



MANITOWOC COUNTY, WISCONSIN

Hazard Mitigation Plan 2020 - 2025



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MANITOWOC COUNTY, WISCONSIN

HAZARD MITIGATION PLAN



Adopted: January 21, 2020

Prepared by:

Bay-Lake Regional Planning Commission

425 S Adams Street, Suite 201

Green Bay, WI 54301

(920) 448-2820



The preparation of this document was financed through contract #18010-05 between Manitowoc County and the Bay-Lake Regional Planning Commission. The cost to develop this plan was paid for through a grant from the Federal Emergency Management Agency (FEMA) through the Pre-Disaster Mitigation program. A local match for the grant was provided through in-kind efforts by Manitowoc County.



FEMA

Resolution of County Adoption

No. 2019/2020-64

RESOLUTION ADOPTING 2020 TO 2025 HAZARD MITIGATION PLAN

TO THE MANITOWOC COUNTY BOARD OF SUPERVISORS:

1 WHEREAS, Manitowoc County recognizes the threat that natural hazards pose to people
2 and property; and

3
4 WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the
5 potential for harm to people and property and save taxpayer dollars; and

6
7 WHEREAS, an adopted natural hazard mitigation plan is required as a condition of future
8 grant funding for mitigation projects; and

9
10 WHEREAS, in recognition of the need to prepare for the mitigation of natural hazards,
11 Manitowoc County has prepared its *Manitowoc County Wisconsin Multi Hazards Mitigation Plan*
12 *2020-2025* (the "Plan"); and

13
14 WHEREAS, Wisconsin Emergency Management ("WEM") has reviewed and approved
15 the Plan; and

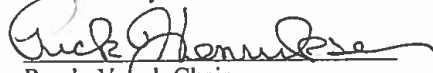
16
17 WHEREAS, after careful consideration and review, the Public Safety Committee
18 recommends the County Board of Supervisors of the County of Manitowoc adopt the Plan;

19
20 NOW, THEREFORE, BE IT RESOLVED, that the County Board of Supervisors of the
21 County of Manitowoc hereby adopts the *Manitowoc County Wisconsin Multi Hazards Mitigation*
22 *Plan 2020-2025* as approved by WEM as the County's official Hazard Mitigation Plan; and

23
24 BE IT FURTHER RESOLVED, that upon approval of the Manitowoc County, Wisconsin
25 Hazard Mitigation Plan (2020-2025), the Bay-Lake Regional Planning Commission will submit
26 the Plan to Wisconsin Emergency Management and Federal Emergency Management Agency
27 officials for final approval, as required under the Hazard Mitigation Grant Program.

Dated this 21st day of January 2020.

Respectfully submitted by the
Public Safety Committee

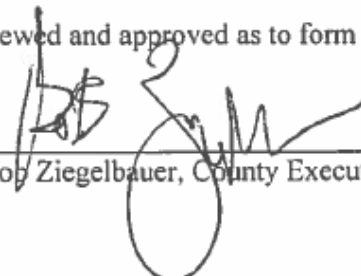

Randy Vogel, Chair

FISCAL IMPACT: None.

FISCAL NOTE: Reviewed and approved by Comptroller. 

LEGAL NOTE: Reviewed and approved as to form by Corporation Counsel. 

APPROVED:


Bob Ziegelbauer, County Executive

1/21/2020
Date

FEMA/WEM Approval Letters



STATE OF WISCONSIN

DEPARTMENT OF MILITARY AFFAIRS

DIVISION OF EMERGENCY MANAGEMENT

Darrell L. Williams, Ph.D.
Administrator

Tony Evers
Governor

December 6, 2019

Mr. Travis Waack, Director
Manitowoc County Emergency Management
1024 South 9th Street
1st Floor, Room 113
Manitowoc, WI 54220

Dear Mr. Waack:

Wisconsin Emergency Management (WEM) has reviewed the *Manitowoc County Wisconsin Multi-Hazards Mitigation Plan 2020-2025*. The Federal Emergency Management Agency (FEMA) and WEM have signed a Program Administration by States operational agreement, dated November 9, 2017, allowing WEM to review local mitigation plans to ensure they meet the required criteria for a multi-jurisdiction hazard mitigation plan outlined in 44 CFR Part 201. Upon review, Manitowoc County has met the required criteria for a multi-jurisdictional hazard mitigation plan.

The county and participating jurisdictions *must now adopt* the plan in order to have a FEMA-approved hazard mitigation plan and be eligible for funding through the Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, and the Flood Mitigation Assistance program.

I have emailed a copy of the WEM Mitigation Plan Review Tool for your records.

If you have any questions, please call Katie Sommers at (608) 242-3222.

Sincerely,

Charles Nettesheim
Hazard Mitigation Specialist
Wisconsin Emergency Management

Enclosures

Cc: Steve Fenske, East Central Region Emergency Management Director
Madison Smith, Bay Lake Regional Planning Commission Representative



STATE OF WISCONSIN
DEPARTMENT OF MILITARY AFFAIRS
DIVISION OF EMERGENCY MANAGEMENT

Darrell L. Williams, Ph.D.
Administrator

Tony Evers
Governor

February 3, 2020

Mr. Travis Waack, Director
Manitowoc County Emergency Management
1024 South 9th Street
1st Floor, Room 113
Manitowoc, WI 54220

Dear Travis:

It gives me great pleasure to inform you that the *Manitowoc County, Wisconsin, Hazard Mitigation Plan 2020-2025* has officially been approved by FEMA for the County! Approval for the other participating jurisdictions is contingent upon receipt of their adoption resolutions.

The plan complies with the requirements of the Disaster Mitigation Act of 2000. The approved jurisdictions are eligible to apply for funding through the Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, and Flood Mitigation Assistance program through February 2, 2025, for projects identified in the Plan. Per regulation, the Plan must be updated and resubmitted for approval every five years for the participating jurisdictions to remain eligible for mitigation funding.

Along with the Meets Requirements letter, you received the Local Mitigation Plan Review Tool, which includes recommended revisions for the five-year update.

Congratulations on the approval of your Plan! Our office commends the County for its commitment to mitigation and reducing future disaster losses, and we look forward to working with you in the future.

If you have any questions, please call me at (608) 242-3222 or Robyn Fennig at (608) 888-5292.

Sincerely,

Katie Sommers, CFM
Hazard Mitigation Section Supervisor

Enclosure

Cc: Steve Fenske, East Central Region Emergency Management Director, WEM
Madison Smith, Environmental Planner, Bay-Lake Regional Planning Commission

FEMA/WEM Approval Letters

FEB 03 2020



U.S. Department of Homeland Security
536 S. Clark St. 6th Floor
Chicago, IL 60605

FEMA

Ms. Robyn Fennig
State Hazard Mitigation Officer
Wisconsin Emergency Management
2400 Wright Street, P.O. Box 7865
Madison, WI 53707-7865

Dear Ms. Fennig:

Thank you for submitting the adoption documentation for the Manitowoc County Wisconsin Multi-Hazards Mitigation Plan 2020-2025. The plan was reviewed based on the local plan criteria contained in 44 CFR Part 201, as authorized by the Disaster Mitigation Act of 2000. The Manitowoc County plan met the required criteria for a multi-jurisdiction hazard mitigation plan and the plan is now approved for the county. Please submit the adoption resolutions for any remaining jurisdictions who participated in the planning process.

The approval of this plan ensures continued availability of the full complement of Hazard Mitigation Assistance (HMA) Grants. All requests for funding, however, will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted.

We encourage Manitowoc County and the participating jurisdictions to follow the plan's schedule for monitoring and updating the plan, and to continue their efforts to implement the mitigation measures. The expiration date of the Manitowoc County plan is five years from the date of this letter. To continue project grant eligibility, the plan must be reviewed, revised as appropriate, resubmitted, and approved no later than the plan expiration date.

Please pass on our congratulations to Manitowoc County. If you or the communities have any questions, please contact Cadence Peterson at cadence.peterson@fema.dhs.gov or at 312-408-5260.

Sincerely,

Julia McCarthy
Chief, Risk Analysis Branch
Mitigation Division

BAY-LAKE REGIONAL PLANNING STAFF



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Environmental Planner

Nicole Barbiaux
GIS Specialist



BAY LAKE

Regional Planning Commission | Since 1972



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EXECUTIVE SUMMARY

PLAN UPDATE SUMMARY

Table 0.1 below lists the plan changes made to the previous Manitowoc County, Wisconsin Hazard Mitigation Plan. Table 0.2 lists the updates made to the previously identified mitigation strategies.

Table 0.1: Plan Update Summary

Plan Chapter	Overview of Plan Update
Chapter 1: Introduction	Updated recent disasters, planning process participants, and public review information. Several updates were made to the original steering committee to reflect the changes in positions since the last plan was adopted. The steering committee updated the prioritized order of the hazards to be addressed and added coastal hazards, landslides, subsidence, and dam failure.
Chapter 2: Planning Area	Updated demographic profile information using the 2010 Census. Updated land use information.
Chapter 3: Risk Assessment	All hazard profiles, occurrences, and probabilities were updated. In addition, the risk assessments were updated. Hazard occurrences were updated to include all from 1995 to 2011 (original plan covered 1990 to 2005). Hazard probabilities were updated based on updated occurrences. Updated critical facilities and changed some categories names. A risk assessment was added for coastal hazards, landslide, subsidence, and dam failure.
Chapter 4: Mitigation Strategy	Updated the mitigation action plan to account for completed projects, updated timetables, and new project additions. Added specific municipal mitigation actions.
Chapter 5: Plan Maintenance and Adoption Process	Updated plan maintenance process and plan update schedule.



Table 0.2: Mitigation Strategy Updates

Project	Changes
All Hazards	
Establish Mutual Aid Agreements for utility and communications systems including 9-1-1 that are similar to the Mutual Aid Box Alarm System (MABAS)	Completed for communications systems, a similar effort has been completed for utilities.
Develop a central data collection process to report hazard incidences and resulting deaths, injuries, and property or crop damages.	Addition
Add capability for the Dispatch Center to accept text messages.	Addition
Maintain Code Red (i.e. Reverse 911) capability.	Addition. Capability provided in 2013, \$22K/year to maintain
Develop land use policies that guide development away from hazardous areas; reduce density in hazardous areas; and/or encourage greater development restrictions in hazardous areas	Completed
Update Comprehensive Plan and include land use policies that guide development away from hazardous areas; reduce density in hazardous areas; and/or encourage greater development restrictions in hazardous areas	Addition
Collect building footprints for all structures in the County to allow for analysis of where facilities/structures are located	Completed for City of Manitowoc +3 miles. Priority changed from "Medium" to "Low" for the remaining of the county. Timetable changed from "2009-2010" to "2015-2020".
Collect building height data for all structures in the County	Priority changed from "Medium" to "Low".
Work with County, State, and Federal agencies to maintain a consistent critical facility database	Changed Responsible Party from "Manitowoc County Planning and Park Commission and Manitowoc County Emergency Management" to "Manitowoc County Hazard Mitigation Plan Steering Committee." Priority changed from "Low" to "High".
Acquire updated air photos and LIDAR data	Addition
Outage management software to help triage outage repairs	Addition
Ability to test individual sirens after repairs	Addition
Develop Comprehensive Safety Plan for all municipal-owned buildings	Addition
Tornado and Strong Wind	
Assist personnel in schools and businesses, public facility managers, mobile home park managers, and citizens in determining "best available" tornado safety areas or need to construct safe rooms	Added "mobile home park manager" and "or need to construct safe rooms" to Project
Continued investment in state-of-the-art early warning systems	Combined with another project
Use of early warning system through pagers, NOAA weather radios, and sirens to first responders	Added "continued investment" and "social media and Code Red" to Project
Consider adoption of ordinances requiring construction of safe shelters for mobile home parks, fairgrounds, shopping malls, or other vulnerable public places	Removed "shopping malls" from Project and changed Timetable from "2008-2012" to "2015-2020"

Table 0.2: Mitigation Strategy Updates (cont'd)

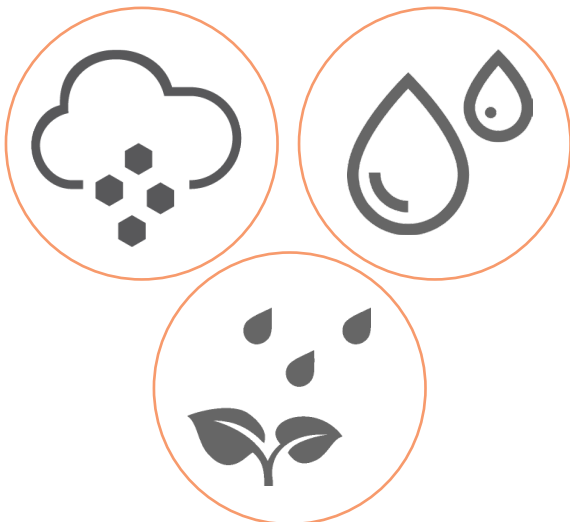
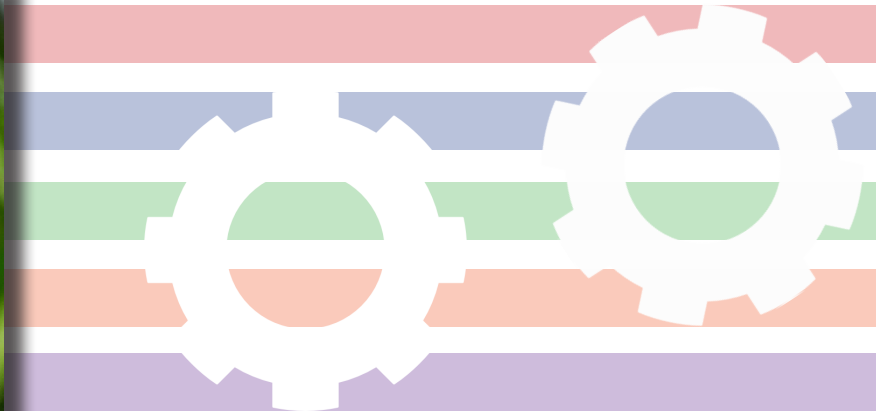
Project	Changes
Tornado and Strong Wind	
Harden utility infrastructure to make more resistant to tornadoes and high winds (i.e., burying of telephone lines)	Removed
Review and update Comprehensive Safety Plan for all county buildings	Added "-owned" to Project
Revise and amend zoning and building ordinances to require anchoring of manufactured and mobile homes and exterior attachments (such as carports and porches)	Removed "...and exterior attachments (such as carports and porches)" from Project and changed Timetable from "2010" to "2015". Changed Estimated Cost from "~\$25.00/mobile home for tie down and then additional costs for leveling and installation" to "Costs to be determined"
Inform public of severe weather	Changed project wording from "Disseminate severe weather safety information to the public" to "Inform public of severe weather"
Hail	
Harden utility infrastructure to make more resistant to hail (i.e., burying of telephone lines)	Changed Timetable from "2010-2012" to "2015-2020" and changed Responsible Party from "Manitowoc County Emergency Management Department, in conjunction with local utility companies" to "local utility companies, and local jurisdictions"
Animal Protection	Added "Costs to be determined" for Estimated Cost
Promote purchase of hail crop insurance	For Project, replaced "Promote purchase of..." with "Provide information about..." Added "Covered by existing budgets" to Estimated Cost
Winter Storms	
Utilization of the media to disseminate emergency information	Added "highway depts" to Responsible Party
Provide educational materials to the public regarding safety during winter storm events	Changed Responsible Party from "Local highway departments and local law enforcement departments" to "County Emergency Management and State EM (readywisconsin.wi.gov)"
Flooding	
Dissemination of instructions to the public through the media	Added "highway depts" to Responsible Party
Handle the evacuation of people and property in the case of a severe flood event	Added "County Emergency Management, County Highway Dept, County Aging Dept, and County Health Dept" to Responsible Party
Sand-bagging when necessary	Added "County Emergency Management, local public works depts" to Responsible Party. Changed Priority from "Low" to "Medium"
Review and update floodplain zoning ordinances as necessary	Added Note "Updated in 2010; approved by FEMA and WDNR"
Land use planning	Added Note "Updated in 2008 with Comprehensive Planning; will update again in 10 years." Changed Timetable from "2008-2011" to "2018-2020". Changed Priority from "High" to "Low"

Table 0.2: Mitigation Strategy Updates (cont'd)

Project	Changes
Flooding	
Promotion of the sale of flood insurance	Removed. Replace by actions that address NFIP.
Issue or deny floodplain development/building permits	Addition to address NFIP Compliance
Inspect all development to assure compliance with local ordinance	Addition to address NFIP Compliance
Maintain records of floodplain development	Addition to address NFIP Compliance
Assist in the preparation and revision of floodplain maps	Addition to address NFIP Compliance
Help residents obtain information on flood hazard, floodplain map data, flood insurance, and proper construction measures	Addition to address NFIP Compliance
Study effects of current and future development in the approximate floodplain and any other areas that have not yet been studied	Changed Estimated Cost of "\$40,000 - \$50,000" with "Costs to be determined." Changed Responsible Party to replace "County Emergency Management" with "GIS"
Review and update floodplain zoning ordinances as necessary	Changed Priority from "Medium" to "Low". Changed Project Timetable from "As Needed" to "Annually".
Stormwater protection planning	Changed Responsible Party to replace "County and Municipal Planning/Zoning" with "Wisconsin DNR and Public Works/Engineering"
Dam Failure Flooding	
Review and update evacuation procedures for persons located in affected area as needed	Moved to "Flooding"
Flooding (Stormwater)	
Stormwater Protection Planning	Moved to "Flooding"
Erosion Control Zoning	Moved to "Flooding"
Stormwater Retention/Detention Facilities	Moved to "Flooding"
Extreme Cold	
Continue to provide safety information to the public during periods of extreme temperature	Added "County Emergency Management, and County Health Dept" to Responsible Party
Extreme Heat	
Continue to provide safety information to the public during periods of extreme temperature	Added "County Emergency Management, and County Health Dept" to Responsible Party
Lightning	
Protection of structures through use of fire resistant materials	For Project, replaced "Protection of..." with "Provide information about protecting..." and added Fire Inspectors to Responsible Party
Disseminate severe weather safety information to the public	Removed as it's covered under "Inform public of severe weather" under Tornado and Strong Wind
Use of early warning system through pagers and NOAA weather radios	Moved to All Hazards. Removed "to first responders" in project
Drought	
Identification of areas with potential ground water level problems and inspection of shallow wells in those areas for adequate depth and construction	Changed Timetable from "2008-2012" to "2015-2020"

Table 0.2: Mitigation Strategy Updates (cont'd)

Project	Changes
Dense Fog	
Upkeep existing signage in areas of high fog event incidence	Changed Responsible Party from "Manitowoc County Traffic Safety Commission" to "County Highway Dept and Local Jurisdictions"
Additional fog warning signs along Interstate State 43	Removed - Determined to be unnecessary.
Wildland Fires	
Coordinate public outreach efforts to promote such things as non-combustible roof covering, fire safe construction, safe burning, and the importance of clearing brush and grass away from buildings	Changed Priority from "Medium" to "Low". Removed "Local building inspectors" from Responsible Party
Coastal Hazards	
Continue to enforce greater setbacks for properties adjacent to Lake Michigan under the county shoreland zoning ordinance	Addition
Land Subsidence	
Provide information to residents as needed	Addition



Chapter 1 - Introduction

► PURPOSE OF THE PLAN

The primary focus of the Manitowoc County, Wisconsin Hazard Mitigation Plan is to evaluate the planning area's potential exposure to hazards and to identify appropriate mitigation strategies. Consistent with the Code of Federal Regulations (44 CFR Part 201.6), this plan conforms to Federal Emergency Management Agency (FEMA) requirements for local hazards mitigation planning.

This plan provides County-level information on areas of risk, magnitude of risk, and strategies for reducing this risk. Through the process of developing this plan, the County addressed issues related to the protection of lives and property from hazards, the protection of critical facilities, and the reduction of community and taxpayer costs associated with disaster relief and rescue efforts. Completion and approval of the plan makes Manitowoc County eligible to apply for future FEMA disaster relief and mitigation project funds, helping the County to implement their recommended mitigation strategies.

► DISASTER MITIGATION ACT OF 2000

The development and update of the Manitowoc County, Wisconsin Hazard Mitigation Plan is in response to passage of the Disaster Mitigation Act of 2000. This act was signed into law in October of 2000. The Act attempts to stem the losses from disasters, reduce future public and private expenditures, and speed up response and recovery from disasters. The Act (Public Law 106-390) was amended by the Robert T. Stafford Relief and Emergency Assistance Act. The following is a summary of the parts of the Disaster Mitigation Act of 2000 that pertain to local governments and tribal organizations:

- The Act establishes a new requirement for local governments and tribal organizations to prepare a hazard mitigation plan in order to be eligible for funding from FEMA through the Pre-Disaster Mitigation Assistance Program and the Hazard Mitigation Grant Program.
- The Act establishes a requirement that natural hazards need to be addressed in the risk assessment/vulnerability analysis part of a hazard mitigation plan. Man-made/technological hazards are encouraged, but not required to be addressed.

- The Act authorizes up to seven percent of Hazard Mitigation Grant Program funds available to a state after a federal disaster to be used for development of state, local and tribal organization hazard mitigation plans.
- The Act established November 1, 2004, as the date by which local governments and tribal organizations are to prepare and adopt their respective plans in order to be eligible for the FEMA Hazard Mitigation Grant Program; this deadline was November 1, 2003, for the Pre-Disaster Mitigation Program.
- If a plan is not prepared by November 1, 2004, and a major disaster is declared, in order for a local government or tribal organization to be eligible to receive funding through the Hazard Mitigation Grant Program, they must agree to prepare a hazard mitigation plan within one year.
- In addition, not having a current, FEMA-approved, and adopted hazard mitigation plan will prevent local and tribal governments from utilize funding through the Pre-Disaster Mitigation Grant Program. Such federal funding hinges on the community being covered by a hazard mitigation plan within one year.

► FUNDING OF THE HAZARD MITIGATION PLAN

In July 2018, Manitowoc County received a planning grant to develop an update to their hazard mitigation plan in the amount of \$33,308 from FEMA through the FFY17 Pre-Disaster Mitigation Program. Through the grant (Agreement #: EMC-2018-PC-0004), FEMA provided 75 percent of the funds (\$24,981), while the remaining 25 percent (\$8,327) was required by Manitowoc County to meet the local match.

Manitowoc County entered into a contract (#18010-05) with the Bay-Lake Regional Planning Commission to prepare the update to the hazard mitigation plan. Development of the plan began in February 2019.

► FIVE PARTS OF THIS NATURAL HAZARDS MITIGATION PLAN

The Manitowoc County, Wisconsin Hazard Mitigation Plan is divided into five chapters in order to address FEMA's local mitigation plan requirements. The five chapters are as follows:

Chapter 1 - Introduction and Planning Process



Chapter 2 - Community Profile



Chapter 3 - Risk Assessment



Chapter 4 - Mitigation Strategy



Chapter 5 - Plan Adoption and Maintenance

► PLANNING PROCESS

Development of the Manitowoc County, Wisconsin Hazard Mitigation Plan was based on the planning requirements and guidance provided by FEMA and WEM. Following these requirements and guidance, the plan meets the requirements of the Disaster Mitigation Act of 2000. Since the WEM guidance for hazard mitigation plans recommended that planning areas "be consistent with a community's comprehensive planning boundary," the planning area for this plan includes all of Manitowoc County with its three cities (Manitowoc, Two Rivers, and Kiel), nine villages (Cleveland, Francis Creek, Kellnersville, Maribel, Mishicot, Reedsville, St. Nazianz, Valders, and Whitelaw), and eighteen towns (Table 2.1).

The steering committee, comprised of county, city, and village representatives, emergency management personnel, and businesses, guided the plan development process over an 18-month time-frame beginning in February 2019. Professional planning support and facilitation was provided by the Bay-Lake Regional Planning Commission. Public review and input was encouraged at all meetings and through a public informational meeting to present the plan goals, mitigation actions plan, and mapped hazard areas.



Development of the plan was structured along a five-phase planning process:

Phase 1: Pre-planning and review of steering committee appointments

Phase 2: Reassessing risks and critical factors

Phase 3: Updating the mitigation action plan

Phase 4: Reviewing the policies and procedures for plan implementation

Phase 5: Documenting the planning process and plan action

Phase 1 involved initial conversations and meetings aimed at reviewing the previous steering committee appointments, reconvening the steering committee, and outlining the planning process and responsibilities of the steering committee.

Phase 2 was comprised of meetings with the steering committee to reassess natural hazards and potential risks to the County, and reassessing identified critical facilities.

Phase 3 involved updating the mitigation strategy to address identified risks including removing completed task and adding new mitigation actions to address risks.

Phase 4 involved reviewing the policies that affect plan implementation and the procedures that would be followed to implement the plan.

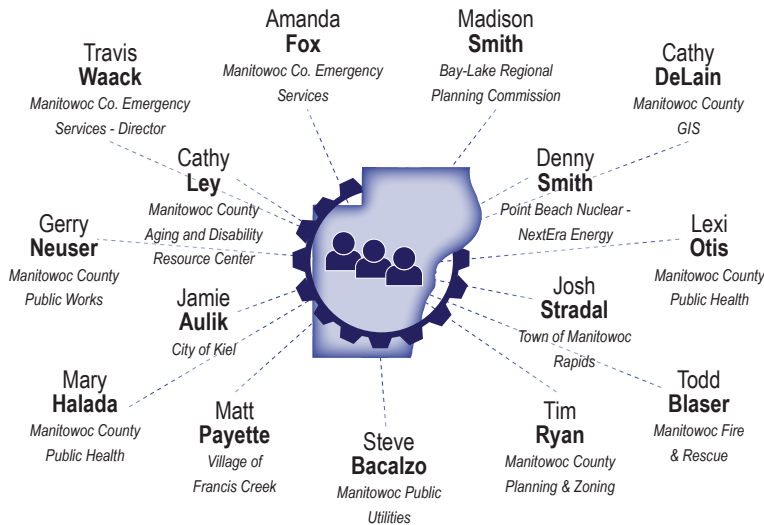
Phase 5 involved documenting the planning process, developing a complete draft of the plan, and plan adoption.

Plan development was completed with the adoption of the plan by resolution at the Manitowoc County Board. The maps in the Planning Area and Risk Assessment chapters of the plan were completed using the Bay-Lake Regional Planning Commission's Geographic Information System (GIS), allowing spatial analysis and a consistent base map. The FEMA HAZUS software was not utilized due to the availability of current local data and numerous differences between census boundaries and locally available map features. Maps included in this plan are for general planning purposes only, and are not for legal or formal survey purposes.

►HAZARD MITIGATION PLAN STEERING COMMITTEE

Manitowoc County established a steering committee for the plan development (Table 1.1). The steering committee was responsible for providing input, helping to guide the planning process, and reviewing draft chapters of the plan.

Table 1.1: Manitowoc County, Hazard Mitigation Plan Steering Committee



Other contributors: Angela Kowalzek-Adrians

During the assessment of natural hazard conditions, the plan steering committee reviewed the prioritization of the various potential natural hazards facing the planning area. The hazards addressed in this plan are listed below in order of priority.

1. Tornado and Strong Wind
2. Winter Storm
3. Hail
4. Flooding
5. Extreme Cold
6. Excessive Heat
7. Drought
8. Lightning
9. Coastal Hazards
10. Dense Fog
11. Land Subsidence
12. Wildland Fires



The steering committee reviewed and analyzed each section of the plan, and subsequently Table 0.1 was developed to document the sections of the plan that were revised as part of the update process. The steering committee held six meetings to update the plan: February 11, 2019, May 16, 2019, July 17, 2019, and October 3, 2019. Copies of the sign-in sheets are included in *Appendix A*.

Public Involvement

Steering Committee Meetings

Opportunities for public comment during the drafting stage of the plan were held at all meetings of the steering committee, which were all open to the public. No comments were provided by the public at these meetings.

Public Informational Meeting

An informational meeting was held for the public on November 11, 2019, 5:30 p.m. at the Manitowoc County Emergency Operations Center (EOC) at 1024 S 9th Street in Manitowoc. This meeting was held to provide additional opportunity for the public to review and comment on the draft plan and maps. No comments were provided by the public at this meeting. Both the steering committee meetings and the public informational meeting were open to the public and notices were posted at County EOC.

County Board Meeting

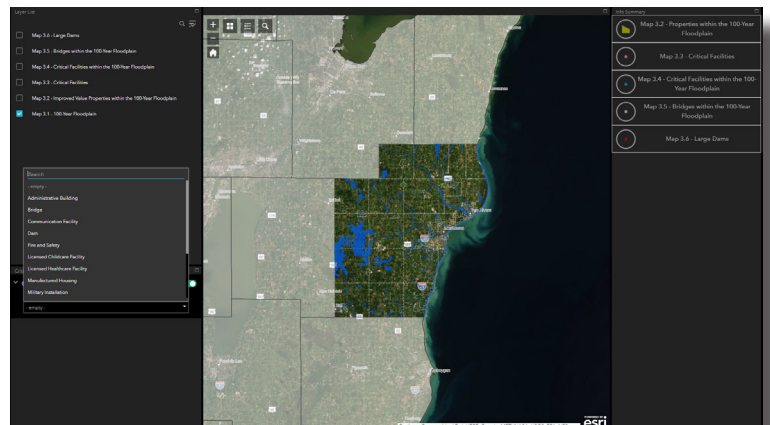
On January 21, 2020 the Manitowoc County Board adopted the hazard mitigation plan at a public meeting. A copy of the resolution of adoption can be found at the front of this plan on page I and II.

Neighboring Jurisdictions

A copy of the Manitowoc County, Wisconsin Hazard Mitigation Plan and an invitation to the public informational meeting was sent to the emergency management directors in counties adjacent to Manitowoc County including Sheboygan, Kewaunee, Calumet, and Brown counties for their review and comment. No comments were received.

Critical Facilities Online Maps

Throughout the development of the Manitowoc County Hazard Mitigation Plan Update, an online ArcGIS platform to view and filter critical facilities was created. The link to this tool is: <https://baylakerpc.maps.arcgis.com/apps/webappviewer/index.html?id=bd4968b7ed394fc4b071a9559af0c708>



Chapter 2 - Community Profile

General Geography

The planning area for the Manitowoc County, Wisconsin Hazard Mitigation Plan covers Manitowoc County and all of the municipalities within the county. The County has twelve incorporated communities (three cities and nine villages).

Map 2.1 illustrates the location of Manitowoc County and its municipalities. Table 2.1 indicates the geographical size of the County as well as the size of each municipality within the County.

Table 2.1: Manitowoc County Planning Area

Municipality	Total Planning Area (Sq. Miles)
C. Kiel	2.1
C. Manitowoc	18.1
C. Two Rivers	6.5
V. Cleveland	2.0
V. Francis Creek	1.2
V. Kellnersville	0.5
V. Maribel	1.1
V. Mishicot	2.5
V. Reedsville	1.2
V. St. Nazianz	0.8
V. Valders	1.4
V. Whitelaw	0.5
T. Cato	34.9
T. Centerville	23.8
T. Cooperstown	35.1
T. Eaton	35.5
T. Franklin	36.2
T. Gibson	35.3
T. Kossuth	38.6
T. Liberty	35.5
T. Manitowoc	6.1
T. Manitowoc Rapids	27.3
T. Maple Grove	35.4
T. Meeme	36.3
T. Mishicot	27.6
T. Newton	34.4
T. Rockland	35.3
T. Schleswig	33.8
T. Two Creeks	14.9
T. Two Rivers	31.7
County Total	595.9

Source: U.S. Bureau of the Census, 2010, and Bay-Lake Regional Planning Commission, 2019.

Historical County Description

Manitowoc was officially founded in 1836. In 1839, the county government was formed and the first courthouse followed a year later. Early county commissioners authorized the first roads to connect the farms and settlements of the area. Manitowoc County is located along Lake Michigan in east central Wisconsin encompassing an area of approximately 380,000 acres. Manitowoc County is bordered by Brown and Kewaunee counties to the north; Calumet County to the west; Sheboygan County to the south; and Lake Michigan to the east. Map 2.1 provides a general location of Manitowoc County in Wisconsin.

Development Pattern

A field inventory of land use of the county was conducted in 2010 by the Bay-Lake Regional Planning Commission, with updates completed in 2015 (Map 2.2). Using GIS, land use types were tabulated to calculate the total area of Manitowoc County at 381,453 acres (Table 2.2).

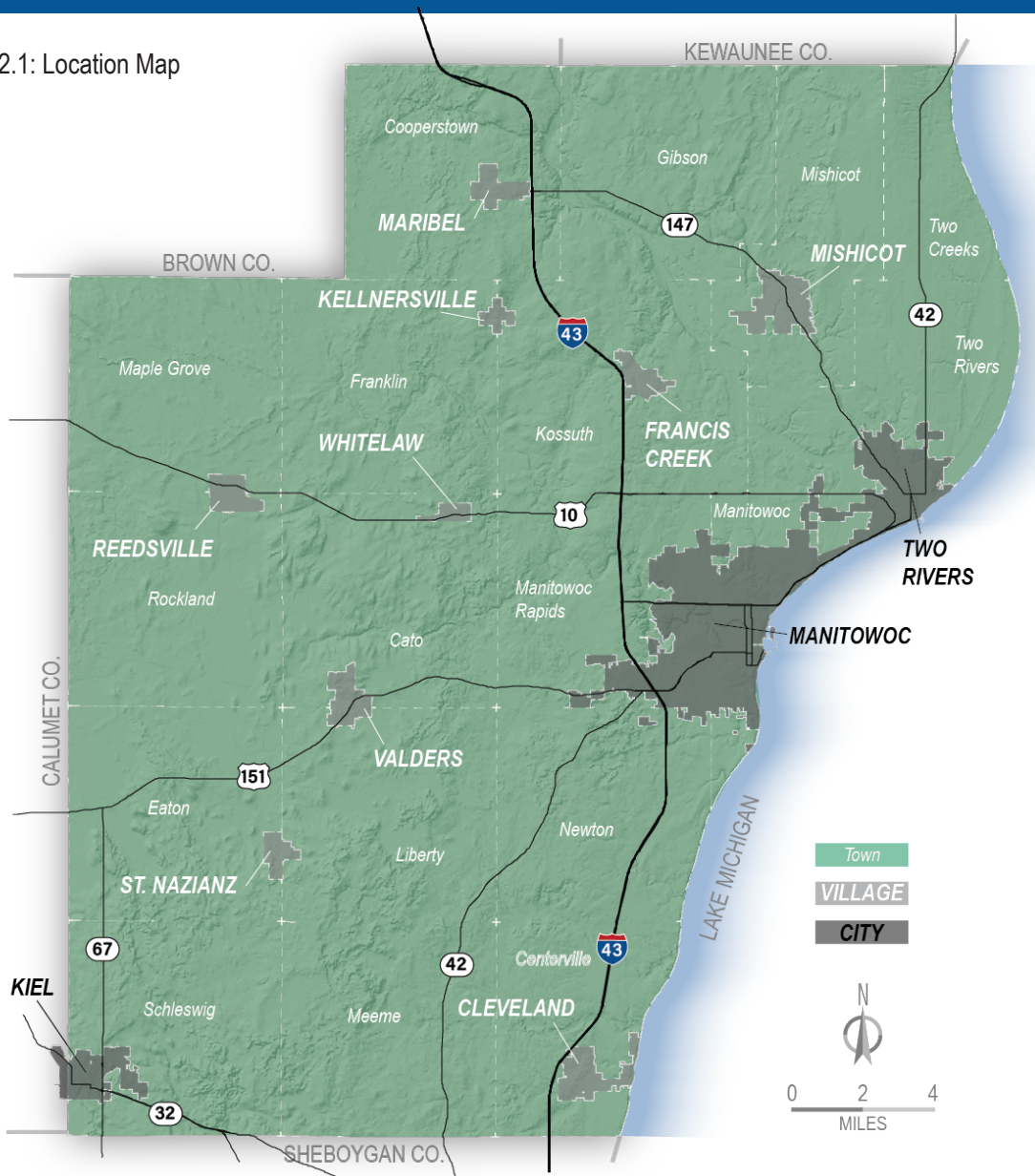
The vast majority of the county is comprised of agricultural land (specifically croplands) with 219,368 acres or 57.5 percent of the land. Woodlands and natural areas comprise 106,890 acres or 28 percent. Approximately 48,129 acres or about 13 percent of Manitowoc County is developed. Developed land is comprised of residential, commercial, industrial, transportation, communications/utilities, governmental/institutional, and parks and recreation.

