's data

Problems or Additional Vulnerability Issues

The City of Middleton's Data Collection Guide issued in 2021 listed:

- **Average 100 Year Floodplain Depth:** Typically 1-2 feet – variable depending on the location, relevant nearest water body, and surrounding topography.

- **Hazard Concerns:** Voss Haus Nursing Home; Middleton Village (Old Middleton Road); Heritage, Artisan, Sage Meadow & Cardinal View senior housing with memory care units. Assisted Living only at Brookdale on Century Avenue & on Gammon/Stonefield, Middleton Glen senior living. Miramont Psychiatric Hospital.

- **Growth Trends:** Strong infill growth and very little outward growth in recent years, yielding healthy population growth of about 25% since 2010. Population is now about 22,000. Future growth area to the north of the city is south of Balzer Road and east of Highway Q. Other areas to the City's west and northwest are growth restricted by City plan and policy. Further restricting growth is Madison to Middleton's south, southwest, east and southeast, and Lake Mendota is directly east.

- **How vulnerability has changed since 2018 NHMP cycle:** Our vulnerability as a community has largely been from flooding limited to commercial and residential areas near the Pheasant Branch Creek corridor. During the 12.7 inch storm in just over 24 hours of August, 2018, no residents were dislocated. However, the City residents incurred about $7 million in reported damages while commercial properties experienced about $34 million in reported damages. Critical public infrastructure also was damaged by about $7 million. 3 years after the floods, the City has received less than $500,000 in assistance from FEMA.

CAPABILITY ASSESSMENT

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities for the City of Middleton.

Mitigation Capabilities Summary

Table 16 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities, or by themselves contribute to reducing hazard losses. The table also indicates which of these tools are currently utilized in the City of Middleton.

Table 16 City of Middleton Regulatory Mitigation Capabilities

Regulatory Tools (ordinances, codes, plans)	Yes/No	Comments
Existing Natural Hazard Mitigation Plan	Yes	Collaboration with DCEM
General or Comprehensive plan	Yes	Adopted 2021: https://www.cityofmiddleton.us/366/2021-Comprehensive-Plan-Update
Zoning ordinance	Yes	https://cityofmiddleton.us/DocumentCenter/View/20/Chapter-10---Zoning-PDF?bidId=
Subdivision ordinance	Yes	https://cityofmiddleton.us/DocumentCenter/View/20/Chapter-10---Zoning-PDF?bidId=
Growth management ordinance	Yes	https://www.cityofmiddleton.us/366/2021-Comprehensive-Plan-Update
Shoreland/wetland zoning ordinance	Yes	https://www.cityofmiddleton.us/DocumentCenter/View/39/Chapter-29---Wetland-Zoning-PDF
Floodplain zoning ordinance	Yes	https://www.cityofmiddleton.us/DocumentCenter/View/34/Chapter-24---Flood-Plain-Zoning-Code-PDF
FEMA / NFIP Community Rating System	Yes	https://www.cityofmiddleton.us/DocumentCenter/View/34/Chapter-24---Flood-Plain-Zoning-Code-PDF
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	https://www.cityofmiddleton.us/DocumentCenter/View/36/Chapter-26---Stormwater-Runoff-Control-PDF
Building code	Yes	https://www.cityofmiddleton.us/DocumentCenter/View/21/Chapter-11---Building-Code-PDF
Fire department ISO rating	Yes	ISO 3 Rating
Climate change Impact program	Yes	Referendum Approved Direction in 2016/Plan underway

Regulatory Tools (ordinances, codes, plans)	Yes/No	Comments
Erosion or sediment control program	Yes	https://www.cityofmiddleton.us/DocumentCenter/View/38/Chapter-28---Erosion-Control-PDF
Stormwater management program	Yes	https://www.cityofmiddleton.us/DocumentCenter/View/36/Chapter-26---Stormwater-Runoff-Control-PDF
Site plan review requirements	Yes	See section 19.07 https://www.cityofmiddleton.us/DocumentCenter/View/29/Chapter-19---Land-Division-and-Subdivision-Regulations-PDF
Capital improvements plan	Yes	5-Year Plan for All City Departments https://www.cityofmiddleton.us/DocumentCenter/View/7602/2021-Capital-Improvement-Plan-Document
Economic development plan	Yes	Pages 70-86: https://www.cityofmiddleton.us/DocumentCenter/View/8030/2021-Comp-Plan_3-2-2021
Local emergency operations plan	Yes	On shared local hard drive and Teams. Plans date from 2006 and were performed in conjunctions with Texas A&M.
Other special plans	Yes	Sustainability Plan: https://www.cityofmiddleton.us/DocumentCenter/View/48/Sustain-City-Plan-PDF?bidId=
Flood insurance study or other engineering study for streams	Yes	We have engendered a study by EOR Engineering by which we've outlined 100-year existing floodplain with projected 200-year floodplain. We have not yet taken action to modify the existing floodplain.
Elevation certificates (for floodplain development)	Not Sure	
Climate Action Plan	Yes	https://www.cityofmiddleton.us/DocumentCenter/View/8579/Signed-100-Clean-Energy-Resolution-by-2050

Data Source: City of Middleton Data Collection Guide, 2021

Table 17 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in the City of Middleton.

Table 17 Responsible Personnel and Departments for the City of Middleton

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	Planning/Director of Planning & Community Development.	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Public Works/Director & City Engineer; Assistant Director & Assistant City Engineer	
Planner/engineer/scientist with an understanding of natural hazards	Yes	Same as above	
Personnel skilled in GIS	Yes	I.T. Manager; Engineers listed above and 3 Engineering Techs; entire FT Planning Staff (3); Fire District staff.	
Full-time Building Official	Yes	Building Inspection Manager; Electrical & Plumbing Inspectors are all FTE	We also employ to part-time technical inspectors, and through them and existing FTEs, the City is able to supplant State commercial plan review.
Floodplain Manager	Yes	Sustainability Coordinator & Director of Planning & Community Development	
Emergency Manager	Yes	City Planner/Zoning Administrator	
Grant Writer	Yes	Chief of Police	
GIS Data Resources – (land use, building footprints, etc.)	No		Project by project basis
Warning systems/services	Yes	Associate Planner has skills but is not a FT grant writer	

Data Source: City of Middleton Data Collection Guide 2021

Table 18 identifies financial tools or resources that the City of Middleton could potentially use to help fund mitigation activities.

Table 18 Financial Resources for the City of Middleton

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	**Yes**
Capital improvements project funding	**Yes**
Authority to levy taxes for specific purposes	**Yes**
Dedicated funding for land, easement or conservation easement acquisition	**No**
Fees for water, sewer, gas, or electric services	**Yes**
Impact fees for new development	**Yes**
Incur debt through general obligation bonds	**Yes**
Incur debt through special tax bonds	**Yes**
Incur debt through private activities	**No**
Withhold Spending in hazard prone areas	**Yes**

Data Source: City of Middleton Data Collection Guide

Additional Capabilities

The City of Middleton has ongoing water conservation messages through the Public Works newsletter and the Water Utility still has rebates for water-saving toilet replacements.

The Fire District has a Captain who dedicates much of his time toward fire safety and household preparedness. He also speaks to numerous schoolrooms to reach parents through their children.

The Middleton-Cross Plains Area School District has an excellent number of teachers who emphasize environmental education. The Friends of Pheasant Branch and the City's Sustainability Committee and Conservancy management through Parks & Recreation have ongoing educational programs in the community.

National Flood Insurance Program Participation

The City of Middleton currently participates in the National Flood Insurance Program.

Public Involvement Activities

The City of Middleton provided a publically noticed listening session with the City of Middleton Common Council on December 7, 2021. No changes were made to the initial draft mitigation strategies based on public comment.

MITIGATION ACTIONS

Below are the identified mitigation strategies developed by the City of Middleton's NHMP steering committee. Mitigation is defined as a sustained action to reduce or eliminate risk to people and property from hazards and their effects. A *mitigation strategy* is a long-term vision for risk reduction in local jurisdictional or regional planning. A mitigation strategy can be achieved by a list of overall improvements to achieve (goals) that provide direction for community efforts to reduce potential losses identified in the risk assessment.

Strategy #1	**Flood Study / Flood Reduction Projects**
Prevention	**Natural Resource Protection**
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	Structural Project

The City of Middleton experienced a large flood event in August of 2018 which caused significant property damage. The City commissioned an updated flood study for the Pheasant Branch corridor and is currently analyzing the results.

The desired outcome will be recommendations of projects that will have the potential to reduce flood elevations (and a corresponding reduction in potential property damage) via improvements to flood storage facilities and stormwater conveyances. Updated flood mapping will be incorporated into the existing floodplain zoning ordinance.

Defined steps to achieving this mitigation strategy

1. Analysis of Flood Study and Existing Stormwater System Facilities
   a. *Responsible Party* – Assistant City Engineer
   b. *Funding source* – N/A
   c. *Completion date* – March 31, 2022

2. Prioritization of Flood Reduction Strategies
   a. *Responsible Party* – Assistant City Engineer, Water Resources Management Commission, Stormwater Utility Board
   b. *Funding source* – Grants, Water Resources Funds
   c. *Completion date* – June 30, 2022

Strategy #1	Flood Study / Flood Reduction Projects

3. Flood Reduction Projects: Design and Construction
   a. *Responsible Party* – Assistant City Engineer
   b. *Funding source* – Grants, Water Resources Funds, Stormwater Utility Funds
   c. *Completion date* – December 31, 2023

Strategy #2	Mitigate Flood Risk at Graber Pond

Prevention	**Natural Resource Protection**
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

Graber Pond has experienced high water levels both recently and in the past. There is a flood risk to properties adjacent to Graber Pond and downstream. The City is working to mitigate the risk through controlling upstream development, diverting stormwater flows from a portion of the watershed, and constructing a new outlet for the pond.

The desired outcome will be a reduction in flood elevations within the pond basin while minimizing additional flows routed downstream.

Defined steps to achieving this mitigation strategy

1. Enforce strict stormwater management requirements for new developments and re-developments upstream of the pond
   a. *Responsible Party* – Assistant City Engineer, Water Resources Management Commission
   b. *Funding source* – N/A
   c. *Completion date* – Ongoing
   a.

2. Divert a portion of the upstream watershed away from Graber Pond.
   d. *Responsible Party* – Assistant City Engineer, City Administrator
   e. *Funding source* – TIF funding
   f. *Completion date* – December 31, 2022

Strategy #2	Mitigate Flood Risk at Graber Pond

3. Design and Construct new pond outlet
   d. *Responsible Party* – Assistant City Engineer, Water Resources Management Commission
   e. *Funding source* – Stormwater Utility
   f. *Completion date* – December 31, 2022

Strategy #3	Reduce Stormwater Run-off through changes to Zoning Code
Prevention	**Natural Resource Protection**
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	Structural Project

The City is in the process of re-writing our zoning code, and intends to encourage reductions in stormwater runoff through the code.

The desired outcome will be a reduction in stormwater runoff from new developments and re-developments, and a corresponding reduction in the rate and volume of stormwater released to downstream conveyance facilities.

Defined steps to achieving this mitigation strategy

1. Review and comment on stormwater component of draft Zoning Ordinance re-write
   d. *Responsible Party* – Assistant City Engineer, Water Resources Management Commission
   e. *Funding source* – N/A
   f. *Completion date* – March 31, 2022
   a.

2. Finalize Zoning Ordinance
   g. *Responsible Party* – Director of Planning, and Assistant City Engineer
   h. *Funding source* – N/A
   i. *Completion date* – June 30, 2022

Dane County Natural Hazard Mitigation Plan

City of Monona Annex

Summer 2022

City of Monona Annex

This annex is a part of the Dane County Natural Hazard Mitigation Plan (DCNHMP). The DCNHMP contains additional information to support the Federal Emergency Management Agency's (FEMA) recognition of the plan (including this annex) as the formal natural hazard mitigation plan for the county and participating local governments. This annex will be valid for as long as FEMA approves the DCNHMP. The strategies adopted in this annex are designed to guide community efforts to reduce risks from natural hazards. These strategies work in conjunction with neighboring communities and Dane County government to reduce risks from natural hazards.

COMMUNITY PROFILE

The City of Monona is located on the southeastern shore of Lake Monona, east of Madison and north of the Village of McFarland. Land use is dominated by residential and commercial use, and dispersed one - and two-family homes. According to the United States Census Bureau, the City of Monona has a total area of 3.26 square miles of land and 0.09 square miles of water. As of 2020, there are 3,896 households residing in the City of Monona, with an average of 2.07 people per household. The population density is 2,310 per square mile.

The municipal population data provided by the American Community Survey, a product of the US Census Bureau, indicates that the 2019 population estimates for City of Monona is comprised of 8,122 people. Table 1 shows the population profile by age for City of Monona.

Table 1 Population Profile of City of Monona, Dane County

Category	Number	Percent
Total Population	**8,122**	**100%**
Under 5 years	400	4.9%
5 to 9 years	520	6.4%
10 to 14 years	399	4.9%
15 to 19 years	328	4.0%
20 to 24 years	374	4.6%
25 to 29 years	519	6.4%
30 to 34 years	613	7.5%
35 to 39 years	562	6.9%
40 to 44 years	501	6.2%
45 to 49 years	482	5.9%
50 to 54 years	512	6.3%
55 to 59 years	599	7.4%
60 to 64 years	650	8.0%
65 to 69 years	552	6.8%
70 to 74 years	462	5.7%
75 to 79 years	263	3.2%
80 to 84 years	166	2.0%
85 years and over	220	2.7%

Data Source: 2019 ACS Estimates - U.S. Census

Growth & Development Trends

Table 2 illustrates how the entire City of Monona has grown in terms of population and number of households between 2010 and 2020. Housing data is to 2020 due to data availability. Table 3 is drawn from the Demographics Services Center at the Wisconsin Department of Administration, and shows population projections through 2040.

