

City of Sheboygan, Wisconsin Natural Hazards Mitigation Plan Update:

An Addendum to the Sheboygan County All Hazards Mitigation Plan



Prepared by:
City of Sheboygan
Hazard Mitigation Plan Steering Committee

March 2012

With Assistance from:
BAY-LAKE
REGIONAL PLANNING COMMISSION
Brown • Door • Florence • Kewaunee • Manitowoc • Marinette • Oconto • Sheboygan

City of Sheboygan, Wisconsin Natural Hazards Mitigation Plan Update

An Addendum to the Sheboygan County All Hazards Mitigation Plan

Adopted:
March 19, 2012

Prepared by:
City of Sheboygan
Hazard Mitigation Plan Steering Committee



With Assistance From:
Bay-Lake Regional Planning Commission
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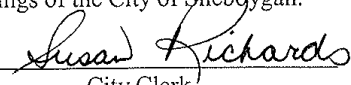
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RESOLUTION OF ADOPTION

OFFICE OF THE CITY CLERK
Sheboygan, Wisconsin
CITY HALL

I hereby certify that this is a true copy of a
document from the Common Council
proceedings of the City of Sheboygan.


City Clerk

Res. No. 156 - 11 - 12. By Alderperson Bohren. March 5, 2012.

A RESOLUTION adopting the *City of Sheboygan, Wisconsin Natural Hazards Mitigation Plan Update: An Addendum to the Sheboygan County All Hazards Mitigation Plan.*

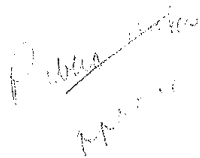
WHEREAS, the City of Sheboygan recognizes the threat that natural hazards pose to people and property; and

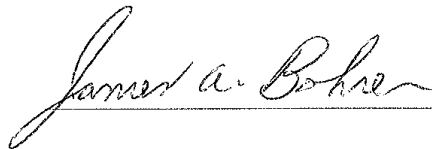
WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted hazards mitigation plan is required as a condition of future grant funding for mitigation projects.

NOW, THEREFORE BE IT RESOLVED: That the Common Council of the City of Sheboygan, Wisconsin, hereby adopts the City of Sheboygan Natural Hazards Mitigation Plan Update as an official plan; and

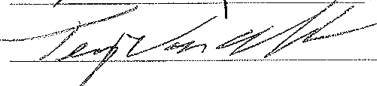
BE IT FURTHER RESOLVED: That upon approval of the Natural Hazards Mitigation Plan, the Department of Public Works will submit the Plan to Wisconsin Emergency Management and Federal Emergency Management Agency officials for final approval, as required under the Hazard Mitigation Grant Program.





I HEREBY CERTIFY that the foregoing Resolution was duly passed by the Common Council of the City of Sheboygan, Wisconsin, on the 19th day of March, 2012.

Dated March 26 2012. , City Clerk

Approved March 26 2012. , Mayor

Proceedings Published March 26, 2012.

Resolutions Published March 26, 2012.

Certified March 26, 2012 to Fin. Dir./Treas.; Dep. Fin. Dir./Treas.; City Planning; DPW; Eng.

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FEMA/WEMAPPROVAL LETTERS

U.S. Department of Homeland Security
Region V
536 South Clark Street, Floor 6
Chicago, IL 60605



FEMA

February 8, 2012

Ms. Roxanne Gray
State Hazard Mitigation Officer
Wisconsin Div. of Emergency Management
2400 Wright Street, P. O. Box 7865
Madison, WI 53707-7865

Dear Ms. Gray:

Thank you for submitting the City of Sheboygan Hazard Mitigation Plan Update for our review. 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 City of Sheboygan met the required criteria for a multi-jurisdictional hazard mitigation plan. Formal approval of this plan is contingent upon the plan adoption by the City. Once FEMA Region V receives documentation of adoption from the City, we will send a letter of official approval to your office.

We look forward to receiving the adoption documentation and completing the approval process for City of Sheboygan.

If you or the community has any questions, please contact me at (312) 408-5220.

Sincerely,

A handwritten signature in purple ink that reads "Tom Smith". The signature is fluid and cursive, with the first name "Tom" and last name "Smith" clearly distinguishable.

Tom Smith
Community Planner
Risk Analysis Branch
Mitigation Division



STATE OF WISCONSIN
DEPARTMENT OF MILITARY AFFAIRS
DIVISION OF EMERGENCY MANAGEMENT

Brian M. Satula
Administrator

Scott Walker
Governor

February 17, 2012

Mr. David Biebel, Deputy Director of Public Works
City of Sheboygan
2026 New Jersey Avenue
Sheboygan, WI 53081

Dear David:

FEMA has notified Wisconsin Emergency Management that the *City of Sheboygan Natural Hazards Mitigation Plan Update* has met the required criteria for a single jurisdictional hazard mitigation plan. FEMA is requiring that copies of sign-in sheets and meeting minutes from the meetings that took place during the planning process be included in the final plan document. In addition, FEMA encourages the City to continue to promote the incorporation of the hazard mitigation plan into other planning mechanisms, especially the City's comprehensive plan.

The City *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, Flood Mitigation Assistance Program, and Repetitive Flood Claims Program.

The attached Local Mitigation Plan Review Tool includes recommended revisions for the five-year update.

If you have any questions, please feel free to call me at 608-242-3222 or Roxanne Gray at 608-242-3211.

Sincerely,

Katie Sommers
Disaster Response and Recovery Planner
Wisconsin Emergency Management

Enclosures

Cc: Dan Dahlke, East Central Regional Emergency Management Director
Angela Pierce, Bay-Lake Regional Planning Commission

ADDENDUM TO THE SHEBOYGAN COUNTY ALL HAZARD MITIGATION PLAN

This update to the *City of Sheboygan, Wisconsin Natural Hazards Mitigation Plan* has been developed as an addendum to the *Sheboygan County All Hazard Mitigation Plan* that was adopted in 2008, and will be updated in 2012. The County hazard mitigation plan was developed as a multi-jurisdictional plan without the inclusion of the City of Sheboygan since they had a current plan at the time when the County plan was being developed.

The City desires with this update to develop it as an addendum to the County plan that will be fully incorporated with the next update to the County plan in 2012. The City of Sheboygan will participate as a partner in the development of the County mitigation plan update, and will adopt the County plan upon completion.

2005 CITY PLAN UPDATE SUMMARY

To aid in the identification of the changes that have been made to the *City of Sheboygan, Wisconsin Natural Hazards Mitigation Plan* in this current update to the original 2005 plan, Table 1 below lists the plan changes and the changes made to the identified mitigation actions.

SIGNIFICANT HAZARD EVENTS OF NOTE

Since the adoption of the previous plan in 2005, the City has experienced a number of hazard events; however, one flooding event in June 2008 was significant enough to require a federal disaster declaration.

On June 9, 2008 Governor Jim Doyle declared a State of Emergency for 30 counties due to storm events that cause significant flooding throughout the state. Sheboygan was included in this 2008 federal disaster declaration.

Table 1: 2005 City of Sheboygan Hazard Mitigation Plan Update Summary

Plan Chapter		Overview of Plan Update
Chapter 1: Introduction		Update of recent disasters, planning process participants, and public review information. Several updates were made to the original steering committee to reflect changes in positions since the last plan was adopted. Explained the status of this update as an addendum to the County hazard mitigation plan.
Chapter 2: Planning Area		Update of demographic profile information using the 2010 Census. Demographics data updated at a county level instead of City level to become consistent with the County Plan.
Chapter 3: Risk Assessment		All hazard profiles, occurrences, and probabilities were updated. In addition, the risk assessments were updated. Addressed hazards and rankings were updated to align with the Sheboygan County Plan. Hazard occurrences were updated to include all from 1995 to 2010 (original plan covered 1990 to 2004). Hazard probabilities were updated based on updated occurrences. Update critical facilities and changes some categories names. The coastal hazards risk assessment was added. Added a statement on NFIP participation under the section on flooding.
Chapter 4: Mitigation Strategy		Revised goals to match those of the County. Changed format of mitigation action plan table to match the Sheboygan County Plan.
Chapter 5: Plan Maintenance and Adoption Process		Update of plan maintenance process and plan update schedule to match the county hazard mitigation plan. Explained the addendum process.
Project		Changes
All Hazards		
Emergency Power Generators at Critical Facilities		No change ¹
Reinstate Local Emergency Planning Committee (LEPC)		New addition
Disaster Preparedness		Moved from "Flooding" to "All Hazards"
Joint City/County Emergency Dispatch Facility (hardened)		New addition
Geo-Notifier ("Reverse 911") Public Notification System		New addition
Flooding		
Flood Forecasting, Warning Systems, Emergency Plans		No change ¹
National Flood Insurance Program		No change ¹
Preservation of Natural Resources in Floodplains		No change ¹
Floodproofing Techniques		Changed the Project Timetable from "2005-2010" to "Ongoing."

1. Due to financial or political support, a number of mitigation actions have had no changes from the 2005 plan and appear again in this plan update.

Table 1: 2005 City of Sheboygan Hazard Mitigation Plan Update Summary (continued)

Project	Changes
Flooding (continued)	
Stormwater Detention (see City of Sheboygan Stormwater Management Plan)	Replaces individual listings from stormwater management plan.
Incorporation of Floodplain Management in Comprehensive Plan Updates	Changed "plans" to "plan updates." Changed Project Timetable from "2005-2010" to "Ongoing."
Topographical Maps of Sheboygan County	Completed (including LIDAR maps) and removed from updated mitigation action plan.
Complete Hydrology Study of Sheboygan County	Added "Complete" in front of "Hydrology Study of Sheboygan County" since parts have been done. Chnaged Project Timetable from "2007-2008" to "2010-2015."
Flood Insurance Rate Map (FIRM) Amendments and Revisions	Completed for the City and removed from updated mitigation action plan.
Geographic Information System (GIS) Coverage	Completed and removed from updated mitigation action plan.
Reevaluation of Floodplain Zoning Ordinances	Chnaged Project Timetable from "2010" to "Ongoing."
Acquisition and Relocation	No change ¹
Annual Review of Flood Mitigation Plan	No change ¹
Lightning Storms and Thunderstorms	
Review Critical Facilities for Lightning Improvements Needs	Replaced "Review of Building Codes" with "Review of Critical Facilities." Changed Project Timetable from "2005-2006" to "Ongoing."
Lightning Safety Guidelines	Changed Responsible Party to "Emergency Response agencies, National Weather Service." Changed Project Timetable from "2005-2006" to "Ongoing."
Tornadoes and High Winds	
Identification of Emergency Shelter Locations	Changed Responsible Party from "City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, Sheboygan County Emergency Management." to "Emergency Response agencies, National Weather Service."
Identification of Emergency Shelter Deficit Locations	Changed Responsible Party from "City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, Sheboygan County Emergency Management." to "Emergency Response agencies, National Weather Service."
Enhanced Construction Standards and Techniques	No change ¹
Encourage Use of Tie-Downs with Ground Anchors for Manufactured Homes and Mobile Homes	No change ¹

1. Due to financial or political support, a number of mitigation actions have had no changes from the 2005 plan and appear again in this plan update.

Table 1: 2005 City of Sheboygan Hazard Mitigation Plan Update Summary (continued)

Project	Changes
Extreme Heat	
Supplies for Vulnerable Populations	Changed Project Timetable from "2005-2010" to "Ongoing."
Publicity of Extreme Heat Events	Changed Priority from "High" to "Medium." Changed Estimated Costs from "Mostly covered by existing annual budgets; \$5000 for informational brochure translation and distribution." to "Covered by Existing Annual Budgets." Added "local news media" to Responsible Party
Winter Storms	
Priority Policy for Salting and Plowing Roadways	No change ¹
Add a Salt Storage Facility	New addition
Promote Winter Storm Hazard Awareness	Changed Estimated Costs from "Mostly covered by existing annual budgets; \$5000 for informational brochure translation and distribution." to "Covered by Existing Annual Budgets." Added "local news media" to Responsible Party.
Extreme Cold	
Publicity of Extreme Cold Events	Changed Estimated Costs from "Mostly covered by existing annual budgets; \$5000 for informational brochure translation and distribution." to "Covered by Existing Annual Budgets." Added "local news media" to Responsible Party.
Fog	
Publicity of Fog Events	Added "local news media" to Responsible Party.

1. Due to financial or political support, a number of mitigation actions have had no changes from the 2005 plan and appear again in this plan update.

PURPOSE OF THE PLAN

The *City of Sheboygan, Wisconsin Natural Hazards Mitigation Plan* was developed consistent with the state hazard mitigation planning requirements outlined in the Code of Federal Regulations (44 CFR Part 201.4 and 201.5). This plan evaluates the city's potential exposure to natural hazards and identifies appropriate mitigation strategies.

Completion of this plan will assist the City of Sheboygan emergency management personnel in identifying areas of risk, assessing the magnitude of the risk, and developing strategies for reducing this risk. Through this process, the City can address issues related to incompatible land uses; the identification and protection of critical facilities; and the reduction of costs associated with natural disaster relief and rescue efforts. Completion and approval of this plan makes the City of Sheboygan eligible to apply for future disaster relief and mitigation project funds to implement some of the recommended mitigation strategies.

Disaster Mitigation Act of 2000

The development of the *City of Sheboygan, Wisconsin Natural Hazards Mitigation Plan* was in response to passage of the Disaster Mitigation Act of 2000. This act was signed into law in October of 2000. This act attempts to stem the losses from disasters, reduce future public and private expenditures, and speed up response and recovery from disasters. This 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 an All Hazards 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 the All Hazards 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 All Hazards 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 an All Hazards Mitigation Plan within one year.
- In addition, by not having an All Hazards Mitigation Plan, local governments, and tribal organizations cannot utilize funding through the Pre-Disaster Mitigation Grant Program.

Funding for this Plan

In September 2010, the City of Sheboygan received a planning grant to develop an update to the hazard mitigation plan in the amount of \$31,772 through the Pre-Disaster Mitigation (PDM) program. Through the grant, FEMA provided 75 percent of the funds (\$23,829), while 25 percent (\$7,943) was required to be the local match.

The City of Sheboygan entered into a contract (#10022-08) with the Bay-Lake Regional Planning Commission to prepare the update to the hazard mitigation plan. Development of the plan began in October 2010 and ended in October 2011.

Five Parts of this Hazard Mitigation Plan

The City of Sheboygan Natural Hazards Mitigation Plan was divided into five chapters in order to address FEMA's local mitigation plan requirements. The five chapters are as follows:

- Chapter 1 – Introduction (Planning Process);
- Chapter 2 – Planning Area;
- Chapter 3 – Risk Assessment;
- Chapter 4 – Mitigation Strategy; and
- Chapter 5 – Plan Maintenance and Adoption Process.

PLANNING PROCESS

Development of the *City of Sheboygan, Wisconsin Natural Hazards Mitigation Plan* was based on the planning requirements and guidance provided by the Federal Emergency Management Agency and the Wisconsin Department of Military Affairs, Wisconsin Emergency Management. Following these requirements and guidance, the plan meets the requirements of the Disaster Mitigation Act of 2000. Since the Wisconsin Emergency Management guidance for All Hazards Mitigation Plans recommended that planning areas “be consistent with a community’s comprehensive planning boundary,” the planning area for this plan includes the City of Sheboygan in Sheboygan County, Wisconsin.

The steering committee comprised of county and local officials, emergency management personnel, and organizations, guided the plan development process over an 18-month timeframe beginning in October 2010. Professional planning support was provided by the Bay-Lake Regional Planning Commission. Public review and input was encouraged through an Open House 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 I: Pre-planning and review of steering committee appointments

Phase II: Reassessing risks

Phase III: Updating the mitigation action plan

Phase IV: Reviewing the policies and procedures for plan implementation

Phase V: Documenting the planning process and plan adoption

Phase I 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 II was comprised of a meeting with the steering committee to reassess natural hazards and potential risks to the City.