Table 2.2: Manitowoc County Land Use, 2015

Land Use Type	Acreage	Percent
Communication/Utilities	831.7	0.2%
Governmental/Institutional	1,598.6	0.4%
Commercial	1,877.7	0.5%
Industrial	3,569.2	0.9%
Parks and Recreation	5,565.4	1.5%
Wetland/Water Features	7,066.3	1.9%
Transportation	17,005.3	4.5%
Residential	17,680.6	4.6%
Woodland/Natural Areas	106,890.3	28.0%
Agricultural	219,368.0	57.5%
Total	381,453.1	100.0%

Source: Bay-Lake Regional Planning Commission, 2010 and 2015 land use data; 2019.

Map 2.1: Location Map



Manitowoc County is located in northeast Wisconsin and has a total of 381,637 acres. The County is surrounded by Brown and Kewaunee Counties to the north, Calumet County to the west, and Sheboygan County to the south. Lake Michigan borders the County to the east and provides over 35 miles of lakeshore coastline.



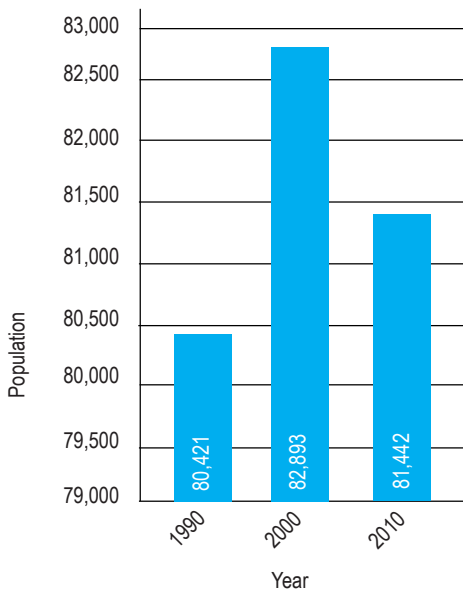
Community Profile

Demographic Trends

Population

Over the past 110 years, Manitowoc County's population increased by 93 percent or 39,181 persons. The county's population increased every decade with the exception of a slight decline between 1980 and 1990, and again between 2000 and 2010. The largest period of population increase in the county occurred between 1910 and 1920 with an increase of 14.8 percent.

Figure 1: Population Trends, Manitowoc County 1990 - 2010



Manitowoc County is projected to see a slow, but steady growth in its population from 2010 to 2030 and is projected to have a population of 82,230 by 2030, according to the Wisconsin Department of Administration (WDOA).

Figure 2: Population Projections, 1990 - 2040

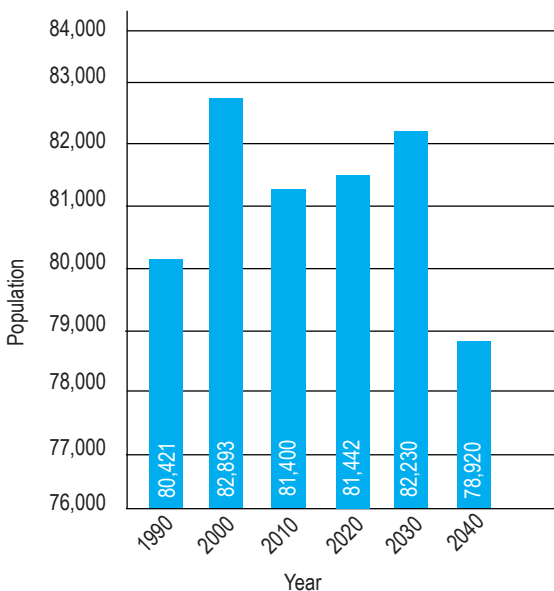
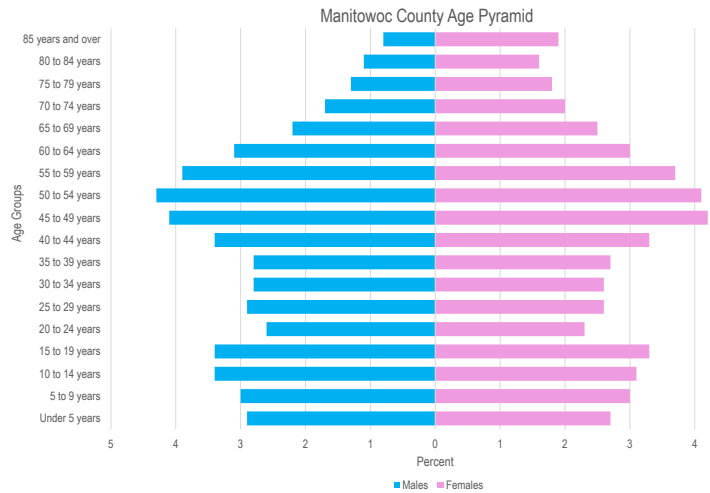


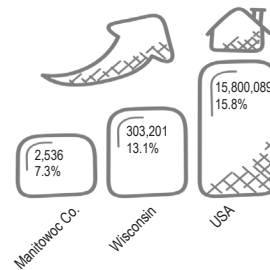
Figure 3: Age Pyramid



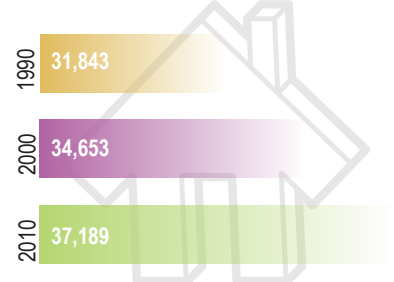
Housing

From 1970 to 2010, Manitowoc County has had steady growth in the number of housing units and gained 2,536 housing units during this time. The market is diverse, 48.1% own their house with a mortgage or loan, 27.3% own without a mortgage and 24.6% rent.

Change of Housing Units, 2000 - 2010

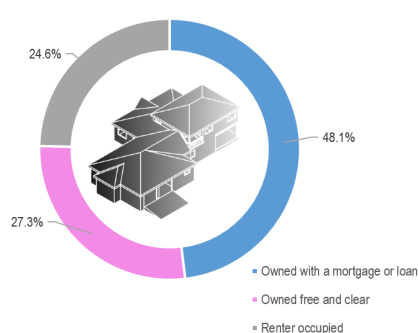


Housing Units

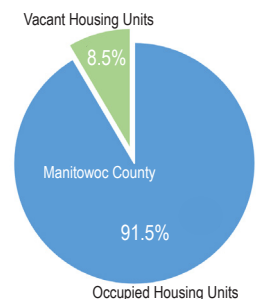


There were approximately 37,356 housing units in Manitowoc County in 2017. Over 30% of homes were built in 1939 or earlier. Between 1980 and 2009, Manitowoc County averaged slightly over 3,300 new housing units every 10 years. However, only 340 new housing units have been built since 2010 with the majority (312) being built in the cities. Just over 75% of housing units in Manitowoc County are single family housing units while 21% of housing units are multifamily. The total housing unit vacancy rate was 8.5% in 2010.

Housing Tenure, 2010



Housing Vacancy, 2010



Economy

As a result of the recession that affected the entire country, there was a significant jump in the county's unemployed in 2009 causing the unemployment rate to reach its highest level, 10.1 percent. It took the county 5 years to recover from this impact.

The civilian labor force is comprised of employed persons and those seeking employment, and excludes persons in the armed forces and those under age 16. Variations in the number of persons in the labor force are the result of many factors. Shifts in the age and gender characteristics of the population, changes in the number of residents aged 16 and over, and the proportion of this group working or seeking employment are all factors affecting the size of the labor force.

The majority of employed county residents worked in manufacturing (30%) followed by healthcare and social assistance. The median household income has increase at a county, state, and national level. Manitowoc County's median household income has increased from 2010 - 2017 by approximately \$1,699 according to the American Community Survey (ACS).

According the 2010 U.S. Census, the poverty rate of Manitowoc County was 9.2%, residing less than the state and national percentages. The County's total percent of population over 16 years old in the labor force is 65.4%, which is less than the state (66.8%), but greater than the national percentage (63.0%).

Industry and employment projections have been developed from the year 2010 to 2020 for the 11 county Bay Area Workforce Development district which consists of Brown, Door, Florence, Kewaunee, Manitowoc, Marinette, Menominee, Oconto, Outagamie, Shawano, and Sheboygan counties. Illustrated in the table above, it is projected that there will be an overall 12 percent increase in full and part-time non-farm employment from 2010 to 2020. The Professional and Business Services industries are expected to add 8,750 jobs for a 23 percent increase, followed by Leisure and Hospitality with 8,091 new jobs reflecting a 21 percent gain.

Figure 4: Median Household Income
Inflation-Adjusted

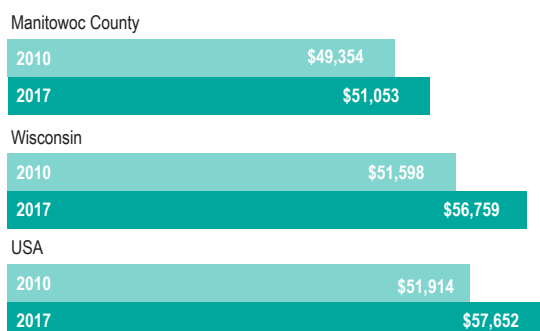
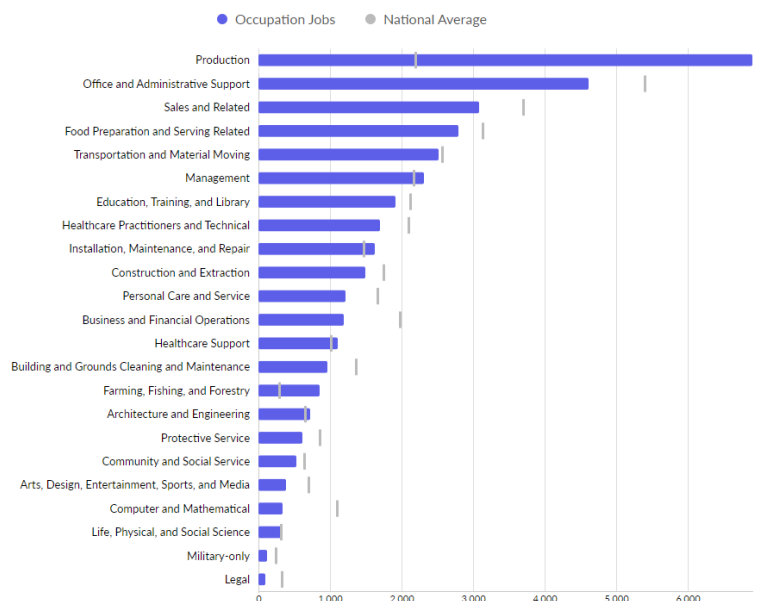


Figure 5: Largest Occupation Jobs, Manitowoc County

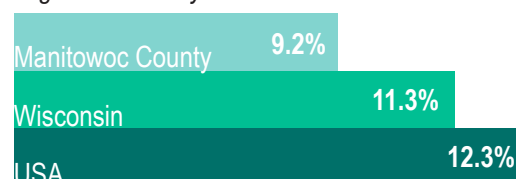


Agriculture remains as a key economic component in Manitowoc County. It includes hundreds of family-owned farms, agriculture-related businesses and industries that provide equipment, services, and other products farmers need to process, market, and deliver food to consumers. The generating, sales, and processing of these farm products create momentous employment and revenue opportunities for residents.

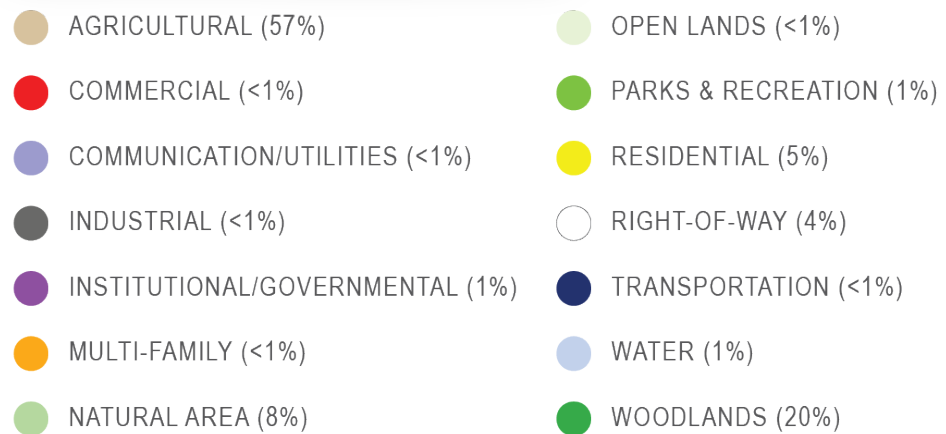
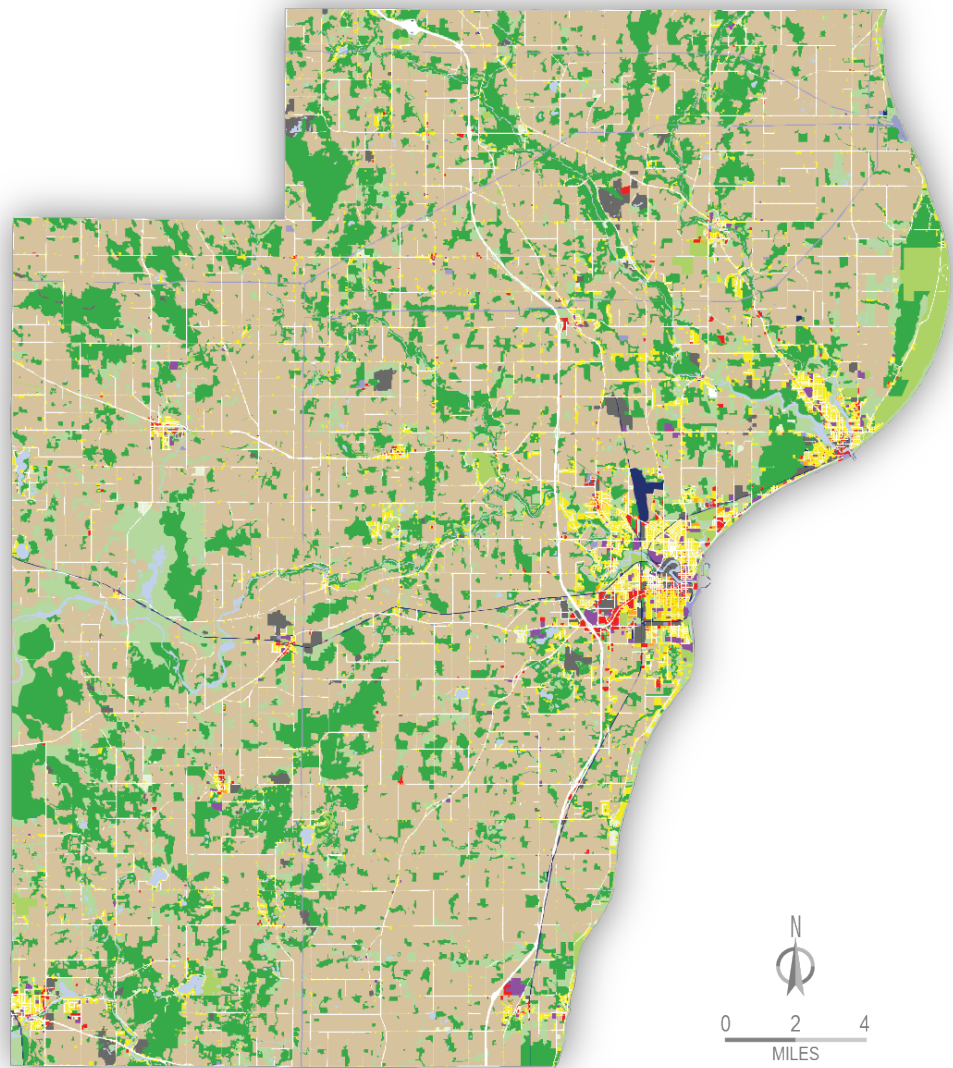
The 2014 UW-Extension Agricultural report, *Manitowoc County Agriculture: Value & Economic Impact*, characterizes the impact of agriculture the County:

- Provides jobs for 5,105 county residents, or 11.5 percent of the county's total employment. Jobs include farm owners and managers, farm employees, veterinarians, crop and livestock consultants, feed, fuel and other crop input suppliers, farm machinery dealers, etc.
- Generates \$1.5 billion in economic activity and contributes \$360 million to the county's total income.
- Pays over \$16 million in taxes (not including all property taxes paid to local schools).

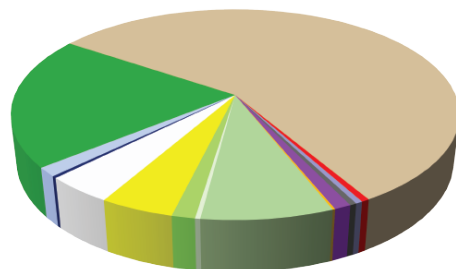
Figure 6: Poverty Rate



Map 2.2: Land Use Map



FAST FACT:
Manitowoc County is
over 50% agricultural
and 20% woodlands.



Chapter 3 - Risk Assessment

In order to more effectively evaluate potential hazard mitigation measures and develop useful strategies to address the risks associated with the identified natural hazards, a risk assessment has been prepared for Manitowoc County. The risk assessment identifies the natural hazards thought to pose the greatest risk to residents of the county, to profile the extent and severity of past natural hazard events that have affected the county, and to assess the vulnerability of the county to the risk of future natural hazard events.

Hazard Identification

Although the county could potentially be at risk from several distinct hazards, this plan focuses on addressing the natural hazards that pose the greatest risk to people and property in the county. Identification of the natural hazards to be addressed was based on a priority rank ordering of the many different natural hazards identified in the Resource Guide to All Hazards Mitigation Planning in Wisconsin (prepared by the Association of Wisconsin Regional Planning Commissions through funding provided by the State of Wisconsin Department of Military Affairs, Wisconsin Emergency Management, and the Federal Emergency Management Agency).

Natural Hazards Prioritization

The plan steering committee identified the following ranked natural hazards to be the focus of the plan assessment and mitigation action strategies. Ranking the potential risks associated with each natural hazard helped the steering committee prioritize the mitigation action strategies that are addressed later in the plan. The following natural hazards combined more than one listing from the NCDC data for consistency (the additional listings are provided in parenthesis). The hazards are listed in order of their prioritized ranking.

1. *Tornado and Strong Wind*

2. *Winter Storm*

3. *Hail*

4. *Flooding*

5. *Extreme Cold*

6. *Excessive Heat*

7. *Drought*

8. *Lightning*

9. *Coastal Hazards*

10. *Dense Fog*

11. *Land Subsidence*

12. *Wildland Fires*



Natural Hazard Events Historical Summary

The National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) publishes National Weather Service (NWS) data describing past weather events and the resulting deaths, injuries, and damages associated with each of these events. Event occurrence information is available at a local, county, or regional level – depending on the area covered by the hazard event. Historical hazard events were available from January 1, 2000 through October 1, 2018. The query for that time period resulted in 246 events recorded (Table 3.1).

The data from the NCDC shows that of the 246 events, the natural hazards occurring most frequently in Manitowoc County between January 2000 and October 2018 include: tornado and strong wind (100 events), winter storms (66 events), hail (46 events), and flooding (15 events). Other events occurring less than ten times in the county since 2000 include extreme cold (6 events), extreme heat (4 events), lightning (3 events), drought (3 events), and dense fog (2 events). Some of the recorded hazard events may not have been specific to the Manitowoc County, as they may have been recorded for a larger regional area, or statewide. Additionally, some of the common hazard events, such as lightning or dense fog, may only get reported to the NCDC if they are extreme events that cause property damage, injury, or death.

Two deaths (from extreme heat) and thirty injuries (from two-inch hail combined with near 100 mph wind) have been reported in Manitowoc County from hazard events since 2000. The most costly hazard events in terms of property damage 2000 has been flooding (\$20,000,000), hail (\$5,190,000), and tornadoes and strong winds (\$20,500). The reported costs of crop damage and property damage can be found on the next page in Table 3.1.



Risk Assessment

Table 3.1: Manitowoc County Hazard Events (2000-2018)

Natural Hazard	# Of Events ¹	Avg #/ Year	Risk ²	Deaths	Injuries	Reported Crop Damage	Property Damage ³
Tornado and Strong Wind	100	5	High	0	0	\$1,977,000	\$20,500
Winter Storms	66	4	High	0	0	\$0	\$0
Hail	46	2	Moderate	0	30	\$53,515,000	\$5,190,000
Flooding	15	1	Moderate	0	0	\$452,000	\$20,000,000
Extreme Cold	6	0	Low	0	0	\$0	\$0
Extreme Heat	4	0	Low	2	0	\$0	\$0
Drought	3	0	Low	0	0	\$0	\$0
Lightning	3	0	Low	0	0	\$3,010	\$0
Coastal Hazards	1	0	Moderate ⁴	0	0	\$50,000	\$0
Dense Fog	2	0	Low	0	0	\$0	\$0
Land Subsidence	ND	ND	Low	ND	ND	ND	ND
Wildland Fires	ND	ND	Low	ND	ND	ND	ND
Total Events	246	--	--	2	30	\$55,997,010	\$25,210,500

ND = No data

1. January 1, 2000 to October 1, 2018 (18.75 years)

2. Risk based on occurrences per year: High>3; Medium 1-3; and Low <1

3. Does not factor in private losses for most occurrences

4. Based on information provided by *Resource Guide for Great Lakes Coastal Hazards in Wisconsin* (coastal.lic.wisc.edu/urpl999.htm#Section_4)

Source: NOAA-NCDC, 2018; and Bay-Lake Regional Planning Commission, 2018.

Disaster Declaration History

There have been 20 major (federal) disaster declarations issued for Wisconsin since 2000. Manitowoc County was included in one of the declarations.

On June 14, 2008, Manitowoc County was included in a major disaster declaration that was issued because of property damage resulting from severe storms, tornadoes, and flooding that occurred over a period from June 5 to July 25, 2008 and affected 30 counties across the southern half of Wisconsin (DR-1768).

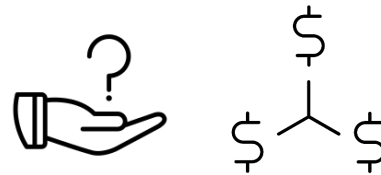


Table 3.2: Manitowoc County Hazard Events (1/1/2000 to 10/1/2018)

Hazard	# Of Events	2019 Rank
Tornado and Strong Wind	100	1
Winter Storm	66	2
Hail	46	3
Flooding	15	4
Extreme Cold	6	5
Excessive Heat	4	6
Drought	3	7
Lightning	3	8
Coastal Hazards	1	9
Dense Fog	2	10
Land Subsidence	ND	11
Wildland Fires	ND	12

Natural Hazards Determined Not to Pose a Significant Risk

The following natural hazards were determined to have a minimal chance of occurring or pose minimal risk to the safety of residents or property in Manitowoc County. These natural hazards are excluded from the full assessment, but are briefly discussed here to meet the comprehensive requirements for developing a natural hazards mitigation plan under Federal law.

Earthquakes

According to the U.S. Geological Survey (USGS), there have been 19 earthquake events in Wisconsin. The closest of these to Manitowoc County occurred in northern Ozaukee County (Lake Church) in 1956, as well as in Fond du Lac County in 1922. Where readings were available, these events were relatively small, most being 3.0 to 4.2 on the Richter Scale in intensity, and the largest being an intensity of 5.3 (Beloit, 1909), which may be strong enough to crack some plaster, but typically does not cause serious damage. Due to the lack of recent events, some geologists question whether many of these events were true earthquakes, but rather were quarry collapses, blasts, etc.

The nearest active earthquake fault outside of Wisconsin is the New Madrid Fault, which stretches from northeast Arkansas to southern Illinois. Manitowoc County falls within the lowest earthquake hazard shaking area, which represents the levels of horizontal shaking which have a 1-in-50 chance of being exceeded in a 50 year period. Similarly, Manitowoc County falls within a 0%g to 1%g peak ground acceleration (PGA) zone as shown on the USGS PGA values map with a 10 percent chance of being exceeded over 50 years. Therefore, the county is considered unlikely to be substantially affected by earthquakes in the long-term future. The earthquake threat to the county is considered very low.

Landslides

The term “landslide” includes a wide range of ground movement, including rock falls, deep failure of slopes and shallow debris flows. Although gravity acting on an overly steep slope is the primary reason for a landslide, there can be other contributing factors, such as erosion by rivers, excess weight from the accumulation of rain or snow, or man-made and other structures stressing weak slopes to the point of failure. In addition, slope material that becomes saturated with water may develop a debris flow or mudflow. The U.S. Geological Survey Landslide Overview Map of the Conterminous United States identifies low landslide risks for all of Manitowoc County. The majority of the land within Manitowoc County does not involve steep slopes and does not pose a landslide risk.



While there are steeper portions of the county, the soils involved pose more of a gradual erosion risk, as opposed to the sudden, large-scale movement of ground associated with landslide hazards. Hillside erosion (minor landslides) within the county is very uncommon, and is the result of man-made impacts, such as the removal of vegetation. Hillside erosion has not posed substantial risk to life or property, and has been largely mitigated through subdivision law, site plan review and erosion control plans for construction sites.

There are no records of substantial damage or injury from large landslides within Manitowoc County, and these hazard threats are considered low.

Risk and Vulnerability Assessment

The risk and vulnerability assessment is intended to describe the frequency, severity, and probability of future occurrence of natural hazards that could impact the planning area. The following hazard profiles attempt to historically describe the characteristics of each natural hazard and how they have affected the population, infrastructure, and environment of the planning area, and the potential risk to the population and property that could occur because of each of these natural hazards.

Critical Facilities

Although the risk assessment focuses on the risk potential to the overall planning area, critical facilities are of particular concern. Critical facilities are necessary to preserve health, welfare, and quality of life in the county, and fulfill important public safety, emergency response, and/or disaster recovery functions, or they house vulnerable populations (such as schools, childcare, and mobile home parks).

Critical facilities in the planning area have been identified and mapped, and are illustrated in Map 3.1. Table 3.3 lists the types and number of critical facilities within the county. Table 3.4 lists the critical facilities by municipality.

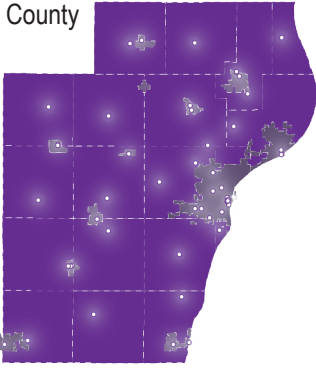
Table 3.3: Number of Critical Facilities by Type

Type	# Of Critical Facilities
Administrative Building	54
Bridge	290
Communication Facility	140
Dam	10
Fire and Safety	79
Licensed Childcare Facility	47
Licensed Healthcare Facility	69
Manufactured Housing	13
Military Installation	3
Post-Disaster Recovery Site	51
Power Facility/Bulk Fuel Storage	33
School	51
Transportation Facility	3
Wastewater Treatment Facility	59
Water Supply	38
Total	940

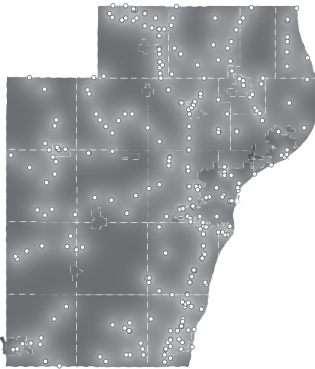
Source: Bay-Lake Regional Planning Commission, 2019.



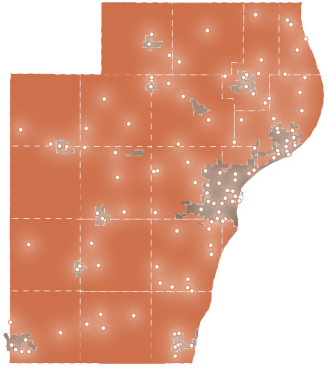
Map 3.1 Critical Facilities by Type, Manitowoc County



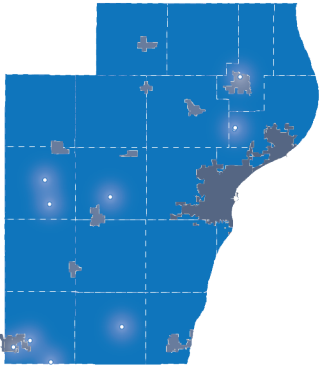
ADMINISTRATIVE BUILDING



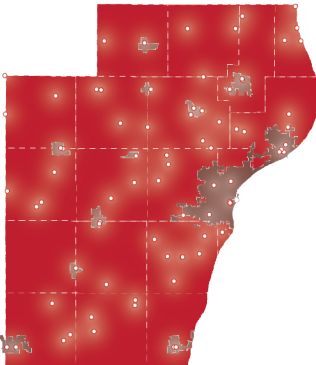
BRIDGE



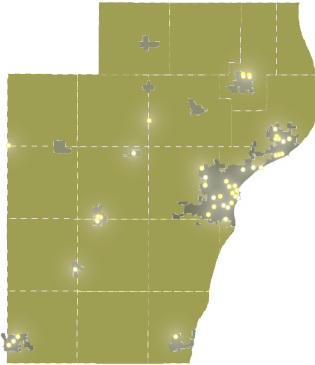
COMMUNICATION FACILITY



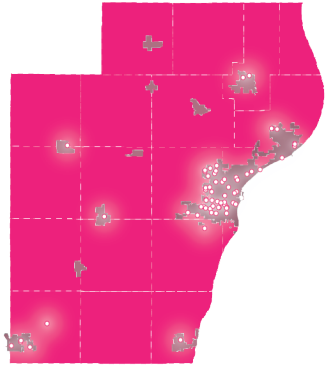
DAM



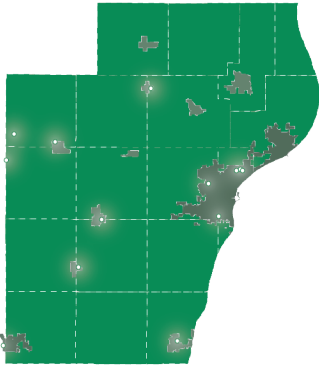
FIRE & SAFETY



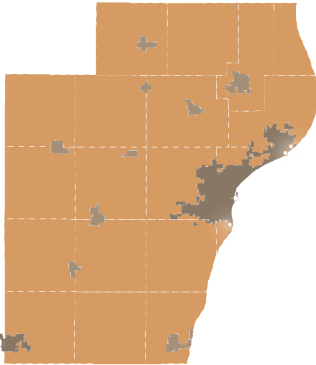
LICENSED CHILDCARE FACILITY



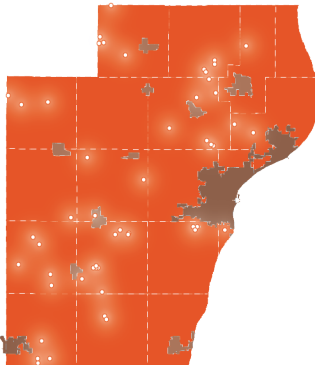
LICENSED HEALTHCARE FACILITY



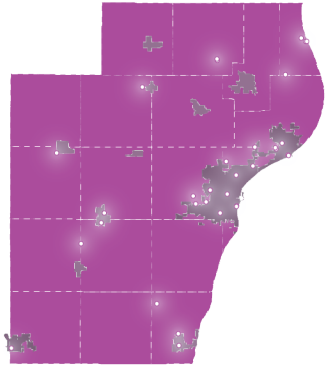
MANUFACTURED HOUSING



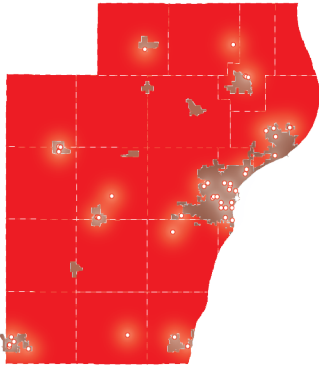
MILITARY INSTALLATION



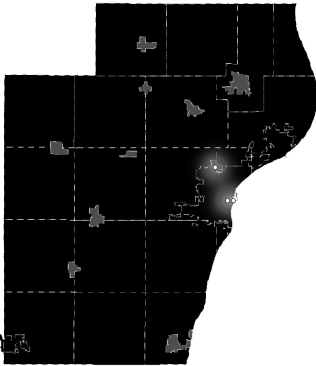
POST DISASTER RECOVERY SITE



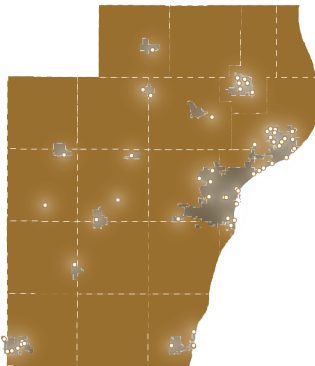
POWER FACILITY/
BULK FUEL STORAGE



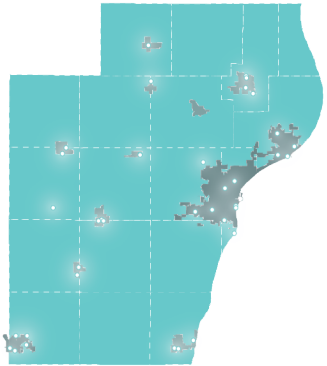
SCHOOL



TRANSPORTATION FACILITY



WASTEWATER TREATMENT FACILITY



WATER SUPPLY

Table 3.4: Number of Critical Facilities by Municipality, Manitowoc County

Municipality	# Of Critical Facilities
City of Kiel	38
City of Manitowoc	204
City of Two Rivers	82
Town of Cato	20
Town of Centerville	33
Town of Cooperstown	42
Town of Eaton	12
Town of Franklin	20
Town of Gibson	27
Town of Kossuth	45
Town of Liberty	18
Town of Manitowoc	14
Town of Manitowoc Rapids	38
Town of Maple Grove	15
Town of Meeme	25
Town of Mishicot	18
Town of Newton	50
Town of Rockland	23
Town of Schleswig	24
Town of Two Creeks	23
Town of Two Rivers	25
Village of Cleveland	28
Village of Francis Creek	6
Village of Kellnersville	4
Village of Maribel	6
Village of Mishicot	36
Village of Reedsville	23
Village of St. Nazianz	12
Village of Valders	21
Village of Whitelaw	6
Total	938

Source: Bay-Lake Regional Planning Commission, 2019.

Hazard Profiles

Hazard profiles are intended to describe the frequency, severity, and probability of future natural hazards that could have an impact on Manitowoc County. These hazard profiles attempt to historically describe the cause and characteristics of each natural hazard and how they have impacted the population, infrastructure, and environment of the county. These potential risks are evaluated to determine their likelihood of re-occurrence and to gauge the impacts to the existing (or planned) population and property that could occur as a result of these hazards.

Hazard probabilities are represented as high, medium, and low. High probability hazards are defined as hazards that occur an average of more than once per year; medium probability hazards are those that occur an average of more than once every two years, but not more than once per year; and low probability hazards occur less frequently than once every two years.

Tornado and Strong Wind

Description of Hazard

A tornado is a violently rotating column of air (vortex) extending from the base of a convective cloud (usually cumulonimbus) to the ground. Tornadoes form in many parts of the world under many types of conditions; however, the most common conditions in Wisconsin are intense squall lines and supercell thunderstorms. Tornadoes can be classified as supercell or nonsupercell. Supercell tornadoes are derived from supercell thunderstorms of which a key component is a rotating updraft. These tornadoes can be devastating. Non-supercell tornadoes are formed by a spinning column of air near the ground and tend to be short-lived and weaker than supercell tornadoes. Non-supercell tornadoes include gustnadoes, land spouts, and water spouts.

The destructive power of the tornado results primarily from strong wind velocities and sudden changes in pressure. Wind and pressure differentials probably account for 90 percent of the damage caused by tornadoes. Since tornadoes are generally associated with severe storm systems, they are usually accompanied by hail, torrential rain, and intense lightning. Depending on their intensity, tornadoes can uproot trees, down power lines and destroy buildings. Flying debris can cause serious injury and death.

Wisconsin lies along the northern edge of the nation's maximum frequency belt for tornadoes (commonly known as "tornado alley"), which extends northeastward from Oklahoma into Iowa and then across to Michigan and Ohio. Generally, the southern and western portions of Wisconsin have a higher frequency of tornadoes; however, every county in Wisconsin has had tornadoes and is considered to be susceptible to a tornado disaster. Tornadoes have occurred in Wisconsin in every month except February.

Wisconsin's tornado season runs from the beginning of April through September. The most severe tornadoes statewide typically occur during the months of April, May, and June. Many tornadoes strike in late afternoon or early evening. However, tornadoes have occurred during other times of the day. Personal property damage, deaths, and injuries have and will continue to occur due to tornado events in Wisconsin. The table on the following page (Table 3.5, page 19) shows the Enhanced Fujita Scale (EF Scale), which is recognized as the tornado magnitude measurement rating.