Table 2 City of Monona Change in Population and Households, 2010-2020

2010 Population	2020 Population	Percent Change (%) 2010-2020	2010 # of Households	2020 # of Households	Percent Change (%) 2010-2020
7,533	8,161	8.33%	3,777	3,783	0.15%

Data Source: Demographic Services Center, Wisconsin Department of Administration, 2021

Table 3 City of Monona Population Projections, 2020-2040

Population Projection	2020	2025	2030	2035	2040
Increase by half of percent of change (8.33%/2) every 5 years	8,161	8500	8,853	9,221	9,604

Data Source: Demographic Services Center, Wisconsin Department of Administration, 2021

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Population Summary

Tables 4-7 illustrates key population demographics within the City of Monona. Key demographics include: (1) Disability Characteristics, (2) Federal Income Poverty Levels, (3) Educational Attainment, and (4) Household Language with English Speaking Capabilities. Due to data availability, all key demographic information has been provided by the American Community Survey (ACS) 2019 estimates. The ACS is a self-reported survey and may include total sample size differences and statistical margin of error.

Table 4 City of Monona, Dane County – Disability Characteristics by Detailed Age

Category	Number	Percent
Total of Resident of Self-Identified as Disabled	**1,432**	**100%**
With a hearing difficulty	**240**	**16.8%**
Population under 18 years	0	-
Population 18 to 64 years	73	-
Population 65 years and over	167	-
With a vision difficulty	**96**	**6.7%**
Population under 18 years	0	-
Population 18 to 64 years	44	-
Population 65 years and over	52	-
With a cognitive difficulty	**269**	**18.8%**
Population under 18 years	4	-
Population 18 to 64 years	141	-
Population 65 years and over	124	-
With an ambulatory difficulty	**408**	**28.5%**
Population under 18 years	0	-
Population 18 to 64 years	116	-
Population 65 years and over	292	-
With a self-care difficulty	**128**	**8.9%**
Population under 18 years	0	-
Population 18 to 64 years	29	-
Population 65 years and over	99	-
With an independent living difficulty	**291**	**20.3%**
Population 18 to 64 years	119	-
Population 18 to 34 years	51	-
Population 65 years and over	172	-

Data Source: 2019 ACS Estimates - U.S. Census

Table 5.1: City of Monona, Dane County – Federal Income Poverty Levels (FIPL) by Families Summary

Category	Number of Families
50 percent of poverty level	28
125 percent of poverty level	68
150 percent of poverty level	120
185 percent of poverty level	167
200 percent of poverty level	187
300 percent of poverty level	307
400 percent of poverty level	694
500 percent of poverty level	927

Data Source: 2019 ACS Estimates - U.S. Census

Note: Use table 5.2 to interpret table 5.1:

5.1 identifies the *total number of families* (regardless of size) by percentage.

5.2 identifies *family size* in relation to annual family income and the percentage category of the FIPL.

Table 5.2: City of Monona, Dane County – Annual Federal Income Poverty Level Guide

Family Size	50%	100%	125%	150%	185%	200%	300%	400%	500%
1	$6,440	$12,880	$16,100	$19,320	$23,828	$25,760	$38,640	$51,520	$64,400
2	$8,710	$17,420	$21,775	$26,130	$32,227	$34,840	$52,260	$69,680	$87,100
3	$10,980	$21,960	$27,450	$32,940	$40,626	$43,920	$65,880	$87,840	$109,800
4	$13,250	$26,500	$33,125	$39,750	$49,025	$53,000	$79,500	$106,000	$132,500
5	$15,520	$31,040	$38,800	$46,560	$57,424	$62,080	$93,120	$124,160	$155,200
6	$17,790	$35,580	$44,475	$53,370	$65,823	$71,160	$106,740	$142,320	$177,900

Data Source: dhs.wisconsin.gov

Table 6: City of Monona, Dane County – Educational Attainment by Householders

Category	Number	Percent
Total of Householders	**2,066**	**100%**
Less than high school graduate	0	0.0%
High school graduate (includes equivalency)	241	11.7%
Some college or associate's degree	521	25.2%
Bachelor's degree or higher	1,304	63.1%

Data Source: 2019 ACS Estimates - U.S. Census

Table 7: City of Monona, Dane County – Household Language & English Speaking Capabilities

Category	Number	Percent
Total of Households	**3,896**	**100%**
English only	**3,691**	**94.7%**
Spanish:	**72**	**1.85%**
Limited English speaking household	0	-
Not a limited English speaking household	72	-
Other Indo-European languages:	**51**	**1.3%**
Limited English speaking household	0	-
Not a limited English speaking household	51	-
Asian and Pacific Island languages:	**27**	**0.7%**
Limited English speaking household	0	-
Not a limited English speaking household	27	-
Other languages:	**55**	**0.6%**
Limited English speaking household	33	-
Not a limited English speaking household	22	-

Data Source: 2019 American Community Survey

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Asset Inventory

Assets include the people, property, and critical facilities within the City of Monona that are exposed to hazards in general. Inventories of property, essential infrastructure, and natural, cultural or historic resources help provide a comprehensive picture of the community and provide a method of assessing exposure to hazards by establishing the improved and total values, capacities and populations for these assets. It also forms the basis for estimating potential losses, where possible.

General Property

Table 8 Property Exposure Summary

Property Type	Parcel Count	Improved Land Count	Improved Land Value ($)	Content Value ($)	Total Value ($)
Total	**3,876**	**3,835**	**1,182,462,600**	**591,231,300**	**1,773,693,900**
Industrial	46	46	40,715,400	20,357,700	61,073,100
Residential	3,555	3,555	919,802,100	459,901,050	1,379,703,150
Transportation	4	4	9,518,100	4,759,050	14,277,150
Utility	8			0	0
Commercial	215	215	208,925,800	104,462,900	313,388,700
Other	13	4	2,877,800	1,438,900	4,316,700
Institutional/ Governmental	35	11	623,400	311,700	935,100

Data Source: Dane County Land Information Office, December 2021

Critical Facilities

The City of Monona has identified the critical facilities important to protect from disaster impacts. These are collected in Table 9. Table 9 is based on GIS data inventories from Dane County and information gathered from the City. No further supplemental data was provided by the community through the Data Collection Guide.

Table 9 Critical Facility Summary/Essential Infrastructure

Facility	Type*	No. of Asset	Replacement Value ($)
Monona City Hall (Administration, Police, Fire, EMS, 911; equipment and vehicles)	EI	1	$20+ MM
Public Works Garage (equipment and vehicles)	EI	1	$10 MM
400,000 Elevated Storage Water Tower	EI	1	$2 MM
100,000 Elevated Storage Water Tower	EI	1	$1 MM
Wells 1, 2 & 3 Pumping Stations	EI	3	$10 MM
Surface Potable Water Storage 900,000 gallons	EI	1	$5 MM
Monona Community Center	EI	1	$5 MM
Monona Library	EI	1	$10 MM
Historic Site (2)	VF	2	N/A
Public Schools (3)	VF	3	N/A
Community Based Residential (2)	VF	2	Unknown
*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities			

Data Source: 2021 City of Monona Data Collection Guide

Other Assets

Other assets help define a community beyond the current composition of the City of Monona. These assets may provide economic benefit to the community, in addition to preserving the heritage and diversity of the community and may include natural, cultural and historic assets or economic assets such as major employers. It may also include more specific detail on critical facilities. The City of Monona has not identified any other assets.

VULNERABILITY ASSESSMENT

A hazard identification and vulnerability analysis was completed for the City of Monona using the same methodology in the County's base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete.

The first step in a hazard analysis is to identify which hazards the community is vulnerable to. Table 10 outlines the hazard identification for the City of Monona based on the Data Collection Guide issued in 2021. The Data Collection Guide listed all of the hazards that could impact Dane County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. Brooklyn's planning team members were asked to complete the matrix by ranking each category on a scale of 0 to 5 based on the experience and perspective of each planning team member. A ranking of 0 indicated "no concern" while a ranking of 5 indicated "highest concern." This matrix appears as Table 10. This matrix reflects the significance of the hazards relative to one another as perceived by the Example's planning team.

This matrix reflects that the City of Monona is most vulnerable to floods, winter storms and tornadoes. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 10: Vulnerability Assessment Matrix for the City of Monona

Name of Jurisdiction: City of Monona										
Hazard	**Hazard Attributes**			**Impact Attributes**						
				Primary Impact (Short Term - Life and Property)			**Secondary Impact (Long Term – Community Impacts)**			
	Area of Impact	Past History, Probability of Future Occurrence	Short Term Time Factors	Impact on General Structures	Impact on Critical Facilities	Impact on At-Risk Populations	Social Impact	Economic Impact	Severity Of Other Associated Secondary Hazards	**Total of Row Values**
	(1-5)	*(1-5)*	*(1-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	
Dam/Levee failure	3	1	3	3	3	3	3	3	3	25
Extreme Cold	2	2	1	1	1	3	2	1	2	15
Extreme Heat	2	1	1	1	1	3	1	1	1	12
Drought	3	1	1	0	0	1	1	2	0	9
Expansive soils	2	1	1	1	1	1	1	2	1	11
Flood	2	4	3	3	3	3	3	3	3	27
Fog	1	1	1	0	0	1	0	0	1	5
Hail Storm	3	1	1	1	1	1	1	1	2	12
Landslide	0	0	0	0	0	0	0	0	0	0
Lightning	1	1	1	1	1	1	1	1	1	9
Tornado	2	2	2	3	3	3	3	3	3	24
Wildfire	0	0	0	0	0	0	0	0	0	0
Windstorm	3	1	3	3	3	3	2	2	3	23
Winter Storm	3	2	3	3	3	3	3	3	3	26

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County. The previous inventory tables quantify what is exposed to the various hazards within City of Monona. Table 11 cross-references the hazards with the various tables where exposure or vulnerability specifics are found. The intent of Table 6 is to quantify, where possible, future impacts of each hazard on the jurisdiction. In many cases it is difficult to estimate potential losses, so the overall exposure of populations, structures, and critical facilities is referenced.

Table 11 Hazard Vulnerability Specifics

Hazard	Populations	Structures	Critical Facilities	Future Damage Potential
Dam Failure	See Dam Hazard Profile in County Plan	See Dam Hazard Profile in County Plan	See Dam Hazard Profile in County Plan	Specifics unknown; See hazard profile in County Plan
Drought	Minimal	None	None	Specifics unknown; See hazard profile in County Plan
Flooding	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below
Fog	Minimal	None	None	Specifics unknown; See hazard profile in County Plan
Hailstorm	Minimal	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Landslide/ Sinkholes/ Erosion	None	None	None	Specifics unknown; See hazard profile in County Plan
Lightning	Minimal	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Severe Cold	See Tables 4-7 Population	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Severe Heat	See Tables 4-7 Population	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Winter Storm	See Tables 4-7 Population	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Tornado	See Table 15 below	See Table 15 below	See Table 15 below	See Table 15 below
Wildfire	None	None	None	Specifics unknown; See hazard profile in County Plan
Windstorm	See Tables 4-7 Population	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan

Data Source: 2021 City of Monona Data Collection Guide – Prepared by DCEM

Previous Hazard Events

Through the Data Collection Guide, the City of Monona noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the main mitigation plan. These events had a particular impact on the community beyond the impacts and events recorded in the Dane County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

City of Monona Historic Natural Hazards

Table 12 City of Monona Historic Natural Hazards

Natural Hazard	Date	Impacted Structures	Comprehensive Harm to Jurisdiction	Other reported Losses (Fiscal reports, programs, etc)	Comments
Flood	2018	N/A	Overtime personnel staff, sandbagging distribution costs, heightened lake levels, local state of emergency declared.	N/A	[High likelihood of reoccurring]

Data Source: 2021 City of Monona Data Collection Guide

Flood Hazard

Structures and Properties in the Floodplain

Refer to the flood profile in the mitigation plan for a description of the methodology used to identify potentially flood-prone properties. Figure 1 shows mapped floodplains, future growth areas, and critical or vulnerable facilities. Tables 13 and 14 outline the primary structures on them within the City of Monona, Dane County. Potential number of individuals at risk figures are based on primary residential structures and the average household size within Dane County (2.37 people as of 2021). Estimated loss potentials for all structures on the floodway can be found within section 4.6 in chapter 4 of the county plan. Unavailable data is due to Land Use data availability.

Table 13 Primary Structures in the 100 Year Floodplain

Residential Structures in 100 yr. Floodway	Non-Residential Structures in 100 yr. Floodplain	Total Structures in 100 yr. Floodplain	Potential # of People at Risk in 100 yr. Floodplain	Total Assessed Values ($) of Structures in 100 yr. Floodplain
52	7	59	123	$19,484,797