Phase III involved updating the mitigation action plan to address identified risks including removing completed task and adding new mitigation methods to address risks.

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

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

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 greater manipulation and analysis from the use of a consistent base map. 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

The City of Sheboygan reconvened the Hazard Mitigation Plan steering committee, shown in Table 2. For the previous 2005 plan, the committee members were selected from all City departments involved in emergency management issues (Mayor's office, Public Works, City Development, Fire, Police, Risk/Administrative Officer, Water Utility, etc.), local electrical and gas utilities, the Sheboygan County Emergency Management Coordinator, a representative of the Sheboygan Area School District, a representative from the local Chamber of Commerce, representatives from the American Red Cross and the Salvation Army, a representative of a local telephone company, representatives of Hmong and Hispanic community organizations, the local U.S. Coast Guard station, the local cable television franchise, representatives of two area hospitals, and a representative of the principal ambulance service for the City. Several updates were made to the original steering committee to reflect changes in positions since the last plan was adopted.

In order to maintain consistency with the county plan in order to ease integration with the next county plan update, the steering committee identified the following hazard to be addressed in this plan. The hazards are listed by order of priority.

1. Flooding (including flash, riverine, lake, stormwater and dam failure flooding);
2. Lightning Storms and Thunderstorms (also including hail storms);
3. Tornadoes (including high winds);
4. Extreme Cold;
5. Extreme Heat;
6. Winter Storms (including heavy snow storms, ice storms and blizzards);
7. Fog;
8. Wildland Fires;
9. Drought; and
10. Coastal Hazards.

Table 2: City of Sheboygan Hazard Mitigation Plan Steering Committee, 2011

Name	Title/Organization
Angela Pierce	Bay-Lake Regional Planning Commission
Betsy Alles	Executive Director, Sheboygan County Chamber of Commerce
Bill Bittner	Director of Public Works, City of Sheboygan
Bill Blashka	Director of Public Works, Town of Sheboygan
Bob Ryan	Mayor, City of Sheboygan
Bob Wallace	Captain, Sheboygan Police Department
Bruce Neerhof	Director of Public Works, Village of Kohler
Chad Pelishek	Development Manager, City of Sheboygan
Chasong Yang	Hmong Mutual Assistance Association of Sheboygan
Chuck Butler	Deputy Chief, Sheboygan Fire Department
Darryl Emrath	U.S. Coast Guard
Dave Albright	Facilities Services Coordinator, Sheboygan Area School District
David Biebel	Deputy Director of Public Works, City of Sheboygan
David Gartman	Chair, Town of Wilson
Dr. Joeseeph Sheehan	Superintendent, Sheboygan Area School District
Eustacio Medina	President, Hispanic Service Club
James Schwinn	Supervisor, Town of Sheboygan
Joe Trueblood	Superintendent, Sheboygan Water Utility
John Miller	Charter Communications
Laura Boxrucker	Facilities Manager, St. Nicholas Hospital
Laura Goetz-Gumm	Account Manager, Alliant Energy
Major Alan Hellstrom	Executive Director, Sheboygan Salvation Army
Marcus Evans	BMC, Officer in Charge, U.S. Coast Guard, Sheboygan Station
Matt Hill	Operations Director, Orange Cross Ambulance
Richard Miller	Facilities Director, Aurora Sheboygan Memorial Medical Center
Robert Downs	U.S. Coast Guard
Roxanne Kahan	Government Liaison Coordinator, American Red Cross
Steve Smith	St. Nicholas Hospital
Steven Steinhardt	Emergency Management Director, Sheboygan County
Ted Vallis	Customer Service Manager, Wisconsin Public Service Corp.
Travis Waack	Disaster Director, American Red Cross

Steering Committee Plan Review

The steering committee reviewed and analyzed each section of the plan, and considered Table 1 to evaluate which sections were revised as part of the update process.

The steering committee held four meetings to update the plan: February 24, 2011; April 5, 2011; May 19, 2011; and August 15, 2011. Additional plan review through e-mail occurred outside of these meetings.

Business, Academic, and Other Involvement

Representatives of the neighboring jurisdictions of the Town of Sheboygan, Town of Wilson, and the Village of Kohler (village president) participated in plan development at several steering committee meetings. In addition, the Emergency Management Director for Sheboygan County served on the plan steering committee. Business, academic and other private and nonprofit interests were involved in the planning process as members of the steering committee.

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 August 30, 2011 at the Mead Public Library. This meeting was held to provide an 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, notices were posted at City Hall, and notice was provided to local media.

Press Coverage

An article describing the City of Sheboygan Hazard Mitigation Plan update process appeared in the Sheboygan Press on September 1, 2011 (Figure 1).

One comment resulted from this article. The comment came from a Sheboygan citizen that was concerned that the emergency exit ladders located along the sheet piling in the Sheboygan River are too high for someone in danger to reach. Water levels have gone down since they were installed and now they need to be extended lower in order to be reached while in the water.

Common Council Meeting

On March 19, 2012, the Sheboygan Common Council adopted this hazard mitigation plan update at a public meeting. A copy of the resolution of adoption can be found at the front of this plan on page iii.

Contact Information

David Biebel
Deputy Director
Department of Public Works
City of Sheboygan
2026 New Jersey Avenue
Sheboygan, WI 53081
(920) 459-3440
E-Mail Address: dbiebel@ci.sheboygan.wi.us

Figure 1: Sheboygan Press Article Regarding Plan Update, 2011

sheboyganpress.com

Committee working to update City of Sheboygan's hazard mitigation plan

Written by

Sheboygan Press staff

11:18 PM, Sep. 1, 2011

The City of Sheboygan is in the process of updating the city's hazard mitigation plan.

The work on the plan, which was developed in 2005 under funding from the Federal Emergency Management Agency, has involved working with a steering committee that includes Sheboygan County emergency management and response along with planning personnel from the private, public and non-profit sectors.

Development of the update, like the original 2005 plan, is being led by the Sheboygan Public Works department, with the Bay-Lake Regional Planning Commission facilitating the process and writing the plan under the direction of the steering committee. The steering committee is made up of personnel from city departments including police, fire, public works, development and the mayor's office. The steering committee also includes school representatives, electric and water utilities, American Red Cross, the U.S. Coast Guard and others.

Hazard mitigation planning involves developing a set of actions designed to reduce or eliminate long-term risk to people

and property from hazards and their effects. The rising costs associated with hazard recovery activities have led a much greater emphasis being placed on dealing with hazards before they occur through hazard mitigation planning. Hazard mitigation planning is the only phase of emergency management planning specifically dedicated to breaking the cycle of damage, reconstruction, and repeated damage.

With this plan, the city is able to identify the actions steps it needs to take in order to minimize risk and damage to people and property from natural hazards. Additionally, the City maintains its qualification to apply for Federal Emergency Management Agency funding to undertake identified projects that will minimize future risks.

A public informational meeting to present the draft plan was held Aug. 30. The draft plan can also be downloaded from www.baylakerpc.org.

Those with questions may contact Angela Pierce with the Bay-Lake Regional Planning Commission at 920-448-2820.

CHAPTER 2 – PLANNING AREA

GEOGRAPHY

The City of Sheboygan is located in Sheboygan County, Wisconsin at latitude 43°45' north, longitude 87°44' west (Map 1). It is the principal city of the Sheboygan, Wisconsin Metropolitan Statistical Area, and has a total area of 14 square miles. The city is located in eastern Wisconsin on Lake Michigan at the mouth of the Sheboygan River, about 50 miles north of Milwaukee and 64 miles south of Green Bay.

DEMOGRAPHIC PROFILE

Population and Housing

Table 3 indicates population, households, and housing units for the City of Sheboygan and Sheboygan County in 2000 and in 2010 using US Census data. The data indicates that the City has experienced a population loss in the last decade. However, the increasing number of housing units is reflective of a decrease in the average household size and an increase in the number of unoccupied housing units. The average household size in Sheboygan County decreased from 2.59 to 2.24 from 2000 to 2010. This is part of a trend which has been observed in the area since the mid 1990s, and is a trend which is expected to continue for several years to come.

Table 3: Population, 2000 and 2010

Jurisdiction	Persons			% Change			Households			% Change			Housing Units			% Change		
	2000	2010	2000-2010	2000	2010	2000-2010	2000	2010	2000-2010	2000	2010	2000-2010	2000	2010	2000-2010	2000	2010	2000-2010
City of Sheboygan	50,792	49,288	-3.1%	20,779	20,308	-2.3%	21,762	22,339	2.6%									
Sheboygan County	112,656	115,507	2.5%	43,548	46,390	6.1%	45,951	50,766	9.5%									

Source: US Bureau of Census, 2000 and 2010.

Employment

Table 4 indicates employment in Sheboygan County (by place of residence) in 2000 and 2009.

Table 4: Employment, Sheboygan County (By Place of Residence), 2000 and 2009

Employment Category	Number Employed in 2000	Percentage Employed in 2000	Number Employed in 2009 ¹	Percentage Employed in 2009	Percent Change 2000 - 2009
Manufacturing	22,760	38.3%	19,488	32.4%	-14.4%
Professional Services ²	13,107	22.0%	14,502	24.1%	10.6%
Wholesale/Retail Trade	7,196	12.1%	8,069	13.4%	12.1%
Miscellaneous Services ³	6,572	11.1%	7,620	12.7%	15.9%
Construction	3,290	5.5%	3,384	5.6%	2.9%
Finance/Insurance/Real Estate/Rental and Leasing	2,490	4.2%	2,748	4.6%	10.4%
Transportation/Warehousing/Utilities	1,690	2.8%	1,821	3.0%	7.8%
Agricultural/Forestry/Fishing/Hunting/Mining	1,158	1.9%	1,268	2.1%	9.5%
Public Administration	1,191	2.0%	1,201	2.0%	0.8%
TOTAL	59,454	100.0%	60,101	100.0%	1.1%

1. 2005-2009 5-Year Estimates

2. Includes Information; Arts, entertainment, and recreation, and accommodation and food services; and Other services (except public administration).

3. Includes Professional, scientific, and management, and administrative and waste management services; and Educational services, and health care and social assistance.

Source: U.S. Bureau of the Census, 2000 (Summary File 3); and American Community Survey, 2005-2009.

The largest employment sector in Sheboygan County in 2000 and 2009 was manufacturing, followed by professional services. However, the manufacturing sector has not grown in the past

decade, and instead saw the largest percent decrease (-14.4%). The largest employment sector increase was seen in the miscellaneous services sector (15.9%), which includes information; arts, entertainment, and recreation, and accommodation and food services; and other services (except public administration). The public administration sector increased in employment between 2000 and 2009 (0.8%), but did not keep pace with the overall employment increase observed during the decade (1.1%).

GENERAL DEVELOPMENT PATTERN

Land Use and Development Pattern

A most recent detailed field inventory of land uses in Sheboygan County was conducted in 2009 by the Bay-Lake Regional Planning Commission. That land use information has been compiled into generalized land use categories and display in Table 5 and in Map 2.

Table 5: 2009 Land Use: Sheboygan County

Land Use Type	Total Acres	Percentage of Total Land
Residential	3,660.3	37.5%
Single Family	2,970.7	30.4%
Two Family	389.3	4.0%
Multi-Family	221.0	2.3%
Mobile Homes	78.3	0.8%
Vacant Residential	0.9	0.0%
Commercial	750.0	7.7%
Industrial	651.7	6.7%
Transportation	738.9	7.6%
Communications/Utilities	108.8	1.1%
Institutional/Governmental	487.0	5.0%
Recreational	456.3	4.7%
Agricultural Structures	3.4	0.0%
Croplands/Pasture	1,091.1	11.2%
Open Space	615.9	6.3%
Woodlands	588.0	6.0%
Other Natural Areas	422.9	4.3%
Water Features	184.6	1.9%
Land Under Development	3.3	0.0%
Total Land Area (Acres)	9,762.1	100.0%

Source: Bay-Lake Regional Planning Commission, 2011.

Sheboygan County Land Mass

Sheboygan County comprises over 331,430 total acres of land. Of this, over 35,282 acres, or over 10.6 percent of the land mass of the county, is developed, leaving 296,148 acres (nearly 89.4 percent) of undeveloped lands in the county. These undeveloped lands consist largely of croplands and pastures, woodlands, and other natural areas.

Residential Land

Residential land in Sheboygan County accounts for nearly 12,744 acres, or over 3.8 percent of the land within the county, the largest developed land category in the county. The majority of this land (over 11,377 acres) is single family residential. Other residential land uses in

Sheboygan County included two family residential (nearly 597 acres), multi-family residential (nearly 371 acres), group quarters (over four acres), and mobile homes (nearly 205 acres). In addition, there were nearly 177 acres of land under residential development as well as nearly 14 acres of vacant residential land in Sheboygan County in 2002.

Commercial Land

Commercial land in Sheboygan County accounts for nearly 1,455 acres, or over 0.4 percent of the land within the county. Although commercial land is scattered throughout the county, significant areas of commercial development in the county include central business districts in cities and some villages, as well as commercial strip development along certain urban corridors. Increasingly, interchanges with Interstate 43 and with State Highway 23 are also emerging as nodes of commercial development.

Industrial Land

Industrial land in Sheboygan County accounts for over 3,161 acres, or nearly 1.0 percent of the land within the county. Although the majority of the industrial land is dedicated to manufacturing, significant proportions of the industrial land involve extractive (mining and quarry) uses as well as open and enclosed storage uses. Traditionally, industrial lands are generally situated along rail corridors and along rivers. More recently, industrial parks have emerged in many cities and villages as well as some towns across Sheboygan County.

Transportation

Transportation land uses in Sheboygan County account for nearly 6,779 acres, or over 2.0 percent of the land within the county, the second largest developed land category in the county. Streets and roads constitute the majority of this land use, but off-street parking and rail and air related uses are significant transportation land uses in Sheboygan County as well.

Communications/Utilities

Communications/Utilities land uses in Sheboygan County account for over 411 acres, or over 0.1 percent of the land within the county. Some of the more significant communications/utilities related land uses (in terms of land mass occupied) in Sheboygan County include landfills, recycling plants (and other non-landfill disposal facilities), sewage treatment plants, electric power plants and substations, and water utility facilities. Other key uses which fall under this category include natural gas terminals, local telephone services, radio stations and towers, and incinerators.

Institutional/Governmental

Institutional/governmental uses are defined as land for public and private facilities for education, health or assembly, for cemeteries and/or related facilities, and for all government facilities used for administration or safety, except public utilities and areas of outdoor recreation. This category accounts for nearly 1,660 acres of land, or just over 0.5 percent of the land within Sheboygan County. Examples of institutional or governmental facilities in Sheboygan County include city, village and town halls; post offices; hospitals and clinics; municipal garages; fire stations; law enforcement facilities (including prisons and jails), all educational facilities, churches and cemeteries. Some of the more significant institutional/governmental land uses in Sheboygan County (in terms of land mass) include prisons and jails, schools, fraternal organizations and clubhouses, churches and cemeteries.

Recreational Lands

Land used in this category is for outdoor sports and general recreation, for camping or picnicking facilities, for nature exhibits or for the preservation of historic or cultural resources. This category accounts for over 5,365 acres of land, or over 1.6 percent of the land within Sheboygan County, the third largest developed land category in the county. Some of the more significant recreational land uses in Sheboygan County (in terms of land mass) include campgrounds, parks, playfields/athletic fields, golf courses and driving ranges, and race tracks.