Table 3.5: Enhanced Fujita Scale (EF Scale)

EF Rating	Wind Speeds	Expected Damage
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.

Source: NOAA National Weather Service, 2018.

Strong winds, including thunderstorm winds and high winds can often be just as damaging as a tornado. Strong winds are most likely to happen in the spring and summer months and during the afternoon and evening hours, but can occur throughout the year and at all hours.

Strong winds include downburst winds and high winds. Downburst winds are strong, concentrated, straight-line winds created by falling rain and sinking air that can reach speeds of 125 miles per hour. High winds are high speeds winds that can be as damaging as a tornado, but remaining nearly straight line and are not the rotating column of air that is characteristic of a tornado.

The National Weather Service classifies a thunderstorm as severe if its winds reach or exceed 58 miles per hour, produces a tornado, or drops surface hail at least 0.75 inch in diameter. Compared with other atmospheric hazards (such as tropical cyclones and winter low pressure systems), individual thunderstorms affect relatively small geographic areas. The average thunderstorm system is approximately 15 miles in diameter, covers 75 square miles, and lasts less than 30 minutes at a single location. However, weather monitoring reports indicate that coherent thunderstorm systems can travel intact for distances in excess of 600 miles.



Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Manitowoc County has experienced 100 significant tornado and strong wind events (including funnel clouds, strong wind, high wind, and thunderstorm wind) over the last 18 years from January 1, 2000 to October 1, 2018.

One significant tornado of note was an EF-1 in the Town of Cato that occurred on July 13, 2004 causing \$1.6 million in damage.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Manitowoc County experiences approximately five significant tornado/strong wind events per year.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Manitowoc County is considered to have a high probability of experiencing a tornado/strong wind event in any given year.

Areas at Greatest Risk

Tornadoes have no defined hazard area within the county. Past events have been relatively uniform across the planning area; however, mobile home residents are often most vulnerable to death, injury, and property damage from tornadoes. Therefore, mobile home parks in the planning area are the areas of greatest risk from this hazard.

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from tornado/strong wind events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018, according to NCDC data.

Structures at Risk

Although tornadoes strike at random, making all buildings vulnerable, there are three types of structures that are most likely to sustain damage. These structure types include mobile homes, homes on crawlspaces, and buildings with vast spans.

Similar to severe thunderstorms, street signs often face disrepair after tornadoes, and debris often litter streets and highways following a tornado, requiring clean-up. Downed trees caused by tornadoes can be problematic in terms of impacting infrastructure (transportation, sewer, water, etc.) as well as critical facilities.



Critical Facilities

Hospitals can see increases in patient load following tornadoes. Schools can sustain damage, and if they do not sustain damage, they often function as temporary shelters in the aftermath of tornadoes. Police and fire departments often see an increased workload during and after tornadoes. Powerlines and communication towers are at risk of being blown down. Any critical facility in the planning area is capable of being hit. However, schools are a prominent concern because of the number of people present, either during school sessions or as a storm shelter; and secondly, they have large span areas, such as gyms and theaters.

Economic Impacts

A tornado can have a significant economic impact to a local economy due to irrecoverable businesses and infrastructure damages. A heavily damaged business, especially one that was struggling to make a profit, often never reopens after the hazard event.

Infrastructure damage is usually limited to above ground utilities, such as power lines. Damage to utility lines can usually be repaired or replaced relatively quickly. Damage to roads and to railroads is also localized; if these facilities cannot be repaired promptly, alternate transportation routes are usually available.

Public expenditures include search and rescue, shelters, and emergency protection measures. The greatest public expenditures for a community result from repairs to public facilities, and clean up and disposal of debris. Most public facilities are insured, so the economic impact on the local treasury is likely to be small. Clean up and disposal can be a larger problem, especially if there is limited landfill capacity near the damage site.

Property Damage

Reported property damage from significant tornadoes/strong winds for Manitowoc County has totaled approximately \$1.9 million in public property and crop damages over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data.

Estimate of Potential Dollar Losses

Since mobile homes are especially vulnerable to tornadoes, a “worst case scenario” for this hazard would involve the total destruction of all mobile homes in the county. In such a “worst case scenario,” the total destruction of all buildings and facilities in the 14 mobile home parks in the County would result in estimated dollar losses of approximately \$6.1 million plus with an additional estimated value of building contents of \$3.0 million (calculated as 50 percent of the building value), for total estimate of potential dollar losses of \$9.1 million.



Hail

Description of Hazard

A severe thunderstorm can produce frozen precipitation, or hail. Hailstones are ice crystals that form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they develop sufficient weight and fall as precipitation. The size of hailstones is a direct function of the severity and size of the storm. Significant damage does not result until the hailstones reach 1.5 inches in diameter, which occurs in less than half of all hailstorms. Hail in Wisconsin ranges from pea-sized to golf ball-sized. Area coverage of individual hailstorms is highly variable and spotty because of the unstable nature of cumulonimbus clouds.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Manitowoc County has experienced 46 significant hail storm events over the last 18 years from January 1, 2000 to October 1, 2018. Some of these reported occurrences may not have been specific to Manitowoc County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Manitowoc County experiences approximately two significant hail storm events per year.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Manitowoc County is considered to have a high probability of experiencing a significant hail storm event in any given year.

Areas at Greatest Risk

Hail storms have no defined hazard area within the planning area. Past events have been relatively uniform across the planning area or the larger regional area.

Impacts from Hazard

Death and Injury

No death, but 30 injuries have been reported from hail events in Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018, according to NCDC data. All 30 injuries occurred during one hail event in St. Nazianz on May 12, 2000 as a result of two-inch hail combined with near 100 mph wind.

Structures at Risk

Hail can inflict severe damage to roofs, windows, and siding, depending on hailstone size and winds.

Critical Facilities

Hail can inflict severe damage to roofs, windows, and siding of critical facilities, depending on hailstone size and winds.

Economic Impacts

Hail can damage or destroy crops. Taller crops, such as corn are particularly vulnerable to hail. Costly damage can occur to roofs, windows, and siding, as well as automobiles, RVs, and boats (including the body, paint and windshields and other windows).

Property Damage

Reported property damage from significant hail events for Manitowoc County has totaled over \$58 million in public property and crop damages over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data.

\$50 million in property and crop damages occurred during one hail event in St. Nazianz on May 12, 2000 as a result of two-inch hail combined with near 100 mph wind.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for hail storm events, since no vulnerable structures have been identified.



Winter Storm

Description of Hazard

Winter storms vary in size and strength and include heavy snowstorms, blizzards, freezing rain, sleet, ice storms, and considerable blowing and drifting snow conditions that can close roads. Additionally, the combination of extremely cold temperatures and strong winds can result in dangerous wind chills that cause bodily injury like frostbite or even death due to exposure (hypothermia). Severe winter storms can cause unusually heavy rain or snowfall, high winds, extreme cold, and ice storms throughout the continental US. Winter storms can be very disruptive to transportation and commerce. Trees, cars, roads, and other surfaces can develop a glaze of ice making conditions extremely hazardous to motorists and pedestrians. The most prevalent impacts of heavy accumulations of ice and snow are slippery roads and walkways leading to vehicle and pedestrian accidents; collapsed roofs from fallen trees and limbs and heavy ice and snow loads; and felled trees, telephone poles and lines, electrical wires, and communications towers. As a result of severe winter storms, power and telecommunications can be disrupted for days.

A variety of weather phenomena and conditions can occur during winter storms. The following are National Weather Service (NWS) approved descriptions of winter storm elements:

- **Heavy snowfall:** accumulation of four or more inches of snow in a 12-hour period or six or more inches in a 24-hour period.
- **Blizzard:** sustained wind or frequent wind gusts of at least 35 mph accompanied by considerable falling and/or blowing snow.
- **Ice storm:** freezing rain produces significant or damaging accumulations of ice, usually 1/4" or thicker.
- **Freezing drizzle/freezing rain:** drizzle or rain that falls as a liquid but freezes into glaze upon contact with the ground or objects with a temperature of 32°F or below.
- **Sleet:** pellets of ice composed of frozen or mostly frozen raindrops or refrozen partially melted snowflakes.
- **Wind chill:** measure of accelerated heat loss from exposed skin due to increased wind speeds.



Source: The Value of Snow and Snow Information Services, Report prepared for NOAA's National Operational Hydrological Remote Sensing Center, 2018.

Much of the snowfall in Wisconsin occurs in small amounts of between one and three inches per occurrence. Heavy snowfalls (producing at least eight to ten inches of accumulation) happen on the average about five times per season. True blizzards are rare in Wisconsin, and are more likely to occur in northwestern Wisconsin than in southern portions of the state, even though heavy snowfalls are more frequent in southeastern Wisconsin. However, blizzard-like conditions often exist during heavy snow storms when gusty winds cause the severe blowing and drifting of snow.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Manitowoc County has experienced 66 significant winter storm events over the last 18 years from January 1, 2000 to October 1, 2018 (including blizzard, heavy snow, and lake-effect snow). Many of these hazard events may not have been specific to Manitowoc County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Manitowoc County experiences approximately four significant winter storm events per year.

Probability of Hazards Occurring in the Future

Based on the hazard frequency, Manitowoc County is considered to have a high probability of experiencing a winter storm event in any given year. Winter storms tend to be a regional phenomenon in that they affect much of northeastern Wisconsin on nearly all of the occasions in which they affect Manitowoc County.

Areas at Greatest Risk

Winter storms have no defined hazard area within the planning area. Past events have been relatively uniform across the planning area or the larger regional area.

Death and Injury

No deaths or injuries have been reported from significant winter storm events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data.





Structures at Risk

Occasionally, heavy snow or accumulated ice will cause structural collapse of buildings (particularly roofs), but most buildings are now constructed with low temperatures, snow loads and ice storms in mind. In addition, with the modern focus on energy conservation, buildings are much better insulated than they were in the past. Therefore, for the most part, winter storms do not have a major impact on buildings in the planning area. The major impacts of winter storms on infrastructure are to utilities and roads. Power lines and tree limbs can be coated with heavy ice in some winter storms, resulting in disrupted power and telephone service, often for days. Cable and satellite television services can also be negatively impacted in certain winter storm events. In the case of transportation, even small accumulations of ice can be extremely dangerous to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces.

Critical Facilities

Street and road crews have an increased burden of snow removal (and salting in the case of ice storms) during and after winter storms. In some cases, winter storms can be so severe that these crews have to be called off the road for a period of time. Hospitals and clinics can treat additional patients for frostbite, pedestrian and vehicular accident injuries, and conditions resulting from the shoveling of heavy snow during and following winter storms. Sometimes, these very hospitals and clinics have difficulty getting their own staff to report to work because of the storm, which increases the work load for the staff who is already there (double shifts, etc.). Police department staff needs to respond to more accidents. Utility and telephone companies need to respond to downed electrical and telephone lines, especially in the case of ice storms. Rescue services can receive more calls because of accidents or health related circumstances. Schools may need to have early dismissal or cancel classes altogether. Shelters may take in additional homeless persons during winter storm events as well, although this has been less of an issue in Manitowoc than it has been in larger cities.

Economic Impacts

Loss of power often means that businesses and manufacturing concerns must close down. Loss of access due to snow or ice covered roads can have a similar effect, especially when trucks cannot travel on major thoroughfares to make "just in time" deliveries to business and industry in the planning area. The effects are particularly difficult when the storm is widespread. Additional economic costs of winter storms include snow removal (exceeds \$2 billion/yr for U.S.), road closures that cause lost retail trade, wages, and tax revenue (exceeds \$10 billion/day for closures in eastern U.S.), flight delays (\$3.2 billion annually for U.S. carriers), damage to utilities (up to \$2 billion per event), flooding from snowmelt (\$4.3 billion for 1997 floods), and cost to agriculture and timber from frost and ice (up to \$1.6 billion per ice storm).

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for winter storm events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from winter storms has been minimal over the past 18 years.



Flooding

Description of Hazard

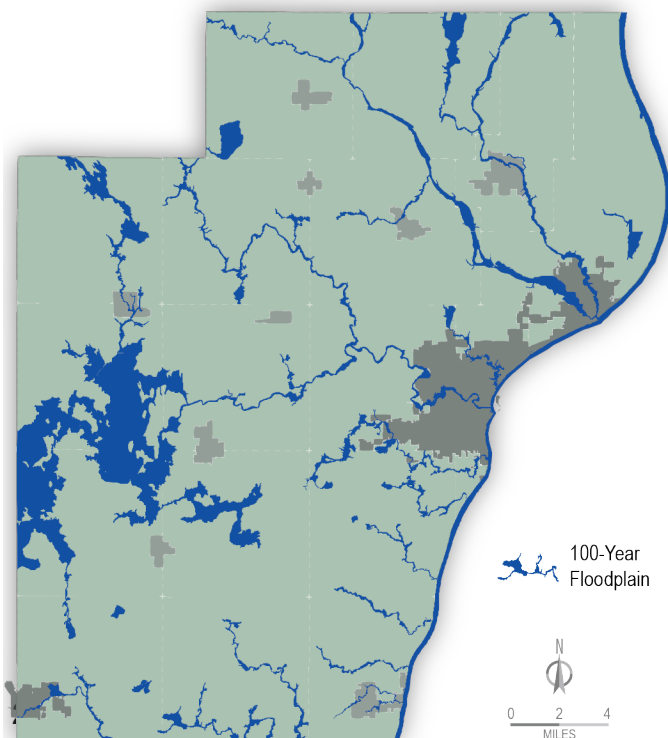
Floods happen when the water draining from a watershed, whether from rainfall or melting snow, exceeds the capacity of the river or stream channel to hold it. Water overflows onto the nearby low-lying lands (floodplains). In hilly and mountainous areas flooding is likely to be rapid, deep, and dangerous. In relatively flat floodplains, land may stay covered with shallow, slow moving water for days or even weeks.

Stormwater Flooding

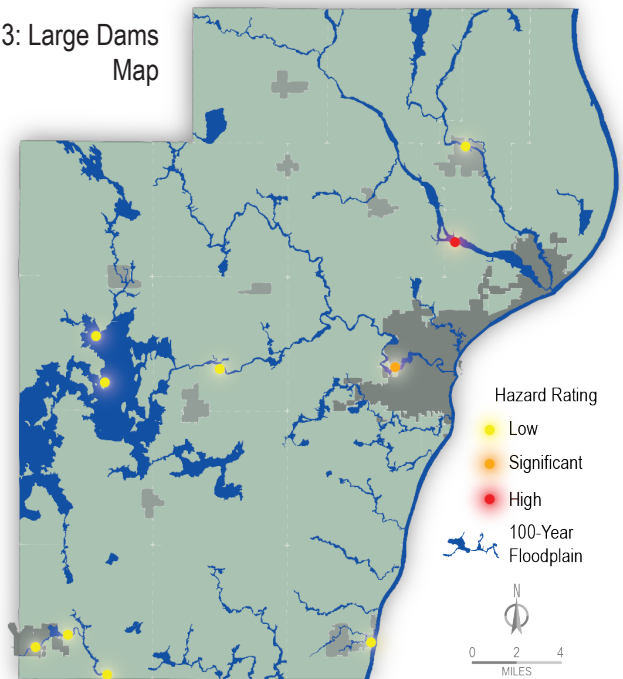
Flooding often occurs in urban areas due to stormwater management issues. Stormwater drainage systems have been designed to manage most storms. However, occasionally larger storms that occur in a short time period, such as flash floods, are of such intensity that the drains cannot handle all the stormwater and flooding occurs. Such intense storms are generally beyond the capacity of any drain, and it would not be economically feasible to design drains to cater for these very large, but infrequent storms. Localized stormwater flooding can also occur if drains in the area are blocked. It is important to keep the drainage system clear of litter and debris to avoid blocked drains. This is also necessary to protect and improve the health of waterways.

Today, new developments and redevelopments incorporate stormwater management measures such as stormwater detention and retention basins that provide greater flood protection. Detention basins slow the flow of stormwater being carried in the drainage system by storing it for a time, while retention basins (i.e. ponds) hold water during most of the year. Detention basins often double as parks and playing fields.

Map 3.2: 100-Year Floodplain Map



Map 3.3: Large Dams Map



Dam Failure Flooding

Flooding can also result from dam failure. A “dam” is an artificial barrier, together with its appurtenant works, constructed in or across a waterway for the primary purpose of impounding or diverting water. Dam failure can occur for a number of reasons, including overtopping caused by floods that exceed the capacity of the dam, deliberate acts of sabotage, structural failure of materials used in dam construction, movement and/or failure of the foundation supporting the dam, settlement and cracking of concrete or embankment dams, piping and internal erosion of soil in embankment dams, or inadequate maintenance and upkeep. In extreme cases, dam failure can occur with little warning and can result in the loss of life and significant property damage in areas downstream of the dam.

As identified by the WDNR, there are a total of 24 dams in Manitowoc County. Of these, nine are classified as large dams. A large dam has a structural height of over 6 feet and impounding 50 acre-feet or more, or having a structural height of 25 feet or more and impounding more than 15 acre-feet is classified as a large dam. The rest of the dams located in the county are regarded as small dams. Map 3.3 displays the large dams in the county. The areas of greatest risk from dam failure are those areas within the hydraulic shadow of dam of these two high and significant risk dams. The hydraulic shadow of the dam is the area of land downstream from a dam that would be inundated by water upon failure of the dam during the regional flood (100-year flood).

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Manitowoc County has experienced 15 significant flooding events (including flash floods, and dam failure flooding) over the last 18 years from January 1, 2000 to October 1, 2018. Some of these reported occurrences may not have been specific to Manitowoc County, and may have been recorded for a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Manitowoc County experiences approximately one significant flooding event every year.

Probability of Hazard Occurring in the Future

FEMA uses the “base” flood as the basis for its regulatory requirements and flood insurance ratings. The hazards mitigation plan also uses the base flood for planning purposes. The base flood is the one percent chance flood, or the flood that has a one percent (one out of 100) chance of occurring in any given year. The one percent chance flood is commonly referred to as the “100-year flood.” Based on the hazard frequency, Manitowoc County is considered to have a medium probability of sustaining a 100-year flood in any given year.

Areas at Greatest Risk

The areas at greatest risk from flooding include the “100-year floodplain” areas of Manitowoc County. FEMA Flood Insurance Rate Maps also call this the Special Flood Hazard Area, or “A Zone.” The base floodplains for the planning area are shown in Map 3.2. Properties that potentially lie within the floodplain and would be affected by the 100-year flood are shown in Map 3.4.

Impacts from Hazard

Death and Injury

No death or injuries from flooding has been reported for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018, according to NCDC data.

Structures at Risk

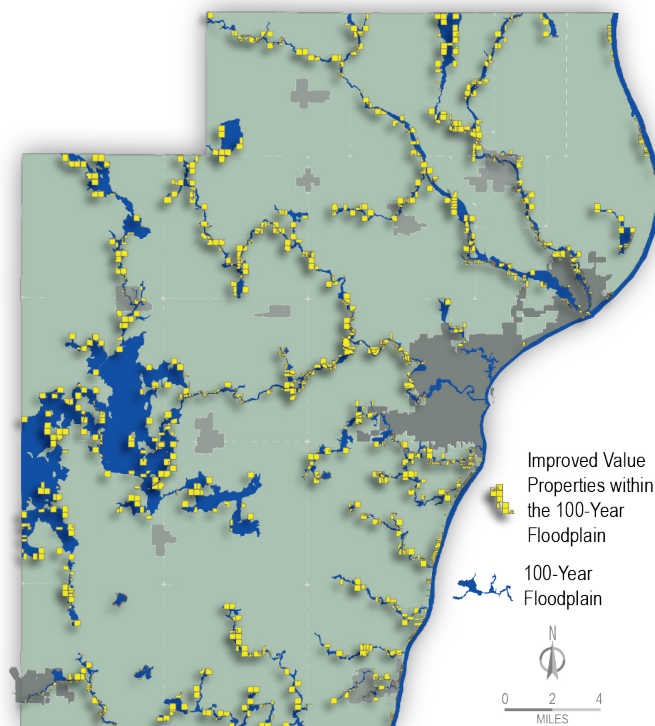
Analysis of the data used to produce Map 3.2 indicates that 2,788 buildings could potentially be impacted by the base flood in the planning area.

A review of FEMA flood loss statistics from January 1, 1978 through September 30, 2018, indicates that there were six paid claims in Manitowoc County in the amount of \$37,766.97 (FEMA National Flood Insurance Program, W2RC1040).

Repetitive Loss Properties

Repetitive loss structure describes a structure, covered by a contract of flood insurance under the NFIP, that has suffered flood damage on two or more occasions over a 10-year period ending on the date when a second claim is made, in which the cost to repair the flood damage, on average, equals or exceeds 25 percent of the market-value of the structure at the time of each flood loss event. For the Community Rating System (CRS) of the NFIP, a repetitive loss property is any property, which the NFIP has paid two or more flood claims of \$1,000 or more in any, given 10-year period since 1978. A repetitive loss structure is important to the NFIP, since structures that flood frequently put a strain on the flood insurance fund. According to FEMA, there are no repetitive loss properties in Manitowoc County.

Map 3.4: Improved Properties within the 100-Year Floodplain Map



Critical Facilities

Analysis of the GIS data used to produce Map 3.3, indicates that there are 199 critical facilities located within 100-year floodplains in Manitowoc County. Table 3.6 lists the critical facility types of those facilities potentially within the 100-year floodplains.

Table 3.6: Critical Facilities within Floodplain Breakdown by Type

Type	# Of Critical Facilities
Administrative Building	1
Bridge	167
Communication Facility	1
Dam	9
Fire and Safety	14
Licensed Childcare Facility	0
Licensed Healthcare Facility	0
Manufactured Housing	0
Military Installation	0
Post-Disaster Recovery Site	1
Power Facility/Bulk Fuel Storage	0
School	0
Transportation Facility	0
Wastewater Treatment Facility	6
Water Supply	0
Total	199



Source: Bay-Lake Regional Planning Commission, 2019.

Critical Facilities

Table 3.7: Number of Critical Facilities by Municipality, Manitowoc County

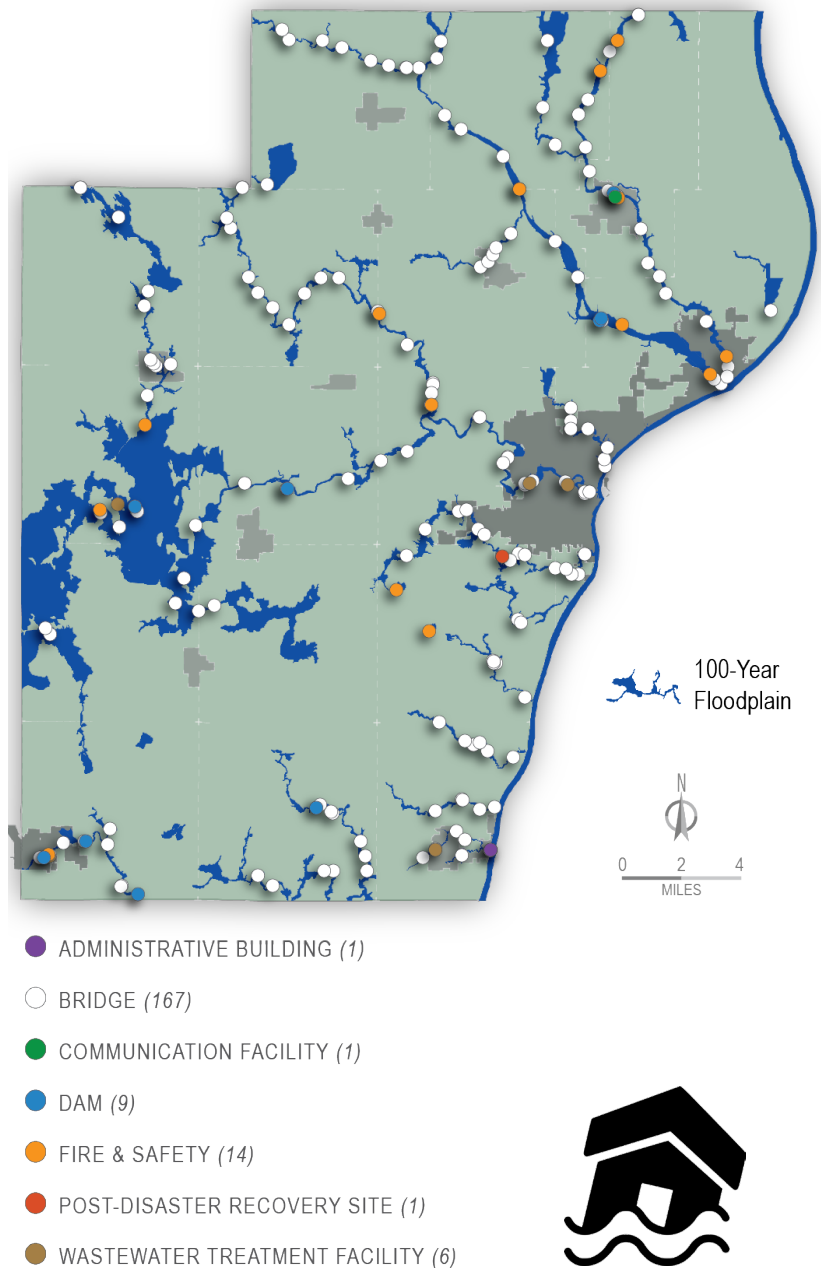
Municipality	# Of Critical Facilities
City of Kiel	6
City of Manitowoc	16
City of Two Rivers	7
Town of Cato	4
Town of Centerville	15
Town of Cooperstown	10
Town of Eaton	4
Town of Franklin	11
Town of Gibson	14
Town of Kossuth	9
Town of Liberty	2
Town of Manitowoc	7
Town of Manitowoc Rapids	16
Town of Maple Grove	5
Town of Meeme	11
Town of Mishicot	6
Town of Newton	14
Town of Rockland	9
Town of Schleswig	7
Town of Two Creeks	0
Town of Two Rivers	7
Village of Cleveland	7
Village of Francis Creek	2
Village of Kellnersville	0
Village of Maribel	0
Village of Mishicot	6
Village of Reedsville	4
Village of St. Nazianz	0
Village of Valders	0
Village of Whitelaw	0
Total	199

Source: Bay-Lake Regional Planning Commission, 2019.

Economic Impacts Property Damage

Reported significant public property and crop damage from flooding in Manitowoc County has totaled \$20,452,000 over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data. Most of the damage cost (\$20 million) was to crops on June 12, 2008 when torrential rain, including over five inches in Valders, caused the Manitowoc River to rise three feet in four hours.

Map 3.5: Critical Facilities within the 100-Year Floodplain Map



Value of Structures at Risk

The value of all at-risk structures is estimated at \$394.6 million. This information was obtained from Manitowoc County database on improved values of real property. The parcel map and the 100-year floodplains were merged to determine at-risk structures in the planning area.



Transportation Route Interruptions

Loss of road access is a major flood impact that affects all residents and businesses, not just those who own property in the floodplain. Sometimes, the loss is temporary, such as during a flood. However, on some occasions, the loss of transportation lasts well after the disaster. When roads, bridges, or railroads are washed out by a flood, it can be weeks or months before they are repaired and reusable. A key evacuation and safety concern is when roads and bridges go under water. Generally, the larger the road, the more likely it will not flood, but this is not always the case. Analysis of the GIS data used to produce Map 3.5, indicates that there are 167 bridges that could potentially be underwater during a base flood. In addition to the sites shown on the map, there may be a number of additional bridges in areas that are not included in the mapped 100-year flood zones, such as areas located along small tributary streams.

Estimate of Potential Dollar Losses

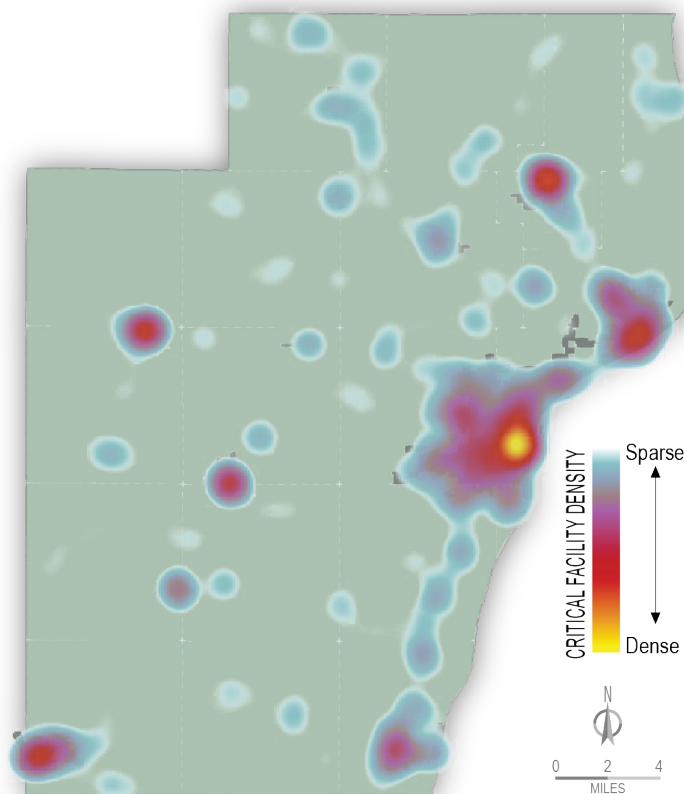
“Vulnerable structures” are those structures located in the 100-year flood hazard area identified in Map 3.5. Since there is no reliable building height data for buildings in these flood hazard areas, a “worst case scenario” of total structural damage for buildings in all of the flood zones of the planning area was assumed in estimating potential dollar losses to vulnerable structures. Building height/elevation data should be collected in the future in order to better assess the risks of damage to structures because of the flood hazard.

It is estimated that over \$394.6 million in losses would occur with the 100-year flood in zones projected to be impacted by the 100-year flood in a “worst case scenario” of total structural damage for all buildings in the county flood zones. This information was obtained from a Manitowoc County database on assessed values of real property. This only involves damage to structures themselves, and may not account for damage to personal property inside or adjacent to vulnerable structures. In addition, there may be areas outside the 100-year flood zones that will flood during an event of that magnitude (or even of lesser magnitude); this planning process has no way of knowing the susceptibility of flooding outside of flood events that have been previously mapped by other governmental agencies.

Development in Areas Subject to Flooding

Development in floodplains, watersheds, and natural resource areas are kept to a minimum through zoning. Manitowoc County has shoreland and floodplain zoning. This ordinance is a useful tool in keeping inappropriate development out of flood hazard zones in the county.

Map 3.6: Critical Facilities Heat Map



NFIP Participation

Manitowoc County has participated in the FEMA National Floodplain Insurance Program (NFIP) since September 1978 by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in the county.

Additionally, the following incorporated communities are also participating in the NFIP:

- City of Manitowoc since April 1977
- City of Two Rivers since April 1978
- City of Kiel since January 1985
- Village of Cleveland since May 1978
- Village of Francis Creek since August 2011
- Village of Kellnersville since August 2011
- Village of Mishicot since May 1972
- Village of Reedsville since September 1988

Not Participating in NFIP

The villages of Maribel, St. Nazianz, Valders and Whitelaw are not participating in NFIP. Since there are no special flood hazard areas (SFHAs) within their municipal boundaries, these communities were not provided a floodplain map, and have not been asked to participate in the NFIP

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Manitowoc County has experienced three significant extreme cold events over the last 13 years from January 1, 2000 to October 1, 2018.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Manitowoc County has experienced 6 significant extreme cold events in the last 18 years.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Manitowoc County is considered to have a low probability of experiencing an extreme cold event in any given year.

Areas at Greatest Risk

Extreme cold events have no defined hazard area within the planning area. Past events have been relatively uniform across the planning area.

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from significant extreme cold events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data.

Structures at Risk

Extreme cold conditions can result in burst water pipes. In addition, it is more expensive to heat homes and other buildings during extreme cold events. Sometimes, residents of the planning area might consider use of space heaters during an extreme cold event. However, use of space heaters comes with its own risks, including a higher probability of fire to a structure if used improperly.

Public domain water pipes can burst in extreme cold conditions, which can also ruin the street above the water pipes. In addition, damage to fiber optic cables can occur during extreme cold episodes, which can negatively affect commerce and hospitals in the planning area.

Critical Facilities

All buildings involving critical facilities will have greater heating expenses during an extreme cold event. Increased demand will also affect electric and natural gas utilities. Hospitals and clinics may be asked to treat patients exposed to the extreme cold conditions. Emergency shelters may take in additional individuals during the extreme cold event. Area schools may cancel classes or call for early dismissal in extreme cold events. Water utilities may need to repair damaged water mains caused by the extreme cold. Local fire departments and rescue services may also deal with direct or indirect consequences of the extreme cold event.

Economic Impacts

Economic impacts of extreme cold events can include lack of motivation to participate in the local economy unless absolutely necessary during the event. Utility bills following the event will be higher, which will give the consumer less ability to purchase discretionary goods about a month after the event (unless that consumer is on a monthly even payment plan with the local utility). If area school districts need to call off school early on extremely cold days, there may be expenses involved with early busing and with paying staff for a full day while only having the benefit of a partial day of instruction. Non-profit organizations will incur expenses in the provision of emergency shelters. The private sector incurs economic losses and production decreases during an extreme cold event.

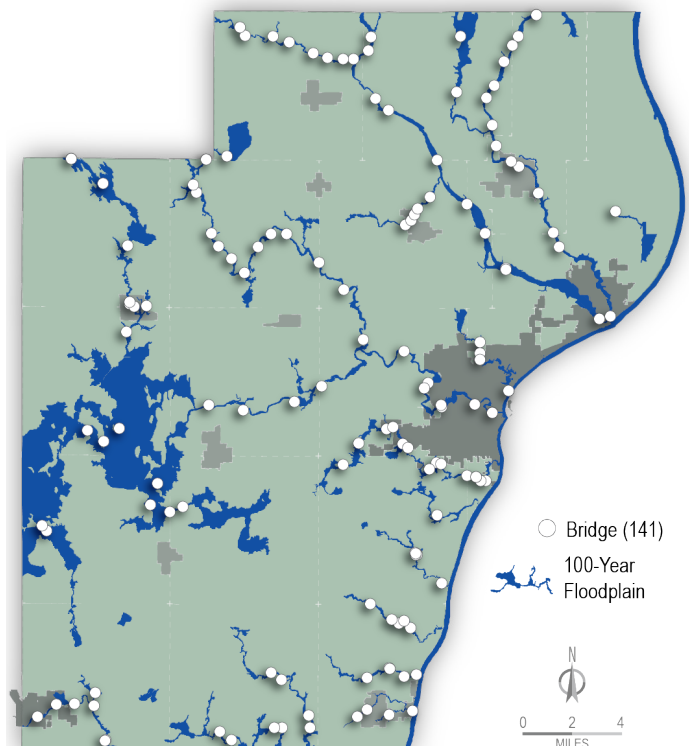
Property Damage

No significant public property damages have been reported from extreme cold events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for extreme cold events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from extreme cold has been minimal over the past 18 years.

Map 3.7: Bridges within the Floodplain Map





Extreme Cold

Description of Hazard

Dangerously cold conditions can be the result of extremely cold temperatures, or the combination of cold temperatures and high winds. The combination of cold temperatures and wind creates a perceived temperature known as “wind chill.” Whenever temperatures drop well below normal and as wind speed increases, heat can leave your body more rapidly. As winds increase, heat is carried away from the body at a faster rate, driving down both the skin temperature and eventually the internal body temperature. This weather related condition may lead to serious health problems. Extreme cold is a dangerous situation that can cause health emergencies for susceptible people, such as those without shelter, those who are stranded outdoors or in a disabled car, or those who live in a home that is poorly insulated or without heat.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Manitowoc County has experienced three significant extreme cold events over the last 13 years from January 1, 2000 to January 31, 2013.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Manitowoc County experiences approximately one significant extreme cold event every five years.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Manitowoc County is considered to have a low probability of experiencing an extreme cold event in any given year.

Areas at Greatest Risk

Extreme cold events have no defined hazard area within the planning area. Past events have been relatively uniform across the planning area.

Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from significant extreme cold events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data.

Structures at Risk

Extreme cold conditions can result in burst water pipes. In addition, it is more expensive to heat homes and other buildings during extreme cold events. Sometimes, residents of the planning area might consider use of space heaters during an extreme cold event. However, use of space heaters comes with its own risks, including a higher probability of fire to a structure if used improperly. Public domain water pipes can burst in extreme cold conditions, which can also ruin the street above the water pipes. In addition, damage to fiber optic cables can occur during extreme cold episodes, which can negatively affect commerce and hospitals in the planning area.