Source: Analysis based on Dane County Land Information Office Data

Table 14 Primary Structures in the 500 Year Floodplain

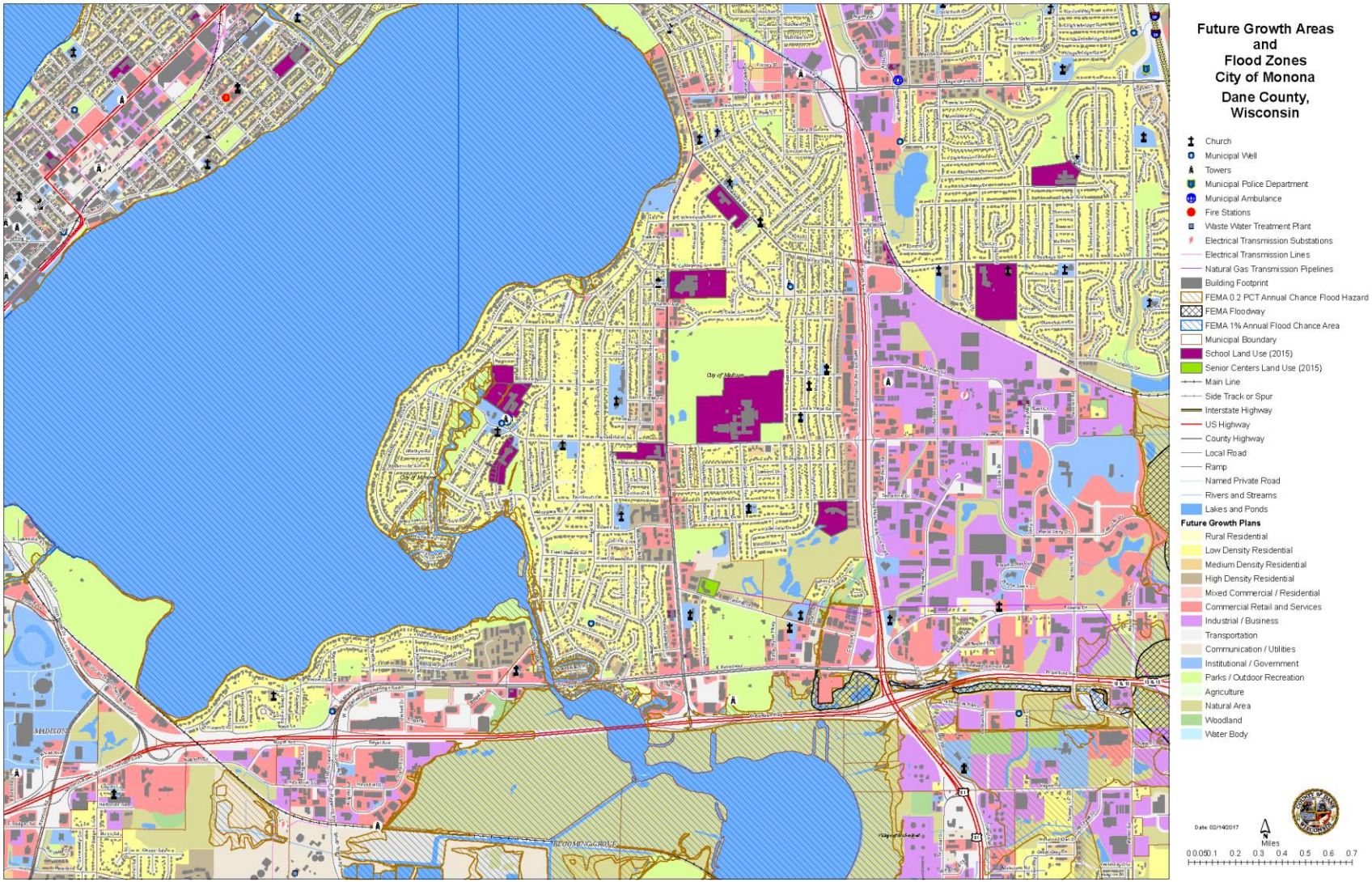
Residential Structures in 500 yr. Floodway	Non-Residential Structures in 500 yr. Floodplain	Total Structures in 500 yr. Floodplain	Potential # of People at Risk in 500 yr. Floodplain	Total Improved Values ($) of Structures in 500 yr. Floodplain
201	6	207	476	N/A

Source: Analysis based on Dane County Land Information Office Data

Repetitive Loss Properties and Flood Insurance Polices

- 2 Repetitive loss properties have been reported in the City of Monona, Dane County.
- The City of Monona has 46 flood insurance policies in force within Dane County, with a total coverage of $15,043,900.

Figure 1 Flood Hazards and Future Land Use Map



Tornado

While it is difficult to estimate specific losses to a tornado due to the random nature of the event, a methodology was developed that was applied to each jurisdiction during the 2023 update. The table below estimates the percent area of the jurisdiction that could be impacted based on the average sized tornado (F2) in Dane County. High value exposure is based on 100% loss, medium 50% loss, and low is 25% loss to the property potentially impacted. The loss ratio, which is the ratio of the damaged building value to total exposed building value, is a measure of the impact to the jurisdiction as a whole. Communities with loss ratios 10% or more may have difficulty recovering from a disaster. Refer to the tornado hazard profile in the main mitigation plan for more details on this methodology.

Table 15 Tornado Loss Estimate

% Area impact	Improved Parcel Count	Affected Structure Estimate	Total Exposed Value ($)	Estimated Loss $ (High Damage Range)	Estimated Loss $ (Moderate Damage Range)	Estimated Loss $ (Low Damage Range)	Loss Ratio for Moderate Damage Range
25.69%	3,835	985	1,773,693,900	455,715,668	227,857,834	113,928,917	13%

Data Source: Analysis Based on Dane County Land Information Office's data

Problems or Additional Vulnerability Issues

The City of Monona's Data Collection Guide issued in 2021 listed:

- **Hazard Concerns**:
  - There was two (2) senior housing facilities within the community that house populations that would have special needs during a hazard or emergency event. In addition, there are multiple-family apartment complexes that are located throughout the community that also have individuals who may have special needs during an emergency event. Commercial/industrial growth in southeastern business park.
- **Growth Trends**:
  - Growth in Monona is limited to redevelopment, which includes construction of more density through multiple family residential structures. These structures, with a higher population density than single family residential, may have additional vulnerabilities during emergency events.
- **Updates since 2018 NHMP Cycle**:
  - N/A. This is an updated to the 2010 plan. The City has worked to make repairs to flooded areas from the 2018 flood event, including additional shoreline protections, however, mitigation strategies are more difficult given that the majority of low-laying/flood prone areas are private property and not public properties.

CAPABILITY ASSESSMENT

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities for the City of Monona.

Mitigation Capabilities Summary

Table 16 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities, or by themselves contribute to reducing hazard losses. The table also indicates which of these tools are currently utilized in the City of Monona.

Table 16 City of Monona Regulatory Mitigation Capabilities

Regulatory Tools (ordinances, codes, plans)	Yes/No	Comments
Existing Natural Hazard Mitigation Plan	Yes	Latest update was from October 2009 Annex
General or Comprehensive plan	Yes	http://mymonona.com/560/2016-Comprehensive-Plan
Zoning ordinance	Yes	https://ecode360.com/30665574
Subdivision ordinance	Yes	https://ecode360.com/30703816
Growth management ordinance	No	Growth limited due to being landlocked
Shoreland / wetland zoning ordinance	Yes	https://ecode360.com/30695725
Floodplain zoning ordinance	Yes	https://ecode360.com/30695725
FEMA / NFIP Community Rating System	Yes	N/A
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	https://ecode360.com/30663698
Building code	No	Follow State Building Codes
Fire department ISO rating	Yes	N/A
Climate change Impact program	No	N/A
Erosion or sediment control program	Yes	https://ecode360.com/30663698
Stormwater management program	Yes	http://www.mymonona.com/1271/Leaf-Management-Adopt-a-Storm-Drain-Prog
Site plan review requirements	Yes	Part of Zoning Ordinance, see above
Capital improvements plan	Yes	http://mymonona.com/Archive.aspx?AMID=36
Economic development plan	Yes	http://mymonona.com/238/City-Plans
Local emergency operations plan		
Other special plans	Yes	http://mymonona.com/238/City-Plans
Flood insurance study or other engineering study for streams	No	WDNR/FEMA
Elevation certificates (for floodplain development)	No	WDNR/FEMA
Climate Action Plan	No	N/A

Regulatory Tools (ordinances, codes, plans)	Yes/No	Comments
Other	Yes	Floodplain educational information. http://mymonona.com/1426/Floodplain-and-Shoreline-Regulations

Data Source: City of Monona Data Collection Guide, 2021

Table 17 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in the City of Monona.

Table 17 Responsible Personnel and Departments for the City of Monona

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	City Planner	In position for 2.5 years
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Contract engineering	Contract with multiple engineering firms for engineering and building inspection services.
Planner/engineer/scientist with an understanding of natural hazards		N/A	Dane County and WDNR
Personnel skilled in GIS	Yes	Project Manager in Public Works Department	N/A
Full-time Building Official	No	N/A	Building Inspection is a contracted professional service
Floodplain Manager	No	N/A	
Emergency Manager	Yes	N/A	WDNR
Grant Writer	Yes	City Administrator/Fire Chief/Police Chief	N/A
GIS Data Resources – (land use, building footprints, etc.)	No	N/A	N/A
Warning systems/services	No	N/A	N/A

Data Source: City of Monona Data Collection Guide 2021

Table 18 identifies financial tools or resources that the City of Monona could potentially use to help fund mitigation activities.

Table 18 Financial Resources for the City of Monona

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	N/A
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	No
Dedicated funding for land, easement or conservation easement acquisition	No
Fees for water, stormwater, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	No
Incur debt through private activities	No
Withhold Spending in hazard prone areas	No

Data Source: City of Monona Data Collection Guide

Additional Capabilities

The City of Monona identified the following as past or ongoing public education or information programs:

- **Past or On-going Public Education:**
  - Monona Sustainability Committee provides public education on topics such as clean energy, bicycle infrastructure, among other sustainability topics. Monona is a Green Tier Legacy Community and has receive a Climate Champion award from Dane County Office of Energy and Climate Change.
- **Past or On-going Loss Prevention Programs**:
  - City is in the process of evaluating and planning for the construction of a new Public Safety Facility to replace existing facilities. Projected construction timeframe is 2024.

National Flood Insurance Program Participation

The City of Monona currently participates in the National Flood Insurance Program.

Public Involvement Activities

The City of Monona provided a publically noticed listening session with the City of Monona Public Safety Committee on November 24, 2021. This listening session was noticed by the *Herald Independent*, a newspaper published in Dane County. Public input was received and documented.

MITIGATION STRATEGIES

Below are the identified mitigation strategies developed by the City of Monona's NHMP steering committee. Mitigation is defined as a sustained action to reduce or eliminate risk to people and property from hazards and their effects. A *mitigation strategy* is a long-term vision for risk reduction in local jurisdictional or regional planning. A mitigation strategy can be achieved by a list of overall improvements to achieve (goals) that provide direction for community efforts to reduce potential losses identified in the risk assessment.

Strategy #1	**Critical Facilities Protection**
Prevention	Natural Resource Protection
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	**Structural Project**

Construct a safe room and Emergency Operations Center (EOC) within proposed new Public Safety facility (joint Police, Fire, and EMS) to provide shelter to residents in emergencies and provide command center facility to coordinate emergency response.

Defined steps to achieving this mitigation strategy

1. Design both safe room capabilities and an Emergency Operations Center (EOC) within the proposed new Monona Public Safety facility.
   a. *Responsible Party* – Police and Fire/EMS Departments
   b. *Funding source* – City Capital Bonding for new facility, and FEMA Building Resilient Infrastructure and Communities (BRIC) grant.
   c. *Completion date* – A feasibility analysis for a new facility is currently underway, with proposed completion date in 2024. Safe room and EOC facilities would be dependent in part of successful award of FEMA BRIC grant(s).

Strategy #2	Flood Mitigation
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

Continue to implement sound floodplain management practices through continued compliance with the National Flood Insurance Program, to include floodplain ordinance enforcement and periodic review, promoting the benefits of flood insurance, and continued staff training and development in floodplain management.

Defined steps to achieving this mitigation strategy

1. Evaluate through the existing staff, County planning staff, and additional DNR staff, if necessary, the regulatory deficiencies and enforcement shortcomings in flood-related ordinances and programs.
   d. *Responsible Party* – Public Works Department and Planning Department
   e. *Funding source* – Existing departmental budgets and staff time
   f. *Completion date* – 2023

2. Update Floodplain Ordinances, as necessary from completion of above Step 1.
   a. *Responsible Party* – Public Works Department and Planning Department
   b. *Funding source* – Existing departmental budgets and staff time
   c. *Completion date* – 2023

3. Ensure that stop work order and other means of compliance are being utilized as authorized by each ordinance.
   a. *Responsible Party* – Public Works Department and Building Inspection
   b. *Funding source* – Existing departmental budgets and staff time
   c. *Completion date* – On-going

Strategy #2	Flood Mitigation

4. Participate in Flood Insurance Rate Map updates by adopting new maps or amendments to maps as necessary.
   a. *Responsible Party* – Public Works Department and Planning Department
   b. *Funding source* – Existing departmental budgets and staff time
   c. *Completion date* – On-going

5. Promote and disperse information on the benefits of flood insurance and other safety information, with assistance from partners such as Dane County, WI DNR, and the Association of State Floodplain Management (ASFPM).
   a. *Responsible Party* – Public Works Department, Fire Department, and Planning Department
   b. *Funding source* – Existing departmental budgets and staff time
   c. *Completion date* – On-going

Strategy #3	**Flood Protection**
Prevention	Natural Resource Protection
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	Structural Project

Decrease localized flooding on private property and roads through a coordinated approach, which improves roads, and storm sewers and sanitary sewer infrastructure, and minimizes flooding on private property.

Defined steps to achieving this mitigation strategy

1. Coordinate the filling/raising of residential lots that are currently located within low-lying areas, such as Belle Isle, to minimize adjacent property flooding that may occur because of the filling.
   a. *Responsible Party* – Public Works Department
   b. *Funding source* – DNR Municipal Flood Control Program grant
   c. *Completion date* – Completion is contingent upon successful grant funding award

2. Improve streets and utilities in low-lying areas with the goal of raising the road above the 100-year floodplain elevation, taking into consideration updates to the 100-year flood plain elevations.
   d. *Responsible Party* – Public Works Department
   e. *Funding source* – Capital Improvement Budget and DNR Municipal Flood Control Program grants
   f. *Completion date* – Completion is contingent upon successful grant funding award and capital budget planning

Strategy #3	Flood Protection

3. Minimize sanitary sewer backups during periods of high water, through continued implementation of inflow/infiltration projects on the City's utility infrastructure.
   d. *Responsible Party* – Public Works Department
   e. *Funding source* – City Capital Improvement Plan and Stormwater Utility Fund
   f. *Completion date* – 2022-2027

Strategy #3	Hazard Awareness & Education
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

Support Dane County efforts to mitigate natural hazards at the local level through continued collaboration with County projects in the City of Monona area. The City will support community resiliency be raising awareness of potential hazards and building support for mitigation strategies community-wide.