Agricultural Structures

Agricultural structures include farm buildings and accessories (barns, silos and sheds used for agricultural purposes), as well as lands devoted to animal husbandry and fish hatcheries/aquaculture. This category accounts for over 3,707 acres of land, or over 1.1 percent of the land within Sheboygan County. The vast majority of land in this category involves farm buildings and accessories.

Open Space

Approximately 0.4 percent (over 1,250 acres) of the total land area of Sheboygan County involves open space.

Croplands/Pastures

Nearly 55.2 percent (over 182,863 acres) of the total land area of Sheboygan County involves croplands and pastures.

Long-Term Specialty Crops

Over 0.1 percent (over 408 acres) of the total land area of Sheboygan County is devoted to the raising of long-term specialty crops.

Vacant Agricultural Lands

Only a small portion (0.014 percent, or over 45 acres) of the total land area of Sheboygan County involves vacant agricultural lands.

Woodlands

Over 21.8 percent (over 72,365 acres) of the total land area of Sheboygan County involves woodlands. While much of this land involves the Kettle Moraine State Forest, woodlands are scattered throughout Sheboygan County.

Other Natural Areas

Over 10.5 percent (nearly 34,809 acres) of the total land area of Sheboygan County involves other natural areas, which are scattered throughout the county. Uses in this category include lands primarily in a natural state for their natural functions, including non-wooded wetlands, grasslands, beaches, designated scientific sites or areas, and other publicly-owned natural areas.

Water Features

Water features include lakes, reservoirs and ponds, rivers and streams, and other impoundments. Over 1.2 percent (nearly 4,114 acres) of the total land area of Sheboygan County involves water features. Significant water features in Sheboygan County (excluding Lake Michigan) include the Black, Mullet, Milwaukee (North Branch), Onion, Pigeon and Sheboygan Rivers, numerous creeks, lakes and ponds, several unnamed tributaries, and the Sheboygan Marsh.

Non-Residential Land Under Development

Just under 0.1 percent (nearly 294 acres) of the total land area of Sheboygan County involved non-residential land under development in 2002. This land was scattered throughout Sheboygan County.

General Development Trends

The following development trends have been observed in Sheboygan County. It is expected that these trends will influence the county's future growth and preservation. All local jurisdictions in the county will need to address these trends over the next several years in their planning processes. Observed general development trends are as follows:

- The demand for larger lot sizes will increase and the ratio of persons per household will decrease, resulting in greater acreage needs to accommodate future residential growth.
- Existing areas of higher density development will continue as new areas outside established neighborhoods in cities and villages develop at lower densities.
- Sheboygan County can expect an increase in the number of dwelling units over the next several years.
- The natural features within Sheboygan County will continue to be maintained, preserving the natural vegetative structure resulting in the protection of wildlife habitats.
- Commercial uses will likely continue to increase along main transportation corridors (Interstate and state highways and interchanges with Interstate Highway 43 and with State Highway 23) to capitalize on good visibility and ease of access.

Sheboygan County will experience an increased demand for services as the median age of the population continues to increase.

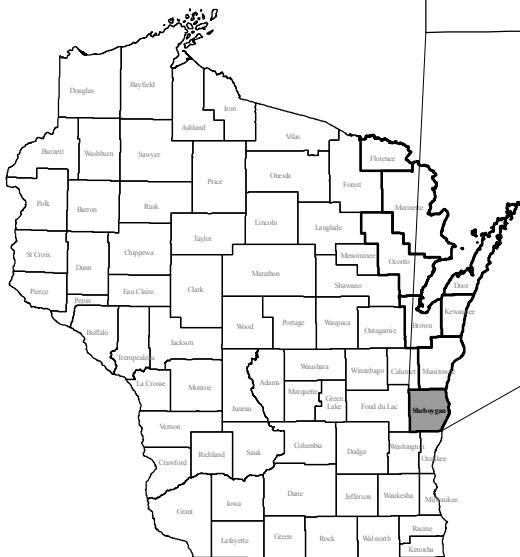
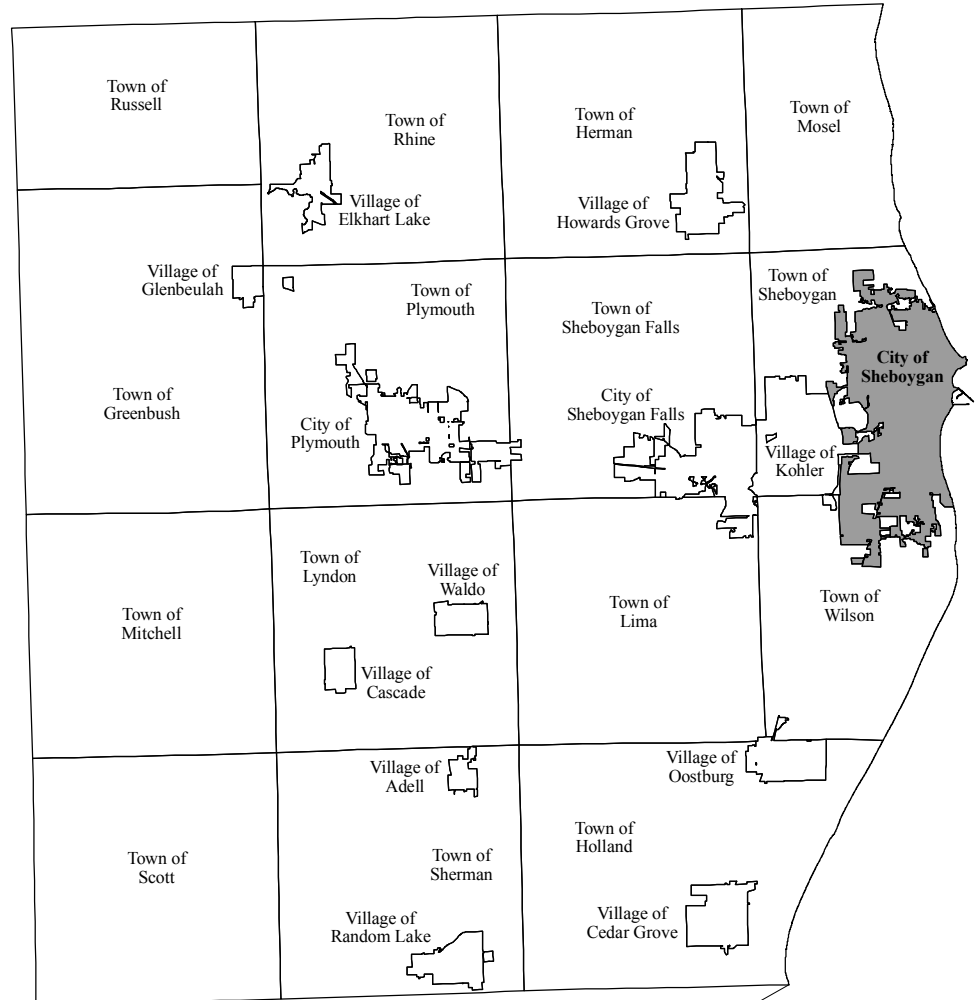
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Location Map

City of Sheboygan Hazard Mitigation Plan

City of Sheboygan, Wisconsin

Sheboygan
County



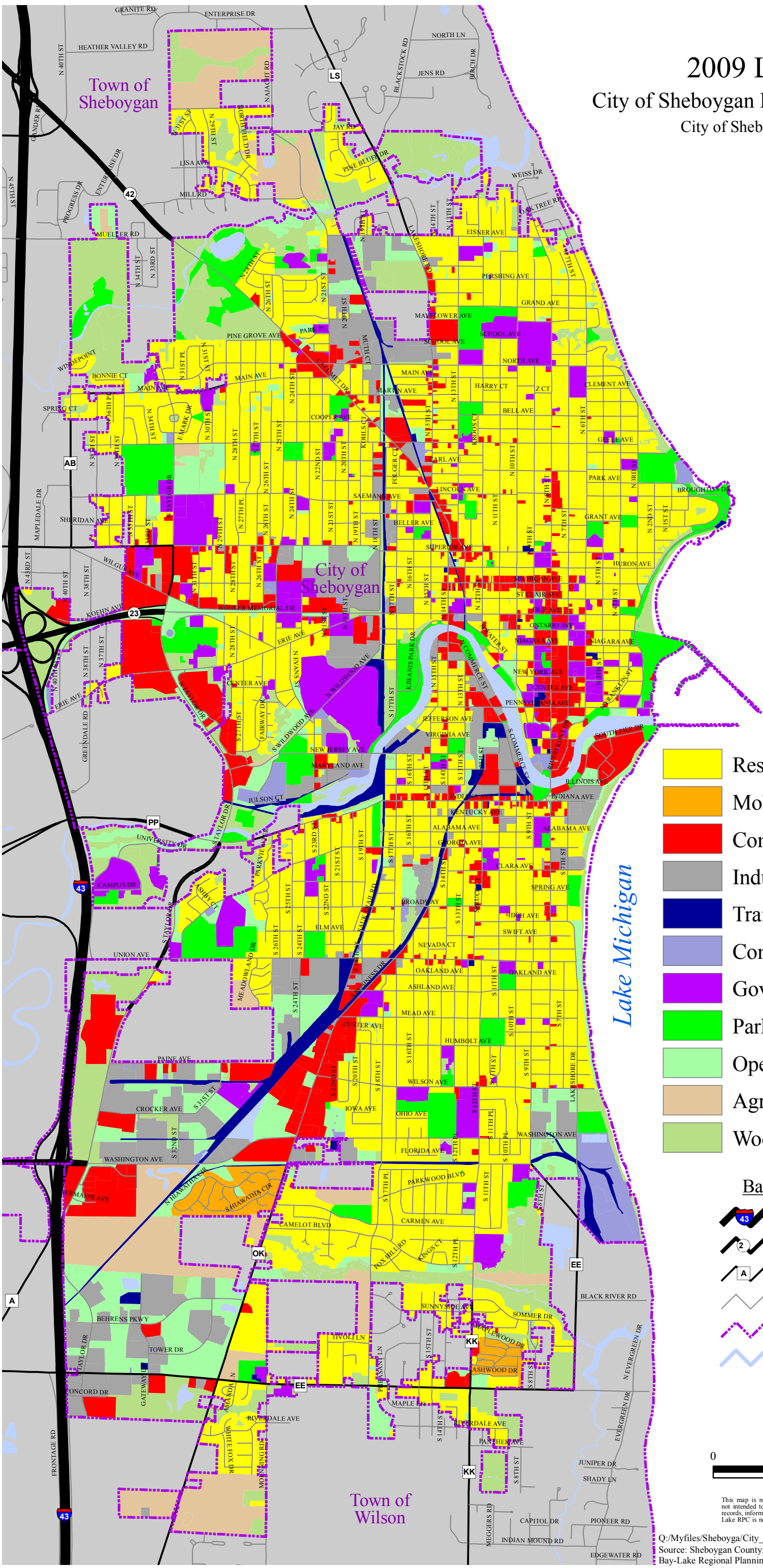
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This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

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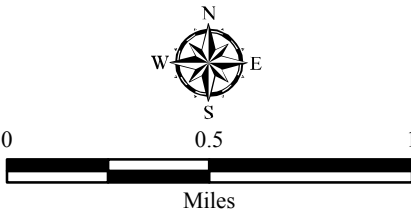
2009 Land Use
City of Sheboygan Hazard Mitigation Plan
City of Sheboygan, Wisconsin



- Residential
- Mobile Homes
- Commercial
- Industrial
- Transportation
- Communications/Utilities
- Governmental/Institutional
- Parks and Recreation
- Open Space/Fallow Fields
- Agricultural
- Woodlands/Natural Areas

Base Map Features

- Interstate Highway
- State Highway
- County Highway
- Local Road
- MCD Boundary
- Major Surface Water



Q:/Myfiles/Sheboyga/City_Sheb/All Hazard
Source: Sheboygan County; City of Sheboygan;
Bay-Lake Regional Planning Commission, 2011.



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, this risk assessment has been prepared to identify the natural hazards which are thought to pose the greatest risk to residents in the planning area, to profile the extent and severity of past natural hazard events that have affected the planning area, and to assess the vulnerability of the planning area to the risk of future natural hazard events.

NATURAL HAZARD IDENTIFICATION

The natural hazards that will be addressed in this plan include those that pose the greatest risk to residents and facilities of the planning area. Identification of the natural hazards was based on a 2008 priority ranking, which was a part of the development of the Sheboygan County hazard mitigation plan. The County's hazard rankings have been used for this City plan update since it is an addendum to the County plan.

The 2008 hazard ranking process utilized the *Risk Assessment Matrix* table (Table 1) found in the *Resource Guide to All Hazards Mitigation Planning in Wisconsin*, which was prepared in 2003 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.

Planning Area Natural Hazards Prioritization

In 2005, the Sheboygan County All Hazard Mitigation Plan steering committee members ranked the natural hazards through consensus, and reviewed past hazard event data to determine the natural hazards that pose the greatest threat to residents and to property.

Based on this information, the following natural hazards were determined to be the focus of the plan assessment, goals, objectives, and strategies for the County plan as well as the City plan update:

- Flooding (including flash, riverine, lake, and stormwater);
- Lightning Storms and Thunderstorms (including hail storms);
- Tornadoes (including high winds);
- Extreme Cold;
- Extreme Heat;
- Winter Storms (including heavy snow storms, ice storms and blizzards);
- Fog;
- Wildland Fires;
- Drought; and
- Coastal Hazards

Other Natural Hazards Determined Not to Pose a Significant Risk

Earthquakes, landslides and land subsidence, and dam failures were determined to have a minimal chance of occurring, to pose minimal risk to the safety of residents or property, or to offer very limited mitigation options. These natural hazards are excluded from the full

assessment, but are briefly discussed here to meet the comprehensive requirements for developing an all 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 Sheboygan 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. Sheboygan County falls within the second 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, Sheboygan County falls within a 1%g to 2%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, Sheboygan County is considered unlikely to be substantially affected by earthquakes in the long-term future. The earthquake threat to Sheboygan County is considered very low.

Landslides and Land Subsidence

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 City of Sheboygan along Lake Michigan. The majority of the land within the City of Sheboygan does not involve steep slopes and does not pose a landslide risk. The landslide risks associated with Lake Michigan are addressed under “Coastal Hazards” in the Risk and Vulnerability section of this plan.

Land subsidence is an event in which a portion of the land surface collapses or settles. Common causes of subsidence are location in an area with karst topography or location in an area where large amounts of groundwater have been withdrawn. The City of Sheboygan is not an area of particularly karst topography or excessive groundwater usage.

Dam Failures

A "dam" is an artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material for the purpose of storage or control of 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. Other failures and breeches can take much longer to occur.

Generally, areas that would be affected by dam failure can be delineated by establishing inundation boundaries, also known as the hydraulic shadow. The inundation boundary defines the area of land downstream from the dam that would be inundated by water upon failure of the dam during a regional flood. A number of different boundaries can be defined for one dam based on various antecedent flow conditions (for example, the boundaries may be delineated considering normal weather conditions as well as during flood conditions).

If a dam failure were to occur, buildings and other structures located within the inundation boundary would likely be damaged, or even destroyed. Additionally, people situated within the boundary at the time of the failure could be hurt, or even killed, if not evacuated in a timely manner.

There are no dams of any size located in the City of Sheboygan based on the December 2010 Wisconsin Department of Natural Resources dam inventory.

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 this assessment will attempt to focus on the risk potential to the overall planning area, critical facilities are of particular concern. Critical facilities provide essential products and services to the general public that are necessary to preserve health, welfare, and quality of life in the planning area; and fulfill important public safety, emergency response, or disaster recovery functions. Critical facilities in the planning area have been identified and mapped, and are illustrated in Map 3. Table 6 lists the types and numbers of critical facilities in the planning area.