Critical Facilities

All buildings involving critical facilities will have greater heating expenses during an extreme cold event. Increased demand will also affect electric and natural gas utilities. Hospitals and clinics may be asked to treat patients exposed to the extreme cold conditions. Emergency shelters may take in additional individuals during the extreme cold event. Area schools may cancel classes or call for early dismissal in extreme cold events. Water utilities may need to repair damaged water mains caused by the extreme cold. Local fire departments and rescue services may also deal with direct or indirect consequences of the extreme cold event.

Economic Impacts

Economic impacts of extreme cold events can include lack of motivation to participate in the local economy unless absolutely necessary during the event. Utility bills following the event will be higher, which will give the consumer less ability to purchase discretionary goods about a month after the event (unless that consumer is on a monthly even payment plan with the local utility). If area school districts need to call off school early on extremely cold days, there may be expenses involved with early busing and with paying staff for a full day while only having the benefit of a partial day of instruction. Non-profit organizations will incur expenses in the provision of emergency shelters. The private sector incurs economic losses and production decreases during an extreme cold event.

Property Damage

No significant public property damages have been reported from extreme cold events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for extreme cold events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from extreme cold has been minimal over the past 18 years.



Extreme Heat Description of Hazard

Extreme heat (often referred to as a heat wave) is primarily a public health concern. During extended periods of very high temperatures or high temperatures with high humidity, individuals can suffer from several ailments, including heat exhaustion and heat stroke. Heat stroke is a particularly life-threatening condition that requires immediate medical attention. In addition to posing a public health hazard, periods of excessive heat usually result in high electrical consumption, which can cause power outages and brown outs. A by-product of this hazard in Manitowoc County often involves periods of high heat with loss of power. The elderly, disabled, and other vulnerable populations are especially susceptible to extreme heat.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Manitowoc County has experienced 4 significant extreme heat events over the last 18 years from January 1, 2000 to October 1, 2018.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Manitowoc County experiences approximately one significant extreme cold event every five years.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Manitowoc County is considered to have a *low* probability of experiencing an extreme heat event in any given year.



Areas at Greatest Risk

Extreme heat events have no defined hazard area within the planning area. Past events have been relatively uniform across the planning area.

Impacts from Hazard

Death and Injury

One death (of an elderly lady), and no injuries, has been reported from significant extreme heat events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data.

Structures at Risk

While there are no direct impacts on buildings, periods of excessive heat can impact the ability of buildings to be comfortable and safe for human habitation. Periods of excessive heat usually result in high electrical consumption for air conditioning, which can cause power outages and brown outs. There are few impacts of extreme heat on publicly owned infrastructure. One impact that extreme heat can have on publicly owned infrastructure involves the buckling of certain streets and highways, which need to be repaired immediately.

Critical Facilities

Utilities may see peak demand for electricity during extreme heat episodes. There have been fears that an extreme heat episode could cause the power grid to collapse. Hospitals and clinics will like experience an increased demand due to heat related illnesses during an extreme heat episode. In some cases, rescue services will experience an increased demand due to these same heat related illnesses. If school is in session during the extreme heat episode, area school districts may dismiss classes early in the day, at least in older schools without air conditioning. Emergency shelters will experience higher demand during the extreme heat episode, with some emergency shelters being set up specifically in response to the episode. Finally, there is likely to be increased water demand during the episode, both for human consumption as well as for lawn watering in the event that the extreme heat episode includes a drought.

Economic Impacts

Economic impacts of an extreme heat episode which can affect private businesses and consumers include higher electrical consumption and increased demands for medical treatment. Local governments may need to incur expenses when repairing streets and highways in the planning area that have been damaged due to buckling. If area school districts need to call off school early on extreme heat days, there may be expenses involved with early busing and with paying staff for a full day while only having the benefit of a partial day of instruction. Non-profit organizations will incur expenses in the provision of emergency shelters. Water utilities will incur the expenses involved with additional demand for water during extreme heat episodes, and these expenses will be passed on to area consumers.

(Cont'd Extreme Heat Economic Impacts)**Property Damage**

No significant public property damages have been reported from extreme heat events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for extreme heat events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from extreme heat has been minimal over the past 18 years.

Lightning**Description of Hazard**

Lightning, which occurs during all thunderstorms, can strike anywhere. Generated by the buildup of charged ions in a thundercloud, the discharge of a lightning bolt interacts with the best conducting object or surface on the ground. The air in the channel of a lightning strike reaches temperatures higher than 50,000 degrees Fahrenheit. The rapid heating and cooling of the air near the channel causes a shock wave which produces thunder. Lightning primarily occurs when warm air is mixed with colder air masses resulting in atmospheric disturbances necessary for polarizing the atmosphere. However, it can also occur during dust storms, forest fires, tornadoes, volcanic eruptions, and even in the cold of winter, where the lightning is known as thundersnow.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Manitowoc County has experienced 3 significant lightning events over the last 18 years from January 1, 2000 to October 1, 2018.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Manitowoc County experiences approximately one significant lightning event every five years.

Probability of Hazard Occurring in the Future

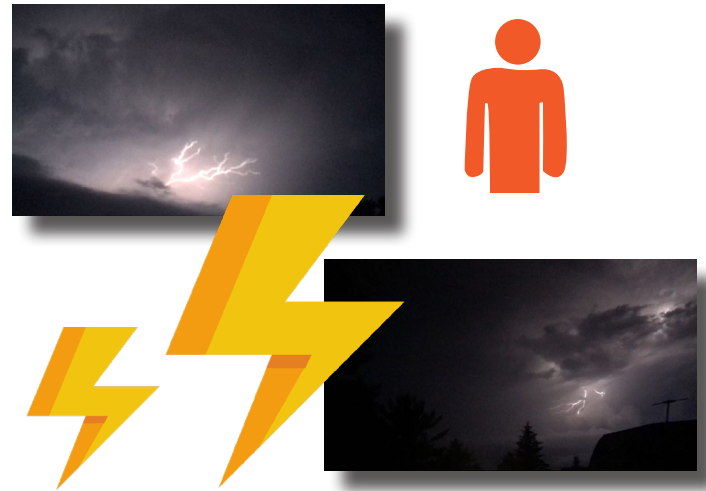
Based on the hazard frequency, Manitowoc County is considered to have a low probability of experiencing a lightning storm and/or thunderstorm event in any given year.

Areas at Greatest Risk

Based on review of the historic patterns of lightning event occurrences, there are no specific areas that are a higher than average risk. The events are relatively uniform throughout Manitowoc County.

Structures at Risk

Lightning can cause direct damage to structures, especially those without lightning protection systems.



Buildings or tall structures hit by lightning may be damaged as the lightning seeks unintended paths to ground. By safely conducting a lightning strike to ground, a lightning protection system can greatly reduce the probability of severe property damage. Lightning strikes can result in fires that damage structures, property, and land.

Critical Facilities

Hospitals can see increases in patient load with sufficiently severe lightning events. Schools can sustain damage, and if they do not sustain damage. Police and fire departments often see an increased workload during and after lightning events. Emergency operations can be disrupted as lightning events affect radio and cellular communications, as antennas are a prime target for lightning.

Economic Impacts

Nationwide, lightning causes \$4 to 5 billion in losses each year (Source: Kithil, R., 21st Century Lightning Safety for Facilities & Structures, 2002) and about \$2 billion annually in airline operating costs and passenger delays (Source: Northeast States Emergency Consortium, Wakefield, Mass., 2002).

Property Damage

Reported property damage from significant lightning for Manitowoc County has totaled approximately \$3,010 over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for lightning events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from extreme heat has been minimal over the past 18 years.

Drought

Description of Hazard

A drought is an extended period of unusually dry weather, which may be accompanied by extreme heat. There are basically two types of drought in Wisconsin: agricultural drought and hydrologic drought. Agricultural drought is a dry period of sufficient length and intensity that markedly reduces crop yields. Hydrologic drought is a dry period of sufficient length and intensity to affect lake and stream levels as well as the height of the groundwater table. These two types of drought may, but do not necessarily, occur at the same time. The severity of a drought depends on a number of factors including duration, intensity, geographic extent, and regional water supply demands by humans and vegetation.

In general, droughts have the greatest impact on agriculture. Small droughts of limited duration can significantly reduce crop growth and yields. More substantial drought events can decimate croplands and can result in a total loss. Droughts can also greatly increase the risk of forest fires and wildfires because of extreme dryness. In addition, the loss of vegetation in the absence of sufficient water can result in flooding, even from average rainfall, following drought conditions.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Manitowoc County has experienced three significant drought events over the last 18 years from January 1, 2000 to October 1, 2018.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Manitowoc County experiences approximately one significant drought event every five years.

Probability of Hazards Occurring in the Future

The future incidence of drought is highly unpredictable, as its occurrence is based on weather patterns, making it difficult to determine probability with any accuracy. Droughts tend to be a regional phenomenon in that it affects much of eastern Wisconsin on nearly all of the occasions in which it affects Manitowoc County. However, based strictly on the hazard frequency, Manitowoc County is considered to have a low probability of experiencing a drought event in any given year.

Areas at Greatest Risk

Droughts have no defined hazard area within the planning area. Past events have been relatively uniform across the planning area. However, agricultural croplands are most vulnerable to losses from drought events. Manitowoc County contains 220,393 acres of agricultural lands (based on land use data shown in Table 2.2).



Impacts from Hazard

Death and Injury

No deaths or injuries have been reported from significant drought events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018, according to NCDC data.

Structures at Risk

There are no direct impacts to structures from a drought event. In terms of infrastructure, droughts have the most impact on municipal water supplies. Droughts will likely cause a shortage of water for human, industrial, and agricultural consumption, as wells and other water reserves may dry up. Also, water quality is often an issue before and after a drought event, which may place an additional burden on wastewater treatment facilities.

Critical Facilities

In drought conditions, water shortages may occur and affect the amount of water available for human consumption. Hospitals may be called upon to treat individuals suffering from dehydration as a result. Parks that provide recreational water facilities are likely to experience increased usage during times of drought as well.

Economic Impacts

Wisconsin is most susceptible to agricultural drought. Even small droughts of limited duration can significantly reduce crop growth and yields, which adversely affects farm income. Substantial drought events can lead to complete crop decimation, resulting in total loss. During severe drought periods farmers are often forced to seek financial assistance from the government to supplement lost income. No significant public property damages have been reported from drought events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018 according to NCDC data.

Estimate of Potential Dollar Losses

Agricultural croplands are most vulnerable to losses from drought events. A “worst case scenario” would involve the total destruction of all 219,368 acres of agricultural lands in the county (based on land use data shown in Table 2.2). The USDA conducts a Census of Agriculture every 5 years based on a sample of farms to estimate the market value of agricultural land and buildings. It can be estimated that if this “worst case scenario” were to occur, the total destruction of all agricultural land in Manitowoc County would cause a loss of \$769,832,749.

Dense Fog

Description of Hazard

Fog is a collection of liquid water droplets or ice crystals suspended in the air at or near the ground. While fog is a type of stratus cloud, the term "fog" is typically distinguished from the more generic term "cloud" in that fog is low-lying, and the moisture in the fog is often generated locally (such as from a nearby body of water, like a lake or stream, or from nearby moist ground or marshes). Fog is distinguished from mist because it has greater density and lower visibility than mist.

Fog is a hazard mainly because of reduced visibility. Airport delays, automobile accidents, ship wrecks, plane crashes, and many other problems are frequently caused by fog. The National Weather Service forecasts fog and issues dense fog advisories when visibility is decreased to less than one quarter of a mile. These advisories alert travelers to potentially dangerous conditions. Traveling in fog requires reduced speed and careful navigation. At night, traveling in fog is especially dangerous because darkness combines with fog to reduce visibility even more. In addition, light from automobile headlights and other navigational lights is scattered off the water droplets of the fog, limiting sight to only a short distance. In response to this problem, automobiles are often equipped with specially designed lights that illuminate a usually dry (and therefore clear) area just above the roadway surface.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), Manitowoc County has experienced two significant dense fog events over the last 18 years from January 1, 2000 to October 1, 2018.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, Manitowoc County experiences approximately one significant dense fog event every five years.

Probability of Hazard Occurring in the Future

Based on the hazard frequency, Manitowoc County is considered to have a low probability of experiencing a significant dense fog event in any given year.

Areas at Greatest Risk

Portions of the planning area along waterways, wetlands, and low lying areas can be at greater risk for fog under certain meteorological conditions. However, no portion of the planning area is free of the possibility of experiencing fog events. Fog events can often be a regional phenomenon in that they affect much of the eastern Wisconsin on many of the occasions in which they affect Manitowoc County, especially near Lake Michigan.

Structures at Risk

There are no direct impacts to buildings from a fog event. The main structures impacted are those associated with infrastructure during a fog event from vehicle accidents. This can result in rescue services helping injured drivers and passengers, clean-up of the affected portions of the street and highway network, and temporary rerouting of motorists after some incidents. In addition, motorists often must travel at slower speeds when fog is in the area, which adds travel time and can lead to vehicular congestion in cases where it would normally not occur. In fog events during the winter, icing can sometimes be a problem. Power lines and tree limbs can be coated with heavy ice in some winter fog events, resulting in disrupted power and telephone service. In addition, in fog events during the winter, even small accumulations of ice can be extremely dangerous to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces.

Critical Facilities

Law enforcement will be asked to respond to an increased number of accidents during many fog events. Hospitals and clinics may be asked to treat individuals injured in accidents that likely would have not occurred in the absence of the fog event. Rescue services may be called to respond to accidents that resulted from the fog event. The starting time for schools may be delayed by the fog event for the safety of students and all involved. Courtrooms may see increased adjudication of traffic law violations resulting from accidents occurring during the fog event. Municipal public works and county highway departments may need to perform emergency repairs to streets and highways in worst-case scenario accidents resulting from the fog event. Airports can experience flight delays and cancellations during certain fog events.

Economic Impacts

There are economic costs in the accidents caused by fog events. Vehicular accidents almost always involve property damage, and some vehicular accidents during fog events involve injuries and/or fatalities. All of these consequences to vehicular accidents have costs both to the individual involved and to society. Airline delays due to fog have economic impacts for travelers as well as for commerce. There are additional economic impacts if the fog event occurs in conjunction with the icing of power lines in cases where the power lines are damaged and residents lose power.

Property Damage

No significant public property damages have been reported from dense fog events for Manitowoc County over the last 18 years from January 1, 2000 to January 31, 2013 according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for dense fog events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property damages from fog have been minimal over the past 18 years.

Wildland Fires

Description of Hazard

A wildland fire is any instance of unplanned burning in brush, marshes, grasslands, or field lands. Typical causes of these fires are lightning, human carelessness, or arson. The county has large expanses of forested areas that could be susceptible to wildland fires. Wildland fires can occur at any time of the year and during any time of the day. The primary factors that can contribute to the start of a wildland fire are land use, vegetation, amount of combustible materials present, and weather conditions such as wind, low humidity, and lack of precipitation. Generally, fires are more likely when vegetation is dry from a winter with little snow or a spring and summer with sparse rainfall. As fires remain a possibility, fire stations in the county are prepared to respond in accordance with established response procedures, while local zoning setback controls and building codes provide additional mitigation measures.

Previous Significant Hazard Occurrences

There have been no significant wildland fires in Manitowoc County since 1995.

Hazard Frequency

No adequate records are available at this time in order to determine a hazard frequency.

Probability of Hazard Occurring in the Future

According to the U.S. Forest Service Wildland Fire Assessment System, Manitowoc County regularly falls within a low to moderate fire danger class. A low rating indicates that fuels do not ignite readily from small firebrands, while a moderate rating means that fires will likely start from most accidental causes. With the exception of lightning fires in some areas, the number of starts is generally low. Additionally, because Manitowoc County is not extensively forested and does not contain the hazards and risks necessary to warrant intensive or extensive fire protection, it is designated as a Cooperative Fire Protection Area. Therefore, there are no Wisconsin DNR ranger stations or suppression resources located in the county. Additionally, the Forestry Division of the Wisconsin DNR has determined that there are no "Communities-at-Risk" and no "Communities-of-Concern" within Manitowoc County. The likelihood that any wildland fire in Manitowoc County would be catastrophic is low as most susceptible areas lack enough acreage to allow for continuous burning. Invasive Species such as Phragmites should be monitored as the dry stalks can often cause fire to spread similar to other dry plants and debris burning.

Areas at Greatest Risk

Manitowoc County contains approximately 77,314 acres of woodlands (based on current land use). Of these, few contain timbers that are very susceptible to burning. Therefore, lands covered in grass fuels pose the highest risk for the planning area. Furthermore, grasslands that abut heavy residential development present an even greater danger, especially when residents practice unapproved outdoor burning of leaves, garbage, and other items which they wish to dispose of by incineration. Point Beach State Forest, the county's largest area of contiguous woodlands with more than 2,500 acres of forestlands, poses some risk for wildland fire.

Impacts from Hazard

Death and Injury

No data on deaths or injuries is available for significant wildland fire events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018.

Structures at Risk

Homes and other structures located within the Wildland Urban Interface (WUI) are at high risk to damage from wildland fires. The WUI refers to the zone of transition between forestland/wildland and human development. The wildland fire risk increases in the WUI because buildings are typically surrounded by fuel sources such as unmowed grass, unraked leaves, flammable vegetation, and dead branches. Structures constructed from materials that may melt or ignite when exposed to a fire present a high risk. In general, the potential for property damage from wildland fires increases as more development occurs on wooded lands.

Residential housing is typically the most dominant type of structure found within the WUI. Though many parts of a home can be affected by wildfire damage, the roof is the most exposed portion of the building and is more at risk from flying embers. Attics may also be affected by airborne embers that enter through open eaves and vents. Structures attached to homes, such as decks, garages, and fences, can also carry a fire into a home.



Photo by the Wisconsin DNR, 2016.

Critical Facilities

Police, fire, and emergency response personnel are greatly affected by wildland fires – suffering increased workloads during and after events. Hospitals can see increases in patient load resulting from burn related injuries and individuals suffering from the effects of smoke inhalation. Schools, if not affected by a fire, could potentially be used as temporary shelter for individuals that can not return to their homes. All critical facilities located in the path of a wildland fire can be affected structurally and functionally if evacuation is deemed necessary.

Economic Impacts

Fires can have an extensive impact on the economy of an affected area by causing thousands of dollars in damages to citizens through loss of private property. Major direct costs associated with wildland fires are incurred by the salvage and removal of downed timber and debris; restoration of the burned area; and reconstruction. Wildland fires can also have a significant impact on local agriculture. Fires will strip the land of vegetation as well as harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life.

Property Damage

No property damage data is available for wildland fire events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses is not needed for the wildland fire hazard as no specific vulnerable structures or geographic areas have been identified.



Coastal Hazards

Description of Hazard

In northeastern Wisconsin, coastal hazards can be described as natural hazards occurring along the shores of Lake Michigan. The coastal hazards of concern in Wisconsin include:

- Erosion of coastal bluffs, banks, beaches and near shore lake beds (including erosion from freezing and thawing of lake ice);
- Flooding from upland runoff, high lake levels and storm-induced surge (temporary water level changes); and
- Damage to shorelines and shoreline structures from storm waves and ice shoves and dams.

Previous Significant Hazard Occurrences

There is no record of significant coastal hazards for Manitowoc County and sources for past coastal hazard occurrences could not be found. However, Manitowoc County has experienced occurrences of ice shoves along Lake Michigan.

Hazard Frequency

There is no record of significant coastal hazards for Manitowoc County in order to develop a hazard frequency. It is important to note the fluctuating water levels and impact in 2018 and 2019. These levels should be monitored annually.

Probability of Hazard Occurring in the Future

According to the Resource Guide for Great Lakes Coastal Hazards in Wisconsin website (<http://coastal.lic.wisc.edu/urpl999.htm>), Manitowoc County is most at risk for coastal erosion. Overall, the probability of coastal hazards is medium for the planning area.

Areas at Greatest Risk

Portions of the county situated along Lake Michigan are at risk for coastal hazards.

Impacts from Hazard

Death and Injury

No data on deaths or injuries is available for significant coastal hazard events for Manitowoc County over the last 18 years from January 1, 2000 to October 1, 2018.

Structures at Risk

Homes and other structures located along Lake Michigan are at risk to damage from coastal hazards. This risk increases where structures are closer to the shoreline, especially over high bluffs. There are 213 improved privately-owned structures directly adjacent to Lake Michigan in Manitowoc County.

Critical Facilities

There are 18 critical facilities located along Lake Michigan at risk of damage from coastal hazards. Most of these facilities are intentionally located adjacent to Lake Michigan; however, there are three critical facilities that are not dependent on a location with proximity to the lake. Two of the critical facilities are administrative buildings in the City of Two Rivers, including a public works facility and a maintenance shop. The third is a childcare facility in the City of Manitowoc, the YMCA Child Development Center Daycare.

Economic Impacts

Coastal hazards can have an extensive impact on the economy of an affected area by causing thousands of dollars in damages to public property and structures, as well as private property and houses.

Property Damage

No significant public property damages have been reported from coastal hazard events for Manitowoc County over the last 13 years from January 1, 2000 to January 31, 2013 according to NCDC data.

Estimate of Potential Dollar Losses

A “worst case scenario” for potential dollar losses from coastal hazards in Manitowoc County would involve the total destruction of all private structures along Lake Michigan, which would cause a loss of \$46.4 in private damages. There are no assessed values available for public properties. This information was obtained from the Manitowoc County database on assessed values of real property (structures and land). This only involves damage to structures themselves, and may not account for damage to personal property inside or adjacent to vulnerable structures.

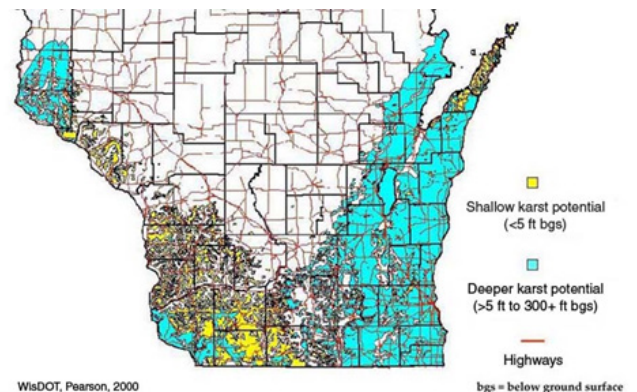
Land Subsidence

Description of Hazard

Land subsidence is an event in which a portion of the land surface collapses or settles. Subsidence or sinkholes in Wisconsin typically occurs in areas of karst terrain (dolomite and limestone bedrock areas). Subsidence in karst terrains occurs where dissolution of bedrock by groundwater flow causes the creation of voids (i.e. caves). The land above these underground voids often appears normal until a critical amount below has been washed away and the soil surface can no longer support the weight and collapses, causing subsidence at the surface (i.e. sinkholes).

Manitowoc County lies within the area of risk in Wisconsin that has been identified by the Wisconsin Geologic and Natural History Survey. This area is delineated as a V-shaped swath across Wisconsin that extends southeast from St. Croix County along the Mississippi River, across the bottom two tiers of counties, and northeast along Lake Michigan up to Marinette County (Figure 1).

Wisconsin subsidence occurrences are unlikely to be significant events. Sinkholes in Wisconsin are relatively small – they tend to be smaller than 10 feet across. The depth of sinkholes can be highly variable, although most are about as deep as they are wide.



Previous Significant Hazard Occurrences

There is no record of significant subsidence occurrences for Manitowoc County and sources for past subsidence occurrences could not be found.

Hazard Frequency

There is no record of significant subsidence occurrences for Manitowoc County in order to develop a hazard frequency.

Probability of Hazard Occurring in the Future

Although Manitowoc County is within the area of risk for subsidence in Wisconsin as identified by the Wisconsin Geologic and Natural History Survey (Figure 1), being in an area of deeper karst potential (instead of the shallow karst areas) with dolomite bedrock reduces the risk of subsidence in the county. Overall, the probability of a significant subsidence occurrence is low for the planning area.

Areas at Greatest Risk

The deeper karst potential is mostly uniform throughout Manitowoc County; therefore, the risk for subsidence is uniform throughout the county.

Impacts from Hazard

Death and Injury

No data on deaths or injuries is available for significant subsidence occurrences for Manitowoc County over the last 138 years from January 1, 2000 to October 1, 2018.

Structures at Risk

Although subsidence occurrences in other parts of the world can be large enough to swallow structures, in Wisconsin subsidence sinkholes are relatively small due to the differences in geology. In Wisconsin, the karst bedrock forms in dolomite. Dolomite is much less easily dissolved than the limestone that forms large subsidence occurrences in other areas. As a result, Wisconsin has fewer and smaller subsidence occurrences and there is minimal risk to structures.

However, the cracks and crevasses in karst act as direct conduits for pollutants to enter groundwater, wells, springs, and streams. Therefore, mindfulness of what is being spread or put on the ground in these areas is warranted to prevent groundwater contamination.

Critical Facilities

There are no critical facilities at a greater risk for damage from subsidence than any other structures in the county.

Economic Impacts

Subsidence can have an impact on the economy of an affected area by causing groundwater contamination that can be costly to treat and affect a large area of groundwater dependent businesses and residents.

Estimate of Potential Dollar Losses

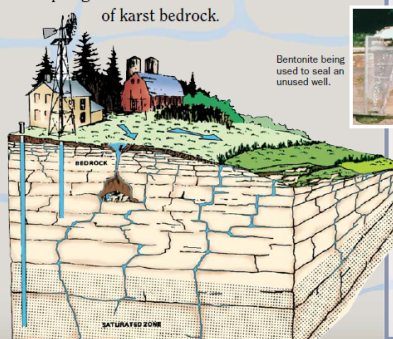
An estimate of potential dollar losses cannot be calculated for subsidence, since no vulnerable structures have been identified.

Information on Karst below:

Karst

What is it?

Karst refers to an area where bedrock such as limestone is easily dissolved by water. Karst regions are generally characterized by connecting cracks and layers between rocks that easily transport water and pollutants to the groundwater. Sinkholes, shallow soils, sinking streams and springs are found in areas of karst bedrock.



Bentonite being used to seal an unused well.

In karst areas, groundwater is threatened by:

Contaminated water from

- ✓ Barnyards and other areas where manure accumulates.
- ✓ Cropland where chemicals and manure are applied.
- ✓ Septic systems and household waste disposal.
- ✓ Roads and other paved areas.

This is a typical karst spring, but not all springs bubble out of karst areas. Many springs in Wisconsin flow out of deep gravel and sand deposited by the glaciers.

The fractures in the bedrock under shallow soil can be seen during a drought. The alfalfa was able to send deep roots down into the moist soil that had accumulated through the cracks.

Sinkholes like the one above are often used to dispose of unwanted junk. Sometimes this junk can contaminate a well miles away.

Caves such as this one can be an important home for bats and hibernating animals.

Groundwater

If you dig a hole and water begins to seep in, you have hit groundwater. It is simply the area beneath the land's surface where all the spaces between soil particles, or in rocks, are filled with water.

Deep soils help filter out sediment and pollutants as water from rain and melting snow percolates downward. Shallow soils are not as effective and, in karst areas, surface water may flow into the groundwater with little or no soil filtration.

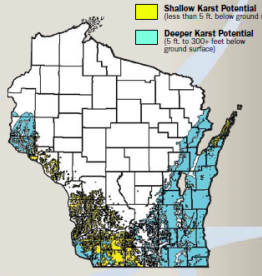



Karst:

Why be concerned?

Where soils are shallow, karst conditions make it easier for groundwater to be contaminated with bacteria, nitrate and pesticides.

Even wells that are hundreds of feet deep can be contaminated.



Shallow Karst Potential
(less than 5 ft. below ground surface)

Deeper Karst Potential
(5 ft. to 300+ feet below ground surface)

Take action to prevent groundwater contamination in karst areas

In the community

- Use care when planning and constructing roads and ditches to avoid runoff draining into cracks in the bedrock.
- Provide "clean sweep" programs to properly dispose of home, business and farm chemicals.
- Consider geology and groundwater in land use planning.

On the farm

- Grow a grass buffer 10-200 feet wide, depending on site conditions, around sinkholes and crevices.
- Do not apply manure, fertilizers, pesticides or other agricultural chemicals near sinkholes.
- Any manure applied near sinkholes should be incorporated into the soil as soon as possible. See your NRCS or LCD office for site-specific guidelines.
- Divert water away from sinkholes and crevices.
- Do not dispose of chemical containers, dead animals, or anything else in sinkholes.

Around the home

- Properly seal unused wells.
- Test wells annually for nitrate and bacteria.
- Pump your septic system at least every three years.

The water along this ditch disappears into a sinkhole, carrying with it oils, lead, salt and other chemicals from roadways.

A sinkhole without a protective berm before and during flooding. A berm would have prevented runoff containing fertilizers and pesticides from draining into the sinkhole.

Help is available

For more information about bedrock concerns, drinking water or cost-share programs, contact:

County Land and Water Conservation Departments
Public Health Departments
University of Wisconsin - Extension
USDA Natural Resources Conservation Department
Wis. Dept. of Natural Resources Service Centers
Wis. Geological and Natural History Survey
Wis. Dept. of Agriculture, Trade and Consumer Protection

Or web sites:
cleanwater.uwex.edu/rockriver/groundwater
www.uwex.edu/wgns/karst.htm

What can be done?

Once contaminants enter the groundwater, little can be done to remove them. The best, easiest and cheapest thing to do is to prevent contamination in the first place.

Specific suggestions can be found on the other side of this brochure.

Chapter 4 - Mitigation Strategy

Introduction

As defined by the Disaster Mitigation Act of 2000, mitigation is a "sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects." Mitigation planning is the systematic process of learning about the hazards that can affect the planning area, setting clear goals, identifying appropriate actions, and following through with an effective mitigation strategy. Mitigation encourages long-term reduction of hazard vulnerability and can reduce the enormous cost of disasters to the government and property owners. Mitigation can also protect critical community facilities and infrastructure; reduce exposure to liability; and minimize community disruption.

The mitigation strategy outlines the general goals to be achieved through the implementation of the Manitowoc County, Wisconsin Hazard Mitigation Plan. From the identified hazard mitigation goals, a mitigation strategy was developed to identify specific projects and activities that could help achieve the County's hazard mitigation goals to make them safer and better prepared for disasters.

This chapter includes a discussion of the mitigation efforts that are currently underway, the County's plan to implement the mitigation actions, an assessment of the County's pre- and post-disaster hazard management policies, programs, and capability to mitigate hazards, and an evaluation of the current and potential sources of federal, state, or private funding to implement mitigation activities.



Mitigation Goals

The following mitigation goals are intended to be used by public officials and emergency management personnel as general guidelines to mitigate natural hazards in Manitowoc County. These goals are broad in order to apply to all of the hazards addressed in the plan.

Goal #1: Implement policies and programs that are designed to reduce or eliminate the impacts of hazards on people and property.

Goal #2: Collect and utilize data needed to improve policy making and the identification of appropriate mitigation projects.

Goal #3: Build and support local capacity and commitment to continuously lessen the impacts of hazards on people and property.

Goal #4: Promote enforcement measures to reduce the impacts of hazards on people and property.

Goal #5: Promote the use of natural resource protection measures as a means to reduce the impacts of hazards on people and property.

Goal #6: Obtain and maximize additional resources that are necessary to reduce the impact of hazards on people and property.

Goal #7: Enhance training, education and outreach efforts that describe potential effects of hazards and ways to reduce their impact.

Goal #8: Promote intergovernmental coordination and cooperation in planning for and implementing hazard mitigation strategies.

Mitigation Action Plan

Mitigation actions form the core of the mitigation plan. Table 4.1 lists the mitigation action plan developed for Manitowoc County. The table lists the hazard type, associated mitigation actions, the estimated costs of each project (where known), responsible agencies, the project timetable, and potential funding sources available for each mitigation action identified. The identified actions and projects address reducing the effects of hazards on the population, services, and existing and new buildings and infrastructure.

The County Emergency Management Department will track the implementation of mitigation actions over time. Information on completed or revised actions will be documented in future five-year updates of the County hazard mitigation plan.

Prioritization Process

In developing this mitigation strategy, members of the plan steering committee considered, from their perspective, the various proposed action items and came to consensus on how each would be ranked, "high," "medium" or "low," based on need, funding, cost-benefit, and anticipated political support.

Cost-Benefit Review

In developing this mitigation strategy, members of the plan steering committee considered, from their perspective, the costs and benefits of the various proposed action items. The cost-benefit review was a factor of the prioritization process. Full-blown cost-benefit calculations were not prepared for each action item included in the plan. The cost effectiveness of each action item will be addressed and completed through the project development process.

Completed Mitigation Actions

Since the preparation of the 2009 hazard mitigation plan for Manitowoc County, some of mitigation actions identified in the action plan have been completed. The following lists those actions that have been completed in Manitowoc County.