Defined steps to achieving this mitigation strategy

1. Utilize existing and future City communication avenues, such as the City's website, social media platforms, Monona's WVMO radio, local print media, and other resources to provide residents with information on potential hazards and mitigation strategies.
   a. *Responsible Party* – City Administration, Fire Department, and Police Department.
   b. *Funding source* – Existing departmental budgets.
   c. *Completion date* – On-going

2. Train a contingent of volunteers to assist public safety and public works safely and appropriately in disaster response efforts. Examples of volunteer partners include (but not limited to): Fire Department volunteers, Red Cross, Salvation Army, staff of Monona WVMO radio station, untrained community volunteers.
   g. *Responsible Party* – Police and Fire/EMS Departments
   h. *Funding source* – Existing departmental budgets
   i. *Completion date* – On-going

Strategy #3	Hazard Awareness & Education

3. Improve non-emergency communications with stakeholders that do not require 911 dispatch communications. Examples of such communications include: "breach in sandbag levee"; "Central location to report problems"; "coordination of donation material collections"; Where is Red Cross set up"; "Report a lost child"; "Rumor control", etc.
   g. *Responsible Party* – Police and Fire/EMS Departments, City Administration, Community Media Department.
   h. *Funding source* – Existing departmental budgets
   i. *Completion date* – On-going

Dane County Natural Hazard Mitigation Plan

City of Sun Prairie Annex

Summer 2022

City of Sun Prairie Annex

This annex is a part of the Dane County Natural Hazard Mitigation Plan (DCNHMP). The DCNHMP contains additional information to support the Federal Emergency Management Agency's (FEMA) recognition of the plan (including this annex) as the formal natural hazard mitigation plan for the county and participating local governments. This annex will be valid for as long as FEMA approves the DCNHMP. The strategies adopted in this annex are designed to guide community efforts to reduce risks from natural hazards. These strategies work in conjunction with neighboring communities and Dane County government to reduce risks from natural hazards.

COMMUNITY PROFILE

The City of Sun Prairie, is located northeast of the City of Madison. The City is located on several major transportation corridors, including US Highway 151. The predominant land uses within Sun Prairie's borders are residential and commercial. Indicated by the Wisconsin Department of Administration and City of Sun Prairie 2019-2039 Comprehensive Plan, there is an estimated 14,203 households with a household size of 2.44, and 12,536-13,236 housing units. The population density is 2401.4 people per square mile.

The municipal population data provided by the American Community Survey, a product of the US Census Bureau, indicates that the 2019 population estimates for City of Sun Prairie is comprised of 33,321 people. Table 1 shows the population profile by age for City of Sun Prairie.

Table 1 Population Profile of City of Sun Prairie, Dane County

Category	Number	Percent
Total Population	**33,321**	**100%**
Under 5 years	2,283	6.9%
5 to 9 years	2,149	6.4%
10 to 14 years	2,603	7.8%
15 to 19 years	2,226	6.7%
20 to 24 years	1,608	4.8%
25 to 29 years	2,464	7.4%
30 to 34 years	2,472	7.4%
35 to 39 years	2,933	8.8%
40 to 44 years	2,385	7.2%
45 to 49 years	2,306	6.9%
50 to 54 years	2,065	6.2%
55 to 59 years	1,992	6.0%
60 to 64 years	1,386	4.2%
65 to 69 years	1,432	4.3%
70 to 74 years	1,247	3.7%
75 to 79 years	650	2.0%
80 to 84 years	523	1.6%
85 years and over	597	1.8%

Data Source: 2019 ACS Estimates - U.S. Census

Growth & Development Trends

Table 2-3 illustrates how the entire City of Sun Prairie has grown in terms of population and number of households between 2010 and 2020. Housing data is to 2020 due to data availability. Table 2-3 is drawn from the City of Sun Prairie Comprehensive Plan 2019-2039, and the Wisconsin Department of Administration.

Table 2 City of Sun Prairie Change in Population and Households, 2010-2020

2010 Population	2020 Population	Percent Change (%) 2010-2020	2010 # of Households	2020 # of Households	Percent Change (%) 2010-2020
29,364	36,394	23.94%	11,636	14,203	22.06%

Data Source: City of Sun Prairie Comprehensive Plan 2019-2039 & Wisconsin Department of Administration, 2021

Table 3 City of Sun Prairie Population Projections, 2020-2040

Population Projection	2020	2025	2030	2035	2040
Increase by half of percent of change (23.94%/2) every 5 years	36,394	40,750	45,627	51,088	57,203

Data Source: Demographic Services Center, Wisconsin Department of Administration, 2021

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Population Summary

Tables 4-7 illustrates key population demographics within the City of Sun Prairie. Key demographics include: (1) Disability Characteristics, (2) Federal Income Poverty Levels, (3) Educational Attainment, and (4) Household Language with English Speaking Capabilities. Due to data availability, all key demographic information has been provided by the American Community Survey (ACS) 2019 estimates. The ACS is a self-reported survey and may include total sample size differences and statistical margin of error.

Table 4 City of Sun Prairie, Dane County – Disability Characteristics by Detailed Age

Category	Number	Percent
Total of Residents Self-Identified as Disabled	**5,002**	**100%**
With a hearing difficulty	**820**	**16.4%**
Population under 18 years	46	-
Population 18 to 64 years	180	-
Population 65 years and over	594	-
With a vision difficulty	**430**	**8.6%**
Population under 18 years	58	-
Population 18 to 64 years	99	-
Population 65 years and over	273	-
With a cognitive difficulty	**943**	**18.9%**
Population under 18 years	175	-
Population 18 to 64 years	458	-
Population 65 years and over	310	-
With an ambulatory difficulty	**1,330**	**26.6%**
Population under 18 years	0	-
Population 18 to 64 years	542	-
Population 65 years and over	788	-
With a self-care difficulty	**577**	**11.5%**
Population under 18 years	39	-
Population 18 to 64 years	235	-
Population 65 years and over	303	-
With an independent living difficulty	**902**	**18.0%**
Population 18 to 64 years	407	-
Population 18 to 34 years	142	-
Population 65 years and over	495	-

Data Source: 2019 ACS Estimates - U.S. Census

Table 5.1: City of Sun Prairie, Dane County – Federal Income Poverty Levels (FIPL) by Families Summary

Category	Number of Families
50 percent of poverty level	124
125 percent of poverty level	571
150 percent of poverty level	710
185 percent of poverty level	970
200 percent of poverty level	1,178
300 percent of poverty level	2,342
400 percent of poverty level	3,422
500 percent of poverty level	4,779

Data Source: 2019 ACS Estimates - U.S. Census

Note: Use table 5.2 to interpret table 5.1:

5.1 identifies the *total number of families* (regardless of size) by percentage.

5.2 identifies *family size* in relation to annual family income and the percentage category of the FIPL.

Table 5.2: City of Sun Prairie, Dane County – Annual Federal Income Poverty Level Guide

	2021 Annual Federal Poverty Level Guide								
Family Size	50%	100%	125%	150%	185%	200%	300%	400%	500%
1	$6,440	$12,880	$16,100	$19,320	$23,828	$25,760	$38,640	$51,520	$64,400
2	$8,710	$17,420	$21,775	$26,130	$32,227	$34,840	$52,260	$69,680	$87,100
3	$10,980	$21,960	$27,450	$32,940	$40,626	$43,920	$65,880	$87,840	$109,800
4	$13,250	$26,500	$33,125	$39,750	$49,025	$53,000	$79,500	$106,000	$132,500
5	$15,520	$31,040	$38,800	$46,560	$57,424	$62,080	$93,120	$124,160	$155,200
6	$17,790	$35,580	$44,475	$53,370	$65,823	$71,160	$106,740	$142,320	$177,900

Data Source: dhs.wisconsin.gov

Table 6: City of Sun Prairie, Dane County – Educational Attainment by Householders

Category	Number	Percent
Total of Householders	**8,410**	**100%**
Less than high school graduate	222	2.6%
High school graduate (includes equivalency)	1,371	16.3%
Some college, associate's degree	2,760	32.8%
Bachelor's degree or higher	4,057	48.2%

Data Source: 2019 ACS Estimates - U.S. Census

Table 7: City of Sun Prairie, Dane County – Household Language & English Speaking Capabilities

Category	Number	Percent
Total of Households	**13,479**	**100%**
English only:	**11,948**	**88.6%**
Spanish:	**508**	**3.8%**
Limited English speaking household	0	-
Not a limited English speaking household	508	-
Other Indo-European languages:	**276**	**2.0%**
Limited English speaking household	20	-
Not a limited English speaking household	256	-
Asian and Pacific Island languages:	**524**	**3.9%**
Limited English speaking household	92	-
Not a limited English speaking household	432	-
Other languages:	**223**	**1.7%**
Limited English speaking household	22	-
Not a limited English speaking household	201	-

Data Source: 2019 American Community Survey

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Asset Inventory

Assets include the people, property, and critical facilities within the City of Sun Prairie that are exposed to hazards in general. Inventories of property, essential infrastructure, and natural, cultural or historic resources help provide a comprehensive picture of the community and provide a method of assessing exposure to hazards by establishing the improved and total values, capacities and populations for these assets. It also forms the basis for estimating potential losses, where possible.

General Property

Table 8 Property Exposure Summary

Property Type	Parcel Count	Improved Land Count	Improved Land Value ($)	Content Value ($)	Total Value ($)
Total	**10,145**	**10,145**	**3,262,932,800**	**1,631,466,400**	**4,894,399,200**
Agriculture	31	31	264,700	132,350	397,050
Industrial	110	110	146,699,500	73,349,750	220,049,250
Residential	9,417	9,417	2,648,563,500	1,324,281,750	3,972,845,250
Transportation	2	2	195,600	97,800	293,400
Utility	44	44	6,718,800	3,359,400	10,078,200
Commercial	415	415	438,267,000	219,133,500	6,57,400,500
Other	48	48	18,071,400	9,035,700	27,107,100
Institutional/ Governmental	78	78	4,152,300	2,076,150	6,228,450

Data Source: Dane County Land Information Office, December 2021

Critical Facilities

The City of Sun Prairie has identified the critical facilities important to protect from disaster impacts. These are collected in Table 9. Table 9 is based on GIS data inventories from Dane County and information gathered from the City. No further supplemental data was provided by the community through the Data Collection Guide.

Table 9 Critical Facility Summary/Essential Infrastructure

Facility	Type*	No. of Facilities	Replacement Value ($)
Recycle Center	VF	1	$2,306,440
Sheehan Park Shelter	VF	1	$36,722
Sheehan Park Shelter	VF	1	$128,526
Sheehan Park Shelter	VF	1	$83,651
Sheehan Park Shelter	VF	1	$116,591
South Substation	EI	1	$2,000,000
Stoneridge Estates Park Shelter	VF	1	$87,926
Substation-Science Dr	EI	1	$2,000,000
Substation – Colorado Ave	EI	1	$2,000,000
Substation – Linnerud Dr	EI	1	$2,000,000
Substation – Thompson Rd	EI	1	$2,000,000
Substation – N. Bird St	EI	1	$2,000,000
Wastewater Treatment Plant	EI	1	$39,657,196
Wastewater Lift Stations	EI	1+	$1,478,944
Wastewater Conveyance	EI	1	$33,563,743
Water & Light	EI	1	$845,548
Water & Light	EI	1	$3,712,583
Water & Light	EI	1	$1,733,727
Water Tower - Linnerud	EI	1	$1,000,000
Water Tower – N Bird	EI	1	$1,000,000
Water Tower – Business Park	EI	1	$1,000,000
Museum	VF	1	$691,109
151 Substation	EI	1	$3,000,000
Well house #3	EI	1	$51,735
Well House #3	EI	1	$48,023
Well House #3	EI	1	$47,463
Well House #4	EI	1	$52,345
Well House #4	EI	1	$51,735
Well House #5	EI	1	$169,976
Well House #5	EI	1	$80,193
Well House #5	EI	1	$79,258

Well House #6	EI	1	$54,574
Well House #6	EI	1	$53,938
Well House #7	EI	1	$118,490
Well House #7	EI	1	$117,108
Well House #8	EI	1	$179,984
Well House #8	EI	1	$177,885
Well House #9	EI	1	$83,411
Westside Public Safety	EI	1	$19,788
Westside Public Safety	EI	1	$12,936,266
Wetmore Park	NA	1	$36,722
Wetmore Park	NA	1	$63,629
Wetmore Park	NA	1	$73,440
Water Reservoir #1 750,000 gal	EI	1	$1,000,000
Water Reservoir #2 500,000 gal	EI	1	$750,000
Water Reservoir #3 500,000 gal	EI	1	$750,000
Sun Prairie HS West	VF	1	$139,739,000
Sun Prairie HS East	VF	1	$139,739,000
CH Bird Elementary	VF	1	Not found
CHUMS	VF	1	Not found
Creekside Elementary	VF	1	Not found
Eastside Elementary	VF	1	Not found
Horizon Elementary	VF	1	Not found
Meadow View Elementary	VF	1	Not found
Northside Elementary	VF	1	Not found
Patrick Marsh Middle School	VF	1	Not found
Prairie View Middle School	VF	1	Not found
Royal Oaks	VF	1	Not found
Token Springs Elementary	VF	1	Not found
Westside Elementary	VF	1	Not found
Sacred Hearts Elementary	VF	1	Not found
Peace Lutheran Elementary	VF	1	Not found
St. Mary's Emergency Dept.	VF	1	Not found
New Perspective Senior	VF	1	$20,152,800
Main St. Health Center	VF	1	Not found
Crossroads Care (assisted living)	VF	1	Not found
Colonial Club	VF	1	$45,700
UW Health Clinic	VF	1	Not found
Dean Health Clinic	VF	1	$7,084,500
*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: Natural Asset			

Data Source: 2021 City of Sun Prairie Data Collection Guide

Other Assets

Other assets help define a community beyond the current composition of the City of Sun Prairie. These assets may provide economic benefit to the community, in addition to preserving the heritage and diversity of the community and may include natural, cultural and historic assets or economic assets such as major employers. It may also include more specific detail on critical facilities. The City of Sun Prairie has not identified any other assets.

VULNERABILITY ASSESSMENT

A hazard identification and vulnerability analysis was completed for the City of Sun Prairie using the same methodology in the County's base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete.

The first step in a hazard analysis is to identify which hazards the community is vulnerable to. Table 10 outlines the hazard identification for the City of Sun Prairie based on the Data Collection Guide issued in 2021. The Data Collection Guide listed all of the hazards that could impact Dane County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. Brooklyn's planning team members were asked to complete the matrix by ranking each category on a scale of 0 to 5 based on the experience and perspective of each planning team member. A ranking of 0 indicated "no concern" while a ranking of 5 indicated "highest concern." This matrix appears as Table 10. This matrix reflects the significance of the hazards relative to one another as perceived by the Example's planning team.