Table 6: Types and Number of Critical Facilities, City of Sheboygan

Type	# of Facilities
School	22
Communications	10
Electric	10
Public Works	8
Fire/Rescue	5
Law Enforcement	5
Disaster Response	2
Government	2
Hospital	2
Rescue	2
Gas	1
Total Critical Facilities	69

Source: Bay-Lake Regional Planning Commission, 2011.

Natural Hazard Past Occurrences

National Weather Service (NWS) data published by the National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC) provided the information contained in this plan on past weather events and the resulting deaths, injuries, and damages associated with each hazard event. This plan utilized data from January 1, 1995 through May 31, 2011. The following hazard types combined more than one listing from the NCDC data for consistency.

- *Winter storm* combines “blizzard,” “blowing snow,” “heavy snow” “ice storm,” “winter storm,” “winter weather,” and “winter weather/mix.”
- *Fog* combines “dense fog” and “fog.”
- *Extreme heat* combines “extreme heat,” “excessive heat”, “record warmth,” “record heat,” and “heat.”
- *Extreme cold* combines “cold,” “cold/wind chill,” “extreme cold,” “extreme cold/wind chill,” and “extreme windchill.”
- *Flooding* combines “flood,” “flash flood,” and “urban/small stream flooding.”
- *Tornado/High Winds* combines “funnel cloud,” “strong wind,” “strong winds,” “high wind,” and “thunderstorm wind.”
- *Lightning Storms/Thunderstorms* combines “hail,” “heavy rain,” and “lightning.”

The NCDC data indicated that 249 discernible hazard events were recorded from January 1, 1995 through May 31, 2011 for the planning area. Many of these hazard events may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area. However, some of the common hazard events, such as lightning storms/thunderstorms, may only get recorded by the NCDC if they are extreme events that cause property damage, injury, or death.

Natural Hazard Frequency and Vulnerability

The data from the NCDC shows that of all the events recorded over the last 16 years, winter storms are the most frequently occurring natural hazard event, with 73 events recorded (averaging 4 events per year). This was followed by fog (4 events per year average), tornado/high winds (3 events per year average), extreme cold (1 event per year average), extreme heat (1 event per year average), flooding (1 event per year average), drought (1 event every 2 years average), and lightning storms/thunderstorms (1 event every 3 years average). Table 7 shows the frequency of natural hazards occurring in the planning area since 1995.

Table 7: Natural Hazard Occurrences, City of Sheboygan, 1995 to 2011¹

Natural Hazard	# of Events	Avg #/Year
Winter Storm	73	4
Fog	60	4
Tornado/High Winds	42	3
Extreme Cold	21	1
Extreme Heat	20	1
Flooding	13	1
Drought	11	0.7 ²
Lightning Storms/Thunderstorms	9	0.5 ³
Total	249	

1. January 1, 1995 to May 31, 2011

2. 1 event every 2 years

3. 1 event every 3 years

Source: NOAA National Climatic Data Center; and Bay-Lake Regional Planning Commission; 2011.

HAZARD PROFILES

Hazard profiles are intended to provide an analysis of the characteristics of natural hazards that could have an impact on the City of Sheboygan. Hazard profiles use historical data to describe the characteristics of each natural hazard, and discuss how the hazards have affected the population, infrastructure, and environment of the area. Potential risks are evaluated to determine their likelihood of reoccurrence and to gauge the negative impacts to the existing population and property that could occur from the hazards.

Although this assessment will attempt to focus on the risk potential to the overall planning area, critical facilities and infrastructure are of particular concern. Critical facilities and infrastructure provide essential services and/or products that are necessary to preserve health, welfare, and quality of life for residents of the city. In addition, critical facilities and infrastructure may fulfill important public safety, emergency response, and/or disaster recovery functions.

A profile of each natural hazard assessed in this plan is provided in the following hazard information section. Much of the hazard assessment information was derived from the *State of Wisconsin Hazard Mitigation Plan* (2008) and the *Sheboygan County All-Hazards Mitigation Plan*.

Past hazard events are indicative of what can happen in the future and hazard studies and mitigation plans are based on the risk of future hazard occurrences. The statistical potential that hazards of a certain magnitude will recur is extrapolated from historical records.

The natural hazards assessed below include flooding, lightning storms and thunderstorms, tornadoes, extreme cold, extreme heat, winter storms, fog, wildland fires, drought, and coastal hazards.

Flooding

Description of Hazard

A flood is a natural event for rivers and streams that occurs when excess water from snowmelt, rainfall, or storm surge accumulates and overflows onto the banks and adjacent floodplains.

Floodplains are lowlands, adjacent to rivers, and lakes that are subject to recurring floods. Most flood-related injuries and deaths occur when people are swept away by flood currents, and the majority of property damage is caused from sediment-laden floodwaters.

The severity of flooding is determined by rainfall intensity (or other water source) and duration. A large amount of rainfall over a short time span can result in flash flood conditions. However, several factors beyond intensity and duration also come into play. For instance, a small amount of rain can cause flooding in areas where the soil is saturated or in areas of impermeable surfaces such as large parking lots, paved roadways, or other impervious developed areas. Topography and ground cover are also contributing factors for floods. Water runoff is greater in areas with steep slopes and little or no vegetative ground cover.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), the City of Sheboygan has experienced 13 significant flooding events (including flash, riverine, lake, and stormwater flooding) in the last 16 years from January 1, 1995 to May 31, 2011. Many of these hazard events may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, the City of Sheboygan experiences approximately one significant flooding event per year.

Probability of Hazard Occurring in the Future

FEMA uses the “base” flood as the basis for its regulatory requirements and flood insurance rate setting. 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 previous hazard occurrences, the City of Sheboygan can expect to experience approximately one significant flooding event per year. The planning area is considered to have a **medium** probability of sustaining a 100-year flood in any given year, based on observations of past flooding events (and the extent of those events).

Areas at Greatest Risk

The areas at greatest risk from flooding include the “base floodplain” areas of the City of Sheboygan. 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 4. Properties and critical facilities that potentially lie within the floodplain and would be affected by the base flood (or “100-year flood”) are shown in Map 5.

Impacts from Hazard

Death and Injury

No death or injuries from flooding has been reported for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data.

Structures at Risk

Analysis of the data used to produce Map 5 indicates that 224 buildings could potentially be impacted by the base flood in the planning area. All but five of the buildings are privately owned. Of these structures, 202 structures are residential structures, 12 structures are commercial structures, five structures are manufacturing structures, two structures are related to recreation uses, two structures are public buildings, and one structure is related to educational uses.

A review of FEMA flood insurance claims from January 1, 1978 through April 30, 2011, indicates that there were 22 claims in the City of Sheboygan; 14 of the claims with a total value of nearly \$154,000 were paid during that period, while eight claims were denied (NFIP, WR2C1040).

Repetitive Loss Properties

There is one repetitive loss property in the City of Sheboygan. This property is a residential property that has had two claims (in 1986 and 1987) for damages to contents for a total claim amount of \$10,177. There have been no claims for this property since 1987, and no mitigation has been undertaken.

Critical Facilities

Impacts on critical facilities include impacts to shelters, schools, utilities, health facilities, police stations, fire stations, city and county government, hospitals, and rescue services. Map 3 shows the critical facilities in the planning area classified by critical facility type.

Critical facilities that could be impacted by flooding are relatively easily identifiable, since they are located in the floodplain. The map of the various types of critical facilities was overlain on the GIS floodplain layer to determine how many and what types of critical facilities are subject to flooding.

While there are numerous critical facilities in the City of Sheboygan, only one critical facility is potentially located in a 100-year floodplain; a lift station on S. Business Drive.

Economic Impacts

Property Damage

Reported property damage from significant flooding for the City of Sheboygan has totaled over \$201.5 million over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of this reported property damage may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Crop Damage

Reported crop damage from significant flooding for the City of Sheboygan has totaled over \$869.7 million over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of this reported crop damage may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Fair Market Value of Structures at Risk

The fair market value of all privately owned at-risk structures is estimated at \$35,482,000. This information was obtained from City of Sheboygan and Sheboygan County database on fair market and assessed values of real property (structures and land). 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.

A review of the Flood Insurance Rate Map and accompanying flood profiles identified 22 bridge or other stream crossing sites that could potentially be underwater during a base flood. These are shown on Map 6. In addition to the sites shown on the map, there may be bridges and culverts in areas that are not included in the Flood Insurance Rate Map 100-year flood zones, such as areas located along small tributary streams.

Estimate of Potential Dollar Losses

The following is an estimate of potential dollar losses to vulnerable structures. “Vulnerable structures” are those structures located in the 100-year flood hazard area, as identified in Map 4. 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 \$49,845,100 (in current dollars) 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 buildings in all of the flood zones of the planning area.

This information was obtained from a City of Sheboygan 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.

In addition, there may be areas outside the 100-year flood zones that will flood during a flood 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 has been kept to a minimum in recent years through such mechanisms as the sewer service extension review process and floodplain overlay zoning.

Regulation of Development in Floodplains, Watersheds, and Natural Resource Areas

The City of Sheboygan regulates development within the floodplain through its Floodplain Ordinance, which is Appendix A of the Sheboygan, Wisconsin Code of Ordinances. In addition, the City of Sheboygan Comprehensive Plan addresses regulation of development in floodplains, watersheds, and natural resource areas.

Sheboygan County has both a Shoreland and Floodplain Ordinance, which are Chapters 72 and 73, respectively, in the county's code of ordinances. These ordinances can be useful tools in keeping inappropriate development out of many flood hazard zones in the planning area.

Finally, the Bay-Lake Regional Planning Commission has tools to keep development out of flood hazard zones in the planning area. The Commission develops and administers the sewer service area plan for the Sheboygan urbanized area, which takes into account preservation of natural features and minimization of future development in flood hazard areas near bodies of water. The Commission reviews proposals for development in the Sheboygan urbanized area for consistency with the sewer service area plan. The Commission also maintains an environmental corridor definition and map of all of Sheboygan County, which is used to comment on development proposals.

NFIP Participation

The City of Sheboygan has participated in the FEMA National Floodplain Insurance Program (NFIP) since March 1977 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 city.

In addition, Sheboygan County has participated in the NFIP since July 1978.

Lightning Storms and Thunderstorms

Description of Hazard

Thunderstorms 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. 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.

Hail storms are an associated threat that has been combined with lightning storms and thunderstorms. 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, having developed sufficient weight, they 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.

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 typically 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), the City of Sheboygan has experienced nine significant lightning storm and/or thunderstorm events (including hailstorms) in the last 16 years from January 1, 1995 to May 31, 2011. Many of these hazard events may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, the City of Sheboygan experiences approximately one significant lightning storm and/or thunderstorm event every three years.

Probability of Hazard Occurring in the Future

Based on previous hazard occurrences, the City of Sheboygan has a 33% chance of experiencing a significant lightning storm and/or thunderstorm event in any given year – a **low** probability of occurrence, based on observation of past events (and the extent of those events).

Areas at Greatest Risk

Based on review of the historic patterns of lightning storms and thunderstorms, there are no specific areas that are a higher than average risk. The events are relatively uniform throughout Sheboygan County, including the City of Sheboygan. However, mobile home residents are often most vulnerable to death, injury, and property damage from lightning and thunderstorms. Therefore, mobile home parks in the planning area are the areas of greatest risk from this hazard.

Impacts from Hazard

Death and Injury

No death or injuries from lightning storms or thunderstorms has been reported for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data.

Structures at Risk

Mobile homes are at a high risk to damage from thunderstorms. Garages are also frequently damaged by thunderstorms. Wind and water damage can result when windows are broken by flying debris or hail. Lightning can cause direct damage to structures (especially those without lightning protection systems), and can cause fires that damage trees and structures. In addition, hail can inflict severe damage to roofs, windows, and siding, depending on hailstone size and winds. Downed trees and limbs cause frequent damage to structures during lightning storms and thunderstorms.

Critical Facilities

Hospitals can see increases in patient load with sufficiently severe lightning storms and thunderstorms. Schools can sustain damage, and if they do not sustain damage, they often function as temporary shelters in the aftermath of severe thunderstorms. Police and fire departments often see an increased workload during and after lightning storms and/or severe thunderstorms. Emergency operations can be disrupted as lightning storms and thunderstorms affect radio communications, as antennas are a prime target for lightning.

Economic Impacts

Property Damage

Reported property damage from significant lightning storms and thunderstorm (and hail) for the City of Sheboygan has totaled approximately \$26,000 over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of this reported property damage may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Crop Damage

Reported crop damage from significant lightning storms and thunderstorm (and hail) for the City of Sheboygan has totaled approximately \$1,000 over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of this reported crop damage may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Estimate of Potential Dollar Losses

Since mobile homes are most vulnerable to lightning storms and thunderstorm, a “worst case scenario” for this hazard would involve the total destruction of all mobile homes in two mobile home parks in the City of Sheboygan. The two mobile homes are Sommer’s Woodhaven Manufactured Home Community (4441 South 12th Street, Sheboygan), and Indian Meadows Manufactured Home Community (3636 South Business Drive, Sheboygan). In this “worst case scenario,” the total destruction of all buildings and facilities (valued at \$2,407,400) would occur.

This information was obtained from a City of Sheboygan 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.

Tornadoes and High Winds

Description of Hazard

A tornado is a rapidly rotating column of air produced by a cumulonimbus cloud. When a tornado funnel drops to the ground, it can create significant damage and loss of life. A tornado is a relatively short-lived storm composed of an intense rotating column of air, extending from a thunderstorm cloud system. It is nearly always visible as a funnel, although its lower end does not necessarily touch the ground. Average winds in a tornado, although never accurately measured, are between 100 and 200 miles per hour, but some tornadoes may have winds in excess of 300 miles per hour.

A tornado path averages four miles, but may reach up to 300 miles in length. Widths average 300 to 400 yards, but severe tornadoes have cut swaths a mile or more in width, or have formed groups of two or three funnels traveling together. On average, tornadoes move between 25 and 45 miles per hour, but speeds over land of up to 70 miles per hour have been recorded. Tornadoes rarely last more than a couple of minutes in a single location or more than 15 to 20 minutes in a ten-mile area, but their short periods of existence do not limit their devastation of an area.

The destructive power of the tornado results primarily from its high 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.

The Fujita scale (Figure 2), which has been recognized as the acceptable tornado magnitude measurement rating until recently. Beginning February 1, 2007, the Fujita scale was updated to the Enhanced F Scale (EF scale) for operational use in the United States (Figure 2). The Enhanced F Scale accounts for different degrees of damage that occur with different types of structures, as well as damage to things other than structures. The scale was revised to reflect better examinations of tornado damage surveys to align wind speeds more closely with associated storm damage. None of the tornadoes recorded before January 31, 2007 will be re-categorized to the EF scale.

The EF scale considers how structures are designed. The wind speeds on the original scale were deemed by meteorologists as being too large and engineering studies have shown that slower winds can cause the same damage as that of winds of 300 mph. The new scale lists an EF-5 as a tornado with winds at or above 200 mph (324 km/h) – which corresponds to the wind speeds of F3 or F4 in the original Fujita scale. Essentially, there is no functional difference in how tornadoes are rated. The old ratings and new ratings are cleanly connected with a linear formula. The only differences are adjusted wind speeds, measurements of which were not used in previous ratings, and refined damage descriptors.

Figure 2: F Scale and EF Scale

ORIGINAL FUJITA SCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	Fastest 1/4-mile (mph)	3-Second Gust (mph)	EF Number	3-Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85	0	65-85
1	73-112	79-117	1	86-109	1	86-110
2	113-157	118-161	2	110-137	2	111-135
3	158-207	162-209	3	138-167	3	136-165
4	208-260	210-261	4	168-199	4	166-200
5	261-318	262-317	5	200-234	5	Over 200

Source: National Weather Service. Graphic by Weather Teacher. www.wxteacher.com.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), the City of Sheboygan has experienced 42 significant tornado and/or high wind events in the last 16 years from January 1, 1995 to May 31, 2011. Many of these hazard events may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, the City of Sheboygan experiences approximately three significant tornado and/or high wind events per year.