- Mutual Aid Agreements have been established for communications systems.
- Building footprints have been collected for all structures in the City of Manitowoc (plus three miles) to allow for analysis of facility/structure locations.
- LIDAR data was acquired and should be updated in 2023
- Code Red was replaced with RAVE
- Building footprints were collected in 2015 from LIDAR for buildings in the towns.
- Weather radios removed
- Individual sirens are tested and repaired manually
- Added capability for the Dispatch Center to accept text messages
- Updated 20-Year County Comprehensive Plan



Table 4.1 Manitowoc County Hazard Mitigation Action Plan 2020-2025

All Hazards					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Update air photos and LIDAR data	High	2023	Covered by existing budgets	Land Information Officer	Change Acquire to update. Cost covered by existing budgets.
Outage management software to help triage outage repairs	High	2020-2025	Costs to be determined	Manitowoc, Two Rivers, and Kiel public utilities	
Maintain RAVE (i.e. Reverse 911) capability	High	Ongoing	\$20,000/year	Joint Dispatch Center	
Work with County, State, and Federal agencies to maintain a consistent critical facility database	High	Ongoing	Costs to be determined	Manitowoc County Hazard Mitigation Plan Steering Committee	
Promote use of NOAA weather radios which continually broadcast National Weather Service forecasts, warnings, and other crucial weather information as well as warnings regarding natural, man-made, or technological hazards	High	Ongoing	No cost; radios are purchased and sold at cost	County Emergency Services and American Red Cross	Still promote, but no longer have them for sale at the County Emergency Services
Develop a central data collection process to report hazard incidences and resulting deaths, injuries, and property or crop damages	Medium	2020-2025	Covered by existing budgets	County Emergency Management	
Develop comprehensive safety plan for all municipal-owned buildings	Medium	2020-2025	Covered by existing budgets	Local jurisdictions	
Encourage residents to prepare themselves by stocking up with necessary items and planning for how family members should respond if any emergency or disaster events strike	Medium	Ongoing	Covered by existing budgets	County Emergency Services, American Red Cross, and County Health Department	
Collect remaining building footprints for all structures in the villages and cities to allow for analysis of where facilities/structures are located	Low	2020-2025	Costs to be determined	County Planning and Park Commission	Complete collection by focusing on villages and cities
Collect building height data for all structures in the County	Low	2020-2025	Costs to be determined	County Planning and Park Commission	
Use of early warning system through pagers and NOAA weather radios	Medium	As needed	Covered by existing budgets	County Emergency Services, Joint Dispatch Center, fire depts, EMS, and law enforcement	



Table 4.1 Manitowoc County Hazard Mitigation Action Plan 2020-2025

Tornado and Strong Wind					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Continued investment and use of early warning system through pagers, NOAA weather radios, sirens, social media, and Code Red	Medium	Ongoing	Covered by existing budgets	County Emergency Services, Joint Dispatch Center, local fire depts and EMTs, and County Sheriff's Dept	
Assist personnel in schools and businesses, public facility managers, mobile home park managers, and citizens in determining "best available" tornado safety areas or need to construct safe rooms	Medium	As needed	Covered by existing budgets	County Emergency Services and American Red Cross	A plan is in place for the fairgrounds as of 2011
Review and update Comprehensive Safety Plan for all county-owned buildings	Medium	Annually	Covered by existing budgets	County Emergency Services	Last updated in 2019-2020
Consider adoption of ordinances requiring construction of safe shelters for mobile home parks, fairgrounds, or other vulnerable public places	Low	2020-2025	Covered by existing budgets	County Planning and Park Commission and local zoning officials	

Winter Storm					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Ensure that plow and sanding equipment is operational and available	High	Ongoing	Covered by existing budgets	County Highway Dept and local public works departments	
Utilization of the media to disseminate emergency information	High	As needed	Covered by existing budgets	National Weather Service, Joint Dispatch Center, highway depts, and all participating jurisdictions	
Provide educational materials to the public regarding safety during winter storm events	Medium	Ongoing	Covered by existing budgets	County Emergency Services and State EM (readywisconsin.wi.gov)	

Hail					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Animal protection	High	Ongoing	Costs to be determined	County UW-Extension and Farm Service Agency	
Provide information about hail crop insurance	Medium	Ongoing	Covered by existing budgets	County UW-Extension and Farm Service Agency	

Table 4.1 Manitowoc County Hazard Mitigation Action Plan 2020-2025

Flooding					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Land use planning	Low	2018 - 2020	Covered by existing budgets	All participating jurisdictions with assistance (when feasible) from County Planning and Resources Department	Will update with Comprehensive Plan
Study effects of current and future development in the approximate floodplain and any other areas that have not yet been studied	High	As funding is available	Costs to be determined	County Planning and Park Commission and GIS	Updated, but still unstudied areas. Need LIDAR and 2' contours.
Maintain information regarding, and coordination of, congregate care facilities	High	Ongoing	Covered by existing budgets	County Emergency Services and American Red Cross	
Continue to issue early warnings through flood advisory bulletins	High	Ongoing	Covered by existing budgets	Wisconsin DNR and public works/engineering	
Stormwater retention/detention facilities	High	Ongoing	Costs to be determined based on specific project	Wisconsin DNR and public works/engineering	
Erosion control zoning	High	Ongoing	Covered by existing budgets	Wisconsin DNR	
Dissemination of instructions to the public through the media	High	As needed	Covered by existing budgets	National Weather Service, Joint Dispatch Center, and local jurisdictions	
Handle the evacuation of people and property in the case of a severe flood event	High	As needed	Covered by existing budgets	Local law enforcement, fire depts, County Emergency Services, County Highway Dept, County Aging Dept, and County Health Dept	
Review and update floodplain zoning ordinances as necessary	Medium	As needed	Covered by existing budgets	County Planning and Park Commission	Updated in 2010; approved by FEMA and WDNR
Sand-bagging when necessary	Medium	As needed	Covered by existing budgets	County Highway Dept, County Emergency Services, local public works depts	
Protection of new buildings and other structures through floodplain zoning	Medium	As needed	Costs to be determined based on specific project	County Planning and Park Commission	
Review and update evacuation procedures for persons located in affected area as needed	Low	Annually	Covered by existing budgets	County Emergency Services	
Issue or deny floodplain development/building permits	Medium	Ongoing	Covered by existing budgets	County Planning and Park Commission, and cities and villages	Addresses NFIP Compliance
Inspect all development to assure compliance with local ordinance	Medium	Ongoing	Covered by existing budgets	County Planning and Park Commission, and cities and villages	Addresses NFIP Compliance

Table 4.1 Manitowoc County Hazard Mitigation Action Plan 2020-2025

Flooding (cont'd)					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Maintain records of floodplain development	Medium	Ongoing	Covered by existing budgets	County Planning and Park Commission, and cities and villages	Addresses NFIP Compliance
Assist in the preparation and revision of floodplain maps	Medium	Ongoing	Covered by existing budgets	County Planning and Park Commission, and cities and villages	Addresses NFIP Compliance
Help residents obtain information on flood hazard, floodplain map data, flood insurance, and proper construction measures	Medium	Ongoing	Covered by existing budgets	County Planning and Park Commission, and cities and villages	Addresses NFIP Compliance

Extreme Cold					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Continue to provide safety information to the public during periods of extreme temperature	Medium	Ongoing	Covered by existing budgets	American Red Cross, County Emergency Services, and County Health Dept	
Organize outreach to vulnerable populations during periods of extreme temperature, including the establishment and promotion of accessible heating or cooling centers in the community	Medium	As needed	Covered by existing budgets	County Health Dept, American Red Cross, and local jurisdictions	

Extreme Heat					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Continue to provide safety information to the public during periods of extreme temperature	Medium	Ongoing	Covered by existing budgets	American Red Cross, County Emergency Services, and County Health Dept	
Organize outreach to vulnerable populations during periods of extreme temperature, including the establishment and promotion of accessible heating or cooling centers in the community	Medium	As needed	Covered by existing budgets	County Health Dept, American Red Cross, and local jurisdictions	

Lightning					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Continue to distribute awareness/educational materials to inform public of safety procedures to follow in a lightning storm	Medium	Ongoing	Covered by existing budgets	County Emergency Services and American Red Cross	
Provide information about protecting structures through use of fire resistant materials	Low	Ongoing	Costs to be determined based on project and jurisdiction	Local Building and Fire Inspectors	

Table 4.1 Manitowoc County Hazard Mitigation Action Plan 2020-2025

Drought					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Identification of areas with potential ground water level problems and inspection of shallow wells in those areas for adequate depth and construction	Low	2020-2025	Costs to be determined based on pending studies	WDNR, UW-Extension, County Land and Water Conservation Dept	
Development of water usage regulations during periods of drought by local communities	Low	As needed	Covered by existing budgets	All participating jurisdictions	
Encourage citizens to take water-saving measures during periods of drought where regulations are not in place	Low	As needed	Covered by existing budgets	All participating jurisdictions	

Dense Fog					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Dissemination of fog advisories	High	As needed	Covered by existing budgets	National Weather Service	
Upkeep existing signage in areas of high fog event incidence	Medium	As needed	Covered by existing budgets	County Traffic Safety Commission	

Wildland Fires					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Encourage citizens to install and maintain smoke detectors and fire extinguishers on each floor of their homes or other buildings	High	Ongoing	Covered by existing budgets	Local fire depts, all participating jurisdictions, and building inspectors	
Schedule regular training and exercise sessions for response personnel	High	Ongoing	Covered by existing budgets	All participating jurisdictions and WDNR	
Develop local ordinances to require burn permits and restriction of campfires and outdoor burning	Medium	2020-2025	Costs to be determined based on needs of jurisdiction	All participating jurisdictions and WDNR	
Coordinate public outreach efforts to promote such things as non-combustible roof covering, fire safe construction, safe burning, and the importance of clearing brush and grass away from buildings	Low	As needed	Covered by existing budgets	Local fire depts, and all participating jurisdictions	

Coastal Hazards					
Project	Priority	Project Timetable	Estimated Cost	Responsible Party	Notes
Continue to enforce greater setbacks for properties adjacent to Lake Michigan under the county shoreland zoning ordinance	Medium	As needed	Covered by existing budgets	County Planning Department	

Land Subsidence				
Project	Priority	Project Timetable	Estimated Cost	Responsible Party
Provide information to residents as needed	Low	Ongoing	Covered by existing budgets	Dependent on assistance needed

Table 4.2 Mitigation Strategies for Communities in Manitowoc County 2020-2025

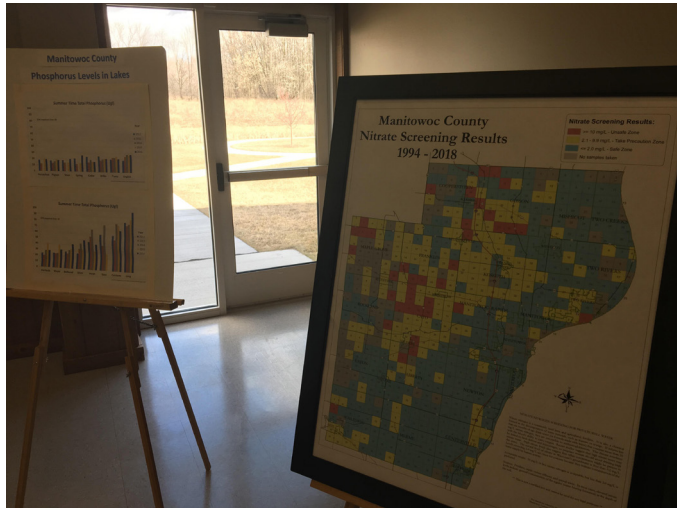
Hazard Type	Mitigation Measures	Costs of Project	Responsible Parties	Project Timetable	Priority
City of Manitowoc					
All Hazards	Acquire, promote and make available 10-year smoke detectors and 7-year CO detectors to in-need residents	\$10,000 initial startup, then \$3,000/year	Manitowoc City Fire Department	Ongoing	Medium
All Hazards	Standby power generation for drinking water facilities	\$3,000,000	Manitowoc Public Utilities	2023	Medium
Extreme Cold	Add protection against frazil ice and water intake freezing	\$2,500,000	Manitowoc Public Utilities	2023	Medium
City of Two Rivers					
All Hazards	Increase the number of warming shelters with working kitchens and sufficient restrooms and showers	\$46,771	City of Two Rivers and Two Rivers Water & Light	Completed	High
City of Kiel					
All Hazards	Severe weather education; promote planning by residents on how to respond, protect and endure emergency weather events	Covered by existing budgets	City of Kiel Emergency Management, Fire Department, and Police Department	Ongoing	High
Village of Cleveland					
All Hazards	Install motion sensors at wells No. 1 and 2 and the water tower	To be determined	Village of Cleveland Public Works	2020	Medium
Village of Francis Creek					
All Hazards	Utilize media for emergency information	Covered by existing budgets	Village President/Clerk	Ongoing	Low
Village of Kellnersville					
All Hazards	Expand and harden fire station to be used as emergency shelter/center	To be determined	Village of Kellnersville, Kellnersville Fire Department, and EMS Volunteer Responder	2020	High
Village of Maribel					
All Hazards	Promote the use of NOAA weather radios	\$1,000	Village of Maribel and Manitowoc County Emergency Management	Ongoing	High
Village of Mishicot					
Extreme Heat/ Cold	Organize outreach to vulnerable populations during periods of extreme temperature, including the establishment and promotion of accessible heating or cooling centers in the community	Covered by existing budgets	Village of Mishicot and Mishicot Police Department	As needed	Medium
Village of Reedsville					
Tornado and Strong Wind	Continue to hold tornado safety drills, with siren testing, and schools practicing tornado safety	Covered by existing budgets	County Emergency Management, Reedsville Fire and Police Departments, and First Responders	Annually in Spring	High
Village of St. Nazianz					
All Hazards	Install a second storm siren (received from closed Kewaunee Nuclear plant)	Covered by existing budgets	Village of St. Nazianz and St. Nazianz Fire Department	Completed	Medium
Village of Valders					
Flooding	Dredge creek along Eisenhower Street to remove debris	\$250,000	Valders Police Department	2020-2025	Medium
Flooding	Create stormwater runoff waterway along field north of Kennedy Street	\$50,000	Valders Police Department	2020-2025	Medium
Village of Whitelaw					
All Hazards	Continued investment in state of the art early warning system	\$3,000	Village of Whitelaw and Whitelaw Fire Department	2020-2025	Medium

Table 4.3 Manitowoc Public Utilities Mitigation Recommendations & Strategy

Action Description	Hazards/Threats	Preliminary Cost	Timeframe	Priority
Develop unified signage that orientation tools so that employees have clear navigation and direction before, during and after hazard/threats	All Hazards	\$2,000	2019-2024	Low
Purchase NOAA All-Hazard Radios to notify employees of emergency alerts and hazardous conditions	All Hazards	\$500	2019-2024	Low
Develop unified signage and materials promoting health and safety of employees; ensure seasonal hazards (such as influenza) are addressed	Emerging Infectious Diseases	\$2,000	2019-2024	Low
Participate in community, county, regional, and other exercises and training for all hazards and threats as available but at a minimum annually, including storm scenarios and threat exercises	All Hazards	To be determined	Ongoing	Medium
Engage outage management software to help triage outage repairs	All Hazards	\$200,000	2019-2021	Medium
Purchase and install standby power generation equipment for drinking water facilities (including plants), such as a blackstart generator	All Hazards	\$3,000,000	2019-2024	High
Study Feasibility	Winter Storm & Extreme Cold	\$25,000	2019-2024	Low
Purchase and install emergency steam production for heating jail (life safety for custodial care facility) and sheriff's office and city/county EOC	All Hazards	\$100,000	Ongoing	To be determined
Purchase and install emergency steam production for heating Lincoln High School	Winter Storm & Extreme Cold	\$100,000	2019-2024	Low
Study feasibility of boiler operation during limestone shortage	All Hazards	To be determined	2019-2024	Medium
Install backup power to entire main office building so that all equipment will be backed up by standby power to ensure network, phone system, business services, and engineering, and GM availability during an outage	All Hazards	\$300,000	2019-2024	High
Identify facilities or spaces in need of portable chiller connections, such as equipment and server rooms: purchase portable chiller units and install connections	Drought & Extreme Heat	To be determined	2019-2024	Medium
Purchase internal alternate communications equipment in the event phone lines and cell towers are down; train staff on operation and use	All Hazards	\$5,000	2019-2024	Low
Investigate protection against frazil ice and water intake freezing	Winter Storm & Extreme Cold	\$2,500,000	2019-2024	Medium
Bank stabilization for Collector well station	Coastal Erosion & Bluff Failure	\$250,000	2019-2024	Medium
Safe room (new construction or retrofit) for control room at power plant	All Hazards & Threats	\$300,000+	2019-2024	Medium
Install new backup targets to accommodate the additional data storage requirements for backing up all the essential programs	Cyber Incident; Severe Weather	\$50,000	2019-2024	High
Install lightning protection on MPU assets, including, stacks and other high points	Severe Weather	\$250,000	2019-2024	Medium
Study feasibility	Solar Flares	\$20,000	2019-2024	Low
Harden/protect sensitive electrical and communications equipment from the effects of solar storms and other geomagnetic interference	All Hazards	\$500,000	Ongoing	To be determined
Harden/Protect buildings from hazards and threats, to ensure operational capability and structural integrity during and after occurrences	All Hazards & Threats	\$300,000	2019-2024	Medium
Develop/maintain a hazard and risk data repository, which details all MPU assets including location and replacement cost for both asset and contents	All Hazards	\$5,000+	In-progress	Medium
Fireproof Main Office to protect files, paper archives, and data	Wildfire	\$40,000+	2019-2024	Low
Develop and exercise a business continuity plan for all departments and activities	All Hazards	\$50,000+	2019-2024	High

Table 4.3 Manitowoc Public Utilities Mitigation Recommendations & Strategy (Cont'd)

Action Description	Hazards/Threats	Preliminary Cost	Timeframe	Priority
Study feasibility for installation of standby generation equipment and procedures to ensure that its power plant and distribution system can function independently of the electrical grid and transmission network during severe storm, winter storm, and excessive heat hazards. This would ensure a power source remains available for electrical distribution, water plant, and district heating	Severe Storms, Winter Weather & Extreme Cold, and Drought & Extreme Heat	To be determined	2019-2024	High
Install standby generation	Severe Storms, Winter Weather & Extreme Cold, and Drought & Extreme Heat	\$10,000,000	2019-2024	High
Install security cameras at critical locations which do not have coverage following 2017 upgrades	All Hazards	To be determined	2019-2024	Low



Hazard Plan

Manitowoc County



Policies, Programs, and Resources for Mitigation

Manitowoc County has a number of authorities that enforce policies, execute programs, and provide resources that support the mitigation action plan for reducing potential losses identified in the risk assessment. These authorities have been identified under the responsible parties (where applicable) in the mitigation action plan (Table 4.1), and include the following;

- **Manitowoc County Planning and Park Commission**

Policies and programs include planning and zoning (including enforcement of county shoreland and floodplain management regulations).

- **Manitowoc County Emergency Services**

Policies and programs include coordinating effective disaster response and recovery efforts in the county through response, recovery, planning, training, and exercises, and mitigation.

- **Fire Departments and Emergency Medical Services**

Policies and programs include coordinating emergency preparedness, mitigation, response, and recovery efforts.

- **Law Enforcement**

Policies and programs include coordinating emergency preparedness, mitigation, response, and recovery efforts.

- **Manitowoc County Joint Dispatch Center**

Policies and programs include coordinating emergency response and recovery efforts with regard to communication between the public and police, fire, and EMS.

- **Manitowoc County Highway Department**

Policies and programs include road maintenance, stormwater management, and management of salt storage for winter storms.

- **Manitowoc County Health Department**

Policies and programs focus on protecting and promoting the health and safety of the people in the county in cooperation with community partners (includes assisting citizens with emergency preparedness).

- **Wisconsin Emergency Management**

Policies and programs include supporting effective disaster response and recovery efforts in support of local government through planning, training, and exercises.

- **Wisconsin Department of Natural Resources**

Relevant policies and programs include regulation enforcement of state shoreland and floodplain management rules, and wildland fire response and education.

- **Power Utilities (Manitowoc Public Utilities, Kiel Utilities, Two Rivers Water & Light, Wisconsin Public Service, WE Energies)**

Policies and programs include maintaining electrical power and transmission facilities.

- **American Red Cross**

Policies and programs include disaster relief and educational programs that promote health and safety.

- **National Weather Service (Green Bay Regional Office)**

Policies and programs include publicizing information, and providing outreach and education about hazardous weather.

These authorities have the ability to expand or modify their programs when needed to improve existing tools to address mitigation. Manitowoc County has taxing authority through property taxes to raise funds for the purpose hazard mitigation. Additional funding sources for hazard mitigation actions are available from a number of federal and state grant programs.

Potential Funding Sources for Mitigation Activities

Funding for hazard mitigation programs and projects can come from a number of sources both public and private. Non-local funding can come from a number of sources, either in the form of a grant or a loan. The following text provides a description of a number of potential grant programs available to Manitowoc County (or other entities seeking to carry out hazard mitigation actions) in funding future mitigation actions identified in this plan:

EDA Public Works and Development Facilities

These funds are available for local units of government to enhance regional competitiveness and promote long-term economic development in regions experiencing substantial economic distress. EDA provides Public Works investments to help distressed communities and regions revitalize, expand, and upgrade their physical infrastructure to attract new industry, encourage business expansion, diversify local economies, and generate or retain long-term private sector jobs and investment.



FEMA Assistance to Firefighters Grant

The primary goal of the Assistance to Firefighters Grants (AFG) is to meet the firefighting and emergency response needs of fire departments and non-affiliated emergency medical services organizations. The AFG program helps firefighters and other first responders to obtain critically needed equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. The National Preparedness Directorate in the Federal Emergency Management Agency administers the grants in cooperation with the U.S. Fire Administration. The Fire Prevention and Safety Grants (FP&S) are part of the Assistance to Firefighters Grants (AFG) and are under the purview of the National Preparedness Directorate in the Federal Emergency Management Agency. FP&S grants support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to target high-risk populations and mitigate high incidences of death and injury.

FEMA Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). FEMA provides FMA funds to assist States and communities implement measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program. Eligible activities include: acquisition, relocation, elevation, and flood-proofing of flood-prone insured properties; flood mitigation planning; and technical assistance. In order to be eligible for funding through this program the local government must be in compliance with the National Flood Insurance Program.

FEMA Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Eligible activities include: flood proofing; acquisition and relocation of flood prone properties; elevation of flood prone properties; retrofitting properties to be wind resistant; stormwater improvements; and education and awareness. In order to be eligible for funding through this program, the local government must be in compliance with the National Flood Insurance Program. All projects must be cost-effective, environmentally sound, and solve a problem. Funds are available anytime after a Presidential Disaster Declaration has been made in the State of Wisconsin.

FEMA Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds. Grant funds can be used to cover management costs, information dissemination, planning, technical assistance, and mitigation projects. In order to be eligible for funding through this program the local government must be in compliance with the National Flood Insurance Program. All projects must be cost-effective and environmentally sound.

Pipeline and Hazardous Materials Safety Administration, Hazardous Materials Emergency Preparedness

The Hazardous Materials Emergency Preparedness (HMEP) grant program is intended to provide financial and technical assistance as well as national direction and guidance to enhance State, Territorial, Tribal, and local hazardous materials emergency planning and training. The HMEP Grant Program distributes fees collected from shippers and carriers of hazardous materials to emergency responders for hazmat training and to Local Emergency Planning Committees (LEPCs) for hazmat planning.

U.S. Department of Education School Emergency Response and Crisis Management Plan Discretionary Grant Program

This grant program is designed to provide funds to Local Education Agencies (LEA) to strengthen and improve their emergency response and crisis plans, at the district and school-building level. Grantees are required to address all four phases of crisis planning: prevention and mitigation, preparedness, response, and recovery. In addition, LEAs are required to form partnerships and collaborate with community organizations, local law enforcement agencies, heads of local governments, and offices of public safety, health, and mental health as they review and revise school crisis plans. Plans must be coordinated with state or local homeland security plans and support implementation of the National Incident Management System (NIMS). Grant funds may be used for the following activities: training school safety teams and students; conducting building and facilities audits; communicating emergency response policies to parents and guardians; implementing an Incident Command System (ICS); purchasing school safety equipment (to a limited extent); conducting drills and tabletop simulation exercises; and preparing and distributing copies of crisis plans.

State of Wisconsin Programs

WDNR Lake Planning Grant Program

Counties, towns, cities, villages, tribes, qualified non-profit conservation organizations, qualified lake associations, school districts (in partnership with another eligible party), public inland lake protection and rehabilitation districts, town sanitary districts, and other local governmental units that are established for the purpose of lake management, are eligible to apply for funding to collect and analyze information needed to protect and restore lakes and their watersheds.

Eligible activities include: gathering and analysis of physical, chemical, and biological information on lakes; describing present and potential land uses within lake watersheds and on shorelines; reviewing jurisdictional boundaries and evaluating ordinances that relate to zoning, sanitation, or pollution control or surface use; assessments of fish, aquatic life, wildlife, and their habitats; and developing, evaluating, publishing, and distributing alternative courses of action and recommendations in a lake management plan.

WDNR Municipal Flood Control Grant Program

The Wisconsin Department of Natural Resources, Bureau of Community Financial Assistance and Bureau of Watershed Management, offers this grant assistance package to all cities, villages, towns, Indian Tribes, and metropolitan sewerage districts concerned with municipal flood control management in the State of Wisconsin. Assistance is provided with the availability of Acquisition and Development grants to purchase property or vacant land, structure removal, construction or other development costs and with Local Assistance Grants for providing administrative support activities.

WDNR River Planning Grant Program

Under this grant program, counties, cities, towns, villages, tribes, other local governmental units, qualified river management organizations, and qualified nonprofit conservation organizations are eligible to apply for funding under this program. Projects funded by this program must be designed to collect, assess and disseminate information on riverine ecosystems; assist in developing organizations to help manage rivers; assist the public in understanding riverine ecosystems; and/or create management plans for the long term protection and improvement of riverine ecosystems. Eligible activities include: organizational development for existing river protection/improvement organizations; assistance with the formation of a qualified river management organization; public education projects; and planning and assessment projects. Capital improvement projects are not eligible for funding under this grant.

WDNR Volunteer Fire Assistance Grant

Volunteer Fire Assistance (VFA) grants are available to Wisconsin county/area fire associations statewide. Grant funding is intended to support wildland fire suppression capabilities in an area through broad-ranging projects of benefit to all of the local fire departments. Successful applications will have a positive impact on the prevention, detection, and suppression of wildland fires in all of the communities served by a county/area fire association. Grant funds can be used for: fire fighter safety; fire fighter training; fire prevention (particularly in the Wildland Urban Interface); dry hydrants and other water resources; mapping; enhanced communications; wildland fire suppression equipment; and the organization of a new fire department.

WDOA Comprehensive Planning Grant Program

The Division of Intergovernmental Relations administers the Wisconsin Comprehensive Planning Grant Program to assist local governments in the development and adoption of comprehensive plans. The Comprehensive Planning Grant Program has established a framework that promotes cooperation, collaboration and the exchange of ideas relating to planning and land use issues.

WDOA, Division of Housing and Intergovernmental Relations, Emergency Housing Grant Program

This program makes available funds for acquisition, rehabilitation, and/or demolition projects after a disaster event has occurred. These funds can be used as a local match to receive FEMA mitigation funds. The project must be used to benefit low and moderate income individuals.



Chapter 5 - Plan Adoption and Maintenance

Plan Adoption Process

The Manitowoc County, Wisconsin Hazard Mitigation Plan development process was guided by the County Hazard Mitigation Plan Steering Committee over an 18-month time-frame, with professional planning support from the Bay-Lake Regional Planning Commission. A list of Steering Committee members is located in Chapter 1 - Introduction of this document, page 9.

WEM reviewed a final draft of the County's hazard mitigation plan prior to adoption by the Manitowoc County Board. Comments received from WEM and no changes were required.

The plan was adopted by resolution by the Manitowoc County Board on January 21, 2020. The resolution adopting the plan can be found on page (I) just before the Table of Contents. After the plan was adopted by the Manitowoc County Board, it was approved by WEM and FEMA. Approval letters from WEM and FEMA can be found on pages (II, III, IV).

Plan Maintenance

Planning is an ongoing process, and this plan should grow and adapt in order to keep pace with growth and change in the planning area and its local jurisdictions. The Disaster Mitigation Act of 2000 requires that local plans be evaluated and updated at least every five years in order to remain eligible for assistance.

Plan Monitoring, Evaluation, and Updating

This Manitowoc County, Wisconsin Hazard Mitigation Plan is an update to the 2014 plan, and will continue to be monitored, evaluated, and updated by Manitowoc County. Every five years, the plan will be comprehensively reviewed, and fully updated. The update shall involve the collection of the most current data to support the plan and the development of new mitigation strategies and an implementation plan. This planning effort will be comprehensive, and will incorporate opportunities for public involvement to meet all requirements of 44 CFR Part 201.6 and/or any applicable requirements or regulations developed over the next five years.

The five-year plan update will be coordinated by either the Manitowoc County Planning Department or the Emergency Management Director for County Board approval. All meetings to update the plan shall be subject to the Wisconsin Open Meeting Law, and shall be properly noticed to allow for public involvement and comment.

Additional Plan Review

Within three to six months following a significant natural hazard event, a special post-disaster review will occur. Information concerning the disaster shall be collected by the Manitowoc County Emergency Services from local law enforcement personnel, fire department personnel, disaster response personnel, Wisconsin Emergency Management staff, FEMA staff, affected citizens, and any other pertinent entities. This information shall be provided to the Steering Committee for its review.

At a public meeting, the Steering Committee will analyze the contributing factors to the impact(s) of the hazard event, the likelihood of the event recurring, and any strategies that should be implemented to mitigate the impact(s) in the future. The County Emergency Management Director will have primary responsibility for establishing post-disaster review meeting dates, distributing related materials, facilitating the meetings, and advertising these special meetings to affected county department heads and citizens and community groups, so that additional input and comment can be received. Special post-disaster review meetings shall be subject to the Wisconsin Open Meeting Law and shall be properly noticed to allow for public involvement and comment.

The Steering Committee may choose to revise or amend the existing County plan based on what is learned in the review process. Any recommended changes to the plan shall be forwarded to the Manitowoc County Board for its action and consideration.



Plan Coordination

The mitigation action plan (provided in Chapter 4) ties the mitigation strategies to related plans or policies. As the county and jurisdictions in the planning area develop or update their comprehensive plans, incorporation of this Hazard Mitigation Plan is highly recommended. The Wisconsin comprehensive planning law includes a detailed description of elements that need to be addressed in all comprehensive plans. The following items must be considered when incorporating this Hazard Mitigation Plan into the required elements of local comprehensive plans for jurisdictions in the planning area:

- **Issues and Opportunities Element**

A summary of major hazards that local governments are vulnerable to, and what is proposed to be done to mitigate future losses from the hazards.

- **Housing Element**

An inventory of the properties that are in the floodplain boundaries, the location of mobile homes, recommendations concerning building codes, shelter opportunities, and a survey of homeowners that may be interested in a voluntary buyout and relocation program.

- **Transportation Element**

Identify any transportation routes or facilities that are more at risk during flooding or winter storms.

- **Agricultural, and Natural and Cultural Resources Element**

Identify the floodplains and agricultural areas that are at risk during hazardous events. Incorporate recommendations on how to mitigate future losses to these areas.

- **Economic Development Element**

Describe the impacts that past hazards have had on area businesses.

- **Intergovernmental Cooperation Element**

Identify intergovernmental police, fire and rescue service sharing agreements that are in effect or which may merit further investigation, and consider cost sharing and resource pooling of government services and facilities.

- **Land Use Element**

Describe how flooding has impacted land uses and what is being done to mitigate negative land use impacts from flooding; map and identify natural hazard areas, such as floodplains and soils with limitations.

- **Implementation Element**

Recommended actions from this plan included in the implementation element of comprehensive plans of all jurisdictions in the planning area.

To maximize coordination with other related plans for Manitowoc County, mitigation strategies recommended in this plan have been and should continue to be considered when developing capital improvement plans, stormwater management plans, or flood mitigation plans.

A number of plans, reports, and technical data were referenced and incorporated into the Manitowoc County, Wisconsin Hazard Mitigation Plan. The following is a comprehensive list of the data and reports that were utilized in plan development:

- Population, housing, and employment data from the Bureau of the Census (2010), and American Community Survey Estimates
- Bay-Lake Regional Planning Commission land use inventory data (2015);
- State of Wisconsin Hazard Mitigation Plan (2016) was used to develop hazard descriptions for the risk assessment;
- FEMA Local Mitigation Plan Review Guide (2011) was used to ensure the plan contained all required information;
- Past hazard occurrences were obtained from National Oceanic and Atmospheric Administration (NOAA) – National Climatic Data Center – severe weather event data (January 2000 – October 2018);
- U.S. Geological Survey maps on landslides, land subsidence and earthquakes were used to describe those hazards;
- FEMA Flood Insurance Studies and FEMA Flood Insurance Rate Maps (FIRMs) were used to map floodplain areas;
- Parcel data from Manitowoc County was used to determine impacts of hazards with defined areas;
- Assessed valuation data from Manitowoc County was used to derive estimates of potential dollar losses;
- Manitowoc County Emergency Operations Plan contributed to the development of the mitigation action plan;
- Manitowoc County Comprehensive Plan was used to develop the community profile and contributed to the development of the mitigation action plan;
- Local municipal comprehensive plans contributed to the development of the mitigation action plan; and
- FEMA Mitigation Ideas: A Resource Risk to Natural Hazards (2013) contributed to the development of the mitigation action plan.

It is recommended that similar materials be referenced when completing any updates to the hazard mitigation plan.

APPENDIX A - Steering Committee Sign-in Sheets

Sign-In Sheet: PDM Kick-Off Meeting – February 11, 2019

Name	Agency
Amanda Fox	Manitowoc Co EM
Steve Bacalzo	MPU
Matt Payette	Village of Francis Creek
Angela Kowalzek-Adrians	Bay-Lake RPC
Tim Ryan	Manitowoc city Planning
Cathy Delain	" " "
Gerry Nenser	Manitowoc County DPW
Dennis Smith	Point Beach Nuclear EM
Jodi Blaser	Manitowoc Fire Rescue
Mary Halado	Manitowoc Co. Health Dept.
Lexi Otis	Manitowoc Co. Health Dept.

Sign-In Sheet: Hazard Mitigation Steering Committee – 5/16/19

Name	Agency
Amanda Fox	Manitowoc Co Eng Svcs
Travis Waack	Manitowoc Co Eng Svcs
Mary Halado	Health Dept.
Lexi Otis	Health Department
Cathy Delain	M.C. GIS Office
Andrea Raymakers	Manitowoc Planning & Zoning
Matt Payette	Village of Francis Creek
Madison Smith	BLRPC
Steve Bacalzo	Manitowoc Public Utilities
Gerry Nenser	Manitowoc County DPW

Sign-In Sheet: Hazard Mitigation Planning Committee – July 17, 2019

Name	Agency
Amanda Fox	Manitowoc County EM
Jamie Aulick	City of Kiel
Lexi Otis	Manitowoc County Health Department
Mary Halado	" "
STEVE BACALZO	MANITOWOC PUBLIC UTILITIES
Gerry Nenser	Manitowoc County DPW
Andrea Raymakers	Manitowoc County P&Z
Cathy Delain	" " "
TRAVIS WAACK	MANITOWOC COUNTY EM
Madison Smith	Bay-Lake RPC

Sign-In Sheet: Hazard Mitigation Meeting – October 3, 2019

Name	Agency
Amanda Fox	Manitowoc County Eng. Svcs
Madison Smith	Bay-Lake RPC
Cathy Delain	M.C. GIS Office
GERRY NENSER	MC DPW
Mary Halado	Manitowoc Co. Health Dept.
Lexi Otis	" "
Jamie Aulick	City of Kiel
TRAVIS WAACK	Manitowoc County Emergency Services
Tim Ryan	Int'l Planning

Sign-In Sheet: Hazard Mitigation Plan Public Meeting
November 11th, 2019

Name	Organization
TRAVIS WAACK	MANITOWOC COUNTY EM
Madison Smith	Bay-Lake RPC

Agendas & Minutes



AGENDA

MANITOWOC COUNTY
HAZARD MITIGATION PLAN UPDATE
STEERING COMMITTEE MEETING

MONDAY, FEBRUARY 11, 2019
1:00 PM – 3:00 PM

MANITOWOC COUNTY EMERGENCY OPERATIONS CENTER (EOC)
1024 S 9TH STREET, MANITOWOC, WI 54220

1. Introduction
2. Public comment
3. Project description - overview of planning process and plan content
4. Review project schedule/expectations of steering committee
5. Review/update the following elements from previous plan (2014)
 - a) goals
 - b) hazard risks and ratings
 - c) critical facilities categories
 - d) mitigation strategies
6. Discuss next steps
7. Schedule next meeting

Project Contacts:
Travis Woack, Emergency Management: traviswoack@co.manitowoc.wi.us 920-323-4207
Amanda Fox, Emergency Management: amandafox@co.manitowoc.wi.us 920-483-4360
Angela Kowalski-Adams, Bay-Lake Regional Planning Commission: Angela.K@bay-lake.org 920-448-2820, Ext. 106

Any person wishing to attend this meeting who, because of a disability, requires special accommodations should contact County Emergency Management at (920) 459-3360 two working days prior to the meeting so that arrangements can be made.



AGENDA

MANITOWOC COUNTY HAZARD MITIGATION PLAN UPDATE
STEERING COMMITTEE MEETING

THURSDAY, MAY 16, 2019
2:00 PM – 4:00 PM

MANITOWOC COUNTY EMERGENCY OPERATIONS CENTER (EOC)
1024 S 9TH STREET, MANITOWOC, WI 54220

1. Introduction
2. Public comment
3. Recap of previous meeting
4. Review goals and hazard risks and ratings
5. Discuss potential man-made/technological hazard additions
6. Review critical facilities
7. Review Draft Chapters 1-2 of the plan
8. Continue updating the mitigation strategies
9. Discuss next steps
10. Schedule next meeting

Project Contacts:
Travis Woack, Emergency Management: traviswoack@co.manitowoc.wi.us 920-323-4207
Amanda Fox, Emergency Management: amandafox@co.manitowoc.wi.us 920-483-4360
Madison Smith, Bay-Lake Regional Planning Commission: msmith@bay-lake.org 920-448-2820, Ext. 106

Any person wishing to attend this meeting who, because of a disability, requires special accommodations should contact County Emergency Management at (920) 459-3360 two working days prior to the meeting so that arrangements can be made.



AGENDA

MANITOWOC COUNTY HAZARD MITIGATION PLAN UPDATE
STEERING COMMITTEE MEETING

WEDNESDAY, JULY 17, 2019
2:00 PM – 4:00 PM

MANITOWOC COUNTY EMERGENCY OPERATIONS CENTER (EOC)
1024 S 9TH STREET, MANITOWOC, WI 54220

1. Introduction
2. Public comment
3. Recap of previous meeting
 - Updated demographics
 - City of Kiel discussion
4. Review critical facilities
 - Discuss mobile homes
 - Discuss communication facilities
5. Review Chapter 3 and Maps
 - Modify prioritization of hazards from previous plan
 - Review historical summary of hazard events
 - Review villages not participating in the NFP
6. Review Chapter 4 and 5 next meeting
 - Goals
 - Mitigation action plan

Schedule next meeting

Project Contacts:
Travis Woack, Emergency Management: traviswoack@co.manitowoc.wi.us 920-323-4207
Amanda Fox, Emergency Management: amandafox@co.manitowoc.wi.us 920-483-4360
Madison Smith, Bay-Lake Regional Planning Commission: msmith@bay-lake.org 920-448-2820, Ext. 106
Any person wishing to attend this meeting who, because of a disability, requires special accommodations should contact County Emergency Management at (920) 459-3360 two working days prior to the meeting so that arrangements can be made.