This matrix reflects that the City of Sun Prairie is most vulnerable to winter storms, tornadoes and floods. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 10: Vulnerability Assessment Matrix for the City of Sun Prairie

Name of Jurisdiction: City of Sun Prairie										
Hazard	**Hazard Attributes**			**Impact Attributes**						
				Primary Impact (Short Term - Life and Property)			**Secondary Impact (Long Term – Community Impacts)**			
	Area of Impact	Past History, Probability of Future Occurrence	Short Term Time Factors	Impact on General Structures	Impact on Critical Facilities	Impact on At-Risk Populations	Social Impact	Economic Impact	Severity Of Other Associated Secondary Hazards	**Total of Row Values**
	(1-5)	*(1-5)*	*(1-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	
Dam/Levee failure	1	1	1	0	0	0	0	0	0	3
Extreme Cold	5	3	3	1	3	4	2	2	2	25
Extreme Heat	5	3	3	1	3	4	2	2	2	25
Drought	5	2	2	1	1	3	2	3	2	21
Expansive soils	1	1	1	0	0	0	0	0	0	3
Flood	5	3	4	4	5	4	2	4	4	35
Fog	5	3	3	0	0	0	1	1	0	13
Hail Storm	3	3	4	4	2	1	2	3	2	24
Landslide	1	1	1	0	0	0	0	0	0	3
Lightning	1	4	4	3	3	1	1	2	1	20
Tornado	3	2	4	5	5	4	4	5	4	36
Wildfire	1	1	5	5	4	0	1	2	2	21
Windstorm	5	4	4	4	4	2	3	4	3	33
Winter Storm	5	5	4	3	4	3	5	4	4	37

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County. The previous inventory tables quantify what is exposed to the various hazards within City of Sun Prairie. Table 11 cross-references the hazards with the various tables where exposure or vulnerability specifics are found. The intent of Table 6 is to quantify, where possible, future impacts of each hazard on the jurisdiction. In many cases it is difficult to estimate potential losses, so the overall exposure of populations, structures, and critical facilities is referenced.

Table 11 Hazard Vulnerability Specifics

Hazard	Populations	Structures	Critical Facilities	Future Damage Potential
Dam Failure	None	None	None	Specifics unknown; See hazard profile in County Plan
Drought	See Tables 4-7 Population	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Flooding	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below
Fog	None	None	None	Specifics unknown; See hazard profile in County Plan
Hailstorm	Minimal	See Property Exposure table 8	Moderate	Specifics unknown; See hazard profile in County Plan
Landslide/ Sinkholes/ Erosion	None	None	None	Specifics unknown; See hazard profile in County Plan
Lightning	Minimal	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Severe Cold	See Tables 4-7 Population	Minimal	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Severe Heat	See Tables 4-7 Population	Minimal	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Winter Storm	See Tables 4-7 Population	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Tornado	See Table 15 below	See Table 15 below	See Table 15 below	See Table 15 below
Wildfire	None	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Windstorm	Moderate	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan

Data Source: 2021 City of Sun Prairie Data Collection Guide – Prepared by DCEM

Previous Hazard Events

Through the Data Collection Guide, the City of Sun Prairie noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the main mitigation plan. These events had a particular impact on the community beyond the impacts and events recorded in the Dane County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

City of Sun Prairie Historic Natural Hazards

Table 12 City of Sun Prairie Historic Natural Hazards

Natural Hazard	Date	Impacted Structures	Comprehensive Harm to Jurisdiction	Other reported Losses (Fiscal reports, programs, etc.)	Comments
Wind storm	08/10/2021	One residence damaged by falling tree.	Down power lines debris.	N/A	[High likelihood of reoccurring]
Wind storm	06/01/2013	Multiple impacted structures	Damage to private fences, overhead power lines, road closure.	N/A	[High likelihood of reoccurring]
Windstorm	06/18/2014	Multiple impacted structures	Damage to roofs, private structures, power lines.	N/A	Mutual aid was requested for clean-up, emergency services, and debris management [High likelihood of reoccurring]
Extreme Cold (Polar Vortex)	01/2019	Multiple impacted structures	Vehicle and equipment failure, frozen pipes, and forced establishment closures.	N/A	[High likelihood of reoccurring]
Extreme Cold (Polar Vortex)	12/2013-01/2014	Multiple impacted structures	Vehicle and equipment failure, frozen pipes, and forced establishment closures.	N/A	[High likelihood of reoccurring]
Wind storm	07/13/2015	Multiple impacted structures	Damage to private structures, roofs, downed trees.	N/A	[High likelihood of reoccurring]

Data Source: 2021 City of Sun Prairie Data Collection Guide

Flood Hazard

Structures and Properties in the Floodplain

Refer to the flood profile in the mitigation plan for a description of the methodology used to identify potentially flood-prone properties. Figure 1 shows mapped floodplains, future growth areas, and critical or vulnerable facilities. Tables 13 and 14 outline the primary structures on them within the City of Sun Prairie, Dane County. Potential number of individuals at risk figures are based on primary residential structures and the average household size within Dane County (2.37 people as of 2021). Estimated loss potentials for all structures on the floodway can be found within section 4.6 in chapter 4 of the county plan.

Table 13 Primary Structures in the 100 Year Floodplain

Residential Structures in 100 yr. Floodway	Non-Residential Structures in 100 yr. Floodplain	Total Structures in 100 yr. Floodplain	Potential # of People at Risk in 100 yr. Floodplain	Total Assessed Values ($) of Structures in 100 yr. Floodplain
6	1	7	14.22	$1,762,000

Source: Analysis based on Dane County Land Information Office Data

Table 14 Primary Structures in the 500 Year Floodplain

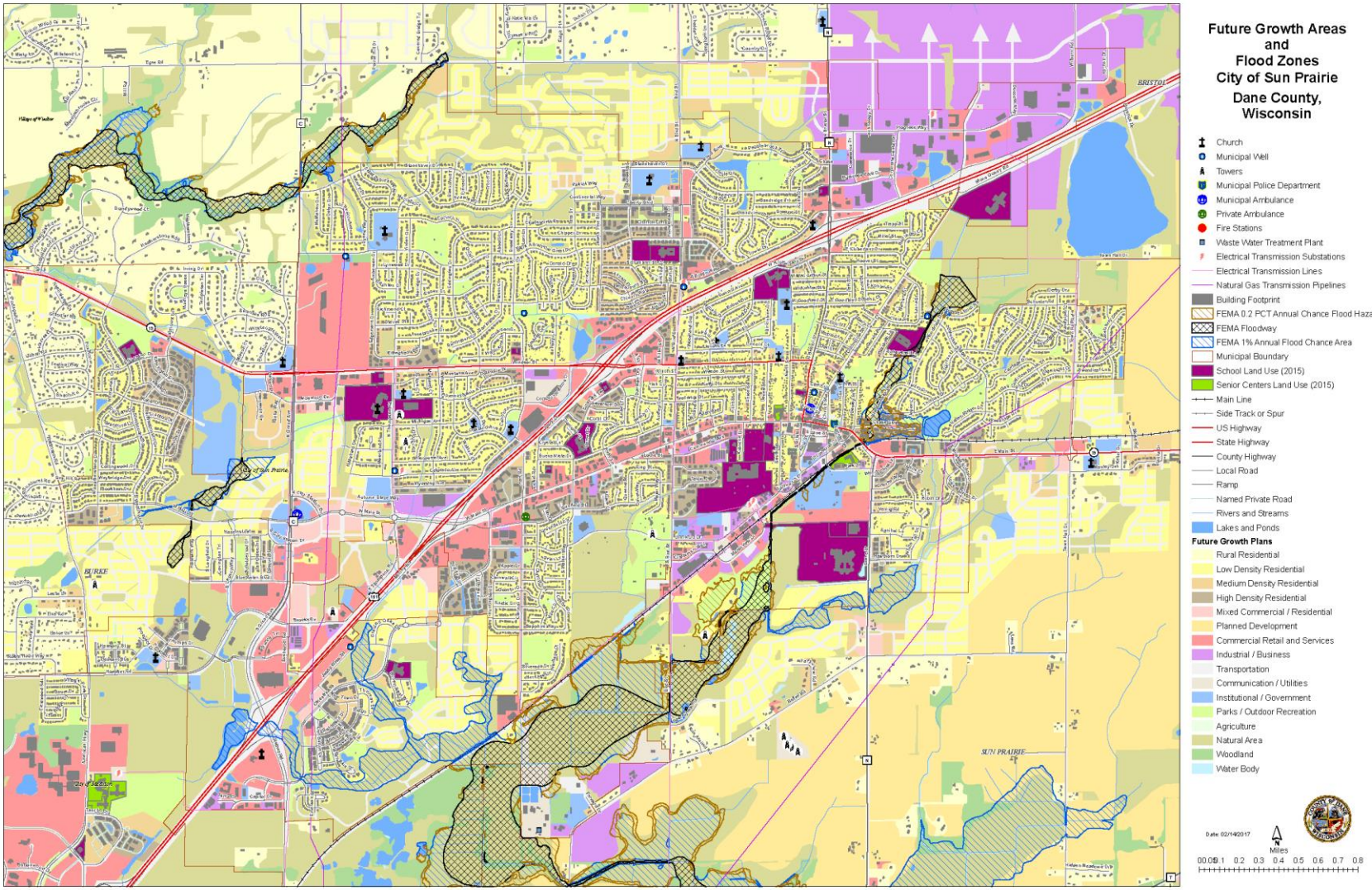
Residential Structures in 500 yr. Floodway	Non-Residential Structures in 500 yr. Floodplain	Total Structures in 500 yr. Floodplain	Potential # of People at Risk in 500 yr. Floodplain	Total Improved Values ($) of Structures in 500 yr. Floodplain
22	2	24	52	$1,695,773

Source: Analysis based on Dane County Land Information Office Data

Repetitive Loss Properties and Flood Insurance Polices

- Repetitive loss properties have not been reported in the City of Sun Prairie, Dane County.
- The City of Sun Prairie has 26 flood insurance policies in force within Dane County, with a total coverage of $7,895,000.

Figure 1 Flood Hazards and Future Land Use Map



Tornado

While it is difficult to estimate specific losses to a tornado due to the random nature of the event, a methodology was developed that was applied to each jurisdiction during the 2023 update. The table below estimates the percent area of the jurisdiction that could be impacted based on the average sized tornado (F2) in Dane County. High value exposure is based on 100% loss, medium 50% loss, and low is 25% loss to the property potentially impacted. The loss ratio, which is the ratio of the damaged building value to total exposed building value, is a measure of the impact to the jurisdiction as a whole. Communities with loss ratios 10% or more may have difficulty recovering from a disaster. Refer to the tornado hazard profile in the main mitigation plan for more details on this methodology.

Table 15 Tornado Loss Estimate

% Area impact	Improved Parcel Count	Affected Structure Estimate	Total Exposed Value ($)	Estimated Loss $ (High Damage Range)	Estimated Loss $ (Moderate Damage Range)	Estimated Loss $ (Low Damage Range)	Loss Ratio for Moderate Damage Range
7.00%	10,145	710	$4,894,399,200	$342,418,960	$171,209,480	$85,604,740	3%

Data Source: Analysis Based on Dane County Land Information Office's data

Problems or Additional Vulnerability Issues

The City of Sun Prairie has not identified other additional vulnerability issues.

CAPABILITY ASSESSMENT

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities for the City of Sun Prairie.

Mitigation Capabilities Summary

Table 16 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities, or by themselves contribute to reducing hazard losses. The table also indicates which of these tools are currently utilized in the City of Sun Prairie.

Table 16 City of Sun Prairie Regulatory Mitigation Capabilities

Regulatory Tools (ordinances, codes, plans)	Yes/No	Comments
Existing Natural Hazard Mitigation Plan	Yes	2018 update to DC NHMP
General or Comprehensive plan	Yes	Yes
Zoning ordinance	Yes	Yes
Subdivision ordinance	Yes	Zoning Ordinance
Growth management ordinance	Yes	Zoning Ordinance/Comp plan
Shoreland / wetland zoning ordinance	Yes	Zoning Ordinance
Floodplain zoning ordinance	Yes	Yes
FEMA / NFIP Community Rating System	Yes	
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Yes (Stormwater) Part of Zoning
Building code	Yes	Yes
Fire department ISO rating	Yes	ISO Rating = 3
Climate change Impact program	Yes	Participated in resolution to be 25% renewable by 2025
Erosion or sediment control program	Yes	Yes – Engineering Dept.
Stormwater management program	Yes	Yes – Engineering Dept.
Site plan review requirements	Yes	Yes – Multiple Departments review
Capital improvements plan	Yes	Yes
Economic development plan	Yes	Yes-part of Comprehensive Plan
Local emergency operations plan	Yes	Yes
Other special plans	Yes	Sun Prairie Stronger Plan, Main St. Overlay
Flood insurance study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	No	

Regulatory Tools (ordinances, codes, plans)	Yes/No	Comments
Climate Action Plan	Yes	Participation in DC Climate Action Plan

Data Source: City of Sun Prairie Data Collection Guide, 2021

Table 17 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in the City of Sun Prairie.

Table 17 Responsible Personnel and Departments for the City of Sun Prairie

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	Engineering Dept./Planning Dept.	N/A
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Engineering Dept./Building Inspection Dept.	N/A
Planner/engineer/scientist with an understanding of natural hazards	Yes	Engineering Dept./Planning Dept.	N/A
Personnel skilled in GIS	Yes	Engineering Department	N/A
Full-time Building Official	Yes	Building Inspections Department/Fire Department	N/A
Personnel Skilled in Climate Resilience	Yes	Sustainability Coordinator	
Floodplain Manager	Yes	Engineering Dept./Planning Dept.	N/A
Emergency Manager	Yes	Police Department	N/A
Real Estate Acquisition Personnel	Yes	Economic Development Dept.	
Grant Writer	No		N/A
Other Personnel	Yes	Assessing Dept., Public Works, Administrative staff	
GIS Data Resources – (land use, building footprints, etc.)	Yes	IT Department/Planning Dept./Engineering Dept.	N/A
Warning systems/services	Yes	Dane Co Emergency Management/Police Dept.	N/A

Data Source: City of Sun Prairie Data Collection Guide 2021

Table 18 identifies financial tools or resources that the City of Sun Prairie could potentially use to help fund mitigation activities.