Probability of Hazard Occurring in the Future

Based on previous hazard occurrences, the City of Sheboygan can expect to experience approximately three significant tornado and/or high wind events per year. The planning area is considered to have a **high** probability of experiencing a tornado and/or high wind event in any given year, based on observation of past events (and the extent of those events).

Areas at Greatest Risk

Tornadoes have no defined hazard area within the planning area. 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 and high winds. Therefore, mobile home parks in the planning area are the areas of greatest risk from this hazard.

Impacts from Hazard

Death and Injury

Four deaths and fifteen injuries have been reported from significant tornadoes or high winds for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of these reported death or injuries may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Structures at Risk

Although tornadoes strike at random, making all buildings vulnerable, there are three types of structures that are most likely to suffer damage. These structure types include mobile homes, homes on crawlspaces (because they are more susceptible to lift), and buildings with large spans (such as airplane hangars, gymnasiums and factories).

Structures within the direct path of a tornado vortex are often reduced to rubble. However, structures adjacent to the path of the tornado are often severely damaged by high winds flowing into the tornado vortex (these winds are known as inflow winds). It is here, adjacent to the tornado's path, where the building type and construction techniques are critical to the structure's survival.

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) 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.

Any critical facility in the planning area is capable of being hit. However, schools are a main concern for two reasons: (1) they have large numbers of people present, either during school or

as a storm shelter; and (2) they have large span areas, such as gyms and theaters. At this time, we do not know which critical facilities in the planning area may have large span structures.

Economic Impacts

The major impact of a tornado on the local economy is damage to businesses and infrastructure. A heavily damaged business, especially one that was barely making a profit, often has to be closed.

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 largest public expenses are for 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.

Many of the economic impacts identified under lightning storms and thunderstorms can also apply to tornadoes.

Property Damage

Reported property damage from significant tornadoes or high winds for the City of Sheboygan has totaled approximately \$12.4 million over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of this reported property damage may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Crop Damage

Reported crop damage from significant tornadoes or high winds for the City of Sheboygan has totaled approximately \$1.8 million over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of this reported crop damage may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Estimate of Potential Dollar Losses

Since mobile homes are most vulnerable to tornadoes or high winds, a “worst case scenario” for this hazard would involve the total destruction of all mobile homes in two mobile home parks in the City of Sheboygan. The two mobile homes are Sommer’s Woodhaven Manufactured Home Community (4441 South 12th Street, Sheboygan), and Indian Meadows Manufactured Home Community (3636 South Business Drive, Sheboygan). In this “worst case scenario,” the total destruction of all buildings and facilities (valued at \$2,407,400) would occur.

This information was obtained from a City of Sheboygan 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.

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.” Wind chill is the apparent temperature that describes the combined effect of wind and air temperatures on exposed skin. When wind blows across the skin, it removes the insulating layer of warm air adjacent to the skin. When all factors are the same, the faster the wind blows the greater the heat loss, which results in a colder feeling. 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. Extreme cold events are most likely during the months of January and February.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), the City of Sheboygan has experienced 21 significant extreme cold events in the last 16 years from January 1, 1995 to May 31, 2011. Many of these hazard events may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, the City of Sheboygan experiences approximately one significant extreme cold event per year.

Probability of Hazard Occurring in the Future

Based on previous hazard occurrences, the City of Sheboygan can expect to experience approximately one significant extreme cold event per year. The planning area is considered to have a **medium** probability of experiencing an extreme cold event in any given year, based on observation of past events (and the extent of those events).

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

Eight deaths and 52 injuries have been reported from significant extreme cold events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of these reported death or injuries may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

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.

It is possible that extreme cold conditions combined with low lake levels might have led to the freezing of the water intake pipe in Lake Michigan in early 2004.

Critical Facilities

All buildings involving critical facilities will have greater heating expenses during an extreme cold event. Increased demand will also affect Wisconsin Public Service, the local natural gas energy utility serving the planning area. 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. The Sheboygan Water Utility 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 also 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

Reported property damage from significant extreme cold events for the City of Sheboygan has totaled approximately \$23,000 over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of this reported property damage may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Crop Damage

No crop damages have been reported from significant extreme cold events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, 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 and crop damages from extreme cold has been minimal over the past 16 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 the

Sheboygan area often involves periods with high ozone levels, which is unhealthy for the lungs and is particularly problematic for people with asthma and other serious respiratory conditions.

Extreme heat has been the most deadly hazard in Wisconsin in recent years. Heat stroke is the leading cause of death in extreme heat episodes. The elderly, disabled, and other vulnerable populations are especially susceptible to heat stroke.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), the City of Sheboygan has experienced 20 significant extreme heat events in the last 16 years from January 1, 1995 to May 31, 2011. Many of these hazard events may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, the City of Sheboygan experiences approximately one significant extreme heat event per year.

Probability of Hazard Occurring in the Future

Based on previous hazard occurrences, the City of Sheboygan can expect to experience approximately one significant extreme heat event per year. The planning area is considered to have a **medium** probability of experiencing an extreme heat event in any given year, based on observation of past events (and the extent of those events).

The likelihood of extreme heat is somewhat lower along Lake Michigan under certain meteorological conditions, which lowers this probability for certain portions of the planning area. Extreme heat episodes tend to be a regional phenomenon in that they affect much of the southeastern half of Wisconsin on nearly all of the occasions in which they affect the planning area.

Areas at Greatest Risk

Portions of the planning area furthest from Lake Michigan are at greatest risk from extreme heat episodes. This is because under certain meteorological conditions, temperatures near Lake Michigan can be several degrees cooler than temperatures a few miles to the west. However, this is not always the case; there are many instances where extreme heat occurs throughout the entire planning area.

Impacts from Hazard

Death and Injury

82 deaths and 43 injuries have been reported from significant extreme heat events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of these reported death or injuries may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

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. There may be higher demand for water recreation in city parks as well, including beaches along Lake Michigan and other swimming venues.

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 in a manner similar to what was experienced in the northeastern United States and in eastern Canada in the summer of 2003. 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. The Sheboygan Water Utility will incur the expenses involved with additional demand for water during extreme heat episodes, and these expenses will be passed on to area consumers.

One less tangible economic impact of extreme heat involves lower productivity from persons who must work outside or in less than ideal conditions. In addition, people will be less motivated to shop at local businesses and may defer non-essential activities until the heat episode is over, negatively impacting the local economy. Extreme heat can negatively impact agriculture in the surrounding area when combined with drought.

Property Damage

No property damages have been reported from extreme heat events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data.

Crop Damage

No crop damages have been reported from extreme heat events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, 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 and crop damages from extreme heat has been minimal over the past 16 years

Winter Storms

Description of Hazard

Winter storms can vary in size and strength, and can include heavy snow storms, blizzards, freezing rain, sleet, ice storms and blowing and drifting snow conditions. Extremely cold temperatures accompanied by strong winds can result in wind chills that cause bodily injury such as frostbite and death. Winter storms can occur as a single event or they can occur in combination, which can make an event more severe. For example, a moderate snowfall could create severe conditions if it were followed by a freezing rain and subsequent extremely cold temperatures. The aftermath of a winter storm can impact a community or region for weeks, and even months.

A variety of weather phenomena and conditions can occur during winter storms. For purposes of classification, the following are National Weather Service approved descriptions of winter storm elements:

Heavy Snowfall – the accumulation of six or more inches of snow in a 12-hour period, or eight or more inches in a 24-hour period.

Winter Storm – the occurrence of heavy snowfall accompanied by significant blowing snow, low wind chills, sleet or freezing rain.

Blizzard – the occurrence of sustained wind speeds in excess of 35 miles per hour accompanied by heavy snowfall or large amounts of blowing or drifting snow.

Ice Storm – an occurrence where rain falls from warmer upper layers of the atmosphere to the colder ground, freezing upon contact with the ground and exposed objects near the ground.

Freezing drizzle/freezing rain – the effect of drizzle or rain freezing upon impact on objects that have a temperature of 32 degrees Fahrenheit or below.

Sleet – solid grains or pellets of ice formed by the freezing of raindrops or the refreezing of largely melted snowflakes. This ice does not cling to surfaces.

Wind chill – an apparent temperature that describes the combined effect of wind and low air temperatures on exposed skin.

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 only 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.

Both ice and sleet storms can occur at any time throughout the winter season from October into April. Early- and late-season ice and sleet storms are generally restricted to northern Wisconsin. Otherwise, the majority of these storms occur in southern Wisconsin. In a typical winter season, there are three to five freezing rain events, and a major ice storm occurs on a frequency of about once every other year. If a half inch of rain freezes on trees and utility wires, extensive damage can occur, especially if accompanied by high winds that compound the effects of the added

weight of the ice. There are also between three and five instances of glazing (less than one quarter inch of ice) throughout Wisconsin during a normal winter.

Winter storms present a serious threat to the health and safety of affected citizens, and can result in significant damage to property. This can occur when the heavy snow or accumulated ice causes structural collapse of buildings, downs power lines, severely affects electrical power distribution, or cuts off people from assistance or services.

Winter storms in Wisconsin are caused by Canadian and Arctic cold fronts that push snow and ice deep into the interior of the United States. The planning area is also occasionally subject to lake effect snow storms that develop from the passage of cold air over the relatively warm surface of Lake Michigan, which can cause heavy snowfall and blizzard conditions.

Previous Significant Hazard Occurrences

According to National Climatic Data Center (NCDC), the City of Sheboygan has experienced 73 significant winter storm events in the last 16 years from January 1, 1995 to May 31, 2011 (including heavy snow storms, ice storms, and blizzards). Many of these hazard events may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, the City of Sheboygan experiences approximately four significant winter storm events per year (including heavy snow storms, ice storms, and blizzards).

Probability of Hazards Occurring in the Future

Based on previous hazard occurrences, the City of Sheboygan can expect to experience approximately four significant winter storm events per year. The planning area is considered to have a **high** probability of experiencing a winter storm event in any given year, based on observation of past events (and the extent of those events).

Winter storms tend to be a regional phenomenon in that they affect much of the southeastern half of Wisconsin on nearly all of the occasions in which they affect the City of Sheboygan. However, the proximity of the planning area to Lake Michigan increases the likelihood of additional moisture enhanced snow during one of these events if meteorological conditions are right.

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; however, areas close to Lake Michigan can have additional moisture enhanced snow during one of these events under certain meteorological conditions (such as wind direction).

Impacts from Hazard

Death and Injury

No deaths, but six injuries, have been reported from significant winter storm events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of these reported death or injuries may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

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

City street and county 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 Sheboygan 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. Agriculture can be negatively impacted by these storms if they occur over a long time period.

Property Damage

Reported property damage from significant winter storms for the City of Sheboygan has totaled approximately \$21,000 over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of this reported property damage may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Crop Damage

No crop damages have been reported from winter storm events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data.

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 and crop damages from winter storms has been minimal over the past 16 years

Fog

Description of Hazard

Fog is basically clouds near the ground. Clouds are areas of condensed water droplets; clouds can also be ice crystals in the upper atmosphere. The same processes that produce clouds high above the ground can produce clouds near the surface. Fog forms when air can no longer hold all of the moisture it contains. This basically occurs under two circumstances: (1) when air is cooled to its dew point (the temperature at which air is holding as much moisture as it can; or (2) when the amount of moisture in the air increases. Once air has reached its dew point, it condenses onto very small particles that form tiny water droplets that comprise fog.

Fog is a hazard mainly for one very important reason: reduced visibility. Airport delays, automobile accidents, ship wrecks, plane crashes, and many other problems are frequently caused by fog. When air pollution (such as smoke) combines with fog, visibility decreases even more. Acid fog, resulting from the combination of air pollutants (such as nitrogen and sulfur oxides) with water droplets can create health problems, especially for people who have respiratory conditions. However, fog can also be beneficial; several species of plants, including some crops, depend on fog for moisture and cool temperatures from decreased sunlight.

Fog is responsible for an average of over \$1,000,000 in property damage, dozens of injuries, and several deaths every year throughout the nation. The financial cost of transportation delays caused by fog has not been calculated, but is substantial.

Fog can occur almost anywhere and during any season. Certain seasons are more likely to have foggy days and nights in certain locations based on several factors, including topography and the process responsible for forming the fog.

Fog is classified based on how it forms, which is often related to where it forms. The following are the four most common types of fog:

- **Advection fog** occurs when warm, moist air is blown over a cold surface, and that surface can lower the temperature of the air to its dew point. Advection fog is common in harbors and bays in the summer. In the winter, warm and humid air from the subtropical oceans can also be blown over the cooler surface of the land, causing extensive fog.
- **Evaporation fog** is the result of water evaporating from streams, lakes and oceans. When cold air blows over warm water, the moisture that is evaporating from the surface will increase the amount of moisture in the air, possibly to the point that the air can no longer hold all of the water it contains. In this type of fog, the temperature of the air does not decrease to dew point. Instead, the moisture content of the air increases, resulting in the dew point being reached for this amount of moisture. Steam rising from lakes is a common type of evaporation fog.
- **Radiation (Ground) fog** is common on clear nights with little or no wind, and forms from the rapid cooling of the Earth's surface in the absence of clouds. Since the temperature of air near the surface is mostly influenced by the surface itself, the air

temperature can easily drop to its dew point on calm, clear nights. This type of fog is common in valleys where cool air tends to accumulate. Often, radiation fog is called “valley fog” when it persists in valleys during the daytime hours and is fairly thick.

- **Upslope fog** can form from the cooling of rising air. If air is blown over high hills or mountains, it may cool enough to reach its dew point. This can result in extensive fog in mid-slope areas, such as the portion of the Great Plains adjacent to the Rocky Mountains.

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), the City of Sheboygan has experienced 60 significant fog events in the last 16 years from January 1, 1995 to May 31, 2011. Many of these hazard events may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, the City of Sheboygan experiences approximately four significant fog events per year.

Probability of Hazard Occurring in the Future

Based on previous hazard occurrences, the City of Sheboygan can expect to experience approximately four significant fog events per year. The planning area is considered to have a **high** probability of experiencing a fog event in any given year, based on observation of past events (and the extent of those events).

The likelihood of fog is somewhat higher along Lake Michigan, in area river valleys and in other low lying portions of the planning area under certain meteorological conditions, which increases this probability for certain portions of the planning area. Fog episodes often can be a regional phenomenon in that they affect much of the southeastern half of Wisconsin on many of the occasions in which they affect Sheboygan County.

Areas at Greatest Risk

Portions of the planning area situated along Lake Michigan, in river valleys and in other 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 at least occasionally.

Impacts from Hazard

Death and Injury

Eleven deaths, but no injuries, have been reported from significant fog events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC

data. Some of these reported death or injuries may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

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.

In winter fog events, utility companies may need to repair their lines in circumstances where the fog combines with icing on electrical lines.

While not a critical facility in the planning area, the Sheboygan County Memorial Airport and other area 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. Fog events can also cost businesses in lost time involving late workers and/or late shipments. If area school districts need to delay school during a fog event, there may be expenses involved with delayed busing and with paying staff for a full day while only having the benefit of a partial day of instruction. 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 property damages have been reported from fog events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data.

Crop Damage

No crop damages have been reported from fog events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data.