AGENDA

MANITOWOC COUNTY HAZARD MITIGATION PLAN UPDATE
STEERING COMMITTEE MEETING

WEDNESDAY, OCTOBER 3, 2019
2:00 PM – 4:00 PM

MANITOWOC COUNTY EMERGENCY OPERATIONS CENTER (EOC)
1024 S 9TH STREET, MANITOWOC, WI 54220

1. Introduction
2. Public comment
3. Recap of previous meeting
 - Minutes
 - Review updated critical facilities, number of events, cost of events
4. Review & approve Chapter 4
 - Follow up discussion with individual municipalities mitigation measures
 - Discuss additions to mitigation measures
5. Review Chapter 5
 - Review Chapter 5
 - Review plan entirely
 - Move to adopt plan as final draft (f)
6. Plan and Discuss Open House
 - Discuss Resolution & Adoption Process
 - Review press notice and open house

Project Contacts:
Travis Woack, Emergency Management: traviswoack@co.manitowoc.wi.us 920-323-4207
Amanda Fox, Emergency Management: amandafox@co.manitowoc.wi.us 920-483-4360
Madison Smith, Bay-Lake Regional Planning Commission: msmith@bay-lake.org 920-448-2820, Ext. 106
Any person wishing to attend this meeting who, because of a disability, requires special accommodations should contact County Emergency Management at (920) 459-3360 two working days prior to the meeting so that arrangements can be made.

Meeting Notes

Manitowoc County Hazard Mitigation Plan Steering Committee

February 11, 2019
1 – 3 pm

Steering Committee Members Present:

Amanda Fox – Manitowoc Co Emergency Services
Angela Kowalski-Adams – Bay-Lake RPC
Cathy Delain – Manitowoc County GIS
Gerry Neuser – Manitowoc County Aging and Disability Resource Center
Denny Smith – Point Beach Nuclear – NextEra Energy
Gerry Neuser – Manitowoc County Public Works
Mary Halada – Manitowoc County Public Health
Lexi Otis – Manitowoc County Public Health
Matt Payette – Village of Francis Creek
Steve Bacalzo – Manitowoc Public Utilities
Tim Ryan – Manitowoc County Planning & Zoning
Todd Blaser – Manitowoc Fire & Rescue

- Introductions were made.
- An overview of the hazard mitigation planning process and plan content was provided along with some informational handouts.
 - o The current county hazard mitigation plan (2014) is available here: <https://bay-lake.org/documents/view/262216>
- The project schedule and expectations of the steering committee was reviewed and discussed. There will be approximately 4-5 meetings of the steering committee and a public informational meeting. The steering committee will update the critical facilities list, the mitigation goals and action plan, and review the plan chapters.
- The plan goals and hazard risks and ratings from the previous plan were reviewed along with a handout providing NCEC (National Climatic Data Center) data on natural hazard events occurring in Manitowoc County between 2000 and 2018. The Steering Committee re-ranked the hazards based on consideration of past occurrences and their impacts.
- A hand-out listing the critical facilities identified in the previous plan was reviewed. Some changes were made to the naming of types. The Steering Committee will continue to work on the critical facilities list at the next meeting.
- A hand-out listing the mitigation strategies developed in the previous plan was reviewed and updates were made to some of the projects, target dates, costs, and responsible parties. The Steering Committee will continue to work on the mitigation action plan at the next meeting.

Meeting Notes

Manitowoc County Hazard Mitigation Plan Steering Committee

May 16, 2019
2 – 4 pm

Steering Committee Members Present:

Amanda Fox – Manitowoc County Emergency Services
Madison Smith – Bay-Lake RPC
Cathy Delain – Manitowoc County GIS
Gerry Neuser – Manitowoc County Public Works
Mary Halada – Manitowoc County Public Health
Lexi Otis – Manitowoc County Public Health
Matt Payette – Village of Francis Creek
Steve Bacalzo – Manitowoc Public Utilities
Andrea Roymakes – Manitowoc County Planning & Zoning (in place of Tim Ryan)
Travis Woack – Manitowoc County Emergency Services

- Introductions were made.
- No public comment.
- Recap of previous meeting and minutes.
- The steering committee reviewed Chapters 1 and 2 of the plan. Bay-Lake RPC will research more recent demographic statistics to go with the 2010 Census data for population, projected population, and housing units. Bay-Lake RPC will add additional employment data pertaining to industries in Manitowoc County.
- Steering committee reviewed the location map, and land-use map. Questions about City of Kiel entirely added or partially. BLRPC will contact Jamie Aulik.
- The steering committee reviewed the critical facilities list. Discussed updating schools and daycares. Discussed cell towers, and any additional critical facilities that need to be included and mapped. Add the Manitowoc County Emergency Operations Center (EOC), and radio towers within communication towers. The Steering Committee decided to not add man-made/technological hazards. Discussed Climate Change impacts, decided against adding that this plan.
- The Steering Committee updated all mitigation strategies, and will work on the mitigation action plan at the next meeting.
- Chapter 3 will be reviewed at the next meeting.

Action Items:

- First week of December the public comment meeting will be held
- December 17, County Board Meeting



Meeting Notes

Manitowoc County Hazard Mitigation Plan Steering Committee

July 17, 2019
2 – 4 pm

Steering Committee Members Present:

Amanda Fox – Manitowoc County Emergency Services
Madison Smith – Bay-Lake RPC
Cathy Delain – Manitowoc County GIS
Gerry Neuser – Manitowoc County Public Works
Lexi Otis – Manitowoc County Public Health
Steve Bacalzo – Manitowoc Public Utilities
Andrea Roymakes – Manitowoc County Planning & Zoning (in place of Tim Ryan)
Travis Woack – Manitowoc County Emergency Services

- Introductions were made.
- No public comment.
- Recap of previous meeting and minutes.
- Updated Demographics
- Madison will send the committee electronically to view
- Industry data was added.
- The committee has chosen to include the entirety of the City of Kiel in its Hazard Mitigation Plan rather than split the City between Manitowoc and Calumet Counties.
- City of Kiel Administrator Jamie Aulik is in attendance; he will notify Calumet County's Emergency Manager Bernie Sorenson.
- Review Critical Facilities
 - Used online web app created to view critical facilities
 - Reviewed list of mobile home parks in the County
 - Determined some mobile home parks may be missing or no longer active; Mary Halada will provide a current list of licensed mobile home parks in the County.
 - Cathy Delain will compare past comprehensive list of communications facilities to current list to determine if any changes should be made
 - The committee chose to label communications facilities generically and not label each individual tower's usage
 - Critical facilities and maps were approved.
- Review Chapter 3 and Maps
 - Review Historical Summary of Hazard Events
 - Review Villages Not Participating in the NFP
 - Determined that Maribel, St. Nazianz, Valders, and Whitelaw are not participating as they do not have special hazard areas for flooding



Meeting Notes

Manitowoc County Hazard Mitigation Plan Steering Committee

October 3, 2019
2 – 4 pm

Steering Committee Members Present:

Amanda Fox – Manitowoc County Emergency Services
Madison Smith – Bay-Lake RPC
Cathy Delain – Manitowoc County GIS
Gerry Neuser – Manitowoc County Public Works
Jamie Aulik – City of Kiel
Mary Halada – Manitowoc County Public Health
Lexi Otis – Manitowoc County Public Health
Tim Ryan – Manitowoc County Planning & Zoning
Travis Woack – Manitowoc County Emergency Services

- Introductions were made.
- No public comment.
- Recap of previous meeting and minutes.
 - Review Critical Facilities
 - Review historic events and cost of events
 - Include link to online critical facilities maps
 - Approved all updates and new maps for chapter 3
 - Revisions of Table, Map, and Figure headings to be made
- Review and approved Chapter 4
 - Discussed individual municipalities mitigation measure updates
 - Continued to update mitigation measures
 - Add City of Manitowoc's mitigation measures following other municipalities
 - Approved Chapter 4
- Review Chapter 5
 - No changes made, move to approve with small grammar changes
- Discussions about next steps
 - Open House – circulate invite; public notice, social media.
 - 30 day public review prior to open house, plan will be available online.

Action Items:

- Draft Plan approved by the steering committee
- Public Open House on November 11, 2019
- December 17, County Board Meeting?



APPENDIX B - Multi-Jurisdictional Cooperation

As a way to ensure accurate data and multi-jurisdictional cooperation in the update of the county's hazard mitigation plan, the steering committee and Bay-Lake Regional Planning Commission engaged the local communities in a cooperation exercise to review and provide input on plan materials.

Communities were provided a listing of their critical facilities, goals identified in the plan, and hazards mitigation actions, and were asked to review and comment on the materials. Additionally, they were asked to identify mitigation actions specific to their community. The following is the letter that was sent to the municipalities in Manitowoc County.

December 20, 2018

RE: Request for Review of Hazard Mitigation Materials

(Please forward to the Plan Commission or Council/Board)

The Manitowoc County Emergency Management and the Bay-Lake Regional Planning Commission have been working with a local steering committee to update the Hazard Mitigation Plan for Marinette County and the municipalities.

The Federal Disaster Mitigation Act of 2000 established a requirement for local governments to prepare a hazard mitigation plan to be eligible for funding from FEMA through the Pre-Disaster Mitigation Grant Program, the Flood Mitigation Assistance Program, the Hazard Mitigation Grant Program, and disaster assistance.

The hazard mitigation planning process is being conducted at the county level. In order to be covered by the plan, cities and villages will need to provide input on the plan, and adopt it once complete. The following materials have been enclosed to facilitate this participation in development of the plan, and ensure that the plan contains accurate municipal information:

EXERCISE #1: Using the current inventory of the critical facilities found in your municipality, plus a list of the critical facility types/categories that are to be included, review the information for accuracy and write in any edits.

- o Ensure that there is an address or lat/long coordinates provided for each critical facility that you add.
- o Only include publicly owned facilities.

EXERCISE #2: Review and sign the sheet of county mitigation strategies.

EXERCISE #3: Identify at least one mitigation strategy specific to your municipality that the community would like to implement if grant funding were available.

Please return your information (with or without edits) no later than February 8, 2019 to Madison Smith at msmith@baylakerpc.org or 425 S. Adams Street, Suite 201, Green Bay, WI 54301.

If you have any questions or need any additional information, please contact Madison at email or phone at (920) 448-2820, Ext. 106. Thank you for your participation in reviewing the enclosed materials.

PLEASE NOTE THAT THIS IS THE ONLY REQUEST THAT WILL BE MADE FOR THIS INFORMATION. IF CITY/VILLAGE MATERIALS ARE NOT RECEIVED, THE MUNICIPALITY WILL NOT BE A PART OF THE PLAN. Not participating in this plan will require the development of a municipal plan in order to be eligible for FEMA funding – including disaster assistance.

Sincerely,

Travis Waack
Emergency Management Director

Enclosures (3): Exercise #1 - Critical Facility Categories and Municipal Critical Facilities List; Exercise #2 - County Mitigation Strategies; and Exercise #3 - Municipal Mitigation Strategy Form



APPENDIX C - Critical Facilities By Municipality

The Manitowoc County Hazard Mitigation Plan Steering Committee and community representatives identified critical infrastructure assets for all the communities in the county. Tables adjacent and on the following pages are each of the critical facilities by municipality for Manitowoc County.

NAME	ADDRESS	Source	Type	MCD	Floodplain
Mehicot	East Twin River	DNR 2019	Dam	Village of Mehicot	Yes
Mehicot Fire Department	214 S Main St	Village	Fire and Safety	Village of Mehicot	Yes
Reis Mills (dry hydrant / Branch River access)	6801 CTH T	Manitowoc County Fire Assoc.	Fire and Safety	Town of Kossuth	Yes
CTH Y / West Twin River (dry hydrant)	4339 CTH Y	Manitowoc County Fire Assoc.	Fire and Safety	Town of Kossuth	Yes
Collins Marsh	Mud Creek	DNR 2019	Dam	Town of Rockland	Yes
Water Pumping Station	20708 Main St		Wastewater Treatment Facility	Town of Rockland	Yes
Clarks Mill	Manitowoc River	DNR 2019	Dam	Town of Cato	Yes
Neshota - South	West Twin River	DNR 2019	Dam	Town of Two Rivers	Yes
Millhome	Sheboygan River	DNR 2019	Dam	Town of Schleswig	Yes
Rockville	Sheboygan River	DNR 2019	Dam	Town of Schleswig	Yes
Kiel	Sheboygan River	DNR 2019	Dam	City of Kiel	Yes
Kiel Fire Department	99 E Fremont St	Hazus MH	Fire and Safety	City of Kiel	Yes
Sewage Lift Station	1162 N Westview St	Village	Wastewater Treatment Facility	Village of Cleveland	Yes
Village of Cleveland	1151 Lakeshore Dr	County	Administrative Building	Village of Cleveland	Yes
Emergency Siren	Salvage Rd & S Rockway St	County	Communication Facility	Village of Mehicot	Yes
Village of Cleveland	1151 Lakeshore Dr		Wastewater Treatment Facility	Village of Cleveland	Yes
Sewage Lift Station	619 STH 67	City	Wastewater Treatment Facility	City of Kiel	Yes
City of Manitowoc Gravel Pit	Gravel Pit Ln	County	Post-Disaster Recovery Site	City of Manitowoc	Yes
Homes Rd / East Twin River (from bridge)	503 Holmes Rd	Town	Fire and Safety	Town of Gibson	Yes
Sewage Lift Station	600 S 19th St	City	Wastewater Treatment Facility	City of Manitowoc	Yes
Sewage Lift Station	4001 Archer St	City	Wastewater Treatment Facility	City of Manitowoc	Yes
B360001	OLD Y RD / WEST TWIN RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360006	N RAPIDS RD / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360011	STH 32 NB-STH 57 NB / SHEBOYGAN RIVER	County/HSI 2019	Bridge	Town of Schleswig	Yes
B360012	DAIRYLAND DR / NORTH BRANCH OF CENTERVILLE CREEK	County/HSI 2019	Bridge	Village of Cleveland	Yes
B360015	STH 32-STH 57 / SHEBOYGAN RIVER	County/HSI 2019	Bridge	City of Kiel	Yes
B360019	CTH JJ / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Rockland	Yes
B360020	N CTH S / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Cato	Yes
B360021	CTH V / WEST TWIN RIVER	County/HSI 2019	Bridge	Town of Kossuth	Yes
B360022	ROCKVILLE RD / SHEBOYGAN RIVER	County/HSI 2019	Bridge	City of Kiel	Yes
B360023	ROCKVILLE RD / SHEBOYGAN RIVER	County/HSI 2019	Bridge	Town of Schleswig	Yes
B360025	LAX CHAPEL RD / TRIBUTARY OF SHEBOYGAN RIVER	County/HSI 2019	Bridge	Town of Schleswig	Yes
B360026	USH 151 / SILVER CREEK	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360028	STURM RD / EAST TWIN RIVER	County/HSI 2019	Bridge	Town of Mehicot	Yes
B360032	ROSECRANS RD / DEVILS RIVER	County/HSI 2019	Bridge	Town of Cooperstown	Yes
B360033	CTH LS / PINE CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360035	CTH B / LITTLE MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360036	I-43 / FISCHER CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes
B360038	GASS LAKE RD / PINE CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360047	I-43 SB / POINT CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes
B360050	I-43 SB / CTH C	County/HSI 2019	Bridge	Town of Newton	Yes
B360051	I-43 NB / CTH C	County/HSI 2019	Bridge	Town of Newton	Yes
B360054	CTH C / PINE CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360055	I-43 / CALVIN CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360060	I-43 / SILVER CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360064	I-43 SB OFF Ramp to CTH C / PINE CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360072	I-43 SB-USH 10 EB / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360073	I-43 NB-USH 10 WB / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360075	STH 67 / CEDAR CREEK	County/HSI 2019	Bridge	Town of Eaton	Yes
B360076	CTH R / DEVILS RIVER	County/HSI 2019	Bridge	Town of Cooperstown	Yes
B360082	I-43 / FRANCIS CREEK	County/HSI 2019	Bridge	Village of Francis Creek	Yes
B360097	I-43 SB / DEVILS RIVER	County/HSI 2019	Bridge	Town of Cooperstown	Yes
B360098	I-43 NB / DEVILS RIVER	County/HSI 2019	Bridge	Town of Cooperstown	Yes
B360105	USH 151 / SILVER CREEK	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360109	STH 147 / EAST TWIN RIVER	County/HSI 2019	Bridge	Town of Mehicot	Yes
B360110	I-43 SB / CENTER ROAD	County/HSI 2019	Bridge	Town of Centerville	Yes
B360111	I-43 NB / CENTER ROAD	County/HSI 2019	Bridge	Town of Centerville	Yes
B360112	USH 10 WB-STH 42 SB-WALDO BLVD / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360113	USH 10 EB-STH 42 NB-WALDO BLVD / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360117	STH 42-WASHINGTON ST / WEST TWIN RIVER	County/HSI 2019	Bridge	City of Two Rivers	Yes
B360118	GRIMMS RD / BRANCH RIVER	County/HSI 2019	Bridge	Town of Franklin	Yes
B360119	WESTVIEW RD / FISCHER CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes
B360120	CTH O / MOLASH CREEK	County/HSI 2019	Bridge	Town of Two Rivers	Yes
B360121	CTH R IN PACKER DR / FRANCIS CREEK	County/HSI 2019	Bridge	Village of Francis Creek	Yes
B360123	STH 147-S MAIN ST / EAST TWIN RIVER	County/HSI 2019	Bridge	Village of Mehicot	Yes
B360124	BROADWAY ST / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360125	DANMAR RD / BRANCH RIVER	County/HSI 2019	Bridge	Town of Kossuth	Yes
B360126	MILL ST / MUD CREEK	County/HSI 2019	Bridge	Village of Reedsville	Yes
B360127	E ZANDER RD / EAST TWIN RIVER	County/HSI 2019	Bridge	Town of Mehicot	Yes
B3601280001	USH 10 EB-10TH ST / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B3601280002	USH 10 EB-10TH ST / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360129	CTH F / POINT CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes
B360131	S CTH J / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Cato	Yes
B360132	STH 67 / SHEBOYGAN RIVER	County/HSI 2019	Bridge	City of Kiel	Yes
B360133	HOLMES RD / EAST TWIN RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360134	STH 42 / MEEME RIVER	County/HSI 2019	Bridge	Town of Meeme	Yes
B360135	STH 147 W / WEST TWIN RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360136	CTH VV-45TH ST / EAST TWIN RIVER	County/HSI 2019	Bridge	City of Two Rivers	Yes
B360137	STH 32 SB-STH 57 SB / SHEBOYGAN RIVER	County/HSI 2019	Bridge	Town of Schleswig	Yes
B360139	W HILLCREST RD / BRANCH RIVER	County/HSI 2019	Bridge	Town of Franklin	Yes
B360140	S 21ST ST NB / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360141	MARITIME DR / LITTLE MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360142	USH 10 WB-8TH ST / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360144	USH 10 / EAST BRANCH OF MUD CREEK	County/HSI 2019	Bridge	Town of Maple Grove	Yes
B360145	REIFS MILLS RD / BRANCH RIVER	County/HSI 2019	Bridge	Town of Franklin	Yes
B360146	CTH CR / SILVER CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360147	S CTH W / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Rockland	Yes
B360151	N WESTVIEW ST / NORTH BRANCH OF CENTERVILLE CREEK	County/HSI 2019	Bridge	Village of Cleveland	Yes
B360152	W TAPAWINGO RD / EAST TWIN RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360153	NACHTWEY RD / NESHOTA RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360154	CTH B / WEST TWIN RIVER	County/HSI 2019	Bridge	Town of Two Rivers	Yes
B360155	STH 42-2ND ST / EAST TWIN RIVER	County/HSI 2019	Bridge	City of Two Rivers	Yes
B360157	COLLINS RD / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Rockland	Yes
B360160	CTH A / TRIB. OF MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Liberty	Yes
B360161	W ZANDER RD / NESHOTA RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360162	MELNIK RD / W TWIN RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360163	QUARRY RD / MANITOWOC R	County/HSI 2019	Bridge	Town of Eaton	Yes
B360164	VILLAGE DRIVE / BRANCH RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360165	SILVER CREEK RD / SILVER CREEK	County/HSI 2019	Bridge	Town of Manitowoc	Yes
B360166	CTH T / BRANCH R	County/HSI 2019	Bridge	Town of Franklin	Yes
B360167	E SPRING VALLEY RD / MEEME RIVER	County/HSI 2019	Bridge	Town of Meeme	Yes
B360168	POINT CREEK RD / POINT CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes
B360169	MICHIGAN AVE / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360172	STEINTHAL RD / SHEBOYGAN RIVER	County/HSI 2019	Bridge	Town of Schleswig	Yes
B360173	CTH JJ / MUD CREEK	County/HSI 2019	Bridge	Town of Rockland	Yes
B360174	CTH LS-LAKESHORE RD / POINT CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes

NAME	ADDRESS	Source	Type	MCD	Floodplain
Mishicot	East Twin River	DNR 2019	Dam	Village of Mishicot	Yes
Mishicot Fire Department	214 S Main St	Village	Fire and Safety	Village of Mishicot	Yes
Reifs Mills (dry hydrant / Branch River access)	6801 CTH T	Manitowoc County Fire Assoc.	Fire and Safety	Town of Kossuth	Yes
CTH Y / West Twin River (dry hydrant)	4339 CTH Y	Manitowoc County Fire Assoc.	Fire and Safety	Town of Kossuth	Yes
Collins Marsh	Mud Creek	DNR 2019	Dam	Town of Rockland	Yes
Water Pumping Station	20708 Main St		Wastewater Treatment Facility	Town of Rockland	Yes
Clarks Mill	Manitowoc River	DNR 2019	Dam	Town of Cato	Yes
Neshoto - South	West Twin River	DNR 2019	Dam	Town of Two Rivers	Yes
Millhome	Sheboygan River	DNR 2019	Dam	Town of Schleswig	Yes
Rockville	Sheboygan River	DNR 2019	Dam	Town of Schleswig	Yes
Kiel	Sheboygan River	DNR 2019	Dam	City of Kiel	Yes
Kiel Fire Department	99 E Fremont St	Hazus MH	Fire and Safety	City of Kiel	Yes
Sewage Lift Station	1162 N Westview St	Village	Wastewater Treatment Facility	Village of Cleveland	Yes
Village of Cleveland	1151 Lakeshore Dr	County	Administrative Building	Village of Cleveland	Yes
Emergency Siren	Salvage Rd & S Rockway St	County	Communication Facility	Village of Mishicot	Yes
Village of Cleveland	1151 Lakeshore Dr		Wastewater Treatment Facility	Village of Cleveland	Yes
Sewage Lift Station	619 STH 67	City	Wastewater Treatment Facility	City of Kiel	Yes
City of Manitowoc Gravel Pit	Gravel Pit Ln	County	Post-Disaster Recovery Site	City of Manitowoc	Yes
Homes Rd / East Twin River (from bridge)	503 Holmes Rd	Town	Fire and Safety	Town of Gibson	Yes
Sewage Lift Station	600 S 19th St	City	Wastewater Treatment Facility	City of Manitowoc	Yes
Sewage Lift Station	4001 Archer St	City	Wastewater Treatment Facility	City of Manitowoc	Yes
B360001	OLD V RD / WEST TWIN RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360006	N RAPIDS RD / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360011	STH 32 NB-STH 57 NB / SHEBOYGAN RIVER	County/HSI 2019	Bridge	Town of Schleswig	Yes
B360012	DAIRYLAND DR / NORTH BRANCH OF CENTERVILLE CREEK	County/HSI 2019	Bridge	Village of Cleveland	Yes
B360015	STH 33-STH 57 / SHEBOYGAN RIVER	County/HSI 2019	Bridge	City of Kiel	Yes
B360019	CTH JJ / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Rockland	Yes
B360020	N CTH S / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Cato	Yes
B360021	CTH V / WEST TWIN RIVER	County/HSI 2019	Bridge	Town of Kossuth	Yes
B360022	ROCKVILLE RD / SHEBOYGAN RIVER	County/HSI 2019	Bridge	City of Kiel	Yes
B360023	ROCKVILLE RD / SHEBOYGAN RIVER	County/HSI 2019	Bridge	Town of Schleswig	Yes
B360025	LAX CHAPEL RD / TRIBUTARY OF SHEBOYGAN RIVER	County/HSI 2019	Bridge	Town of Schleswig	Yes
B360026	USH 151 / SILVER CREEK	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360028	STURM RD / EAST TWIN RIVER	County/HSI 2019	Bridge	Town of Mishicot	Yes
B360032	ROSECRANS RD / DEVILS RIVER	County/HSI 2019	Bridge	Town of Cooperstown	Yes
B360033	CTH LS / PINE CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360035	CTH B / LITTLE MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360036	I-43 / FISCHER CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes
B360038	GASS LAKE RD / PINE CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360047	I-43 SB / POINT CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes
B360050	I-43 SB / CTH C	County/HSI 2019	Bridge	Town of Newton	Yes
B360051	I-43 NB / CTH C	County/HSI 2019	Bridge	Town of Newton	Yes
B360054	CTH C / PINE CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360055	I-43 / CALVIN CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360060	I-43 / SILVER CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360064	I-43 SB Off Ramp to CTH C / PINE CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360072	I-43 SB-USH 10 EB / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360073	I-43 NB-USH 10 WB / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360075	STH 67 / CEDAR CREEK	County/HSI 2019	Bridge	Town of Eaton	Yes
B360076	CTH R / DEVILS RIVER	County/HSI 2019	Bridge	Town of Cooperstown	Yes
B360082	I-43 / FRANCIS CREEK	County/HSI 2019	Bridge	Village of Francis Creek	Yes
B360097	I-43 SB / DEVILS RIVER	County/HSI 2019	Bridge	Town of Cooperstown	Yes
B360098	I-43 NB / DEVILS RIVER	County/HSI 2019	Bridge	Town of Cooperstown	Yes
B360105	USH 151 / SILVER CREEK	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360109	STH 147 / EAST TWIN RIVER	County/HSI 2019	Bridge	Town of Mishicot	Yes
B360110	I-43 SB / CENTER ROAD	County/HSI 2019	Bridge	Town of Centerville	Yes
B360111	I-43 NB / CENTER ROAD	County/HSI 2019	Bridge	Town of Centerville	Yes
B360112	USH 10 WB-STH 42 SB-WALDO BLVD / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360113	USH 10 EB-STH 42 NB-WALDO BLVD / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360117	STH 42-WASHINGTON ST / WEST TWIN RIVER	County/HSI 2019	Bridge	City of Two Rivers	Yes
B360118	GRIMMS RD / BRANCH RIVER	County/HSI 2019	Bridge	Town of Franklin	Yes
B360119	WESTVIEW RD / FISCHER CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes
B360120	CTH O / MOLAISH CREEK	County/HSI 2019	Bridge	Town of Two Rivers	Yes
B360121	CTH R IN PACKER DR / FRANCIS CREEK	County/HSI 2019	Bridge	Village of Francis Creek	Yes
B360123	STH 147-S MAIN ST / EAST TWIN RIVER	County/HSI 2019	Bridge	Village of Mishicot	Yes
B360124	BROADWAY ST / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360125	DANMAR RD / BRANCH RIVER	County/HSI 2019	Bridge	Town of Kossuth	Yes
B360126	MILL ST / MUD CREEK	County/HSI 2019	Bridge	Village of Reedsville	Yes
B360127	E ZANDER RD / EAST TWIN RIVER	County/HSI 2019	Bridge	Town of Mishicot	Yes
B3601280001	USH 10 EB-10TH ST / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B3601280002	USH 10 EB-10TH ST / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360129	CTH F / POINT CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes
B360131	S CTH J / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Cato	Yes
B360132	STH 67 / SHEBOYGAN RIVER	County/HSI 2019	Bridge	City of Kiel	Yes
B360133	HOLMES RD / EAST TWIN RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360134	STH 42 / MEEME RIVER	County/HSI 2019	Bridge	Town of Meeme	Yes
B360135	STH 147 W / WEST TWIN RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360136	CTH VV-45TH ST / EAST TWIN RIVER	County/HSI 2019	Bridge	City of Two Rivers	Yes
B360137	STH 32 SB-STH 57 SB / SHEBOYGAN RIVER	County/HSI 2019	Bridge	Town of Schleswig	Yes
B360139	W HILLCREST RD / BRANCH RIVER	County/HSI 2019	Bridge	Town of Franklin	Yes
B360140	S 21ST ST NB / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360141	MARITIME DR / LITTLE MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360142	USH 10 WB-8TH ST / MANITOWOC RIVER	County/HSI 2019	Bridge	City of Manitowoc	Yes
B360144	USH 10 / EAST BRANCH OF MUD CREEK	County/HSI 2019	Bridge	Town of Maple Grove	Yes
B360145	REIFS MILLS RD / BRANCH RIVER	County/HSI 2019	Bridge	Town of Franklin	Yes
B360146	CTH CR / SILVER CREEK	County/HSI 2019	Bridge	Town of Newton	Yes
B360147	S CTH W / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Rockland	Yes
B360151	N WESTVIEW ST / NORTH BRANCH OF CENTERVILLE CREEK	County/HSI 2019	Bridge	Village of Cleveland	Yes
B360152	W TAPAWINGO RD / EAST TWIN RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360153	NACHTWEY RD / NESHOTA RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360154	CTH B / WEST TWIN RIVER	County/HSI 2019	Bridge	Town of Two Rivers	Yes
B360155	STH 42-22ND ST / EAST TWIN RIVER	County/HSI 2019	Bridge	City of Two Rivers	Yes
B360157	COLLINS RD / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Rockland	Yes
B360160	CTH A / TRIB. OF MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Liberty	Yes
B360161	W ZANDER RD / NESHOTA RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360162	MELNIK RD / W TWIN RIVER	County/HSI 2019	Bridge	Town of Gibson	Yes
B360163	QUARRY RD / MANITOWOC R	County/HSI 2019	Bridge	Town of Eaton	Yes
B360164	VILLAGE DRIVE / BRANCH RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360165	SILVER CREEK RD / SILVER CREEK	County/HSI 2019	Bridge	Town of Manitowoc	Yes
B360166	CTH T / BRANCH R	County/HSI 2019	Bridge	Town of Franklin	Yes
B360167	E SPRING VALLEY RD / MEEME RIVER	County/HSI 2019	Bridge	Town of Meeme	Yes
B360168	POINT CREEK RD / POINT CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes
B360169	MICHIGAN AVE / MANITOWOC RIVER	County/HSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360172	STEINTHAL RD / SHEBOYGAN RIVER	County/HSI 2019	Bridge	Town of Schleswig	Yes
B360173	CTH JJ / MUD CREEK	County/HSI 2019	Bridge	Town of Rockland	Yes
B360174	CTH LS-LAKESHORE RD / POINT CREEK	County/HSI 2019	Bridge	Town of Centerville	Yes