Table 18 Financial Resources for the City of Sun Prairie

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Dedicated funding for land, easement or conservation easement acquisition	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	No
Withhold Spending in hazard prone areas	No

Data Source: City of Sun Prairie Data Collection Guide

National Flood Insurance Program Status

The City of Sun Prairie currently participates in the National Flood Insurance.

Public Involvement Activities

The City of Sun Prairie provided a publically noticed listening session with the City of Sun Prairie _ Committee _ __, 2021. It was noticed on _ websites, and provided an agenda discussing the draft mitigation strategies. No changes were made to the initial draft mitigation strategies.

MITIGATION ACTIONS

Below are the identified mitigation strategies developed by the City of Sun Prairie's NHMP steering committee. Mitigation is defined as a sustained action to reduce or eliminate risk to people and property from hazards and their effects. A *mitigation strategy* is a long-term vision for risk reduction in local jurisdictional or regional planning. A mitigation strategy can be achieved by a list of overall improvements to achieve (goals) that provide direction for community efforts to reduce potential losses identified in the risk assessment.

Strategy #1	**Winter storm/Blizzard Impact Mitigation**
Prevention	Natural Resource Protection
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

The goal of this mitigation strategy is to provide education and awareness of the dangers of winter storms/Blizzards. Additionally, to assist residents, and businesses develop plans for extended periods severe winter weather.

By providing the education and awareness to residents and business owners, the city hopes to lessen the disruption to services and help the community prepare for and recover more quickly from a severe winter storm or blizzard.

Deliver a series of programs annually.

Defined steps to achieving this mitigation strategy

1. Identify the risks inherent in severe winter weather for both the residents and business community of the City of Sun Prairie.
   a. *Responsible Party* – A Severe Weather Mitigation Committee (SWMC) would be developed with all stakeholders represented. This would include (but not limited to): Emergency services, public works, city engineering, building inspections, city administration, community leaders, business leaders, and school district administration.
   b. *Funding source* – Municipal budget, grant funding will be sought.
   c. *Completion date* – Within 1 month of SWMC initial kick off.

Strategy #1	Winter storm/Blizzard Impact Mitigation

2. Prioritize and define the risks, and the goals of the winter storm/Blizzard impact Mitigation project. Determine the target populations, demographic groups and businesses would be targeted for education and awareness.
   a. *Responsible Party* – Sun Prairie SWMC
   b. *Funding source* – Municipal budget
   c. *Completion date* – 30 days after completion of step 1 (60 days from start of project)
   d.

3. Develop strategies and plans to educate the residents of and business community
   a. *Responsible Party* – Sun Prairie SWMC
   b. *Funding source* – Municipal budget, and seek additional funding as needed via grant opportunities.
   c. *Completion date* – 60 days after completion of step 1 (90 days from start of project)

4. Prepare the learning objectives and delivery method (s) of the winter storm/blizzard impact mitigation plan. Advertise the plan to the target audience (s). Ensure the messages are deliverable in all appropriate languages, and ensure that programs are held in places where all residents are able to attend no matter their means of transportation (or lack of transportation)
   a. *Responsible Party* – Sun Prairie SWMC
   b. *Funding source* – Municipal budget, additional funding as available
   c. *Completion date* – 90 days after completion of step 1 (120 days from start of project)

Strategy #1	Winter storm/Blizzard Impact Mitigation

5. Implement the winter storm/blizzard impact mitigation learning objectives. Determine times, locations to deliver the program (s). Ensure that different time frames are offered at each location to accommodate all work or business schedules.
   a. *Responsible Party* – Sun Prairie SWMC with assistance from Fire, EMS and PD staff to ensure adequate manpower.
   b. *Funding source* – Municipal budget, additional funding as available
   c. *Completion date* – All programs delivered within 9 months of program initiation.

6. Monitor, evaluate and modify the winter storm/blizzard impact mitigation education and awareness program. Seek input from stakeholders and participants for improvement on effectiveness of the materials and delivery methods. Make necessary changes for future delivery of the program as needed.
   a. *Responsible Party* – Sun Prairie SWMC
   b. *Funding source* – Municipal budget, additional funding as available.
   c. *Completion date* – within 1 year of program initiation.

Strategy #2	Tornado warning siren upgrade
Prevention	Natural Resource Protection
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	**Structural Project**

Due to the rapid growth and expansion of the city, current tornado sirens may not be located in prime locations to ensure that all residents are able to adequately hear the sirens as needed.

This mitigation strategy would identify areas where a siren may not be reaching effectively, relocate existing and add additional sirens to ensure the earliest possible warning of an impending tornado or supercell development.

Ultimately this project will provide tornado siren coverage for existing, and planned areas of development. .

Defined steps to achieving this mitigation strategy

1. Identify all existing tornado sirens, effective range of warning and evaluate against new neighborhoods and areas of development.
   a. *Responsible Party* – Emergency Manager (+ staff)
   b. *Funding source* – Municipal budget, state and federal emergency management agencies, grant opportunities.
   c. *Completion date* – February 2023

2. Prioritize areas of new neighborhood and commercial development/growth. Evaluate whether or not those areas have adequate siren coverage.
   a. *Responsible Party* – Emergency Manager (+ staff) with assistance from Dane County Emergency Management.
   b. *Funding source* – Municipal budget, state and federal emergency management agencies, grant opportunities
   c. *Completion date* – April 2023

Strategy #2	Tornado warning siren upgrade

3. Develop a strategy to either add sirens or relocate sirens. Identify needed equipment, supplies and contractors to implement the plan
   a. *Responsible Party* – Emergency Manager (+ staff) with assistance from Dane County Emergency Management.
   b. *Funding source* – Municipal budget, state and federal emergency management agencies, grant opportunities
   c. *Completion date* – June 2023

4. Prepare the relocation and or addition plan by securing land, utilities, equipment and contractors.
   a. *Responsible Party* – Emergency Manager (+ staff) with assistance from Dane County Emergency Management and city staff.
   b. *Funding source* – Municipal budget, state and federal emergency management agencies, grant opportunities
   c. *Completion date* – August 2023

5. Implement the plan. Begin the work of installation, relocation, programming and testing of the sirens to ensure full coverage of the city.
   a. *Responsible Party* – Emergency Manager (+ staff) with assistance from Dane County Emergency Management and contractors.
   b. *Funding source* – Municipal budget, state and federal emergency management agencies, grant opportunities
   c. *Completion date* – November/December (prior to ground frost)

Strategy #2	Tornado warning siren upgrade

6. Monitor, evaluate and modify the execution of the plan, installation, and effectiveness of the new siren locations. Plan for additional sirens in areas that have not yet been developed. Provide program recap and benefits to residents and elected officials.
   a. *Responsible Party* – Emergency Manager (+ staff) with assistance from Dane County Emergency Management
   b. *Funding source* – Municipal budget, state and federal emergency management agencies, grant opportunities
   c. *Completion date* – January 2024

Dane County Natural Hazard Mitigation Plan

City of Verona Annex

Summer 2022

City of Verona Annex

This annex is a part of the Dane County Natural Hazard Mitigation Plan (DCNHMP). The DCNHMP contains additional information to support the Federal Emergency Management Agency's (FEMA) recognition of the plan (including this annex) as the formal natural hazard mitigation plan for the county and participating local governments. This annex will be valid for as long as FEMA approves the DCNHMP. The strategies adopted in this annex are designed to guide community efforts to reduce risks from natural hazards. These strategies work in conjunction with neighboring communities and Dane County government to reduce risks from natural hazards.

COMMUNITY PROFILE

The City of Verona is located one mile southwest of Madison within the Town of Verona in the center of the County. Land use is dominated by residential and commercial uses. According to the United States Census Bureau, the City of Verona has a total area of 6.3 square miles, all of it land. As of the 2019 Census Estimates, there is an estimated 5,248 households in the City of Verona and the average household size is 2.53 people per household.

The municipal population data provided by the American Community Survey, a product of the US Census Bureau, indicates that the 2019 population estimates for City of Verona is comprised of 13,004 people. Table 1 shows the population profile by age for City of Verona.

Table 1 Population Profile of City of Verona, Dane County

Category	Number	Percent
Total population	**13,004**	**100%**
Under 5 years	815	6.3%
5 to 9 years	1,066	8.2%
10 to 14 years	1,248	9.6%
15 to 19 years	827	6.4%
20 to 24 years	673	5.2%
25 to 29 years	600	4.6%
30 to 34 years	982	7.6%
35 to 39 years	932	7.2%
40 to 44 years	938	7.2%
45 to 49 years	1,253	9.6%
50 to 54 years	860	6.6%
55 to 59 years	881	6.8%
60 to 64 years	611	4.7%
65 to 69 years	392	3.0%
70 to 74 years	394	3.0%
75 to 79 years	271	2.1%
80 to 84 years	137	1.1%
85 years and over	124	1.0%

Data Source: 2019 ACS Estimates - U.S. Census

Growth & Development Trends

Table 2-3 illustrates how the entire City of Verona has grown in terms of population and number of households between 2010 and 2020. Housing data is to 2020 due to data availability. This data may differ from the 2019 Census Population Estimates, due to sampling differences and margin of error. Table 2-3 is drawn from the Wisconsin Department of Administration.

Table 2 City of Verona Change in Population and Households, 2010-2020

2010 Population	2020 Population	Percent Change (%) 2010-2020	2010 # of Households	2020 # of Households	Percent Change (%) 2010-2020
10,619	13,124	23.58%	4,223	5,248	24.27%

Data Source: Demographic Services Center, Wisconsin Department of Administration, 2021

Table 3 City of Verona Population Projections, 2020-2040 11.79

Population Projection	2020	2025	2030	2035	2040
Increase by half of percent of change (23.58%/2) every 5 years	13,124	14,671	16,400	18,333	20,494

Data Source: Demographic Services Center, Wisconsin Department of Administration, 2021

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Population Summary

Tables 4-7 illustrates key population demographics within the City of Verona. Key demographics include: (1) Disability Characteristics, (2) Federal Income Poverty Levels, (3) Educational Attainment, and (4) Household Language with English Speaking Capabilities. Due to data availability, all key demographic information has been provided by the American Community Survey (ACS) 2019 estimates. The ACS is a self-reported survey and may include total sample size differences and statistical margin of error.

Table 4 City of Verona, Dane County – Disability Characteristics by Detailed Age

Category	Number	Percent
Total of Residents Self-Identified as Disabled	**1,095**	**100%**
With a hearing difficulty	**78**	**7.1%**
Population under 18 years	0	
Population 18 to 64 years	0	
Population 65 years and over	78	
With a vision difficulty	**107**	**9.8%**
Population under 18 years	0	
Population 18 to 64 years	91	
Population 65 years and over	16	
With a cognitive difficulty	**203**	**18.5%**
Population under 18 years	40	
Population 18 to 64 years	84	
Population 65 years and over	79	
With an ambulatory difficulty	**354**	**32.3%**
Population under 18 years	26	
Population 18 to 64 years	131	
Population 65 years and over	197	
With a self-care difficulty	**161**	**14.7%**
Population under 18 years	40	
Population 18 to 64 years	33	
Population 65 years and over	88	
With an independent living difficulty	**192**	**17.5%**
Population 18 to 64 years	62	
Population 18 to 34 years	0	
Population 65 years and over	130	

Data Source: 2019 ACS Estimates - U.S. Census

Table 5.1: City of Verona, Dane County – Federal Income Poverty Levels (FIPL) by Families Summary

Category	Number of Families
50 percent of poverty level	16
125 percent of poverty level	98
150 percent of poverty level	108
185 percent of poverty level	180
200 percent of poverty level	197
300 percent of poverty level	515
400 percent of poverty level	830
500 percent of poverty level	1,212

Data Source: 2019 ACS Estimates - U.S. Census

Note: Use table 5.2 to interpret table 5.1:

5.1 identifies the *total number of families* (regardless of size) by percentage.

5.2 identifies *family size* in relation to annual family income and the percentage category of the FIPL.

Table 5.2: City of Verona, Dane County – Annual Federal Income Poverty Level Guide

Family Size	50%	100%	125%	150%	185%	200%	300%	400%	500%
1	$6,440	$12,880	$16,100	$19,320	$23,828	$25,760	$38,640	$51,520	$64,400
2	$8,710	$17,420	$21,775	$26,130	$32,227	$34,840	$52,260	$69,680	$87,100
3	$10,980	$21,960	$27,450	$32,940	$40,626	$43,920	$65,880	$87,840	$109,800
4	$13,250	$26,500	$33,125	$39,750	$49,025	$53,000	$79,500	$106,000	$132,500
5	$15,520	$31,040	$38,800	$46,560	$57,424	$62,080	$93,120	$124,160	$155,200
6	$17,790	$35,580	$44,475	$53,370	$65,823	$71,160	$106,740	$142,320	$177,900

Data Source: dhs.wisconsin.gov

Table 6: City of Verona, Dane County – Educational Attainment By Householders

Category	Number	Percent
Total of Householders	**3,352**	**100%**
Less than high school graduate	70	2.1%
High school graduate (includes equivalency)	307	9.2%
Some college, associate's degree	712	21.2%
Bachelor's degree or higher	2,263	67.5%

Data Source: 2019 ACS Estimates - U.S. Census

Table 7: City of Verona, Dane County - Household Language & English Speaking Capabilities

Category	Number	Percent
Total of Households	**5,122**	**100%**
English only	**4,625**	**90.3%**
Spanish:	**68**	**1.3%**
Limited English speaking household	0	-
Not a limited English speaking household	68	-
Other Indo-European languages:	**257**	**5.0%**
Limited English speaking household	0	-
Not a limited English speaking household	257	-
Asian and Pacific Island languages:	**106**	**2.1%**
Limited English speaking household	26	-
Not a limited English speaking household	80	-
Other languages:	**66**	**1.3%**
Limited English speaking household	0	-
Not a limited English speaking household	66	-

Data Source: 2019 American Community Survey

Note: Population estimates offered by the U.S. Census Bureau's American Community Survey may differ from the WDOA data, due to sourcing, margin of error, and data availability.