Estimate of Potential Dollar Losses

An estimate of potential dollar losses cannot be calculated for fog events, since no vulnerable structures have been identified. Based on previous damages reported by the NCDC, property and crop damages from winter storms has been minimal over the past 16 years

Wildland Fires

Description of Hazard

A wildland fire is any instance of uncontrolled burning in brush, marshes, grasslands, or field lands. Typical causes of these fires are lightning, human carelessness or arson. Wildland fires can occur at any time of the year and during any time of the day. The primary factors that generally 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 to occur when vegetation is dry from a winter with little snow or a spring and summer with sparse rainfall. In recent times, development of homes and other structures in areas of highly flammable vegetation have caused an increase in wildfire danger. This condition is known as the wildland-urban interface (WUI).

If not promptly controlled, wildland fires can develop into an emergency or even a disaster. Fires threaten lives, resources, and property. In addition, fires can affect livestock and other domesticated pets.

Previous Significant Hazard Occurrences

There have been no significant wildland fires anywhere in Sheboygan County since 1980.

Hazard Frequency

There have been no significant wildland fires anywhere in Sheboygan County since 1980 in order to develop a hazard frequency.

Probability of Hazard Occurring in the Future

According to the U.S. Forest Service Wildland Fire Assessment System, Sheboygan 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 Sheboygan 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.

Overall, the probability of a naturally occurring wildland fire is **low** for the entire county.

Areas at Greatest Risk

Sheboygan County contains approximately 45,000 acres of forestland. 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. The likelihood that any wildland fire in Sheboygan County would be catastrophic is low, as most susceptible areas lack enough acreage to allow for continuous burning.

Impacts from Hazard

Structure at Risk

Homes and other structures located in the WUI are at high risk to damage from wildland fires. This risk increases when buildings are 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 and usage of recreational properties increases.

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.

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.

Estimate of Potential Dollar Losses

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

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), the City of Sheboygan has experienced 11 significant drought events in the last 16 years from January 1, 1995 to May 31, 2011. Many of these hazard events may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

Hazard Frequency

Based on previous hazard occurrences as reported by the NCDC, the City of Sheboygan experiences approximately one significant drought event every two 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. However, based strictly on previous hazard occurrences, the City of Sheboygan can expect to experience approximately one significant drought events every two years. The planning area is considered to have a **low** probability of experiencing a drought event in any given year, based on observation of past events (and the extent of those events).

Droughts tend to be a regional phenomenon in that they affect much of the southeastern half of Wisconsin on nearly all of the occasions in which they affect the City of Sheboygan.

Areas at Greatest Risk

Droughts 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 drought events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data.

Structures at Risk

There are no direct impacts to buildings 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 and industrial consumption, as wells and other water reserves may dry up. Also, water quality is generally 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.

There are few other direct impacts on critical facilities as a result of drought conditions. However, droughts can trigger other natural and man-made hazards, such as wildfires and post-drought flooding, which can have an impact on these facilities.

Economic Impacts

The State of 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.

Livestock can also be adversely affected by droughts. Lack of water can lead to animal deaths. In addition, as drought conditions are often accompanied by periods of prolonged sunshine and high temperatures, animals are at risk to overexposure and heatstroke. Death of livestock can also lead to substantial loss of income for farmers.

Drought can also affect local commercial and industrial businesses. During times of severe drought, limitations are often placed on water usage. These limitations could have a negative impact on businesses such as car washes and landscapers as they will likely be unable to provide services to their customers. It is also likely that areas depending on tourism will see fewer people traveling to their area in times of drought. Industries which utilize large amounts of water in processing materials may also be subject to these limitations, which could potentially reduce their production capabilities.

Property Damage

No property damages have been reported from drought events for the City of Sheboygan over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data.

Crop Damage

Reported crop damage from significant drought for the City of Sheboygan has totaled approximately \$4.5 million over the last 16 years from January 1, 1995 to May 31, 2011, according to NCDC data. Some of this reported crop damage may not have been specific to the City of Sheboygan, as they were recorded for Sheboygan County or a larger regional area.

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 146,436 acres of harvested cropland in the county (2007 Census of Agriculture) as well as loss of livestock. According to the City of Sheboygan land use, the city has approximately 417 acres of agricultural land. The 2007 Census of Agriculture estimated the market value of farm land and buildings, based on an average value per acre, was \$3,869 (based on a sample of farms). Therefore, it can be estimated that if this “worst case scenario” were to occur, the total destruction of all agricultural land in the City of Sheboygan would cause a loss of \$1,613,373.

Coastal Hazards

Description of Hazard

In Northeast 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 the City of Sheboygan. However, reliable sources for coastal hazard occurrences could not be found.

Hazard Frequency

There is no record of significant coastal hazards for the City of Sheboygan in order to develop a hazard frequency. However, reliable sources for coastal hazard occurrences could not be found.

Probability of Hazard Occurring in the Future

According to the *Wisconsin Coastal Management Program: Needs Assessment and Strategy 2006-2010* (January 2006), the Sheboygan County is at risk for coastal erosion and coastal flooding.

Sheboygan County is identified as an area at “greatest risk” for coastal erosion and at “medium risk” for coastal flooding.

Overall, the probability of coastal hazards is **medium** for the planning area.

Areas at Greatest Risk

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

Impacts from Hazard

Structure 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 28 properties directly adjacent to Lake Michigan in the City of Sheboygan, all but four are public properties, and a number of them are parks.

Critical Facilities

There are no critical facilities located along Lake Michigan at risk of damage from coastal hazards.

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 a private property and houses.

Estimate of Potential Dollar Losses

A “worst case scenario” for potential dollar losses from coastal hazard in the City of Sheboygan would involve the total destruction of all private structures along Lake Michigan, which would cause a loss of \$136,971,700 in private damages. There are no assessed values available for public properties.

This information was obtained from a City of Sheboygan 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.

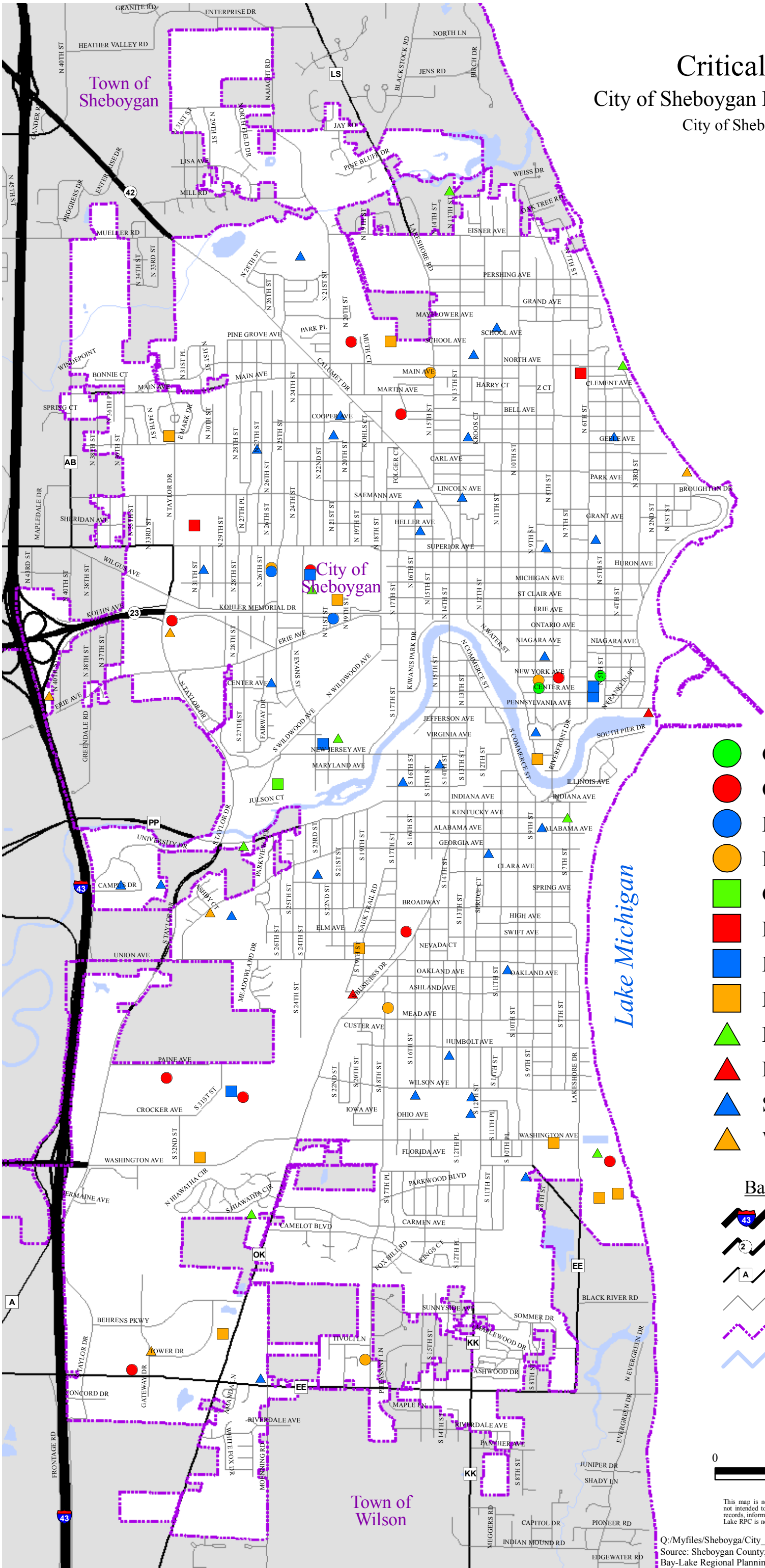
Critical Facilities

City of Sheboygan Hazard Mitigation Plan

City of Sheboygan, Wisconsin

City of Sheboygan

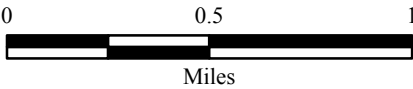
3-31



- Government
- Communications
- Disaster Response
- Fire/Rescue
- Gas
- Hospital
- Law Enforcement
- Electric
- Public Works
- Rescue
- School
- Water

Base Map Features

- Interstate Highway
- State Highway
- County Highway
- Local Road
- MCD Boundary
- Major Surface Water



This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

Q:/Myfiles/Sheboyga/City_Sheb/All Hazard
Source: Sheboygan County; City of Sheboygan;
Bay-Lake Regional Planning Commission, 2011.