NAME	ADDRESS	Source	Type	MCD	Floodplain
B360176	STH 310 MADISON ST / W TWIN RIVER	CountyHSI 2019	Bridge	City of Two Rivers	Yes
B360177	CTH J / BRANCH RIVER	CountyHSI 2019	Bridge	Town of Franklin	Yes
B360182	VALLEY DR / SILVER CREEK	CountyHSI 2019	Bridge	Town of Manitowoc	Yes
B360183	CTH T / DEVILS RIVER	CountyHSI 2019	Bridge	Town of Cooperstown	Yes
B360185	S CLEVELAND RD / MEEME RIVER	CountyHSI 2019	Bridge	Town of Meeme	Yes
B360186	MEADOW LN / FRANCIS CREEK	CountyHSI 2019	Bridge	Town of Kossuth	Yes
B360187	CTH CR / CALVIN CREEK	CountyHSI 2019	Bridge	Town of Newton	Yes
B360188	PIONEER RD / MEEME RIVER	CountyHSI 2019	Bridge	Town of Meeme	Yes
B360189	17TH ST / E TWIN RIVER	CountyHSI 2019	Bridge	City of Two Rivers	Yes
B360191	S CLEVELAND RD / PIGEON RIVER	CountyHSI 2019	Bridge	Town of Meeme	Yes
B360192	S CLEVELAND RD / PIGEON RIVER	CountyHSI 2019	Bridge	Town of Meeme	Yes
B360193	USH 10 / BRANCH R	CountyHSI 2019	Bridge	Town of Manitowoc Rapids	Yes
B360210	USH 151 / CEDAR CREEK	CountyHSI 2019	Bridge	Town of Eaton	Yes
B360211	USH 151 / TRIB. OF MANITOWOC RIVER	CountyHSI 2019	Bridge	Town of Eaton	Yes
B360213	MANITOWOC ST / MUD CREEK	CountyHSI 2019	Bridge	Village of Reedsville	Yes
B360214	HILLCREST RD / BRANCH RIVER	CountyHSI 2019	Bridge	Town of Franklin	Yes
B360216	PLEASANT RD / DEVILS RIVER	CountyHSI 2019	Bridge	Town of Cooperstown	Yes
B360217	N 4TH ST / MUD CREEK	CountyHSI 2019	Bridge	Village of Reedsville	Yes
B360218	MINERAL SPRINGS RD / PIGEON RIVER	CountyHSI 2019	Bridge	Town of Meeme	Yes
B360220	HILLCREST RD / BRANCH RIVER	CountyHSI 2019	Bridge	Town of Franklin	Yes
B360221	CENTER RD / NORTH BRANCH OF CENTERVILLE CREEK	CountyHSI 2019	Bridge	Town of Centerville	Yes
B360230	I-43 NB / POINT CREEK	CountyHSI 2019	Bridge	Town of Centerville	Yes
B360237	HICKORY HILLS RD / MUD CREEK	CountyHSI 2019	Bridge	Town of Maple Grove	Yes
B360318	CTH B-S STATE ST / EAST TWIN RIVER	CountyHSI 2019	Bridge	Village of Mishicot	Yes
B360511	TISCH MILLS RD / EAST TWIN RIVER	CountyHSI 2019	Bridge	Town of Mishicot	Yes
B360892	USH 10-MAIN ST / MUD CREEK	CountyHSI 2019	Bridge	Village of Reedsville	Yes
B360900	STH 42-WALDO BLVD / LITTLE MANITOWOC RIVER	CountyHSI 2019	Bridge	City of Manitowoc	Yes
B360910	CTH XX / MEEME RIVER	CountyHSI 2019	Bridge	Town of Meeme	Yes
B360913	CTH XX-E WASHINGTON AVE / S BR. CENTERVILLE CREEK	CountyHSI 2019	Bridge	Village of Cleveland	Yes
B360915	CTH B / EAST TWIN RIVER	CountyHSI 2019	Bridge	Town of Gibson	Yes
C360017	I-43 / CENTERVILLE CREEK	CountyHSI 2019	Bridge	Town of Centerville	Yes
C360040	KOJIAN RD / TRIB. TO BRANCH RIVER	CountyHSI 2019	Bridge	Town of Cooperstown	Yes
P360022	MILL RD (PEDESTRIAN BRIDGE) / MANITOWOC RIVER	CountyHSI 2019	Bridge	Town of Manitowoc Rapids	Yes
P360066	CTH M / PIGEON RIVER	CountyHSI 2019	Bridge	Town of Meeme	Yes
P360069	CTH Q / WEST TWIN RIVER	CountyHSI 2019	Bridge	Town of Mishicot	Yes
P360082	W ZANDER RD / JAMBO CREEK	CountyHSI 2019	Bridge	Town of Gibson	Yes
P360085	TWIN BRIDGE RD / JAMBO CREEK	CountyHSI 2019	Bridge	Town of Gibson	Yes
P360086	HILLVIEW RD / E TWIN RIVER	CountyHSI 2019	Bridge	Town of Gibson	Yes
P360087	ROCKLEDGE RD / EAST TWIN RIVER	CountyHSI 2019	Bridge	Town of Gibson	Yes
P360090	JAMBO CREEK RD / JAMBO CREEK	CountyHSI 2019	Bridge	Town of Gibson	Yes
P360097	ZANDER RD / TRIB. OF DEVILS RIVER	CountyHSI 2019	Bridge	Town of Cooperstown	Yes
P360100	ZANDER RD / DEVILS RIVER	CountyHSI 2019	Bridge	Town of Cooperstown	Yes
P360104	HEROLD RD / DEVILS RIVER	CountyHSI 2019	Bridge	Town of Cooperstown	Yes
P360108	TAUS ROAD / MUD CREEK	CountyHSI 2019	Bridge	Town of Maple Grove	Yes
P360109	REIFS MILLS RD / MUD CREEK	CountyHSI 2019	Bridge	Town of Maple Grove	Yes
P360118	TAUS RD / BRANCH RIVER	CountyHSI 2019	Bridge	Town of Franklin	Yes
P360119	E TAUS RD / BRANCH RIVER	CountyHSI 2019	Bridge	Town of Franklin	Yes
P360121	CTH Y / WEST TWIN RIVER	CountyHSI 2019	Bridge	Town of Kossuth	Yes
P360123	DEVILS RIVER STATE TRAIL / MEADOW LN	CountyHSI 2019	Bridge	Town of Kossuth	Yes
P360125	PARKWAY RD / FRANCIS CREEK	CountyHSI 2019	Bridge	Town of Kossuth	Yes
P360126	FRANCIS CREEK RD / FRANCIS CREEK	CountyHSI 2019	Bridge	Town of Kossuth	Yes
P360133	STEINERS CORNERS RD / EAST TWIN RIVER	CountyHSI 2019	Bridge	Village of Mishicot	Yes
P360134	E HILLCREST RD / EAST TWIN RIVER	CountyHSI 2019	Bridge	Town of Two Rivers	Yes
P360135	MAPLEWOOD RD / EAST TWIN RIVER	CountyHSI 2019	Bridge	Town of Two Rivers	Yes
P360144	N UNION RD / BRANCH RIVER	CountyHSI 2019	Bridge	Town of Manitowoc Rapids	Yes
P360145	CTH CS-W CUSTER ST / SILVER CREEK	CountyHSI 2019	Bridge	Town of Manitowoc Rapids	Yes
P360146	N UNION RD / MANITOWOC RIVER	CountyHSI 2019	Bridge	Town of Manitowoc Rapids	Yes
P360147	BRANCH RIVER RD / BRANCH RIVER	CountyHSI 2019	Bridge	Town of Manitowoc Rapids	Yes
P360148	S ALVERNO RD / SILVER CREEK	CountyHSI 2019	Bridge	Town of Manitowoc Rapids	Yes
P360151	HIGHWAY H RD / MANITOWOC RIVER	CountyHSI 2019	Bridge	Town of Manitowoc Rapids	Yes
P360158	W GOODWIN RD / MUD CREEK	CountyHSI 2019	Bridge	Town of Rockland	Yes
P360165	TOMKINS RD / TRIB. OF MANITOWOC RIVER	CountyHSI 2019	Bridge	Town of Liberty	Yes
P360168	HECKER RD / SILVER CREEK	CountyHSI 2019	Bridge	Town of Newton	Yes
P360174	CTH LS / SILVER CREEK	CountyHSI 2019	Bridge	City of Manitowoc	Yes
P360176	SILVER CREEK RD / SILVER CREEK	CountyHSI 2019	Bridge	Town of Manitowoc	Yes
P360177	S 26TH ST / SILVER CREEK	CountyHSI 2019	Bridge	Town of Manitowoc	Yes
P360182	CENTER RD / POINT CREEK	CountyHSI 2019	Bridge	Town of Centerville	Yes
P360184	CENTERVILLE RD / FISCHER CREEK	CountyHSI 2019	Bridge	Town of Centerville	Yes
P360185	CENTERVILLE RD / POINT CREEK	CountyHSI 2019	Bridge	Town of Centerville	Yes
P360187	CTH LS-LAKESHORE RD / FISCHER CREEK	CountyHSI 2019	Bridge	Town of Centerville	Yes
P360193	W WASHINGTON RD / MEEME RIVER	CountyHSI 2019	Bridge	Town of Meeme	Yes
P360700	CTH LS-LAKESHORE DR / CENTERVILLE CREEK	CountyHSI 2019	Bridge	Village of Cleveland	Yes
P360707	REED AVE / LITTLE MANITOWOC RIVER	CountyHSI 2019	Bridge	City of Manitowoc	Yes
P360904	CTH K / BRANCH RIVER	CountyHSI 2019	Bridge	Town of Franklin	Yes
P360910	S UNION RD / SILVER CREEK	CountyHSI 2019	Bridge	Town of Newton	Yes
P360912	CTH Q / LITTLE MANITOWOC RIVER	CountyHSI 2019	Bridge	Town of Manitowoc	Yes
P360913	CTH Q / LITTLE MANITOWOC RIVER	CountyHSI 2019	Bridge	Town of Manitowoc	Yes
P360914	CTH Q / LITTLE MANITOWOC RIVER	CountyHSI 2019	Bridge	City of Manitowoc	Yes
P360915	MANCAL RD / TRIB. OF BRANCH RIVER	CountyHSI 2019	Bridge	Town of Franklin	Yes
P360917	S 19TH ST / SILVER CREEK	CountyHSI 2019	Bridge	Town of Manitowoc	Yes
P360919	LEIST RD / MANITOWOC RIVER	CountyHSI 2019	Bridge	Town of Cato	Yes
P360925	CTH K / MUD CREEK	CountyHSI 2019	Bridge	Town of Maple Grove	Yes
Nesholo - North	West Twin River	DNR 2019	Dam	Town of Two Rivers	Yes
Meeme	Meeme River	County 2019	Dam	Town of Meeme	Yes
Branch River Fill Site (float)	7901 N Union Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Manitowoc Rapids	Yes
Carstens Lake Public Access (lake access)	6205 Carstens Lake Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Newton	Yes
Collins / Manitowoc River (dry hydrant)	1184 Collins Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Rockland	Yes
E Zander Rd / East Twin River (river access)	522 E Zander Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Mishicot	Yes
English Lake Public Access (lake access)	9348 S Lake Dr	Manitowoc County Fire Assoc.	Fire and Safety	Town of Newton	Yes
Hilltop Dry Hydrant (at Mud Creek)	19586 Hilltop Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Rockland	Yes
Paddlers Park (draft, East Twin River access)	1223 27th St	Manitowoc County Fire Assoc.	Fire and Safety	City of Two Rivers	Yes
Shoto Boat Landing (draft, West Twin River access)	921 CTH VV	Manitowoc County Fire Assoc.	Fire and Safety	Town of Two Rivers	Yes
Vet's Park & Marina (draft at boat ramp)	1818 18th St	Manitowoc County Fire Assoc.	Fire and Safety	City of Two Rivers	Yes
Fels Pond (dry hydrant)	CTH Z	Town	Fire and Safety	Town of Cooperstown	No
Cooperstown Maintenance Shop	11626 CTH Z	Town	Administrative Building	Town of Cooperstown	No
Cooperstown Town Hall	11626 CTH Z	Town	Administrative Building	Town of Cooperstown	No
Gibson Town Hall	14920 CTH Q	Town	Administrative Building	Town of Gibson	No
Tower	11811 Saxonburg Rd	Town	Communication Facility	Town of Mishicot	No
Power Facility	6610 Nuclear Rd	ATC	Power Facility/Bulk Fuel Storage	Town of Two Creeks	No
Power Facility	4802 CTH V	ATC	Power Facility/Bulk Fuel Storage	Town of Two Creeks	No
Point Beach Nuclear Plant	6610 Nuclear Rd	Hazus MH	Power Facility/Bulk Fuel Storage	Town of Two Creeks	No
Two Creeks Town Hall	5128 E Tapawingo Rd	County	Administrative Building	Town of Two Creeks	No
Two Creeks Fire Department	5128 E Tapawingo Rd	Town	Fire and Safety	Town of Two Creeks	No
Water Treatment Facility	14701 Pleasant Rd	Town	Wastewater Treatment Facility	Village of Maribel	No
Water Storage Tower	10416 E Belmar Ave		Water Supply	Village of Maribel	No
Maribel Fire Department	15127 N Maribel Rd	Village	Fire and Safety	Village of Maribel	No
Maribel Village Hall	15127 N Maribel Rd	Village	Administrative Building	Village of Maribel	No

NAME	ADDRESS	Source	Type	MCD	Floodplain
New York Ave Pump Station	1906 New York Ave		Water Supply	City of Manitowoc	No
Water Storage Tower	Reed Ave & N 8th St		Water Supply	City of Manitowoc	No
Manitowoc Fire Station 2	1410 N 8th St	County	Fire and Safety	City of Manitowoc	No
Valders Police Department	207 S Liberty St	Hazus MH	Fire and Safety	Village of Valders	No
Valders Fire Department	103 Eisenhower St	Hazus MH	Fire and Safety	Village of Valders	No
Village of Valders	340 N Adams St	Hazus MH	Wastewater Treatment Facility	Village of Valders	No
Valders Elementary	331 W Wilson St	County 2019	School	Village of Valders	No
Valders High	201 W Wilson St	County 2019	School	Village of Valders	No
Valders Middle	138 Jefferson St	County 2019	School	Village of Valders	No
Natural Gas Substation	108 Brennan Rd		Power Facility/Bulk Fuel Storage	Village of Valders	No
Nordic Lands	141 Jackson St	County 2019	Manufactured Housing	Village of Valders	No
Water Storage Tower	250 N Calumet Dr	Village	Water Supply	Village of Valders	No
Valders Village Hall	207 S Liberty St	County	Administrative Building	Village of Valders	No
Water Well 1	207 S Liberty St	Village	Water Supply	Village of Valders	No
Water Well 2	314 S Adams St	Village	Water Supply	Village of Valders	No
Country Visions Coop	511 S Calumet Dr	Village	Power Facility/Bulk Fuel Storage	Village of Valders	No
Power Facility	5109 CTH A	ATC	Power Facility/Bulk Fuel Storage	Town of Liberty	No
Liberty Town Hall	13812 English Lake Rd	Village	Administrative Building	Town of Liberty	No
Building	7520 English Lake Rd (Lakefield Telephone Co. LLC)	County	Communication Facility	Town of Newton	No
Building	Newton Rd (Lakefield Telephone Co. LLC)	County	Communication Facility	Town of Newton	No
Newtown Fire Department	6528 Carstens Lake Rd	Hazus MH	Fire and Safety	Town of Newton	No
Saint John's Evangelical Lutheran School	7531A English Lake Rd	County 2019	School	Town of Newton	No
Newtown Town Hall	6532 Carstens Lake Rd	Town	Administrative Building	Town of Newton	No
Water Supply Booster/Pumping Station	Viebahn St		Water Supply	Town of Manitowoc	No
Silver Creek Fire Department - Station 1	1822 Silver Creek Rd	County	Fire and Safety	Town of Manitowoc	No
Collector Well C	3983 S 10th St		Water Supply	City of Manitowoc	No
Village St Nazianz	608 N 1st Ave	BLRPC	Wastewater Treatment Facility	Village of St. Nazianz	No
St Nazianz Fire Station	202 N 4th Ave	Hazus MH	Fire and Safety	Village of St. Nazianz	No
Eaton Town Hall	316 W Main St	Town	Administrative Building	Village of St. Nazianz	No
St Nazianz Village Shop	110 Colonial Dr	Village	Administrative Building	Village of St. Nazianz	No
Water Utility Well	106 Colonial Dr	Village	Water Supply	Village of St. Nazianz	No
Water Utility Well	600 S 4th Ave	Village	Water Supply	Village of St. Nazianz	No
Power Facility	1618 E STH 310	ATC	Power Facility/Bulk Fuel Storage	Town of Two Rivers	No
Sewage Lift Station	44th St	City	Wastewater Treatment Facility	City of Two Rivers	No
Two Rivers High	4519 Lincoln Ave	County 2019	School	City of Two Rivers	No
Aurora Medical Center	5000 Memorial Dr	County 2019	Licensed Healthcare Facility	City of Two Rivers	No
Atrium Post Acute Care of Two Rivers	1 Hamilton Dr	County 2019	Licensed Healthcare Facility	City of Two Rivers	No
Two Rivers Police Department	1717 E Park St	Hazus MH	Fire and Safety	City of Two Rivers	No
Two Rivers Fire Department	2122 Monroe St	Hazus MH	Fire and Safety	City of Two Rivers	No
Two Rivers Wastewater Treatment	1415 Lake St	Hazus MH	Wastewater Treatment Facility	City of Two Rivers	No
Koenig Elementary	1114 Lowell St	County 2019	School	City of Two Rivers	No
Clarke Middle	4608 Bellevue Pl	County 2019	School	City of Two Rivers	No
Magee Elementary	3502 Glenwood St	County 2019	School	City of Two Rivers	No
Sewage Lift Station	Lakeview Ave/Jessie St	City	Wastewater Treatment Facility	City of Two Rivers	No
Sewage Lift Station	Gardner St	City	Wastewater Treatment Facility	City of Two Rivers	No
Sewage Lift Station	Columbus St	City	Wastewater Treatment Facility	City of Two Rivers	No
Water Tower	2612 12th St	City	Water Supply	City of Two Rivers	No
Building (Switch Station)	4412 Browns Dr (Lakefield Telephone Co. LLC)	City	Communication Facility	City of Two Rivers	No
Sewage Lift Station	Woodland Dr	City	Wastewater Treatment Facility	City of Two Rivers	No
Building (Switch Station)	1609 Adams St (GTE Telephone Operations)	City	Communication Facility	City of Two Rivers	No
Two Rivers Department Public Works	1415 Lake Street	City	Administrative Building	City of Two Rivers	No
Two Rivers Utility Shop & Office	1415 Lake Street	City	Administrative Building	City of Two Rivers	No
Lakeshore Substation	Memorial Dr & 12th St	City	Power Facility/Bulk Fuel Storage	City of Two Rivers	No
Water Supply Filter Treatment Plant	Memorial Dr	City	Water Supply	City of Two Rivers	No
500 kva Generator	Memorial Dr	City	Power Facility/Bulk Fuel Storage	City of Two Rivers	No
Two Rivers City Hall	1717 E Park St	City	Administrative Building	City of Two Rivers	No
Sewage Lift Station	Pierce St	City	Wastewater Treatment Facility	City of Two Rivers	No
Water Tower	2314 Picnic Hill Ln	City	Water Supply	City of Two Rivers	No
Sewage Lift Station	23rd St/Pine Tree Dr	City	Wastewater Treatment Facility	City of Two Rivers	No
US National Guard	2225 Sandy Bay Rd	City	Military Installation	City of Two Rivers	No
Aurora Two Rivers Clinic	2219 Garfield St	County 2019	Licensed Healthcare Facility	City of Two Rivers	No
Tower	2500 Garfield St	City	Communication Facility	City of Two Rivers	No
Cable TV Control Center	807 34th St (Charter Communications)	City	Communication Facility	City of Two Rivers	No
Sewage Lift Station	Pierce Ct	City	Wastewater Treatment Facility	City of Two Rivers	No
Sewage Lift Station	Blue Heron Dr	City	Wastewater Treatment Facility	City of Two Rivers	No
Sewage Lift Station	31st St	City	Wastewater Treatment Facility	City of Two Rivers	No
West River Substation	27th St & W River St	City	Power Facility/Bulk Fuel Storage	City of Two Rivers	No
Sewage Lift Station	W River St	City	Wastewater Treatment Facility	City of Two Rivers	No
Natural Gas Substation	1921 Columbus St	City	Power Facility/Bulk Fuel Storage	City of Two Rivers	No
Sub Station	2929 Hawthorne Ave	City	Power Facility/Bulk Fuel Storage	City of Two Rivers	No
Sewage Lift Station	Parkway Blvd	City	Wastewater Treatment Facility	City of Two Rivers	No
Sewage Lift Station	37th St	City	Wastewater Treatment Facility	City of Two Rivers	No
St. Johns Evangelical Lutheran	3607 45th St	County 2019	School	City of Two Rivers	No
Sewage Lift Station	CTH W (45th St)	City	Wastewater Treatment Facility	City of Two Rivers	No
Holy Family Memorial Two Rivers Health Center	3310 45th St	County 2019	Licensed Healthcare Facility	City of Two Rivers	No
Meadow View Assisted Living	4606 Methodist Rd	County 2019	Licensed Healthcare Facility	City of Two Rivers	No
Sewage Lift Station	Forest Hills Dr	City	Wastewater Treatment Facility	City of Two Rivers	No
Wisteria Haus Assisted Living	2741 45th St	County 2019	Licensed Healthcare Facility	City of Two Rivers	No
Sewage Lift Station	Riverhills Rd/Bellevue Pl	City	Wastewater Treatment Facility	City of Two Rivers	No
Sewage Lift Station	43rd St ?	City	Wastewater Treatment Facility	City of Two Rivers	No
Building (Switch Station)	2722 45th St (Lakefield Telephone Co. LLC)	City	Communication Facility	City of Two Rivers	No
Schleswig Town Hall	21935 Rockville Rd	Town	Administrative Building	Town of Schleswig	No
Power Facility	705 Washington Ave	ATC	Power Facility/Bulk Fuel Storage	City of Kiel	No
Kiel Police Department	619 Paine St	Hazus MH	Fire and Safety	City of Kiel	No
Divine Savior Catholic School	423 Fremont St	County 2019	School	City of Kiel	No
Kiel High	210 Raider Hts	County 2019	School	City of Kiel	No
Kiel Middle	502 Paine St	County 2019	School	City of Kiel	No
Zelania Elementary	1010 Adams St	County 2019	School	City of Kiel	No
Well #3, Water Storage Tower	1401 1st St	City	Water Supply	City of Kiel	No
Wastewater Treatment Facility	100 Rockville Rd	City	Wastewater Treatment Facility	City of Kiel	No
Well #4	501 CTH XX		Water Supply	City of Kiel	No
Well #5	355 Clay St	City	Water Supply	City of Kiel	No
Trinity Lutheran School	387 Cemetery Rd	County 2019	School	City of Kiel	No
Water Storage Tower	198 3rd St		Water Supply	City of Kiel	No
Kiel City Hall	621 6th St	County	Administrative Building	City of Kiel	No
Well #1	705 Washington St		Water Supply	City of Kiel	No
Natural Gas Substation	Point Creek Rd	Town	Power Facility/Bulk Fuel Storage	Town of Centerville	No
Building	1050 N Linden St		Communication Facility	Village of Cleveland	No
Cleveland Wastewater Treatment Facility	245 Whittail Ln	BLRPC	Wastewater Treatment Facility	Village of Cleveland	No
Wind Turbine	1290 North Ave		Power Facility/Bulk Fuel Storage	Village of Cleveland	No
Power Facility	W Washington Ave		Power Facility/Bulk Fuel Storage	Village of Cleveland	No
Cleveland Village Hall	1150 W Washington Ave	BLRPC	Administrative Building	Village of Cleveland	No
Sewage Lift Station	1151 Lakeshore Dr	Hazus MH	Wastewater Treatment Facility	Village of Cleveland	No
Lakeshore Technical College	1290 North Ave	County 2019	School	Village of Cleveland	No
Cleveland VA Clinic	1205 North Ave	County 2019	Licensed Healthcare Facility	Village of Cleveland	No
Cleveland Heights Mobile Home Park	115 Edgewood St	County 2019	Manufactured Housing	Village of Cleveland	No
Cleveland Fire Department	1274 W Washington Ave	Village	Fire and Safety	Village of Cleveland	No

Critical Facilities

NAME	ADDRESS	Source	Type	MCD	Floodplain
Water Tower	819 Polk Ln	County 2019	Water Supply	Village of Cleveland	No
Cleveland Police Department	1150 W Washington Ave	Village	Fire and Safety	Village of Cleveland	No
Well #1	1245 Park Ln	Village	Water Supply	Village of Cleveland	No
Well #2	1299 Franklin Dr	Village	Water Supply	Village of Cleveland	No
Manitowoc City Transit System	915 S 11th St	Hazus MH	Transportation Facility	City of Manitowoc	No
US Coast Guard	13 East St	BLRPC	Military Installation	City of Two Rivers	No
Bethany Evangelical Lutheran	3209 Meadow Ln	County 2019	School	City of Manitowoc	No
Tower	1024 S 9th St	BLRPC	Communication Facility	City of Manitowoc	No
McKinley Academy Charter	1010 Huron St	County 2019	School	City of Manitowoc	No
Manitowoc Public School District	2902 Lindbergh Dr	County	Administrative Building	City of Manitowoc	No
Mishicot Village Hall	511 E Main St	BLRPC	Administrative Building	Village of Mishicot	No
Mishicot Police Department	511 E Main St	BLRPC	Fire and Safety	Village of Mishicot	No
Manitowoc Fire Station 3	3820 Dewey St	County	Fire and Safety	City of Manitowoc	No
Manitowoc County Highway Shop	3500 STH 310	County	Administrative Building	Town of Kossuth	No
St Nazianz Village Hall	228 W Main St	County	Administrative Building	Village of St. Nazianz	No
Manitowoc County Highway Shop	318 W Main St	County	Administrative Building	Village of St. Nazianz	No
Mishicot Town Hall	710 N State St	BLRPC	Administrative Building	Village of Mishicot	No
Meeme Town Hall	15316 CTH X	BLRPC	Administrative Building	Town of Meeme	No
Manitowoc Town Hall	1822 Silver Creek Rd	BLRPC	Administrative Building	Town of Manitowoc	No
Manitowoc Rapids Town Hall	8624 CTH JJ	BLRPC	Administrative Building	Town of Manitowoc Rapids	No
Two Rivers Town Hall	6525 CTH B	BLRPC	Administrative Building	Town of Two Rivers	No
Franklin Town Hall	7524 CTH J	BLRPC	Administrative Building	Town of Franklin	No
K-Ville Mobile Home Park	444 Pleasant Ln	County 2019	Manufactured Housing	Village of Kellnersville	No
Building	1915 Mirro Dr (Seehafer Broadcasting)	County 2019	Communication Facility	City of Manitowoc	No
Small Steps Family Child Care	1025 1st St	County 2019	Licensed Childcare Facility	City of Kiel	No
Countryside Family Care Center	24322 Manitowoc Rd	County 2019	Licensed Childcare Facility	Town of Maple Grove	No
Wee Care - Jodi's Day Care	124 Jefferson St	County 2019	Licensed Childcare Facility	Village of Valders	No
Forever Friends Family Child Care	824 Randolph St	County 2019	Licensed Childcare Facility	Village of Mishicot	No
Kids Crayon Club	7219 CTH T	County 2019	Licensed Childcare Facility	Town of Kossuth	No
Tiny Treasures Christian Child Care	1029 33rd St	County 2019	Licensed Childcare Facility	City of Two Rivers	No
A Child's Place Day Care	2611 11th St	County 2019	Licensed Childcare Facility	City of Two Rivers	No
Lakeshore Child Care Center	3400 Division St	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Manitowoc/Two Rivers YMCA Child Development Center	205 Maritime Dr	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Cathey's Day Care Center	1314 Manila St	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Jesus' Lambs of Grace	2426 N Rapids Rd	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Kinderheit Haus Child Care	948 N 5th St	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Rise and Shine Child Care	1335 S 20th St	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Sue's Little Angels Day Care	912 N 12th St	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Lulu's House Family Child Care	1609 Viebahn St	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Tower	1615 Spring St	County	Communication Facility	City of Manitowoc	No
Tower	1815 Freedom Way	County	Communication Facility	City of Manitowoc	No
Tower	23233 Mueller Rd	County	Communication Facility	Town of Schleswig	No
Tower	4400 Michigan Ave	County	Communication Facility	City of Manitowoc	No
Radio Tower	4009 Viebahn St (Seehafer Broadcasting)	County	Communication Facility	City of Manitowoc	No
Tower	1015 S Lakeview Dr	County	Communication Facility	City of Manitowoc	No
Building	3730 Mangin St (Seehafer Broadcasting)	County	Communication Facility	City of Manitowoc	No
Radio Tower	4009 Viebahn St (Seehafer Broadcasting)	County	Communication Facility	City of Manitowoc	No
Radio Tower	4009 Viebahn St (Seehafer Broadcasting)	County	Communication Facility	City of Manitowoc	No
Radio Tower	4009 Viebahn St (Seehafer Broadcasting)	County	Communication Facility	City of Manitowoc	No
The Bay at North Ridge Health and Rehabilitation	1445 N 7th St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
River's Bend Health Services	950 S Rapids Rd	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Laurel Grove Assisted Living Center	1308 S 22nd St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Atrium Senior Living of Two Rivers at Northland	2500 Garfield St	County 2019	Licensed Healthcare Facility	City of Two Rivers	No
Sacred Heart Court	1903 Division St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
The Artisan Manitowoc	1480 N 7th St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Care Partners Manitowoc	1858 Mirro Dr	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Fieldcrest Manor	1510 S 30th St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Hannah Home I	4025 Delta St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Hannah Home II	3407 Wildwood Dr	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Harbor View Assisted Living	2115 Cappaert Road	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
HIL Lighthouse	1301 N 24th St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
HIL Whitetail Court	4705 W Whitetail Ct	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
HIL Wisconsin Home	1348 S 39th St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Kindredhearts Manitowoc	5005 Vista Rd	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Marco Services Inc	1114 S 11th St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
TLC Homes Oakwood	1220 S 8th St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Point Creek Home	1722 New York Ave	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Rainbow House	3100 Southbrook Ct	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Reifs Harmony House II	2303 Marshall Street	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Samaritan on 7th	622 North 7th St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
TLC Homes Fleetwood	4438 Fleetwood Drive	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
The Villa	1600 S 18th St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Whitetail Estates II	910 River Bluff Dr	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
St Mary's Home for the Aged	1635 S. 21st St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Field of Dreams	505 Belitz Dr	County 2019	Licensed Healthcare Facility	City of Kiel	No
Holy Family Memorial Harbor Town	1650 S 41st St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Holy Family Lakeshore Pediatrics	4303 Michigan Ave	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Bellin Health Manitowoc	3415 Custer St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Emergency Siren	CTH Q	County	Communication Facility	Town of Gibson	No
Emergency Siren	E Zander Rd & Stangel Rd	County	Communication Facility	Town of Mishicot	No
Emergency Siren	STH 42	County	Communication Facility	Town of Two Creeks	No
Emergency Siren	Saxonburg Rd	County	Communication Facility	Town of Mishicot	No
Emergency Siren	Nuclear Rd & Twin Elder Rd	County	Communication Facility	Town of Two Creeks	No
Emergency Siren	Chemey Rd	County	Communication Facility	Town of Mishicot	No
Emergency Siren	CTH V	County	Communication Facility	Town of Two Rivers	No
Emergency Siren	Division Dr and Rawley Rd	County	Communication Facility	Town of Mishicot	No
Emergency Siren	CTH V	County	Communication Facility	Town of Two Rivers	No
Emergency Siren	E Hillcrest Rd	County	Communication Facility	Town of Two Rivers	No
Emergency Siren	Crystal Springs Rd	County	Communication Facility	Town of Two Rivers	No
Emergency Siren	3900 block of Bellvue Pl	County	Communication Facility	City of Two Rivers	No
Emergency Siren	29th St & Adams St	County	Communication Facility	City of Two Rivers	No
Emergency Siren	2600 Block of 13th St	County	Communication Facility	City of Two Rivers	No
Emergency Siren	1002 E Cedar Ave	County	Communication Facility	City of Manitowoc	No
Emergency Siren	1605 N 8th St	County	Communication Facility	City of Manitowoc	No
Emergency Siren	26th St and Hamilton St	County	Communication Facility	City of Manitowoc	No
Emergency Siren	1115 Washington St	County	Communication Facility	City of Manitowoc	No
Emergency Siren	708 N Water St	County	Communication Facility	City of Manitowoc	No
Emergency Siren	4921 Expo Dr	County	Communication Facility	City of Manitowoc	No
Emergency Siren	N Rapids Rd & Menasha Ave	County	Communication Facility	City of Manitowoc	No
Emergency Siren	Fleetwood Dr	County	Communication Facility	City of Manitowoc	No
Emergency Siren	21st St & Viebahn St	County	Communication Facility	Town of Manitowoc	No
Emergency Siren	Harvest Cir & Broadway St	County	Communication Facility	City of Manitowoc	No
Emergency Siren	Dairyland Dr & W Washington Ave	County	Communication Facility	Village of Cleveland	No
Emergency Siren	411 E Washington Ave	County	Communication Facility	Village of Cleveland	No
Emergency Siren	207 S Liberty St	County	Communication Facility	Village of Valders	No
Emergency Siren	202 N 4th Ave	County	Communication Facility	Village of St. Nazianz	No
Emergency Siren	212 Church St	County	Communication Facility	Village of St. Nazianz	No

NAME	ADDRESS	Source	Type	MCD	Floodplain
Emergency Siren	1214 Main St	County	Communication Facility	Village of Kellnersville	No
Emergency Siren	520 Manitowoc St	County	Communication Facility	Village of Reedsville	No
Emergency Siren	417 Paine St	County	Communication Facility	City of Kiel	No
Emergency Siren	102 Rockville Rd	County	Communication Facility	City of Kiel	No
Communication Tower for Utility & Public Works Building (Switch Station)	1415 Lake Street	City	Communication Facility	City of Two Rivers	No
Shady Oaks Mobile Home Park LLC	2205 Forest Ave (Lakefield Telephone Co. LLC)	County	Communication Facility	City of Two Rivers	No
Affinity Medical	13835 Cedar Lake Rd	County 2019	Manufactured Housing	City of Kiel - Calumet County	No
Aurora Kiel Clinic	632 Fremont St	County 2019	Licensed Healthcare Facility	City of Kiel	No
Aurora Manitowoc Clinic	1001 Service Rd	County 2019	Licensed Healthcare Facility	City of Kiel	No
Manitowoc County Highway Shop	601 Reed Ave	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Manitowoc County Highway Shop	10510 I-43	TAC	Administrative Building	Town of Centerville	No
Menchaivre Fire Department	710 N State St	TAC	Administrative Building	Village of Mishicot	No
Water Reservoir	15331 County Rd K	TAC	Fire and Safety	Town of Franklin	No
Silver Lake College	3900 Bellevue Pl	TAC	Water Supply	City of Two Rivers	No
Sewage Lift Station	2406 S Alverno Rd	County 2019	School	City of Manitowoc	No
Sewage Lift Station	301 River Ter	City	Wastewater Treatment Facility	City of Kiel	No
Sewage Lift Station	access from Rockville Rd	City	Wastewater Treatment Facility	City of Kiel	No
Sewage Lift Station	Rockville Rd	City	Wastewater Treatment Facility	City of Kiel	No
Sewage Lift Station	402 8th St	City	Wastewater Treatment Facility	City of Kiel	No
Sewage Lift Station	1055 STH 57	City	Wastewater Treatment Facility	City of Kiel - Calumet County	No
Co HWY Dept Gravel Pit	S 15th St	County	Post-Disaster Recovery Site	Town of Manitowoc	No
Gravel Pit (Biese)	Glen Flora Rd	County	Post-Disaster Recovery Site	Town of Eaton	No
Gravel Pit (Brockner)	STH 67	County	Post-Disaster Recovery Site	Town of Eaton	No
Co HWY Dept Gravel Pit	7416 CTH J	County	Post-Disaster Recovery Site	Town of Liberty	No
Co HWY Dept Gravel Pit	16833 Christel Rd	County	Post-Disaster Recovery Site	Town of Liberty	No
Gravel Pit (Cherney Construction)	15201 CTH NN	County	Post-Disaster Recovery Site	Town of Cooperstown	No
Co HWY Dept Gravel Pit	12415 CTH Q	County	Post-Disaster Recovery Site	Town of Gibson	No
Co HWY Dept Gravel Pit	15233 CTH X	County	Post-Disaster Recovery Site	Town of Meeme	No
Gravel Pit (JPC Investments)	14511 CTH Z	County	Post-Disaster Recovery Site	Town of Cooperstown	No
Co HWY Dept Gravel Pit	Schaefer Rd	County	Post-Disaster Recovery Site	Town of Maple Grove	No
Co HWY Dept Gravel Pit	16800 Little Elkhart Lake Rd	County	Post-Disaster Recovery Site	Town of Schleswig	No
Co HWY Dept Gravel Pit	Robley Rd	County	Post-Disaster Recovery Site	Town of Liberty	No
Co HWY Dept Gravel Pit	3107 Fricke Dr	County	Post-Disaster Recovery Site	Town of Newton	No
Co HWY Dept Gravel Pit	14601 Lux Shapel Rd	County	Post-Disaster Recovery Site	Town of Schleswig	No
Co HWY Dept Gravel Pit	Tamarack Rd	County	Post-Disaster Recovery Site	Town of Maple Grove	No
Co HWY Dept Gravel Pit	3198 STH 147 W	County	Post-Disaster Recovery Site	Town of Gibson	No
Co HWY Dept Gravel Pit	CTH Q	County	Post-Disaster Recovery Site	Town of Kossuth	No
Co HWY Dept Gravel Pit	3304 STH 310	County	Post-Disaster Recovery Site	Town of Kossuth	No
Co HWY Dept Gravel Pit	16318 Little Elkhart Lake Rd	County	Post-Disaster Recovery Site	Town of Schleswig	No
Gravel Pit (Triple P)	CTH NN	County	Post-Disaster Recovery Site	Town of Cooperstown	No
Only Hwy Dept Gravel Pit	CTH F	County	Post-Disaster Recovery Site	Town of Liberty	No
Co HWY Dept Gravel Pit	CTH Q	County	Post-Disaster Recovery Site	Town of Kossuth	No
Co HWY Dept Gravel Pit	E Tapawingo Rd	County	Post-Disaster Recovery Site	Town of Mishicot	No
Co HWY Dept Gravel Pit	English Lake Rd	County	Post-Disaster Recovery Site	Town of Liberty	No
Co HWY Dept Gravel Pit	Lax Shapel Rd	County	Post-Disaster Recovery Site	Town of Schleswig	No
Gravel Pit (Litz)	Glen Flora Rd	County	Post-Disaster Recovery Site	Town of Eaton	No
Co HWY Dept Gravel Pit	9803 Long Lake Rd	County	Post-Disaster Recovery Site	Town of Maple Grove	No
Co HWY Dept Gravel Pit	15322 CTH C	County	Post-Disaster Recovery Site	Town of Liberty	No
Co HWY Dept Gravel Pit	3500 STH 310	County	Post-Disaster Recovery Site	Town of Kossuth	No
Co HWY Dept Gravel Pit	CTH VV	County	Post-Disaster Recovery Site	Town of Two Rivers	No
Gravel Pit (Sauer)	1534 Highway H Rd	County	Post-Disaster Recovery Site	Town of Cato	No
Co HWY Dept Gravel Pit	Mineral Springs Rd	County	Post-Disaster Recovery Site	Town of Meeme	No
Co HWY Dept Gravel Pit (Olm)	Hickory Hills Rd	County	Post-Disaster Recovery Site	Town of Eaton	No
Co HWY Dept Gravel Pit	13701 English Lake Rd	County	Post-Disaster Recovery Site	Town of Liberty	No
Co HWY Dept Gravel Pit	Parkway Rd	County	Post-Disaster Recovery Site	Town of Kossuth	No
Co HWY Dept Gravel Pit	Reifs Mills Rd	County	Post-Disaster Recovery Site	Town of Kossuth	No
Co HWY Dept Gravel Pit	5202 Silver Creek Rd	County	Post-Disaster Recovery Site	Town of Newton	No
Co HWY Dept Gravel Pit	4005 Rockwood Rd	County	Post-Disaster Recovery Site	Town of Kossuth	No
Gravel Pit (MCC)	12599 Hidden Valley Rd	County	Post-Disaster Recovery Site	Town of Cooperstown	No
Co HWY Dept Gravel Pit	English Lake Rd	County	Post-Disaster Recovery Site	Town of Liberty	No
Co HWY Dept Gravel Pit	2941 STH 147 W	County	Post-Disaster Recovery Site	Town of Gibson	No
Co HWY Dept Gravel Pit	6800 Manitou Dr	County	Post-Disaster Recovery Site	Town of Two Rivers	No
Co HWY Dept Gravel Pit (Sukowaty)	USH 151	County	Post-Disaster Recovery Site	Town of Eaton	No
Co HWY Dept Gravel Pit	Quarry Rd	County	Post-Disaster Recovery Site	Town of Rockland	No
Co HWY Dept Gravel Pit	Quarry Ln	County	Post-Disaster Recovery Site	Village of Valders	No
Co HWY Dept Gravel Pit	CTH C	County	Post-Disaster Recovery Site	Town of Liberty	No
Co HWY Dept Gravel Pit	CTH C	County	Post-Disaster Recovery Site	Town of Liberty	No
Gravel Pit (Graymont Western Lime)	16377 Lime Kiln Rd	County	Post-Disaster Recovery Site	Town of Cato	No
Co HWY Dept Gravel Pit	CTH Q	County	Post-Disaster Recovery Site	Town of Gibson	No
Manitowoc County Office Complex	4319 Expo Dr	County	Administrative Building	City of Manitowoc	No
Gravel Pit (Kolank)	Cooperstown Rd	County	Post-Disaster Recovery Site	Town of Cooperstown	No
Kellnersville Fire Department and First Responders	807 Main St	Village	Fire and Safety	Village of Kellnersville	No
Sewage Lift Station	Zeman Rd	Village	Wastewater Treatment Facility	Village of Kellnersville	No
Waste Storage	E Tapawingo Rd	Town	Power Facility/Bulk Fuel Storage	Town of Two Creeks	No
Wotachek Pond	18804 STH 42	Town	Fire and Safety	Town of Two Creeks	No
Sprang Pond	16704 Lakeshore Dr	Town	Fire and Safety	Town of Two Creeks	No
Harpt Lake Boat Landing (dry hydrant)	6001 North Lake Rd	Town	Fire and Safety	Town of Gibson	No
Cenex	Avery Rd	Town	Power Facility/Bulk Fuel Storage	Town of Gibson	No
Schaus (LP tank fill station)	3200 STH 147 W	Town	Power Facility/Bulk Fuel Storage	Town of Gibson	No
Utility Support Building	1418 S Main St	Village	Administrative Building	Village of Mishicot	No
Sewage Lift Station 2	676 E Church St	Village	Wastewater Treatment Facility	Village of Mishicot	No
Sewage Lift Station 3	400 Washington St	Village	Wastewater Treatment Facility	Village of Mishicot	No
Sewage Lift Station 4	E Samz Rd/S State St	Village	Wastewater Treatment Facility	Village of Mishicot	No
Sewage Lift Station 5	139 W Church St	Village	Wastewater Treatment Facility	Village of Mishicot	No
Sewage Lift Station 6	Riverwood Dr/Riverwood Ct	Village	Wastewater Treatment Facility	Village of Mishicot	No
Sewage Lift Station 1	Laduron Dr	Village	Wastewater Treatment Facility	Village of Mishicot	No
Fox Hills Pond (dry hydrant)	898 W Samz Rd	Village	Fire and Safety	Village of Mishicot	No
Water Tower	3145 Basswood Rd	City	Water Supply	Town of Manitowoc Rapids	No
Public Utilities	15201/1540 Dewey St	City	Administrative Building	City of Manitowoc	No
Manitowoc Two Rivers YMCA - Onon	2210 Woodland Dr	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Sewage Lift Station	2511 Lakeside Blvd	City	Wastewater Treatment Facility	City of Manitowoc	No
Sewage Lift Station	3201 S 10th St	City	Wastewater Treatment Facility	City of Manitowoc	No
Sewage Lift Station	1396 Irving Cr	City	Wastewater Treatment Facility	City of Manitowoc	No
Sewage Lift Station	1800 E Horseshoe Dr	City	Wastewater Treatment Facility	City of Manitowoc	No
Sewage Lift Station	2329 Silveredge Dr	City	Wastewater Treatment Facility	City of Manitowoc	No
Sewage Lift Station	500 S 16th St	City	Wastewater Treatment Facility	City of Manitowoc	No
Sewage Lift Station	2319 S 14th St	City	Wastewater Treatment Facility	City of Manitowoc	No
Sewage Lift Station	5023 River Heights Dr	City	Wastewater Treatment Facility	City of Manitowoc	No
Sewage Lift Station	2300 Paul Rd	City	Wastewater Treatment Facility	City of Manitowoc	No
Sewage Lift Station	911 Lawton Ter	City	Wastewater Treatment Facility	City of Manitowoc	No
Sewage Lift Station	820 Marline Dr	City	Wastewater Treatment Facility	City of Manitowoc	No
Lakeshore Tech College Child Care	1290 North Avenue	County 2019	Licensed Childcare Facility	Village of Cleveland	No
Precious Memories Daycare LLC	132 W Menasha Avenue	County 2019	Licensed Childcare Facility	Village of Whitelaw	No
Chatterbox Child Learning Center	65 Riverview Road	County 2019	Licensed Childcare Facility	City of Kiel	No
Chatterbox Kids Campus	510 Woodlawn Dr	County 2019	Licensed Childcare Facility	Village of Mishicot	No
Chatterbox Kids Campus - Valders	331 Wilson Street	County 2019	Licensed Childcare Facility	Village of Valders	No
Falling Star Child Care LLC	1501 N Rapids Road	County 2019	Licensed Childcare Facility	City of Manitowoc	No