Asset Inventory

Assets include the people, property, and critical facilities within the City of Verona that are exposed to hazards in general. Inventories of property, essential infrastructure, and natural, cultural or historic resources help provide a comprehensive picture of the community and provide a method of assessing exposure to hazards by establishing the improved and total values, capacities and populations for these assets. It also forms the basis for estimating potential losses, where possible.

General Property

Table 8 Property Exposure Summary

Property Type	Parcel Count	Improved Land Count	Improved Land Value ($)	Content Value ($)	Total Value ($)
Total	**4,276**	**4,233**	**8,179,690,700**	**4,089,845,350**	**12269,536,050**
Agriculture	15	15	79,454,200	39,727,100	119,181,300
Industrial	68	68	44,928,500	22,464,250	67,392,750
Residential	3,761	3,761	886,186,600	443,093,300	1329,279,900
Transportation	11	11	841,043,800	420,521,900	1261,565,700
Utility	21	21	804,900	402,450	1,207,350
Commercial	296	296	6,323,148,600	3,161,574,300	9484,722,900
Other	49	48	3,716,300	1,858,150	5,574,450
Institutional/ Governmental	55	13	407,800	203,900	611,700

Data Source: Dane County Land Information Office, December 2021

Critical Facilities

The City of Verona has identified the critical facilities important to protect from disaster impacts. These are collected in Table 9. Table 9 is based on GIS data inventories from Dane County and information gathered from the City. No further supplemental data was provided by the community through the Data Collection Guide.

Table 9 Critical Facility Summary/Essential Infrastructure

Facility	Type*	No. of Facilities	Replacement Value ($)
Verona City Hall/Police Station	EI	1	11,826,000
Fire & EMS Station	EI	1	12,426,000
Public Works Facility	EI	1	5,413,000
Parks Facility	EI	1	394,000
Well #1	EI	1	345,000
Well #2	EI	1	611,000
Well #3	EI	1	541,000
Well #4	EI	1	891,000
Well #5	EI	1	3,614,000
Well #6	EI	1	2,200,000
Water Tower - W. Verona Ave.	EI	1	1,333,000
Water Tower – Southeast	EI	1	1,432,000
Water Tower – North	EI	1	1,900,000
Southeast Booster Station	EI	1	287,000
Electric Substation – CTH M	EI	1	N/A
Electric Substation – Northern Lights Rd.	EI	1	N/A
Old CTH PB Bridge	EI	1	N/A
Stewart Woods Road Bridge	EI	1	N/A
Verona Public Library	VF	1	10,343,000
Verona Senior Center	VF	1	1,889,000
Noel Manor Assisted Living	VF	1	N/A
Legacy at Noel Manor	VF	1	N/A
Willow Pointe Assisted Living	VF	1	N/A
Four Winds Lodge	VF	1	N/A
Sonrisas Assisted Living	VF	1	N/A
J & B Assisted Living	VF	1	N/A
Evergreen Home Care	VF	1	N/A
Willow Pointe Memory Care	VF	1	N/A
Name of Asset	Type*	1	Replacement value ($)
Four Winds Manor	VF	1	N/A

The Caring Center	VF	1	N/A
Once Upon a Time Child Care	VF	1	N/A
La Petite Academy	VF	1	N/A
St. James Preschool	VF	1	N/A
Hometown Preschool	VF	1	N/A
Let the Dragons Fly Family Child Care	VF	1	N/A
Bahr Family Child Care	VF	1	N/A
Chichon Family Day Care	VF	1	N/A
Sue Rowe's 1st Care for Children	VF	1	N/A
M&M's Learn and Play Care Center	VF	1	N/A
Jennifer's Joyous Ones	VF	1	N/A
Pekol Family Day Care	VF	1	N/A
Aurora Miranda	VF	1	N/A
The Goddard School	VF	1	N/A
Big Apple Early Learning Academy	VF	1	N/A
Little Parachutes	VF	1	N/A
Carnes Corporation	HM	1	N/A
MilliporeSigma	HM	1	N/A
Coating Place	HM	1	N/A
United Vaccines	HM	1	N/A
Verona Area High School	N/A	1	175,000,000
Greenhouse	N/A	1	182,782.00
Athletic Storage Shed	N/A	1	74,599.00
Concession Stand & Restrooms	N/A	1	310,702.00
Badger Ridge MS Natatorium	N/A	1	2,828,554.00
Maintenance Shop	N/A	1	666,066.00
Maintenance Cold Storage Shed	N/A	1	113,804.00
Sugar Creek Elementary School	N/A	1	23,972,306.00
Sugar Creek Garage	N/A	1	54,598.00
New Century Elementary School	N/A	1	10,266,565.00
Badger Ridge Middle School/CKCS	N/A	1	45,074,343.00
Administration Building	N/A	1	2,180,418.00
Country View Elementary School	N/A	1	14,522,637
CV Softball Field Storage Shed #1	N/A	1	43,679.00
CV Softball Field Storage Shed #2	N/A	1	43,679.00
CV Softball Field Candy Shop	N/A	1	12,481.00
Glacier Edge Elementary School	N/A	1	15,765,212
*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities			

Data Source: 2021 City of Verona Data Collection Guide

Other Assets

Other assets help define a community beyond the current composition of the City of Verona. These assets may provide economic benefit to the community, in addition to preserving the heritage and diversity of the community and may include natural, cultural and historic assets or economic assets such as major employers. It may also include more specific detail on critical facilities. The City of Verona has not identified any other assets.

VULNERABILITY ASSESSMENT

A hazard identification and vulnerability analysis was completed for the City of Verona using the same methodology in the County's base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete.

The first step in a hazard analysis is to identify which hazards the community is vulnerable to. Table 10 outlines the hazard identification for the City of Verona based on the Data Collection Guide issued in 2021. The Data Collection Guide listed all of the hazards that could impact Dane County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. Brooklyn's planning team members were asked to complete the matrix by ranking each category on a scale of 0 to 5 based on the experience and perspective of each planning team member. A ranking of 0 indicated "no concern" while a ranking of 5 indicated "highest concern." This matrix appears as Table 10. This matrix reflects the significance of the hazards relative to one another as perceived by the Example's planning team.

This matrix reflects that the City of Verona is most vulnerable to winter storms, tornadoes, and lightning. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 10: Vulnerability Assessment Matrix for the City of Verona

Name of Jurisdiction: City of Verona										
Hazard	**Hazard Attributes**			**Impact Attributes**						
				Primary Impact (Short Term - Life and Property)			**Secondary Impact (Long Term – Community Impacts)**			
	Area of Impact	Past History, Probability of Future Occurrence	Short Term Time Factors	Impact on General Structures	Impact on Critical Facilities	Impact on At-Risk Populations	Social Impact	Economic Impact	Severity Of Other Associated Secondary Hazards	**Total of Row Values**
	(1-5)	*(1-5)*	*(1-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	*(0-5)*	
Dam/Levee failure	1	1	1	0	0	0	0	0	0	3
Extreme Cold	4	2	1	1	1	1	2	1	1	14
Extreme Heat	4	3	2	0	0	3	2	1	1	16
Drought	2	1	1	0	0	0	1	1	1	7
Expansive soils	1	1	1	1	1	1	1	1	1	9
Flood	3	3	3	3	1	2	1	3	3	22
Fog	2	2	2	0	0	0	1	1	1	9
Hail Storm	2	2	3	1	1	1	1	1	1	13
Landslide	1	1	1	0	0	0	0	0	0	3
Lightning	2	3	3	3	3	3	2	2	2	23
Tornado	3	3	3	5	5	5	5	5	5	39
Wildfire	1	1	1	3	2	2	2	3	2	17
Windstorm	3	3	3	2	1	1	2	2	2	19
Winter Storm	5	5	3	2	2	3	3	3	3	29

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County. The previous inventory tables quantify what is exposed to the various hazards within City of Verona. Table 11 cross-references the hazards with the various tables where exposure or vulnerability specifics are found. The intent of Table 6 is to quantify, where possible, future impacts of each hazard on the jurisdiction. In many cases it is difficult to estimate potential losses, so the overall exposure of populations, structures, and critical facilities is referenced.

Table 11 Hazard Vulnerability Specifics

Hazard	Populations	Structures	Critical Facilities	Future Damage Potential
Dam Failure	None	None	None	Specifics unknown; See hazard profile in County Plan
Drought	None	None	None	Specifics unknown; See hazard profile in County Plan
Flooding	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below	See Tables 13-14 below
Fog	None	None	None	Specifics unknown; See hazard profile in County Plan
Hailstorm	See Tables 4-7 Population	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Landslide/ Sinkholes/ Erosion	None	None	None	Specifics unknown; See hazard profile in County Plan
Lightning	See Tables 4-7 Population	See Property Exposure table 8	See Critical Facility Inventory Table(s)	Specifics unknown; See hazard profile in County Plan
Severe Cold	Minimal	Minimal	Minimal	Specifics unknown; See hazard profile in County Plan
Severe Heat	See Tables 4-7 Population	None	None	Specifics unknown; See hazard profile in County Plan
Winter Storm	See Tables 4-7 Population	Moderate	Moderate	Specifics unknown; See hazard profile in County Plan
Tornado	See Table 15 below	See Table 15 below	See Table 15 below	See Table 15 below
Wildfire	Moderate	See Property Exposure table 8	Moderate	Specifics unknown; See hazard profile in County Plan
Windstorm	Minimal	Moderate	Minimal	Specifics unknown; See hazard profile in County Plan

Data Source: 2021 City of Verona Data Collection Guide – Prepared by DCEM

Previous Hazard Events

Through the Data Collection Guide, the City of Verona noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the main mitigation plan. These events had a particular impact on the community beyond the impacts and events recorded in the Dane County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

City of Verona Historic Natural Hazards

Table 12 City of Verona Historic Natural Hazards

Natural Hazard	Date	Impacted Structures	Comprehensive Harm to Jurisdiction	Other reported Losses (Fiscal reports, programs, etc.)	Comments
Heavy Rain	08/20-21/2018	N/A	Road Closures on Cross Country Rd., Prairie Way Blvd, Edwards St., Bruce St., and N. Nine Mound Rd.	$10,000+ in damages	10.47" of rain in one-day [High likelihood of reoccurring]
Fog	02/12/2018	N/A	29 vehicles involved in crash. One dead and six injured.	N/A	Occurred on U.S. Highway 18/151 near state highway 69 eastbound [High likelihood of reoccurring]
Tornado	07/29/2021	Multiple Impacted Structures	Roof stripped, trees snapped, uprooted, or had broken limbs.	N/A	EF-0 Tornado

Data Source: 2021 City of Verona Data Collection Guide

Flood Hazard

Structures and Properties in the Floodplain

Refer to the flood profile in the mitigation plan for a description of the methodology used to identify potentially flood-prone properties. Figure 1 shows mapped floodplains, future growth areas, and critical or vulnerable facilities. Tables 13 and 14 outline the primary structures on them within the City of Verona, Dane County. Potential number of individuals at risk figures are based on primary residential structures and the average household size within Dane County (2.37 people as of 2021). Estimated loss potentials for all structures on the floodway can be found within section 4.6 in chapter 4 of the county plan.

Table 13 Primary Structures in the 100 Year Floodplain

Residential Structures in 100 yr. Floodway	Non-Residential Structures in 100 yr. Floodplain	Total Structures in 100 yr. Floodplain	Potential # of People at Risk in 100 yr. Floodplain	Total Assessed Values ($) of Structures in 100 yr. Floodplain
16	11	27	38	$4,036,234

Source: Analysis based on Dane County Land Information Office Data

Table 14 Primary Structures in the 500 Year Floodplain

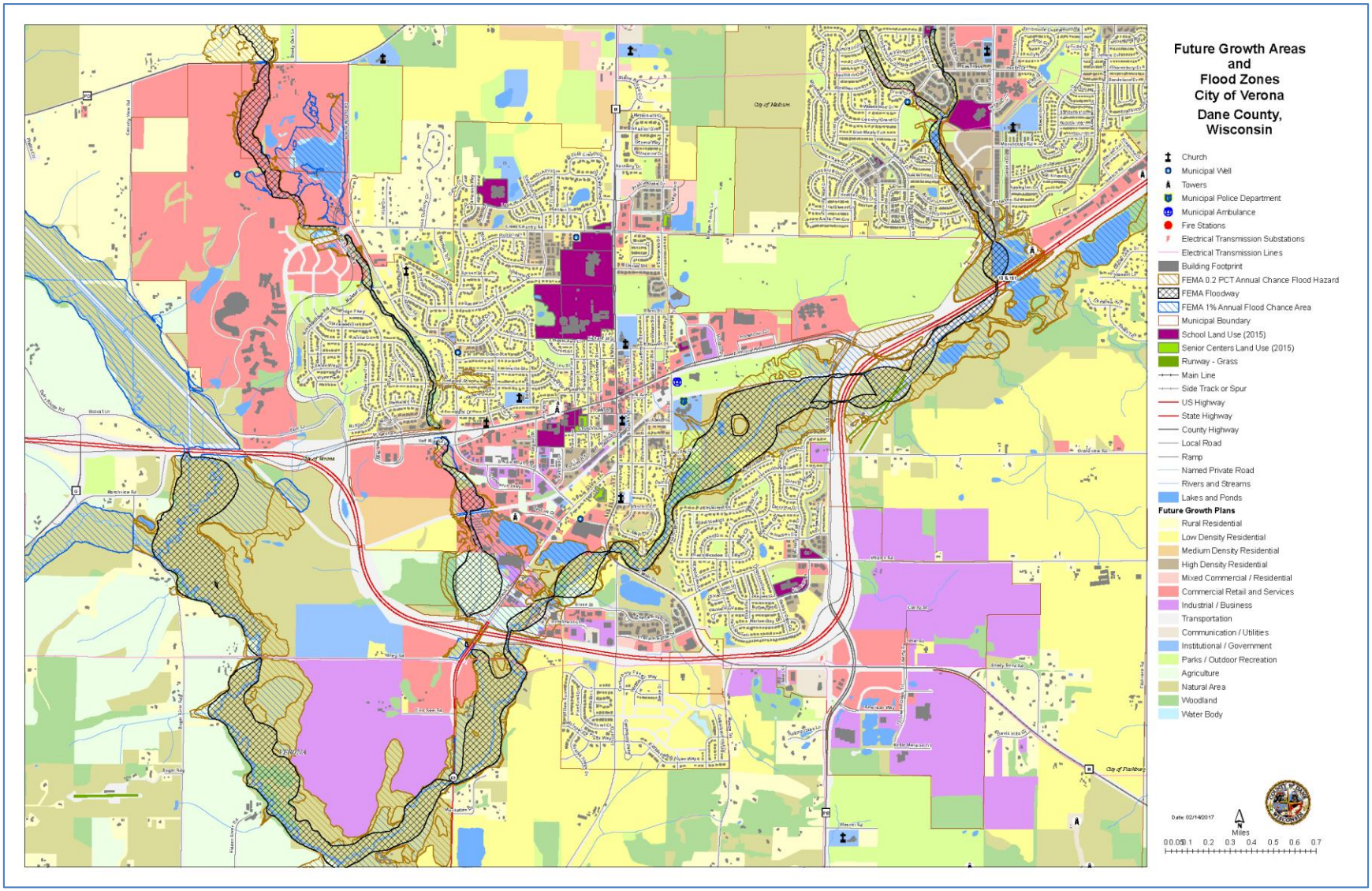
Residential Structures in 500 yr. Floodway	Non-Residential Structures in 500 yr. Floodplain	Total Structures in 500 yr. Floodplain	Potential # of People at Risk in 500 yr. Floodplain	Total Improved Values ($) of Structures in 500 yr. Floodplain
60	5	65	142	$11,332,497

Source: Analysis based on Dane County Land Information Office Data

Repetitive Loss Properties and Flood Insurance Polices

- Repetitive loss properties have not been reported in the City of Verona, Dane County.
- The City of Verona has 21 flood insurance policies in force within Dane County, with a total coverage of $8 349 000.