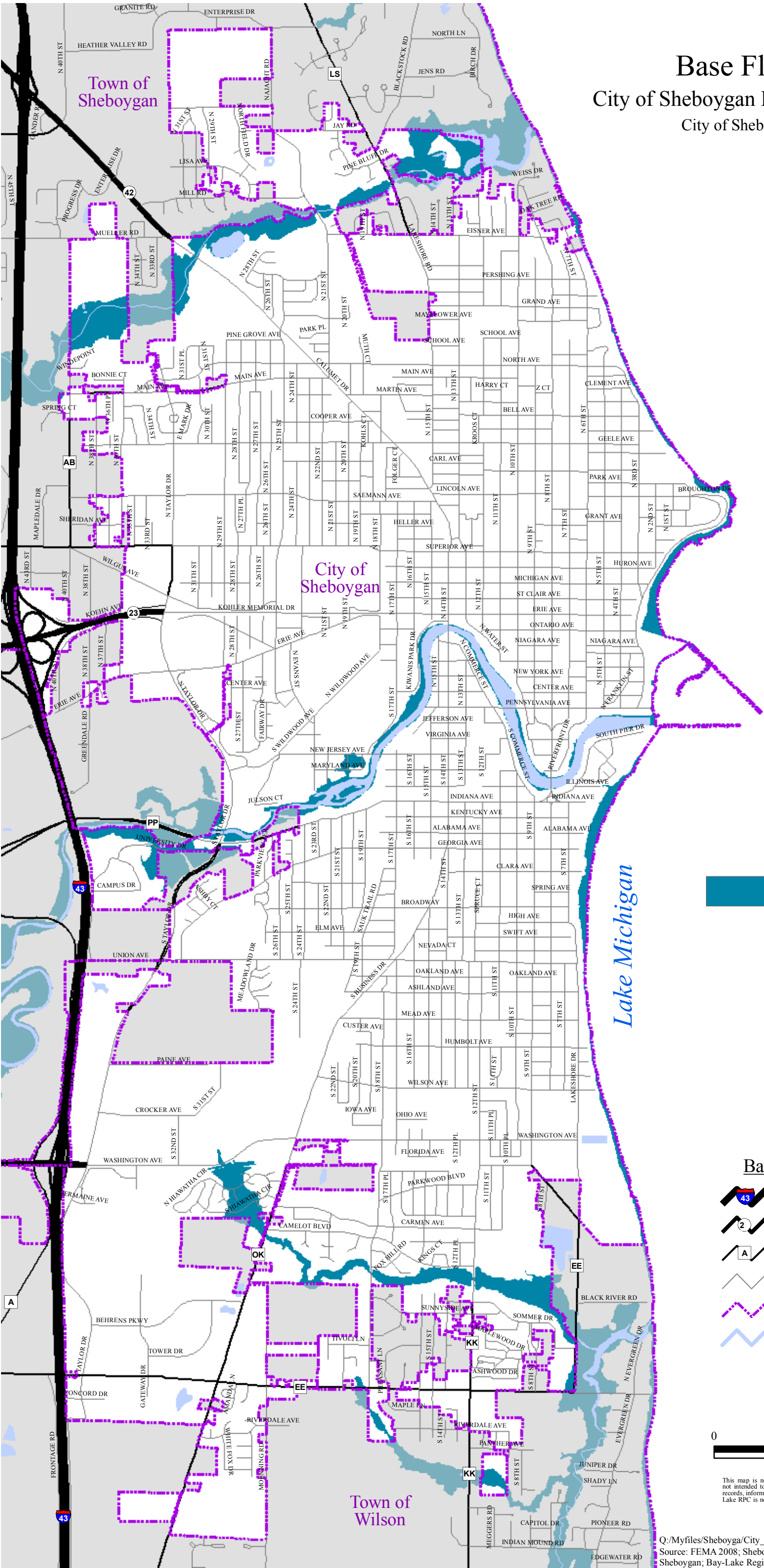


Natural Hazards Mitigation Plan

Base Floodplains

City of Sheboygan Hazard Mitigation Plan

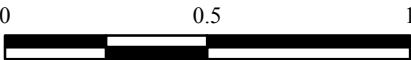
City of Sheboygan, Wisconsin



Base Floodplains

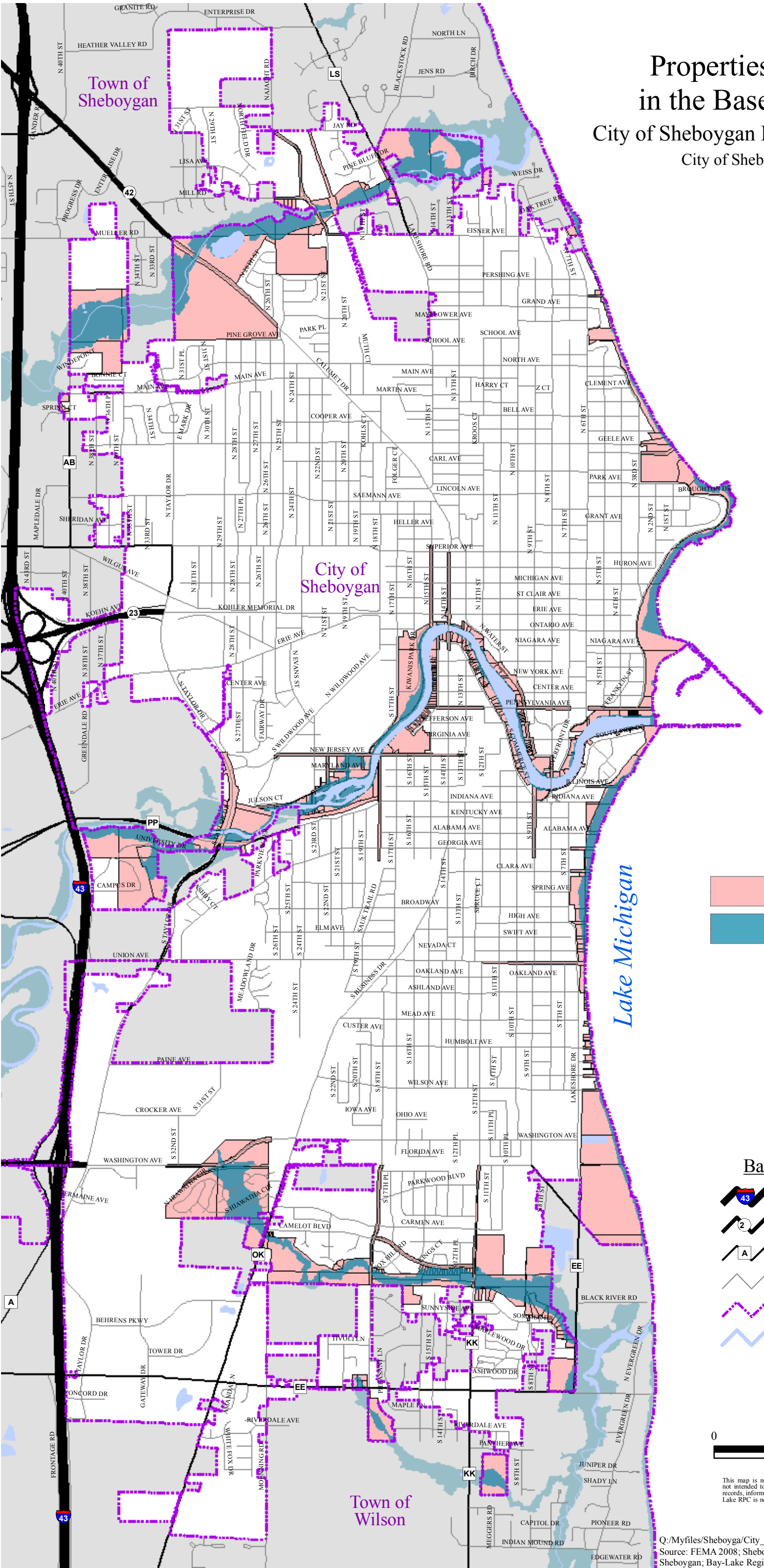
Base Map Features

- Interstate Highway
- State Highway
- County Highway
- Local Road
- MCD Boundary
- Major Surface Water



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Properties Potentially
in the Base Floodplains
City of Sheboygan Hazard Mitigation Plan
City of Sheboygan, Wisconsin



Properties
Base Floodplains

Base Map Features

- Interstate Highway
- State Highway
- County Highway
- Local Road
- MCD Boundary
- Major Surface Water



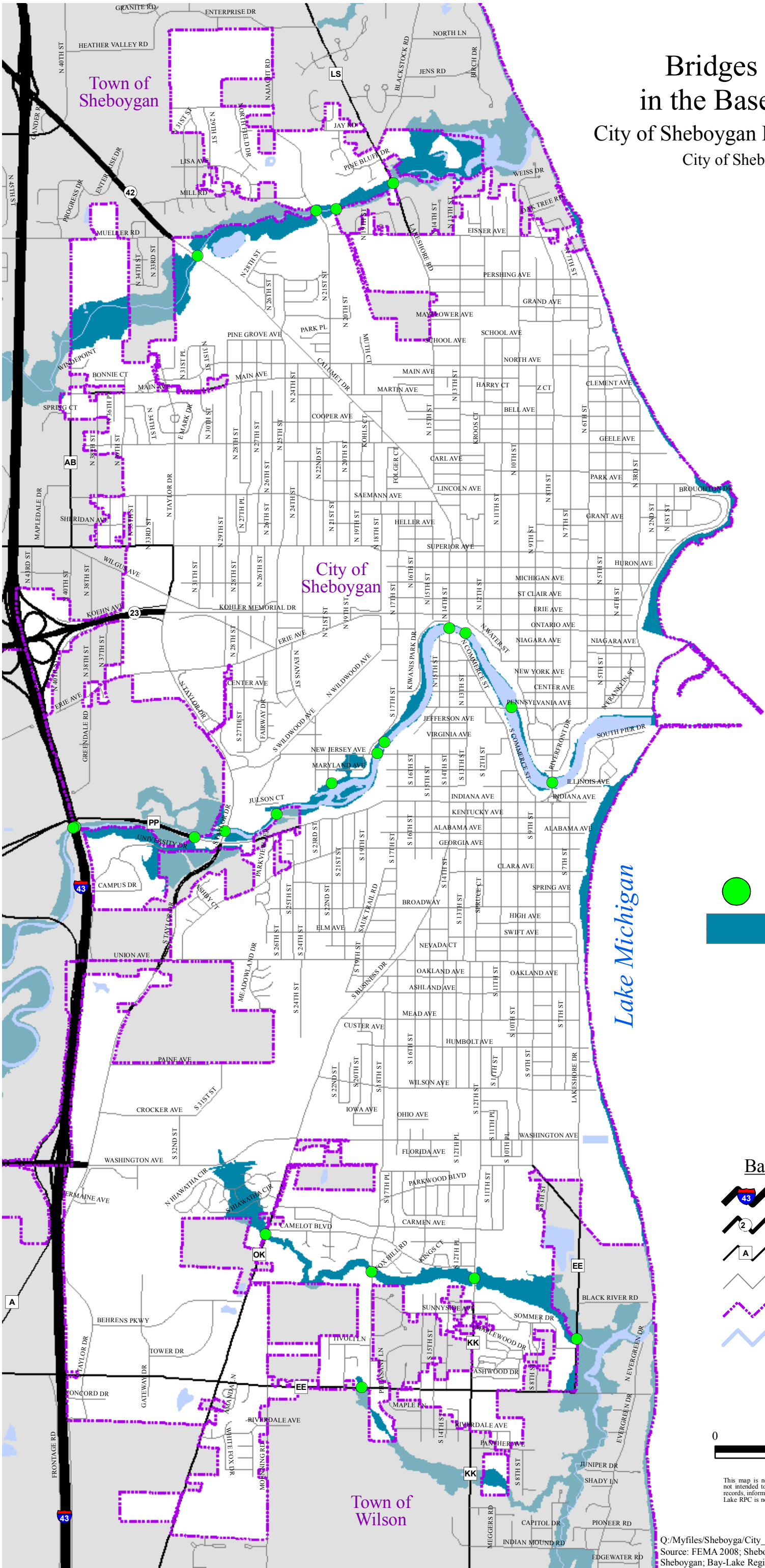
0 0.5 1
Miles

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Bridges Potentially in the Base Floodplains

City of Sheboygan Hazard Mitigation Plan

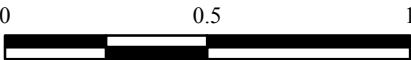
City of Sheboygan, Wisconsin



- Bridge
- Base Floodplains

Base Map Features

- Interstate Highway
- State Highway
- County Highway
- Local Road
- MCD Boundary
- Major Surface Water



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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.

This section outlines the general goals to be achieved through the implementation of the City of Sheboygan 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 City's hazard mitigation goals to make the City safer and better prepared for disasters.

This chapter includes a discussion of the mitigation efforts that are currently underway, the City's plan to implement the mitigation actions, an assessment of the City'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 response personnel as general guidelines to address the needs identified by the natural hazard risk assessment. The goals are broad in order to apply to all of the natural hazards addressed in the plan. These goals were updated to be consistent with the Sheboygan County hazard mitigation plan.

- Goal #1 Implement policies and programs 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 Enhance enforcement measures to reduce the impacts of hazards on people and property.
- Goal #5 Enhance 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 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.

COMPLETED MITIGATION ACTIONS

Since the preparation of the 2005 hazard mitigation plan for the City of Sheboygan, some of mitigation actions identified in the action plan have been completed. The following lists those actions that have been completed in the City of Sheboygan.

- Topographical Maps of Sheboygan County have been completed along with LIDAR (Light Detection and Ranging) data available for the City.
- Flood Insurance Rate Map (FIRM) Amendments and Revisions have been completed for the City.
- Geographic Information System (GIS) coverage has been completed for the City.

MITIGATION ACTION PLAN

Mitigation actions form the core of the mitigation plan. Table 8 illustrates the mitigation action plan developed for Sheboygan County and all participating jurisdictions. The table lists the hazard type, associated mitigation actions, the estimated costs of each project (where known), responsible agencies, the project timetable, and possible 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.

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.

Table 8: Hazard Mitigation Action Plan, 2011

Project	Priority	Project Timetable	Estimated Cost	Responsible Party
All Hazards				
Emergency Power Generators at Critical Facilities	High	Ongoing	Costs to be Determined	Individual owners of critical facilities (potential for grant funding).
Reinstate Local Emergency Planning Committee (LEPC)	High	2010	Minimal, Covered by Existing Annual Budgets	City of Sheboygan Mayor's Office, City Council
Disaster Preparedness	High	Ongoing	Covered by Existing Annual Budgets	City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, Sheboygan County Emergency Management
Joint City/County Emergency Dispatch Facility (hardened)	High	2010-2015	\$3-5 million	City of Sheboygan, Sheboygan County
Geo-Notifier ("Reverse 911") Public Notification System	Medium	2010-2015	\$1 per capita annually	City of Sheboygan, Sheboygan County Emergency Management, local communities
Flooding				
National Flood Insurance Program*	High	Ongoing	Covered by Existing Annual Budgets	City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, FEMA
Preservation of Natural Resources in Floodplains	High	Ongoing	Covered by Existing Annual Budgets	City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, Sheboygan County Planning
Flood Forecasting, Warning Systems, Emergency Plans	Medium	Ongoing	Covered by Existing Annual Budgets	National Weather Service, City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, Sheboygan County Emergency Management
Floodproofing Techniques*	Medium	Ongoing	Costs to be Determined	City of Sheboygan

Table 8: Hazard Mitigation Action Plan, 2011 (continued)

Project	Priority	Project Timetable	Estimated Cost	Responsible Party
Flooding (cont.)				
Stormwater Detention (see City of Sheboygan Stormwater Management Plan)	Medium	2010-2015	Costs detailed in Stormwater Management Plan	City of Sheboygan Department of Public Works
Incorporation of Floodplain Management in Comprehensive Plan Updates*	Medium	Ongoing	Covered by Comprehensive Planning Grants (WDOA)	City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, Sheboygan County Planning
Inform Property Owners in cases where property is located in the 100 Year Floodplain*	Medium	Ongoing	Covered by Existing Annual Budgets	City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, Sheboygan County Planning
Reevaluation of Floodplain Zoning Ordinances*	Medium	Ongoing	Covered by Existing Annual Budgets	City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, Sheboygan County Planning
Acquisition and Relocation*	Medium	Ongoing	Costs to be Determined	City of Sheboygan
Annual Review of Flood Mitigation Plan*	Medium	Ongoing	Covered by Existing Annual Budgets	City of Sheboygan
Complete Hydrology Study of Sheboygan County (Currently only have parts of county at this time.)*	Low	2010 - 2015	Costs to be Determined	Sheboygan County (Planning, land information, Emergency Management), Wisconsin Department of Natural Resources
Lightning Storms and Thunderstorms				
Review Critical Facilities for Lightning Improvements Needs	Medium	Ongoing	Covered by Existing Annual Budgets	City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, Sheboygan County Planning
Lightning Safety Guidelines	Low	Ongoing	Costs to be Determined	Emergency Response agencies, National Weather Service

Table 8: Hazard Mitigation Action Plan, 2011 (continued)

Project	Priority	Project Timetable	Estimated Cost	Responsible Party
Tornadoes and High Winds				
Identification of Emergency Shelter Locations	High	Ongoing	Covered by Existing Annual Budgets	Municipal and County Emergency Management, American Red Cross
Identification of Emergency Shelter Deficit Locations	Medium	Ongoing	Covered by Existing Annual Budgets	Municipal and County Emergency Management, American Red Cross
Encourage Use of Tie-Downs with Ground Anchors for Manufactured Homes and Mobile Homes	Medium	Ongoing	Covered by Existing Annual Budgets	City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, Sheboygan County Planning
Enhanced Construction Standards and Techniques	Low	Ongoing	Covered by Existing Annual Budgets	City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, Sheboygan County Planning
Extreme Heat				
Publicity of Extreme Heat Events	Medium	Ongoing	Covered by Existing Annual Budgets	Sheboygan County Emergency Management, City of Sheboygan Mayor's Office, local news media
Supplies for Vulnerable Populations	Low	Ongoing	Costs to be Determined	City of Sheboygan Planning & Development, local non-profit organizations (American Red Cross, Salvation Army, etc.), Sheboygan County Health and Human Services

Table 8: Hazard Mitigation Action Plan, 2011 (continued)

Project	Priority	Project Timetable	Estimated Cost	Responsible Party
Winter Storms				
Priority Policy for Salting and Plowing Roadways	High	Ongoing	Covered by Existing Annual Budgets	City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson and Sheboygan County Highway Department
Add a Salt Storage Facility	High	2012	~\$500,000	City of Sheboygan Department of Public Works
Promote Winter Storm Hazard Awareness	Medium	Ongoing	Covered by Existing Annual Budgets	Sheboygan County Emergency Management, City of Sheboygan, Village of Kohler, Town of Sheboygan, Town of Wilson, local non-profit organizations, local news media
Extreme Cold				
Publicity of Extreme Cold Events	Medium	Ongoing	Covered by Existing Annual Budgets	Sheboygan County Emergency Management, City of Sheboygan Mayor's Office, local news media
Fog				
Publicity of Fog Events	Medium	Ongoing	Covered by Existing Annual Budgets	Sheboygan County Emergency Management, City of Sheboygan Mayor's Office, local news media

Note: The actions items that address NIFP compliance are indicated with an asterisks (*).

Policies, Programs, and Resources for Mitigation

The City of Sheboygan 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 8), and include the following;

- Planning and Development
 - Relevant policies and programs include planning and zoning (including shoreland and floodplain management), and housing rehabilitation.
- Public Works
 - Relevant policies and programs include street maintenance, stormwater management, and management of salt storage for winter storms.
- Fire Department
 - Relevant policies and programs include coordinating emergency preparedness, mitigation, response, and recovery efforts.
- Mayor's Office
 - Relevant policies and programs include performing the executive function of the City, acting as the chief administrative officer, and directing the work of the Department Heads to oversee the administrative functions of the City.
- Sheboygan County Emergency Management
 - Relevant policies and programs include coordinating effective disaster response and recovery efforts in support of local government through planning, training, and exercises.
- Sheboygan County Planning Department
 - Relevant policies and programs include planning and zoning (including enforcement of county shoreland and floodplain management regulations).
- Wisconsin Department of Natural Resources
 - Relevant policies and programs include regulation enforcement of state shoreland and floodplain management rules.

These authorities have the ability to expand or modify their programs when needed to improve existing tools to address mitigation. The City of Sheboygan and Sheboygan County have 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

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 grant programs available to the City of Sheboygan, or other entities seeking to carry out hazard mitigation actions, in funding future mitigation actions identified in this plan:

Federal Programs

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 nonaffiliated emergency medical services organizations. The AFG program has 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.

Great Lakes Restoration Initiative

The Great Lakes Restoration Initiative (GLRI) grant program of the U.S. EPA has five focus areas: cleaning up toxics and areas of concern; combating invasive species; promoting nearshore health by protecting watersheds from polluted run-off; restoring wetlands and other habitats; and working with partners on outreach. While these focus areas are not specifically targeted at hazard mitigation, many project may address a focus area while also mitigating hazards in Great Lakes' coastal communities.

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

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

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.