NAME	ADDRESS	Source	Type	MCD	Floodplain
Kiel Cooperative Preschool	621 6th Street	County 2019	Licensed Childcare Facility	City of Kiel	No
Good Shepherd Lutheran Preschool 4k	3234 Michicot Road	County 2019	Licensed Childcare Facility	City of Two Rivers	No
The Peanut Gallery CC and Learning Center	2411 Wolmer Street	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Manitowoc Two Rivers YMCA SACC - Franklin	800 S 35th Street	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Man-Tr YMCA - Madison	701 N 4th Street	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Manitowoc Two Rivers YMCA - Riverview	4400 Michigan Avenue	County 2019	Licensed Childcare Facility	City of Manitowoc	No
St Peter's Lutheran Tiny Treasures Preschool	325 Randolph St	County 2019	Licensed Childcare Facility	Village of Mishicot	No
Redeemer Lutheran Christian Preschool	1712 Menasha Ave	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Follow Your Heart Learning Center LLC	2132 32nd Street	County 2019	Licensed Childcare Facility	City of Two Rivers	No
Happy Hearts Childcare	440 Elizabeth Street	County 2019	Licensed Childcare Facility	Village of Mishicot	No
Creative Learning Child Enrichment Center	4404 Bellevue Pl	County 2019	Licensed Childcare Facility	City of Two Rivers	No
Creative Kids Club	3502 Glenwood Street	County 2019	Licensed Childcare Facility	City of Two Rivers	No
CESA 7 Head Start - Manitowoc	4400 Michigan Avenue	County 2019	Licensed Childcare Facility	City of Manitowoc	No
CESA 7 Head Start - Two Rivers	3234 Michicot Road	County 2019	Licensed Childcare Facility	City of Two Rivers	No
CESA 7 Head Start	1130 S 9th Street	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Building Blocks Day Care Center and Preschool	315 S Adams Street	County 2019	Licensed Childcare Facility	Village of Valders	No
Children's House Montessori of Manitowoc	4020 Memorial Drive	County 2019	Licensed Childcare Facility	City of Two Rivers	No
Cooperative Nursery Center Preschool	501 8th Street	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Learning Center	1630 28th Street	County 2019	Licensed Childcare Facility	City of Two Rivers	No
Magic Ladder Nursery School	255 Roosevelt Street	County 2019	Licensed Childcare Facility	Village of Valders	No
St Gregory Preschool and Daycare	212 Church Street	County 2019	Licensed Childcare Facility	Village of St. Nazianz	No
St Peter the Fisherman Preschool	2203 12th Street	County 2019	Licensed Childcare Facility	City of Two Rivers	No
Trinity Christian School 4-year-old Kindergarten	2201 S 42nd St	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Two Rivers Nursery School	1218 Madison Street	County 2019	Licensed Childcare Facility	City of Two Rivers	No
Ashling Montessori School	2005 Johnston Dr	County 2019	Licensed Childcare Facility	City of Manitowoc	No
Ascension Medical Group Kiel	1160 Servic Rd, Kiel	County 2019	Licensed Healthcare Facility	City of Kiel	No
Pathways to a Better Life 2 LLC	13127 Lax Chapel Rd, Kiel	County 2019	Licensed Healthcare Facility	Town of Schleswig	No
Pathways to a Better Life 1 LLC	13111 Lax Chapel Rd, Kiel	County 2019	Licensed Healthcare Facility	Town of Schleswig	No
Aurora Valders Clinic	106 Wilson St, Valders	County 2019	Licensed Healthcare Facility	Village of Valders	No
The Willows	611 Washington St, Mishicot	County 2019	Licensed Healthcare Facility	Village of Mishicot	No
Holy Family Lakefront Campus	800 Lakefront Way, Two Rivers	County 2019	Licensed Healthcare Facility	City of Two Rivers	No
TLC Homes East Cedar	705 E Cedar Ave	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Vista Care North 21st Street AFH	2127 Menasha Ave, Manitowoc	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
TLC Homes Cappaert Road	2233 Cappaert Rd, Manitowoc	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Hi The Winds	2408 Knuehl St, Manitowoc	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Vista Care Kimberly Circle AFH	3302 Kimberly Circle, Manitowoc	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
TLC Homes Paul Road	2213 Paul Rd, Manitowoc	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Vista Care Rock Street AFH	4020 Rock St, Manitowoc	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Orthopedic Associates	501 N. 10th St, Manitowoc	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Lakeshore Community Health Care	2719 Calumet Ave	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Hi Wisconsin Home	1350 S 39th St	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Prevea Manitowoc Health Center	4810 Expo Dr	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Vista Care Expo Drive AFH	5053 Expo Dr, Manitowoc	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Tender Reflections of Manitowoc	2210 Dufek Dr	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Aurora Manitowoc Clinic	4100 Dewey Ave	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Aurora Manitowoc Clinic	3509 Dewey Ave	County 2019	Licensed Healthcare Facility	City of Manitowoc	No
Hi Newport Home	3609 Hecker Rd	County 2019	Licensed Healthcare Facility	Town of Newton	No
Kiel Elementary	416 Paine St	County 2019	School	City of Kiel	No
Saint Francis of Assisi Elementary	223 Manitowoc St	County 2019	School	Village of Reedsville	No
Lakeside Mennonite School	722 Hillview Road	County 2019	School	Town of Gibson	No
Lighthouse Learning Acad	4521 Lincoln Ave	County 2019	School	City of Two Rivers	No
Life Academy	2810 Wolmer St	County 2019	School	City of Manitowoc	No
Saint Francis of Assisi Middle	2109 Marshall St	County 2019	School	City of Manitowoc	No
Saint Mary/Saint Michael School	19 S CTH J	County 2019	School	Town of Cato	No
St. John's Lutheran School	14323 S Maribel Rd	County 2019	School	Village of Maribel	No
UW Green Bay - Manitowoc Campus	705 Viebahn St	County 2019	School	City of Manitowoc	No
Cleveland Elementary School	411 E Washington Ave	County 2019	School	Village of Cleveland	No
Northeast Wisconsin Montessori School	411 E Washington Ave	County 2019	School	Village of Cleveland	No
Meeme Leads Charter School	12121 XX	County 2019	School	Town of Meeme	No
Collins Marsh Sub-impound	Trib. of Mud Creek	DNR 2019	Dam	Town of Rockland	No
9360013	DAIRYLAND DR / FISCHER CREEK	County/HSI 2019	Bridge	Town of Centerville	No
9360016	DAIRYLAND DR / SOUTH BRANCH OF CENTERVILLE CREEK	County/HSI 2019	Bridge	Town of Centerville	No
9360029	USH 10-STH 42-WALDO BLVD / WISCONSIN CENTRAL RR	County/HSI 2019	Bridge	City of Manitowoc	No
9360030	CTH R / DEVILS RIVER STATE TRAIL	County/HSI 2019	Bridge	Town of Gibson	No
9360034	N CTH J / BRANCH OF BRANCH RIVER	County/HSI 2019	Bridge	Town of Cato	No
9360037	CLEVELAND RD / I-43	County/HSI 2019	Bridge	Town of Centerville	No
9360039	CTH XX / I-43	County/HSI 2019	Bridge	Town of Centerville	No
9360040	I-43 SB / CTH F	County/HSI 2019	Bridge	Town of Newton	No
9360041	I-43 NB / NEWTON RD	County/HSI 2019	Bridge	Town of Newton	No
9360042	I-43 SB / WESTVIEW RD	County/HSI 2019	Bridge	Town of Centerville	No
9360043	FISCHER CREEK RD / I-43	County/HSI 2019	Bridge	Town of Centerville	No
9360045	CTH X / I-43	County/HSI 2019	Bridge	Town of Centerville	No
9360046	POINT CREEK RD / I-43	County/HSI 2019	Bridge	Town of Centerville	No
9360048	I-43 NB / CTH F	County/HSI 2019	Bridge	Town of Centerville	No
9360052	I-43 SB / CARSTENS LAKE RD	County/HSI 2019	Bridge	Town of Newton	No
9360053	I-43 NB / CARSTENS LAKE RD	County/HSI 2019	Bridge	Town of Newton	No
9360056	I-43 SB / CLOVER RD	County/HSI 2019	Bridge	Town of Newton	No
9360057	I-43 NB / CLOVER RD	County/HSI 2019	Bridge	Town of Newton	No
9360058	I-43 / PINE CREEK	County/HSI 2019	Bridge	Town of Newton	No
9360059	SILVER CREEK RD / I-43	County/HSI 2019	Bridge	Town of Newton	No
9360061	I-43 NB / WESTVIEW RD	County/HSI 2019	Bridge	Town of Centerville	No
9360062	CTH CL-VIEBAHN ST / I-43	County/HSI 2019	Bridge	City of Manitowoc	No
9360063	USH 151-STH 42 NB / I-43	County/HSI 2019	Bridge	City of Manitowoc	No
9360065	I-43 SB-STH 42 SB / CTH CS-W CUSTER ST	County/HSI 2019	Bridge	Town of Manitowoc Rapids	No
9360066	I-43 NB-STH 42 NB / CTH CS-W CUSTER ST	County/HSI 2019	Bridge	Town of Manitowoc Rapids	No
9360067	I-43 SB-STH 42 SB / Wisconsin Central RR	County/HSI 2019	Bridge	Town of Manitowoc Rapids	No
9360068	I-43 NB-STH 42 NB / Wisconsin Central RR	County/HSI 2019	Bridge	Town of Manitowoc Rapids	No
9360069	MIDDLE RD / I-43-STH 42	County/HSI 2019	Bridge	Town of Manitowoc Rapids	No
9360070	I-43 SB / USH 10 EB-STH 42 SB	County/HSI 2019	Bridge	Town of Manitowoc Rapids	No
9360071	I-43 NB / USH 10 EB-STH 42 SB	County/HSI 2019	Bridge	Town of Manitowoc Rapids	No
9360077	I-43 SB / USH 10 WB-STH 310	County/HSI 2019	Bridge	Town of Kossuth	No
9360078	I-43 NB / USH 10 WB-STH 310	County/HSI 2019	Bridge	Town of Manitowoc Rapids	No
9360079	ROCKWOOD RD / I-43	County/HSI 2019	Bridge	Town of Kossuth	No
9360080	REIFS MILL RD / I-43	County/HSI 2019	Bridge	Town of Kossuth	No
9360081	CTH V-HILLCREST RD / I-43	County/HSI 2019	Bridge	Town of Kossuth	No
9360083	HIDDEN VALLEY RD / I-43	County/HSI 2019	Bridge	Town of Cooperstown	No
9360084	POLIFKA RD / I-43	County/HSI 2019	Bridge	Town of Kossuth	No
9360085	CTH P-HOMESTEAD RD / I-43-USH 10	County/HSI 2019	Bridge	Town of Manitowoc Rapids	No
9360086	I-43 SB / CTH K	County/HSI 2019	Bridge	Town of Kossuth	No
9360087	I-43 NB / CTH K	County/HSI 2019	Bridge	Town of Kossuth	No
9360088	FISCHERVILLE RD / I-43	County/HSI 2019	Bridge	Town of Kossuth	No
9360089	ZANDER RD / I-43	County/HSI 2019	Bridge	Town of Cooperstown	No
9360090	GREENSTREET RD / I-43	County/HSI 2019	Bridge	Town of Cooperstown	No
9360091	I-43 SB / DEVILS RIVER STATE TRAIL	County/HSI 2019	Bridge	Town of Cooperstown	No
9360092	I-43 NB / DEVILS RIVER STATE TRAIL	County/HSI 2019	Bridge	Town of Cooperstown	No
9360093	I-43 SB / STH 147	County/HSI 2019	Bridge	Town of Cooperstown	No
9360094	I-43 NB / STH 147	County/HSI 2019	Bridge	Town of Cooperstown	No

NAME	ADDRESS	Source	Type	MCD	Floodplain
B360095	I-43 SB / SCHLEY RD	CountyHSI 2019	Bridge	Town of Cooperstown	No
B360096	I-43 NB / SCHLEY RD	CountyHSI 2019	Bridge	Town of Cooperstown	No
B360099	I-43 NB / CTH T	CountyHSI 2019	Bridge	Town of Cooperstown	No
B360100	I-43 SB / CTH T	CountyHSI 2019	Bridge	Town of Cooperstown	No
B360101	I-43 SB / DEVILS RIVER STATE TRAIL	CountyHSI 2019	Bridge	Town of Cooperstown	No
B360102	I-43 NB / DEVILS RIVER STATE TRAIL	CountyHSI 2019	Bridge	Town of Cooperstown	No
B360103	I-43 SB / ROSECRANS RD	CountyHSI 2019	Bridge	Town of Cooperstown	No
B360104	I-43 NB / ROSECRANS RD	CountyHSI 2019	Bridge	Town of Cooperstown	No
B360106	18TH ST / SPRING ST CONNECTOR	CountyHSI 2019	Bridge	City of Manitowoc	No
B360114	USH 10 WB-STH 42 SB-WALDO BLVD / WHITEWATER DR	CountyHSI 2019	Bridge	Town of Manitowoc Rapids	No
B360115	USH 10 EB-STH 42 NB-WALDO BLVD / WHITEWATER DR	CountyHSI 2019	Bridge	Town of Manitowoc Rapids	No
B360116	WISCONSIN CENTRAL RR / DEWEY ST	CountyHSI 2019	Bridge	City of Manitowoc	No
B360122	REVERE DR SB / MANITOWOC RIVER	CountyHSI 2019	Bridge	City of Manitowoc	No
B3601280003	USH 10 EB-10TH ST / MANITOWOC RIVER	CountyHSI 2019	Bridge	City of Manitowoc	No
B360130	ZANDER RD / DEVILS RIVER STATE TRAIL	CountyHSI 2019	Bridge	Town of Cooperstown	No
B360138	CTH W / BRANCH OF MUD CREEK	CountyHSI 2019	Bridge	Town of Rockland	No
B360143	CTH B / WEST TWIN RIVER	CountyHSI 2019	Bridge	Town of Two Rivers	No
B360148	COOPERSTOWN RD / TRIBUTARY OF THE DEVILS RIVER	CountyHSI 2019	Bridge	Town of Cooperstown	No
B360158	BOXWOOD RD / BRANCH OF MUD CREEK	CountyHSI 2019	Bridge	Town of Rockland	No
B360159	CTH BB / BLACK CREEK	CountyHSI 2019	Bridge	Town of Gibson	No
B360170	PINE RIVER RD / POINT CREEK	CountyHSI 2019	Bridge	Town of Liberty	No
B360178	STH 42 / S TWO CREEKS	CountyHSI 2019	Bridge	Town of Two Creeks	No
B360179	NEWTON RD / POINT CREEK	CountyHSI 2019	Bridge	Town of Newton	No
B360180	STH 42 / TRIB. TO MEEME CR	CountyHSI 2019	Bridge	Town of Meeme	No
B360181	STH 42 / TRIB. TO POINT CREEK	CountyHSI 2019	Bridge	Town of Newton	No
B360224	CTH X / TRIB. TO SHEBOYGAN RIVER	CountyHSI 2019	Bridge	Town of Schleswig	No
B360227	STH 42 / UNNAMED TRIB. TO LAKE MICHIGAN	CountyHSI 2019	Bridge	Town of Two Creeks	No
B360229	S UNION RD / POINT CREEK	CountyHSI 2019	Bridge	Town of Newton	No
B360231	I-43 SB / NEWTON RD	CountyHSI 2019	Bridge	Town of Newton	No
B360317	SHOTO RD / BRANCH OF WEST TWIN RIVER	CountyHSI 2019	Bridge	Town of Kossuth	No
B360461	STH 42 / SILVER CREEK	CountyHSI 2019	Bridge	Town of Manitowoc	No
C360002	I-43 / TRIB. TO FISCHER CREEK	CountyHSI 2019	Bridge	Town of Centerville	No
C360005	STH 42 / MOLASH CREEK	CountyHSI 2019	Bridge	Town of Two Rivers	No
C360006	STH 42 / Unnamed Creek	CountyHSI 2019	Bridge	Town of Two Creeks	No
C360007	STH 42 / Unnamed Creek	CountyHSI 2019	Bridge	Town of Two Creeks	No
C360008	STH 42 / Unnamed Creek	CountyHSI 2019	Bridge	Town of Two Creeks	No
C360010	STH 42 / Drainage Way	CountyHSI 2019	Bridge	Town of Two Creeks	No
C360011	STH 42 / Drainage Way	CountyHSI 2019	Bridge	Town of Two Creeks	No
C360013	STH 42 / Drainage Way	CountyHSI 2019	Bridge	City of Two Rivers	No
C360014	STH 147-S MAIN ST / TRIB. TO EAST TWIN RIVER	CountyHSI 2019	Bridge	Town of Mishicot	No
C360015	STH 147 / Unnamed Creek	CountyHSI 2019	Bridge	Town of Mishicot	No
C360019	I-43 / Unnamed Creek	CountyHSI 2019	Bridge	Town of Centerville	No
C360020	I-43 / PINE CREEK	CountyHSI 2019	Bridge	Town of Newton	No
C360021	I-43 / SOUTH BRANCH OF CENTERVILLE CREEK	CountyHSI 2019	Bridge	Town of Centerville	No
C360025	I-43 / Unnamed Creek	CountyHSI 2019	Bridge	Town of Kossuth	No
C360026	STH 147-S MAIN ST / JOHNSON CREEK	CountyHSI 2019	Bridge	Village of Mishicot	No
C360028	I-43 / KRIWANAK CREEK	CountyHSI 2019	Bridge	Town of Cooperstown	No
C360034	CTH W / NORTH BRANCH OF MUD CREEK	CountyHSI 2019	Bridge	Town of Rockland	No
C360035	STH 42 / POINT CREEK	CountyHSI 2019	Bridge	Town of Newton	No
C360037	USH 10 / TRIB. OF BRANCH RIVER	CountyHSI 2019	Bridge	Town of Cato	No
C360039	GRIMMS RD / TRIB. TO BRANCH RIVER	CountyHSI 2019	Bridge	Town of Cato	No
C360046	STH 32 / MILLHOME CREEK	CountyHSI 2019	Bridge	Town of Schleswig	No
C360058	USH 10 / Unnamed Creek	CountyHSI 2019	Bridge	Town of Maple Grove	No
C360090	I-43 / Unnamed Creek	CountyHSI 2019	Bridge	Town of Cooperstown	No
C360784	USH 151 / UNNAMED CREEK	CountyHSI 2019	Bridge	Town of Eaton	No
C360785	USH 151 / TRIB. TO MANITOWOC RIVER	CountyHSI 2019	Bridge	Town of Eaton	No
C361016	STH 42 / Drainage way	CountyHSI 2019	Bridge	City of Two Rivers	No
C361024	STH 42 / DRAINAGE WAY	CountyHSI 2019	Bridge	Town of Newton	No
P360068	OLD Q RD / TRIB. TO WEST TWIN RIVER	CountyHSI 2019	Bridge	Town of Kossuth	No
P360094	COOPERSTOWN RD / TRIBUTARY OF THE DEVILS RIVER	CountyHSI 2019	Bridge	Town of Cooperstown	No
P360105	KVITEK RD / DEVILS RIVER	CountyHSI 2019	Bridge	Town of Cooperstown	No
P360127	FRANCIS CREEK RD / TRIB. TO FRANCIS CREEK	CountyHSI 2019	Bridge	Town of Kossuth	No
P360130	CHURCH ST / TRIB. TO EAST TWIN RIVER	CountyHSI 2019	Bridge	Town of Mishicot	No
P360154	OLD WOODEN BRIDGE RD / SOO LINE	CountyHSI 2019	Bridge	Town of Cato	No
P360156	MANITOWOC RD / TRIB. OF MUD CREEK	CountyHSI 2019	Bridge	Town of Rockland	No
P360160	HILLTOP RD / MUD CREEK	CountyHSI 2019	Bridge	Town of Rockland	No
P360171	CTH U / PINE CREEK	CountyHSI 2019	Bridge	Town of Newton	No
P360191	WILLMAS RD / MEEME RIVER	CountyHSI 2019	Bridge	Town of Meeme	No
P360199	POINT CREEK RD / TRIB TO SHEBOYGAN RIVER	CountyHSI 2019	Bridge	Town of Schleswig	No
P360903	DEVILS RIVER STATE TRAIL / HOSTAK RD	CountyHSI 2019	Bridge	Town of Cooperstown	No
P360911	LAKE SHORE RD / RABE FOREST CREEK	CountyHSI 2019	Bridge	Town of Two Rivers	No
P360920	CTH Q / TRIB. OF WEST TWIN RIVER	CountyHSI 2019	Bridge	Town of Kossuth	No
P360924	E CTH V / TRIB. OF EAST TWIN RIVER	CountyHSI 2019	Bridge	Town of Mishicot	No
P360927	BOOT LAKE RD / LONG LAKE TRIB	CountyHSI 2019	Bridge	Town of Rockland	No
P360935	CTH X / FISCHER CREEK	CountyHSI 2019	Bridge	Town of Centerville	No
P360942	LAKE SHORE RD / TRIB. TO LAKE MICHIGAN	CountyHSI 2019	Bridge	Town of Two Creeks	No
Cell Tower	4004 N CTH J	County 2019	Communication Facility	Town of Cato	No
Cell Tower	13615 McGuire Rd	County 2019	Communication Facility	Town of Cato	No
Cell Tower	15709 Limestone Rd	County 2019	Communication Facility	Town of Cato	No
Cell Tower	13003 USH 151	County 2019	Communication Facility	Town of Cato	No
Cell Tower	16317 Dairyland Dr	County 2019	Communication Facility	Town of Centerville	No
Cell Tower	West View Rd	County 2019	Communication Facility	Town of Centerville	No
Cell Tower	10167 Schley Rd	County 2019	Communication Facility	Town of Cooperstown	No
Cell Tower	8304 Paulz Rd	County 2019	Communication Facility	Town of Cooperstown	No
Cell Tower	22520 Croh Rd	County 2019	Communication Facility	Town of Eaton	No
Cell Tower	9388 Menchaville Rd	County 2019	Communication Facility	Town of Franklin	No
Cell Tower	16818 Long Rd	County 2019	Communication Facility	Town of Franklin	No
Cell Tower	7318 Old Y Rd	County 2019	Communication Facility	Town of Gibson	No
Cell Tower	11000 Thunder Rd	County 2019	Communication Facility	Town of Kossuth	No
Cell Tower	11315 CTH T	County 2019	Communication Facility	Town of Kossuth	No
Cell Tower	9635 Hillside Ln	County 2019	Communication Facility	Town of Kossuth	No
Cell Tower	7500 Village Dr	County 2019	Communication Facility	Town of Kossuth	No
Cell Tower	7500 Village Dr	County 2019	Communication Facility	Town of Kossuth	No
Cell Tower	5102 Marken Rd	County 2019	Communication Facility	Town of Liberty	No
Cell Tower	15562 CTH C	County 2019	Communication Facility	Town of Liberty	No
Cell Tower	9526 Hilltop Rd	County 2019	Communication Facility	Town of Manitowoc Rapids	No
Cell Tower	6492 Homestead Rd	County 2019	Communication Facility	Town of Manitowoc Rapids	No
Cell Tower	5712 CTH JJ	County 2019	Communication Facility	Town of Manitowoc Rapids	No
Cell Tower	2033 Highway H RD	County 2019	Communication Facility	Town of Manitowoc Rapids	No
Cell Tower	9630 Old 151 Rd	County 2019	Communication Facility	Town of Manitowoc Rapids	No
Cell Tower	Oakwood Rd / USH 10	County 2019	Communication Facility	Town of Maple Grove	No
Cell Tower	20400 Manitowoc Rd	County 2019	Communication Facility	Town of Maple Grove	No
Cell Tower	15318 CTH X	County 2019	Communication Facility	Town of Meeme	No
Cell Tower	11932 CTH X	County 2019	Communication Facility	Town of Meeme	No
Cell Tower	13103 Moraine Rd	County 2019	Communication Facility	Town of Meeme	No
Cell Tower	15007 CTH XX	County 2019	Communication Facility	Town of Meeme	No
Cell Tower	9940 STH 147	County 2019	Communication Facility	Town of Mishicot	No

Critical Facilities

NAME	ADDRESS	Source	Type	MCD	Floodplain
Cell Tower	2786 Sturm Rd	County 2019	Communication Facility	Town of Mishicot	No
Cell Tower	5405 CTH CR	County 2019	Communication Facility	Town of Newton	No
Cell Tower	4014 Carstens Lake Rd	County 2019	Communication Facility	Town of Newton	No
Cell Tower	9542 CTH C	County 2019	Communication Facility	Town of Newton	No
Cell Tower	9407 Newton Rd	County 2019	Communication Facility	Town of Newton	No
Radio Tower	7914 CTH F (Seehafer Broadcasting)	County 2019	Communication Facility	Town of Newton	No
Cell Tower	9431 Center Rd	County 2019	Communication Facility	Town of Newton	No
Cell Tower	5622 CTH F	County 2019	Communication Facility	Town of Newton	No
Cell Tower	13426 Meggers Rd	County 2019	Communication Facility	Town of Schleswig	No
Cell Tower	14000 Louis Corners Rd	County 2019	Communication Facility	Town of Schleswig	No
Cell Tower	23233 MUELLER RD	County 2019	Communication Facility	Town of Schleswig	No
Cell Tower	6010 Nuclear Rd	County 2019	Communication Facility	Town of Two Creeks	No
Cell Tower	5036 Lehmann Rd	County 2019	Communication Facility	Town of Two Creeks	No
Cell Tower	4802 CTH V	County 2019	Communication Facility	Town of Two Creeks	No
Cell Tower	6220 STH 42	County 2019	Communication Facility	Town of Two Rivers	No
Cell Tower	6200 STH 42	County 2019	Communication Facility	Town of Two Rivers	No
Cell Tower	3607 Maplewood Rd	County 2019	Communication Facility	Town of Two Rivers	No
Cell Tower	5103 CTH B	County 2019	Communication Facility	Town of Two Rivers	No
Cell Tower	6229 Greenfield Ln	County 2019	Communication Facility	Town of Two Rivers	No
Cell Tower	10416 E Belmar Rd	County 2019	Communication Facility	Village of Maribel	No
Cell Tower	819 Polk Ln	County 2019	Communication Facility	Village of Cleveland	No
Cell Tower	621 6th St	County 2019	Communication Facility	City of Kiel	No
Cell Tower	198 3rd St	County 2019	Communication Facility	City of Kiel	No
Cell Tower	2701 18th St	County 2019	Communication Facility	City of Two Rivers	No
Cell Tower	2318 Plonic Hill Ln	County 2019	Communication Facility	City of Two Rivers	No
Cell Tower	800 Columbus St	County 2019	Communication Facility	City of Two Rivers	No
Cell Tower	4410 Custer St	County 2019	Communication Facility	City of Manitowoc	No
Cell Tower	2515 Viebahn St	County 2019	Communication Facility	City of Manitowoc	No
Cell Tower	1915 Mirro Dr	County 2019	Communication Facility	City of Manitowoc	No
Cell Tower	1915 Mirro Dr	County 2019	Communication Facility	City of Manitowoc	No
Cell Tower	221 S Rockway St	County 2019	Communication Facility	Village of Mishicot	No
Cell Tower	425 E Samz Rd	County 2019	Communication Facility	Village of Mishicot	No
Cell Tower	419 Buchanan St	County 2019	Communication Facility	Village of Mishicot	No
Cell Tower	250 N Calumet Dr	County 2019	Communication Facility	Village of Valders	No
Cell Tower	111 Industrial Park Dr	County 2019	Communication Facility	Village of Reedsville	No
Cell Tower	6610 Nuclear Rd	County 2019	Communication Facility	Town of Two Creeks	No
Cell Tower	16919 USH 10	County 2019	Communication Facility	Town of Cato	No
Cell Tower	3636 CTH CR	County 2019	Communication Facility	Town of Newton	No
Cell Tower	1290 North Ave	County 2019	Communication Facility	Village of Cleveland	No
Cell Tower	1400 N 8th St	County 2019	Communication Facility	City of Manitowoc	No
Cell Tower	736 Revere Dr	County 2019	Communication Facility	City of Manitowoc	No
Cell Tower	3110 Viebahn St	County 2019	Communication Facility	City of Manitowoc	No
Cell Tower	2035 S 30th ST	County 2019	Communication Facility	City of Manitowoc	No
Cell Tower	204 N 8th St	County 2019	Communication Facility	City of Manitowoc	No
Cell Tower	Hempton Lake Rd	County 2019	Communication Facility	Town of Franklin	No
West Shore Retreat	3301 Long Lake Rd	County 2019	Manufactured Housing	Town of Rockland	No
Voigt's Maple Terrace Mobile Home Court	400 E Main St	County 2019	Manufactured Housing	Village of St. Nazianz	No
Al Miller's Mobile Home Park	23604 Sunny Slope Rd	County 2019	Manufactured Housing	Town of Maple Grove	No
Manitowoc County Administration Office Building	1110 S 9th St	County	Administrative Building	City of Manitowoc	No
Manitowoc County Airport	1815 Freedom Way	County	Administrative Building	City of Manitowoc	No
Manitowoc County Communications & Technology Bldg.	1024 S 9th St	County	Administrative Building	City of Manitowoc	No
Manitowoc County Exps	4921 Expo Dr	County	Administrative Building	City of Manitowoc	No
Manitowoc County Heritage Center	1701 Michigan Ave	County	Administrative Building	City of Manitowoc	No
Manitowoc County Human Services Department	926 S 8th St	County	Administrative Building	City of Manitowoc	No
Manitowoc County Material Recycling Facility	3000 Basswood Rd	County	Administrative Building	Town of Manitowoc Rapids	No
Manitowoc County Public Health Department	1028 S 9th St	County	Administrative Building	City of Manitowoc	No
Manitowoc County Sheriff's Office	1025 S 9th St	County	Administrative Building	City of Manitowoc	No
Tower	3730 Mangin St	County	Communication Facility	City of Manitowoc	No
Branch Fire Dept	8124 Village Dr	County	Fire and Safety	Town of Manitowoc Rapids	No
Town of Two Rivers Fire Department	6525 CTH B	County	Fire and Safety	Town of Two Rivers	No
Town of Two Rivers Fire Dept (equip. storage)	7915 STH 42	County	Fire and Safety	Town of Two Rivers	No
Bullhead Lake Public Access (dry hydrant)	507 Bullhead Lake Ln	Manitowoc County Fire Assoc.	Fire and Safety	Town of Rockland	No
Cedar Lake Boat Landing (lake access; draft)	18584 Split Rail Ln	Manitowoc County Fire Assoc.	Fire and Safety	Town of Schleswig	No
Clarks Mills (dry hydrant; Manitowoc River access)	13845 Old Mill Ln	Manitowoc County Fire Assoc.	Fire and Safety	Town of Cato	No
Eggers Industries Pond (dry hydrant)	1 Eggers Dr	Manitowoc County Fire Assoc.	Fire and Safety	City of Two Rivers	No
Grotegut Pond (pond on farm)	7407 Newton Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Newton	No
Horseshoe Lake Boat Landing (dry hydrant)	13716 Northwood Ct	Manitowoc County Fire Assoc.	Fire and Safety	Town of Meeme	No
Kalies Pond Dry Hydrant	7206 E Taus Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Franklin	No
Long Lake Rd (dry hydrant)	pond on W side of rd 1600' N of Long Lake Rd	Manitowoc County Fire Assoc.	Fire and Safety	Calumet County	No
Man-Cal Rd (dry hydrant)	pond on S side of rd 500' W of Long Lake Rd	Manitowoc County Fire Assoc.	Fire and Safety	Calumet County	No
Marquette Pond (dry hydrant)	19420 Marquette Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Maple Grove	No
Matthias Pond	1540 N Union Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Manitowoc Rapids	No
Natural Owens Tank	4300 CTH CR	Manitowoc County Fire Assoc.	Fire and Safety	Town of Newton	No
Newton Fire Station (50,000 gallon tank)	6528 Carstens Lake Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Newton	No
Osman Cistern 2 (underground tank)	11380 Point Creek Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Meeme	No
Osman Cistern 1	10521 STH 42	Manitowoc County Fire Assoc.	Fire and Safety	Town of Meeme	No
Pigeon Lake Public Access (dry hydrant)	8964 Pigeon Lake Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Liberty	No
Pt Peach NPP Hydrant (hydrant on north end)	6610 Nuclear Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Two Creeks	No
Rokilio Pump (pump on north side of Cedar Lake)	14004 Rokilio Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Schleswig	No
Schenian Dry Hydrant (pond)	10455 Menchalville Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Franklin	No
Schenian Dry Hydrant	10455 Menchalville Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Franklin	No
School Hill Cistern (Marken Rd and Lincoln Ave)	12228 Marden Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Meeme	No
Seven Lakes (dry hydrant)	3108 N CTH S	Manitowoc County Fire Assoc.	Fire and Safety	Town of Cato	No
Stocks Pond	6007 Gass Lake Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Newton	No
Wilke Lake Boat Landing (draft; lake access)	10901 Wilke Lake Rd	Manitowoc County Fire Assoc.	Fire and Safety	Town of Schleswig	No

MANITOWOC COUNTY, WISCONSIN

Hazard Mitigation Plan 2020 - 2025