Figure 1 Flood Hazards and Future Land Use Map



Tornado

While it is difficult to estimate specific losses to a tornado due to the random nature of the event, a methodology was developed that was applied to each jurisdiction during the 2023 update. The table below estimates the percent area of the jurisdiction that could be impacted based on the average sized tornado (F2) in Dane County. High value exposure is based on 100% loss, medium 50% loss, and low is 25% loss to the property potentially impacted. The loss ratio, which is the ratio of the damaged building value to total exposed building value, is a measure of the impact to the jurisdiction as a whole. Communities with loss ratios 10% or more may have difficulty recovering from a disaster. Refer to the tornado hazard profile in the main mitigation plan for more details on this methodology.

Table 15 Tornado Loss Estimate

% Area impact	Improved Parcel Count	Affected Structure Estimate	Total Exposed Value ($)	Estimated Loss $ (High Damage Range)	Estimated Loss $ (Moderate Damage Range)	Estimated Loss $ (Low Damage Range)	Loss Ratio for Moderate Damage Range
12.00%	4,233	508	12,269,536,050	1,472,406,527	736,203,263	368,101,631	6%

Data Source: Analysis Based on Dane County Land Information Office's data

Problems or Additional Vulnerability Issues

The City of Verona's Data Collection Guide issued in 2021 listed:

- **Hazard Concern (i.e. vulnerable populations)**:
  - None of the vulnerable population centers are far from existing creeks in higher elevation areas.
- **Growth Trends:**
  - The City is growing and continues to have new development. There are areas within the growth areas that are labeled as environmental corridors, which prohibit growth and development in these areas. We do not allow new development is areas that are protected. All development must be built to the current standards.

CAPABILITY ASSESSMENT

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities for the City of Verona.

Mitigation Capabilities Summary

Table 16 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities, or by themselves contribute to reducing hazard losses. The table also indicates which of these tools are currently utilized in the City of Verona.

Table 16 City of Verona Regulatory Mitigation Capabilities

Regulatory Tools (ordinances, codes, plans)	Yes/No	Comments
Existing Natural Hazard Mitigation Plan	Yes	Dane County's Plan
General or Comprehensive plan	Yes	City Website: http://www.ci.verona.wi.us/
Zoning ordinance	Yes	City Website: http://www.ci.verona.wi.us/ Overhauled in May of 2021
Subdivision ordinance	Yes	City Website: http://www.ci.verona.wi.us/
Growth management ordinance	No	
Shoreland/wetland zoning ordinance	Yes	City Website: http://www.ci.verona.wi.us/
Floodplain zoning ordinance	Yes	City Website: http://www.ci.verona.wi.us/
FEMA / NFIP Community Rating System	No	
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	City Website: http://www.ci.verona.wi.us/
Building code	Yes	City Website: http://www.ci.verona.wi.us/
Fire department ISO rating	Yes	Rating Level:4
Climate change Impact program	No	
Erosion or sediment control program	No	
Stormwater management program	Yes	
Site plan review requirements	Yes	City Website: http://www.ci.verona.wi.us/
Capital improvements plan	Yes	City Website: http://www.ci.verona.wi.us/
Economic development plan	No	
Local emergency operations plan	Yes	In Progress
Other special plans	Yes	Neighborhood Plans

Regulatory Tools (ordinances, codes, plans)	Yes/No	Comments
Flood insurance study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	Yes	With property records
Climate Action Plan	No	We have an adopted climate resolution that has a task list.

Data Source: City of Verona Data Collection Guide, 2021

Table 17 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in the City of Verona.

Table 17 Responsible Personnel and Departments for the City of Verona

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	Planning Director, Community Development Specialist	Full time staff for Planning Department
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Engineering contracted with AECOM. Public Works Director is a PE.	Full time staff for Public Works.
Planner/engineer/scientist with an understanding of natural hazards	No	N/A	
Personnel skilled in GIS	Yes	N/A	Part time Contracted
Full time building official	Yes	Director and Building Inspectors	2 full time staff and other part time staff
Personnel skilled in Climate resilience	No	N/A	N/A
Floodplain manager	Yes	City Engineer contracted through AECOM	Full time staff
Emergency manager	Yes	Police Chief	
Real estate acquisition personnel	No	N/A	N/A
Grant writer	No	N/A	N/A
Other personnel		N/A	N/A
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Contracts with Ruekert-Mielke	Also uses Dane County GIS data
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	N/A	Dane County

Data Source: City of Verona Data Collection Guide 2021

Table 18 identifies financial tools or resources that the City of Verona could potentially use to help fund mitigation activities.

Table 18 Financial Resources for the City of Verona

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Dedicated funding for land, easement or conservation easement acquisition	No
Fees for water, stormwater, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

Data Source: City of Verona Data Collection Guide

Additional Capabilities

The City of Verona identified the following as past or ongoing public education or information programs:

- Tornado Spotter Certification
- Smart Water Meters
- Public Education events for k-12 and senior citizens hosted by the Fire department.
- Public Safety events jointly hosted by the Police department and Fire department
- NFIP Participant
- City engineer is a certified floodplain manager, and ensures city compliance to regulations.

National Flood Insurance Program Participation

The City of Verona currently participates in the National Flood Insurance Program.

Public Involvement Activities

The City of Verona provided a publically noticed listening session with the City of Verona Public Safety and Welfare Committee on November 8, 2021. It was noticed on the city website, as well as the Verona Press, a local newspaper agency. An agenda discussing the draft mitigation strategies was provided. No changes were made to the initial draft mitigation strategies.

Mitigation Actions

Mitigation Strategies

Below are the identified mitigation strategies developed by the City of Verona's NHMP steering committee. Mitigation is defined as a sustained action to reduce or eliminate risk to people and property from hazards and their effects. A *mitigation strategy* is a long-term vision for risk reduction in local jurisdictional or regional planning. A mitigation strategy can be achieved by a list of overall improvements to achieve (goals) that provide direction for community efforts to reduce potential losses identified in the risk assessment.

Strategy #1	**Flood Plain Management**
Prevention	**Natural Resource Protection**
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	Structural Project

Continue to implement sound floodplain management practices through continued compliance with the National Flood Insurance Program, to include floodplain ordinance enforcement and periodic review, promoting the benefits of flood insurance, and continued staff training and development in floodplain management. This is a perpetual goal that the City must consider as it continues to grow.

Defined steps to achieving this mitigation strategy

1. Evaluate regulatory deficiencies and enforcement shortcomings in flood related ordinances and programs. Update ordinances as necessary.
   a. *Responsible Party* – City planning staff in consultation with County planning staff and the WDNR
   b. *Funding source* – City Budget / Grants
   c. *Completion date* – On-Going

2. Ensure that stop work orders and other means of compliance are being used as authorized by ordinance ; suggest changes to improve compliance
   a. *Responsible Party* – City Staff
   b. *Funding source* – City Budget
   c. *Completion date* – On-Going

Strategy #1	Flood Plain Management

3. Encourage floodplain management staff to become or maintain Certified Floodplain Managers (CFM.) The City Engineer is a CFM.
   a. *Responsible Party* – City Floodplain Management Staff / City Engineer
   b. *Funding source* – City Budget / Private funding
   c. *Completion date* – On-Going

4. Participate in Flood Insurance Rate Map updates by adopting new maps or amendments to maps; utilize Digital Flood Insurance Rate maps in conjunction with GIS to improve floodplain management, such as improved risk assessment and tracking of permits
   a. *Responsible Party* – City Planning Staff
   b. *Funding source* – City Budget
   c. *Completion date* – On-Going

5. Promote and disperse information on the benefits of flood insurance, with assistance from County, WDNR, or ASFPM; evaluate costs and benefits of becoming a Community Rating Systems participant.
   a. *Responsible Party* – City Staff
   b. *Funding source* – City Budget
   c. *Completion date* – On-Going

Strategy #2	Generator Enhancement Project
Prevention	Natural Resource Protection
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	Structural Project

The City of Verona has identified power supply deficiencies which occur during extended power outages. The Southeast Booster Station does not have back-up power which limits the city's ability to efficiently manage water distribution during power outages. The Verona Library and the Verona Senior Center have been designated as heating and cooling stations during extreme weather conditions. Neither facility has back-up generator power. Two water towers maintain radio equipment for a local analog sub-system shared by the City of Verona and the City of Fitchburg. Neither location has back-up generator power rendering the radios inoperable during power outages.

Defined steps to achieving this mitigation strategy

1. Identify Requirements
   a. *Responsible Party* – City of Verona Staff
   b. *Funding source* – City Budget / Grant
   c. *Completion date* – 5 year plan

2. Seek Approval from Library Board
   d. *Responsible Party* – City of Verona Staff / Library Board Members
   e. *Funding source* – City Budget / Grant
   f. *Completion date* – 5 year Plan
   g.

3. Purchase 3 fixed generators and 2 mobile generators
   d. *Responsible Party* – City of Verona Staff
   e. *Funding source* – City Budget / Grant
   f. *Completion date* – 5 year Plan

Strategy #2	Generator Enhancement Project

4. Installation
   d. *Responsible Party* – City of Verona Staff / Private Contractors
   e. *Funding source* – City Budget / Grant
   f. *Completion date* – 5 Year Plan

5. Identify Requirements
   a. *Responsible Party* – City of Verona Staff
   b. *Funding source* – City Budget / Grant
   c. *Completion date* – 5 year plan

Strategy #3	Stormwater Quantitative Management Study
Prevention	**Natural Resource Protection**
Property Protection	**Critical Facilities Protection**
Public Education & Awareness	Structural Project

Prepare a storm water quantitative management plan that would analyze the City storm water conveyance system and management facilities (ponds). The study would include constructing a model to include the current conveyance system network and storage facilities to determine areas of need for increasing hydraulic capacity. The study would also include alternatives to increase system performance for specific storm events for high risk areas susceptible to flooding.

Other indirect elements to achieve this mitigation approach is to properly plan, engineer, approve, and ensure construction was completed in accordance to the approved plans for any improvement or addition to the City storm water conveyance system and management facilities. This also includes keep up to date on any ordinance changes, updated technology, rainfall data, and other engineering standards.

Defined steps to achieving this mitigation strategy

1. Standards / Engineering / Construction
   a. *Responsible Party* – City of Verona / City engineer
   b. *Funding source* – City of Verona storm water utility
   c. *Completion date* – with each projects deadline

2. Budget for study
   h. *Responsible Party* – City of Verona and qualified consultant
   i. *Funding source* – City of Verona storm water utility, levy, and/or grants
   j. *Completion date* – Budgetary dependent
   k.

3. Execute the study
   g. *Responsible Party* – City of Verona and qualified consultant
   h. *Funding source* – City of Verona storm water utility, levy, and/or grants
   i. *Completion date* – Budgetary dependent

Strategy #3	Stormwater Quantitative Management Study
4. Program Capital Improvement projects g. *Responsible Party* – City of Verona h. *Funding source* – City of Verona storm water utility, levy, and/or grants i. *Completion date* – Budgetary dependent	
5. Update study on 10-year intervals or as needed d. *Responsible Party* – City of Verona e. *Funding source* – City of Verona storm water utility, levy, and/or grants f. *Completion date* – Budgetary dependent	

Strategy #4	Urban Tree Canopy / Tree & Vegetation Management
Prevention	**Natural Resource Protection**
Property Protection	Critical Facilities Protection
Public Education & Awareness	Structural Project

Planting, managing, pruning, and maintaining healthy tree and vegetation populations to aid with providing shade, creating and encouraging animal habitat, preventing run-off & erosion, combating climate change, and minimizing damage from large storm events. This is a perpetual goal that the City must consider as it continues to grow.

Defined steps to achieving this mitigation strategy

1. Planning public tree planting and care for existing and new developments as well as promoting the health of privately owned trees through public education and outreach
   d. *Responsible Party* – City Staff
   e. *Funding source* – City Budget
   f. *Completion date* – On-Going

2. Planting, Managing, Pruning, and Maintaining trees and vegetation to maintain a healthy and diverse urban forest
   l. *Responsible Party* – City Park Staff, Dane Co. Ice Age Trail
   m. *Funding source* – City Budget, Dane County Parks
   n. *Completion date* – On-Going
   o.

3. Monitoring and Treating for Emerald Ash Borer and other Insect & Disease threats. This improves overall tree health and manages the annual rate of removal and replacement
   j. *Responsible Party* – City Park Staff, Dane Co. Ice Age Trail
   k. *Funding source* – City Budget, Dane County Parks
   l. *Completion date* – On-Going