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CHAPTER 5 – PLAN MAINTENANCE AND ADOPTION PROCESS

PLAN ADOPTION PROCESS

The *City of Sheboygan All Hazards Mitigation Plan* development process was guided by the City of Sheboygan County Hazard Mitigation Plan Steering Committee (Steering Committee) over a 18-month timeframe, with professional planning support from the Bay-Lake Regional Planning Commission. A list of Steering Committee members is located in Table 2 of this document.

Both Wisconsin Emergency Management (WEM) and FEMA reviewed a final draft of the City's hazard mitigation plan prior to adoption by the Sheboygan City Council. Comments received from WEM and FEMA were reviewed by the Steering Committee and necessary revisions were made. The plan was then adopted by resolution by the Sheboygan City Council on March 19, 2012. The resolution adopting the plan can be found on page iii, just after the *Table of Contents*. After the plan was adopted by the Sheboygan City Council, it was forwarded to WEM and FEMA for final approval.

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 *City of Sheboygan All Hazard Mitigation Plan* is an update to the 2005 plan and has been developed as an addendum to the *Sheboygan County All Hazards Mitigation Plan*. As a result, this plan will be updated in approximately 2013 with the County plan, and will become fully integrated with the county plan at that time.

The *Sheboygan County All Hazards Mitigation Plan* (including the *City of Sheboygan All Hazard Mitigation Plan* addendum) will be monitored, evaluated, and updated by Sheboygan County Emergency Management.

Every five years, the *Sheboygan County All Hazards Mitigation Plan* will be comprehensively reviewed, and fully updated. This 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 should be comprehensive, and should 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. At that time, the Sheboygan County Emergency Management Coordinator shall propose an updated All Hazards Mitigation Plan Steering Committee and process for Sheboygan County Board of Supervisors approval. Plan update steering committee meetings 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 (as determined by the Steering Committee), a special post-disaster review will occur. Information concerning the disaster shall be collected by the Sheboygan County Emergency Management Coordinator 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 Committees for the County and City plan will analyze factors which contributed to any impacts of the hazard event, the likelihood of the event recurring, and any strategies that should be implemented to mitigate the impacts in the event of a recurrence. The Steering Committee Chair will have primary responsibility for establishing post-disaster review meeting dates, distributing related materials and facilitating the meetings. The Steering Committee Chair will also advertise these special meetings to affected city department heads, 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 (including the City of Sheboygan addendum) based on what is learned in the review process. Any recommended changes to the plan shall be forwarded to the Sheboygan County Board of Supervisors for its action and consideration.

PLAN COORDINATION

To maximize coordination with other related plans for the City of Sheboygan, mitigation strategies recommended in this plan have been and should continue to be considered when developing the following plans:

- City of Sheboygan comprehensive plan
- City of Sheboygan capital improvement plans
- City of Sheboygan stormwater management plan
- City of Sheboygan flood mitigation plan

Incorporated Plans, Studies, Reports and Technical Data

A number of plans, reports, and technical data were referenced and incorporated into the *City of Sheboygan Natural Hazards 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 (2000 and 2010);
- Bay-Lake Regional Planning Commission land use inventory data (2009);
- *Resource Guide to All Hazards Mitigation Planning in Wisconsin* (AWRPC, 2003);
- Local Hazard Mitigation Plan Review Crosswalk, Completed for the City of Sheboygan in 2005
- State of Wisconsin Hazard Mitigation Plan (2008)
- FEMA Local Multi-Hazard Mitigation Planning Guidance and Plan Review Crosswalk (2008)
- National Oceanic and Atmospheric Administration (NOAA) – National Climatic Data Center – severe weather event data (1995 – April 2011);

- U.S. Geological Survey maps on landslides, land subsidence and earthquakes;
- City of Sheboygan Flood Mitigation Plan (2000);
- FEMA Flood Insurance Studies (for the City of Sheboygan and surrounding areas in Sheboygan County)(1991);
- FEMA Flood Insurance Rate Maps (FIRMs);
- Parcel data from the City of Sheboygan and Sheboygan County;
- Assessed valuation data from the City of Sheboygan and Sheboygan County;
- Sheboygan County Emergency Operations Plan (2010);
- City of Sheboygan Comprehensive Plan (2001 and 2011 Draft);
- FEMA Mitigation Ideas: Possible Mitigation Measures by Hazard Type (2002)

It is recommended that similar materials be referenced when completing any updates to this or Sheboygan County's *hazard mitigation plan*.

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APPENDIX A – MEETING SIGN-IN SHEETS AND MINUTES

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February 24, 2011

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City of Sheboygan Hazard Mitigation Plan - Steering Committee Meeting

February 24, 2011

Sheboygan City Hall

10:00 a.m. – 11:30 a.m.

Steering Committee Members Present:

Angela Pierce – Bay-Lake Regional Planning Commission
Roxanne Kahan – Red Cross, Scenic Shores Chapter
Chuck Butler – Sheboygan Fire Department
Major Alan Hellstrom – Sheboygan Salvation Army
Richard Miller Facilities – Aurora Sheboygan Memorial Medical Center
David Biebel – City of Sheboygan Public Works
Joe Trueblood – Sheboygan Water Utility
Ted Vallis – Wisconsin Public Service Corp.
Marcus Evans – U.S. Coast Guard, Sheboygan Station
James Schwinn – Town of Sheboygan

- Introductions were made and a list of the steering committee members was handed out.
- An overview of the hazard mitigation planning process and plan content was provided along with some informational handouts. The current (2005) hazard mitigation plan for the city was passed around. The plan is available for download here: <http://www.baylakerpc.org/natural-resources/hazard-mitigation-planning>.
- It was explained that the hazard mitigation plan update for the City will be developed as an addendum to the County hazard mitigation plan. Thereby enabling the City's plan to become part of the County's plan when they undertake their next update in a couple years. By doing this, the City will maintain all the same eligibility for FEMA grant funding and input into the County plan without the need to undertake the process on their own.
- The project schedule and expectations of the steering committee was reviewed and discussed. There will be approximately six more meetings of the steering committee and two public meetings. The steering committee will develop the critical facilities list, the mitigation action plan, and review the plan chapters.
- It was discussed that rather than re-evaluate the hazard risks and ratings from the 2005 plan, the hazard risks and ratings from the County hazard mitigation plan will be used to allow easier integration of the City's update into the County's plan.

- A hand-out listing the critical facilities identified in the 2005 plan was reviewed. Some changes were made, but mostly the committee decided they would rather receive the spreadsheet digitally and provide comments back to Angela. The Steering Committee will continue to work on the critical facilities list at the next meeting.
- A hand-out listing the mitigation strategies outlined in the 2005 plan was reviewed and some updates were made to projects, target dates, costs, and responsible parties. A hand-out of examples of mitigation projects was provided to help the committee think about additional projects that they would like to add. The Steering Committee will continue to work on the mitigation action plan at the next meeting.
- The next meeting will be scheduled based on the greatest availability determined by using a Doodle poll.

April 5, 2011

[illegible]

City of Sheboygan Hazard Mitigation Plan - Steering Committee Meeting

April 5, 2011

Sheboygan City Hall

1:00 p.m. – 3:00 p.m.

Steering Committee Members Present:

Angela Pierce – Bay-Lake Regional Planning Commission
Chuck Butler – Sheboygan Fire Department
Richard Miller – Aurora Sheboygan Memorial Medical Center
David Biebel – City of Sheboygan Public Works
Joe Trueblood – Sheboygan Water Utility
James Schwinn – Town of Sheboygan
Bob Wallace – Sheboygan Police
David Gartman – Town of Wilson
Steve Steinhardt – Sheboygan County Emergency Management
Darryl Emrath – US Coast Guard
Bruce Neerhof – Village of Kohler
Laura Gumm – Alliant Energy
Mayor Bob Ryan – City of Sheboygan
Chad Pelishek – City of Sheboygan Development

- Introductions were made and notes from the previous meeting were reviewed.
- The steering committee reviewed the 2005 goals identified for the city's hazard mitigation plan and compared them to the goals identified for the county's hazard mitigation plan. The committee decided to modify the goals in the city plan to be consistent with the county's plan.
- A list of critical facilities identified in the 2005 plan were reviewed. Some updates were made. Additional information will be acquired and reviewed again at the next meeting.
- The updated mitigation strategies list was reviewed and some updates/additional were made to projects, target dates, costs, and responsible parties. The changes will be made and the mitigation action plan will be reviewed at the next meeting.
- The steering committee discussed the public informational meeting and it was decided that A. Pierce will schedule a meeting and inform the committee of the date. A public open house on the project will be held once the critical facilities and mitigation action plan are ready to be presented.
- The next meeting will be scheduled based on the greatest availability determined by using a Doodle poll.

May 19, 2011

1

City of Sheboygan Hazard Mitigation Plan - Steering Committee Meeting

May 19, 2011
Sheboygan City Hall
1:00 p.m. – 3:00 p.m.

Steering Committee Members Present:

Angela Pierce – Bay-Lake Regional Planning Commission
Steve Smith – St. Nicholas Hospital
Chuck Butler – Sheboygan Fire Department
Jim Schwinn – Town of Sheboygan
Bob Wallace – Sheboygan Police
Dave Albright – Sheboygan Area School District
David Gartman – Town of Wilson
Steve Steinhardt – Sheboygan County Emergency Management
Travis Waack – American Red Cross
Bruce Neerhof – Village of Kohler
Laura Gumm – Alliant Energy
Roxanne Kahan – American Red Cross

- Introductions were made and notes from the previous meeting were reviewed.
- The steering committee reviewed the updated mitigation strategies. No further changes have been proposed. The mitigation list is ready to be finalized.
- The list of critical facilities for the plan was reviewed. Some updates were made. Additional information will be acquired and finalized at the next meeting.
- The next steps for the plan will include a public meeting to review the mitigation strategies identified. The public meeting will be scheduled for sometime in July. Future meetings will center on reviewing the draft plan.
- The next meeting will be scheduled for later in the summer to early fall (using a Doodle poll) to allow time for the plan to be drafted for steering committee review.

[illegible]

City of Sheboygan Hazard Mitigation Plan - Steering Committee Meeting

August 15, 2011
Sheboygan City Hall
1:00 p.m. – 3:00 p.m.

Steering Committee Members Present:

Angela Pierce – Bay-Lake Regional Planning Commission
Steve Smith – St. Nicholas Hospital
James Schwinn – Town of Sheboygan
Bob Wallace – Sheboygan Police
Dave Albright – Sheboygan Area School District
Steve Steinhardt – Sheboygan County Emergency Management
Bob Ryan – Mayor, City of Sheboygan
Bruce Neerhof – Village of Kohler
Laura Gumm – Alliant Energy
Roxanne Kahan – American Red Cross

- Introductions were made and notes from the previous meeting were reviewed.
- A. Pierce reviewed through the draft plan and noted comments by the steering committee.
 - Suggested changes included editorial corrections.
 - Suggested looking into information on the link between extreme heat and air quality impacts.
 - Additionally, the committee is interested in getting a list of the industries located in the floodplain. This information would not be included in the plan, but would be used to follow up with those industries that have chemicals stored on site that could be compromised during a flood.
- Information was provided about the public information meeting that is scheduled for August 30, 2011 at 4PM at the Mead Public Library in Sheboygan.
- The next steps for the plan will include revising the draft to reflect the comments from the steering committee and the public, then submitting the revised draft to Wisconsin Emergency Management (WEM) for initial review. Any suggested changes received from WEM will be brought to the steering committee for review.
- The next meeting will be scheduled sometime after comments are received back from WEM.

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APPENDIX B – PLAN REVIEW TOOL (“CROSSWALK”)

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APPENDIX A:

LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: City of Sheboygan	Title of Plan: City of Sheboygan Natural hazards Mitigation Plan Update	Date of Plan: December, 2011
Local Point of Contact: David Biebel	Address: 2026 New Jersey Avenue Sheboygan, Wisconsin 53081	
Title: Deputy Director		
Agency: Sheboygan Department of Public Works		
Phone Number: 920-459-3440	E-Mail: dbiebel@ci.sheboygan.wi.us	

State Reviewer: Katie Sommers	Title: Disaster Response and Recovery Planner	Date: December 28, 2011
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FEMA Reviewer: Tom Smith	Title: Community Planner	Date: February 8, 2012
Date Received in FEMA Region (insert #)	January 4, 2012	
Plan Not Approved		
Plan Approvable Pending Adoption	February 8, 2012	
Plan Approved		

**SECTION 1:
REGULATION CHECKLIST**

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Chapter 1, pp. 2-6	X		
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Chapter 1, page 5	X		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Chapter 1, pp. 5-6	X		
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Chapter 5, pp. 2-3	X		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Chapter 5, pp. 1-2	X		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Chapter 5, pp. 1-2	X		
<u>ELEMENT A: REQUIRED REVISIONS</u>				

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Chapter 3, pp. 5-30	X		
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Chapter 3, pp. 5-30 And Chapter 3, Table 7, page 5.	X		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Chapter 3, pp. 5-30	X		
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Chapter 3, page 7	X		
<u>ELEMENT B: REQUIRED REVISIONS</u>				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Chapter 4, pp. 7	X		
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Chapter 3, page 9.	X		
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Chapter 4, pp. 1-2	X		
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Chapter 4, Table 8, pp. 3-6	X		
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Chapter 4, page 2	X		
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Chapter 5, page 2	X		
<u>ELEMENT C: REQUIRED REVISIONS</u>				

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Chapter 2, page 5 and Chapter 3, pp. 8-9	X		
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Chapter 4, page 2	X		
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	More coordination with county plan. Previous plan focused on flood risks. Table 1, page 2	X		
ELEMENT D: REQUIRED REVISIONS				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Pending FEMA review			X
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Pending FEMA review.			X
ELEMENT E: REQUIRED REVISIONS				
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)				
F1.				
F2.				
ELEMENT F: REQUIRED REVISIONS				

SECTION 2: PLAN ASSESSMENT

Plan Strengths

1. **Strong Mapping.** The plan includes maps indicating the location of critical facilities; floodplain boundaries; properties potentially impacted by flooding; and bridges potentially impacted by flooding. These maps help to clarify the community assets and community flood risks.
2. **Identification of Mitigation Funding Resources.** The plan includes a valuable description of potential federal and state grant programs for supporting local mitigation efforts. (see Chapter 4, pp. 7-8)
3. **Hazard Impacts.** The plan includes some estimates of potential losses from different hazards based on the property damage observed during past events. It is estimated that “over \$49,845,100 (in current dollars) in losses would occur with the 100-year flood in a “worst case scenario” of total structural damage for buildings in all of the flood zones of the planning area.” The plan identifies 224 buildings could potentially be impacted by the base flood in the planning area. Of these structures, 202 structures are residential structures, 12 structures are commercial structures, five structures are manufacturing structures, two structures are related to recreation uses, two structures are public buildings, and one structure is related to educational uses.
4. **Hazard Mitigation Strategies.** The plan includes important long-term strategies for hazard mitigation. These include protection of natural resources within flood plains; improvements to storm water management programs; updating floodplain zoning ordinances; and incorporation of floodplain maps into the City’s comprehensive plan.

Opportunities for Improvement

1. **Coordination with Comprehensive Plan.** According to the City of Sheboygan website, the City’s is nearing completion of a comprehensive plan update. The draft comprehensive plan indicates that the City will include flood hazard maps similar to those used in the hazard mitigation plan. **We strongly encourage this coordination.** If possible, we would encourage incorporation of those flood hazard maps used in the City’s hazard mitigation plan into the City’s comprehensive plan. We would also recommend that the comprehensive plan reference the risks to homes and critical facilities from flooding and the potential property damage associated with a 1% chance flood.

Bay-Lake Regional Planning Commission

2012

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